CANADIAN PUBLIC HEALTH ASSOCIATION

The Voice of Public Health

TOBACCO AND VAPING USE IN CANADA

Moving Forward

POSITION STATEMENT | MAY 2021

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OUR MISSION
To enhance the health of all people and communities in Canada, particularly those who are structurally disadvantaged, and to contribute to a healthier and more equitable world

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Tobacco and Vaping Use in Canada: Moving Forward

In December 2011, CPHA released a position statement entitled *The Winnable Battle: Ending Tobacco Use in Canada*[1] that called on all levels of government to take the steps necessary to eliminate tobacco consumption in Canada. Appendix 1 presents the recommendations provided in that statement. Since then, all levels of government have taken significant actions to reduce the prevalence of smoking. After 10 years, it is time to review the results of these efforts, assess the current situation and provide recommendations that may lead to further reductions in tobacco consumption.

When the 2011 position statement was developed, vaping* products had limited entry into the Canadian marketplace, and their potential health effects were poorly understood. In 2018, more was known and CPHA released a position statement entitled *A Public Health Approach to Nicotine-containing Vaping Devices,*[2] which provided recommendations (Appendix 2) concerning their regulation. Since the release of that statement, nicotine-containing e-cigarettes were legalized (2019) and regulated, and a significant body of information has developed concerning the use of vaping products. That information must be considered as steps are proposed to regulate further the sale of vaping devices.

The challenge is to recognize the differences and similarities between tobacco and vaping products and understand their differing health and health equity implications. It is also necessary to recognize the success achieved to date in reducing smoking prevalence, and the challenges associated with making further progress. Understanding these challenges will lead to options that address the current needs of those who are more susceptible to tobacco consumption and nicotine addiction.

ACKNOWLEDGEMENT

CPHA recognizes that tobacco is an integral part of First Nations culture in many parts of Canada. It is used in ritual, ceremony and prayer, and is considered a sacred plant with immense healing and spiritual benefits. It is important not to confuse traditional tobacco and its sacred uses with the commercial use of tobacco. The latter use is the subject of this position statement.

HEALTH EQUITY IMPACT ASSESSMENT

In accordance with current administrative policy, a Health Equity Impact Assessment (HEIA) was conducted on this position statement prior to final approval by CPHA's Board using the methodology that was approved in December 2019. The assessment was conducted by a group of three volunteers from within CPHA's membership who had not participated in the development of the statement. The Association thanks these members for their work.

* Vaping is the action or practice of inhaling and exhaling the vapour produced by an electronic cigarette or similar device. The vapour is composed of a carrying fluid with or without nicotine and flavourings.

RECOMMENDATIONS

CPHA calls on federal, provincial, territorial and municipal governments in Canada to take the following actions:

Tobacco Consumption

- Improve routine surveillance to better understand the prevalence of tobacco use in Canada and its structural, social, demographic and economic underpinnings;
  - Develop and implement surveillance tools specific for structurally disadvantaged* populations;
- Maintain existing federal laws, regulations, taxation practices, and labelling requirements for tobacco products;
- Maintain provincial and territorial laws and regulations, and municipal by-laws concerning tobacco consumption;
- Develop integrated evidence-informed federal, provincial and territorial approaches and whole-of-government considerations to reducing tobacco consumption in Canada;
- Evaluate existing and planned health promotion and smoking cessation programs to assess their effectiveness at the population level. Expand those programs that work, test and implement those that might work, and eliminate those that do not work;
- Evaluate the current and planned regulatory approaches used to reduce the prevalence of tobacco consumption (e.g., labelling, plain packaging, etc.) to determine their likelihood for current and future success as tools for reducing tobacco consumption. Keep those that work and eliminate those that do not;
- Conduct economic analyses concerning the effectiveness of taxation as a tool for tobacco consumption cessation and its equity implications;
- Develop targeted, culturally-responsive† health promotion and smoking cessation approaches for those most likely to consume tobacco; and
- Increase research funding that targets understanding the psychological, social, economic and demographic influences that result in increased prevalence of tobacco use.

Vaping Products

- Improve routine surveillance to better understand the extent of vaping, and the structural, social, economic and demographic influences that result in people using vaping products;
- Develop and implement surveillance tools specific for structurally disadvantaged populations;
- Support research concerning:
  - the health effects of vaping nicotine-containing and nicotine-free products;
  - the effect of secondhand inhalation of vaping by-products;
  - the factors that lead youth to vape;
  - the likelihood of vaping leading to tobacco consumption;
  - the potential for vaping products as smoking cessation interventions and/or harm reduction tools;
- Develop prevention and cessation programs targeted to and developed by youth; and
- Evaluate existing programs to reduce vaping activities for the population-level effectiveness, and adjust them as necessary to improve success.

* Structural disadvantage refers to the disadvantage experienced by some individuals, families, groups or communities because of the way society functions (how resources are distributed, how people relate to each other, who has power, and how institutions are organised).

† Cultural responsiveness is the ability to learn from and relate respectfully with people of your own culture as well as those from other cultures. Individuals are required to be culturally competent, which means having an awareness of one's own cultural identity, views about difference with other cultures, and the ability to learn and build on the varying cultural and community norms within a sphere of practice. It is most often used to describe teaching approaches and pedagogy.

CONTEXT

Both tobacco products and nicotine-containing vaping devices can result in nicotine addiction. The two delivery methods, however, have differing health and social implications. As such, the health implications and regulation of tobacco and vaping products are considered separately. The discussion will focus on the federal perspective, knowing that provinces, territories and municipalities have undertaken significant actions to reduce the prevalence of tobacco consumption and vaping product use among those living in Canada.

TOBACCO CONTROL

Background

Tobacco control in Canada was introduced to limit the direct and indirect effects of smoking on people's health, thereby reducing suffering, death and health care costs. Lung cancer (one disease with a causal relation to smoking tobacco) was rare prior to the 20th century, but with the increase in cigarette smoking in that century, there was well-documented growth in the rate of lung cancer.[3] Some small-scale, retrospective studies identified the possible link between smoking and lung cancer in the late 1940s, but it was not until the early 1950s when data from two large prospective cohort studies substantiated this relationship.[4] A subsequent report in 1962 by the Royal College of Physicians of London further described smoking's link with a number of diseases and premature death.[5] Since then, the health effects of tobacco consumption have been documented,[6] as have the effects of second-hand smoke.[7]

Tobacco control efforts in Canada have continued unabated since the 1960s. The Canadian Cancer Society[8] has developed a timeline of these efforts, while Table 1 provides some of the more salient events.

Internationally, the World Health Organization's (WHO) Framework Convention on Tobacco Control (FCTC) was implemented in 2005. This document describes the baseline mechanisms and approaches that WHO believes are necessary to strengthen tobacco control. In particular, Article 5.3 stipulates that the development of public health policies should be protected from commercial and other vested interests of the tobacco industry. There are currently 180 signatories to the FCTC, including Canada.[11]

Table 1 Timeline of Select Tobacco Control Initiatives in Canada[8-10]

Year	Federal Tobacco Control Initiatives
1969	A recommendation to ban tobacco advertising and include health warnings on packages by the House of Commons Standing Committee on Health, Welfare, and Social Affairs
1988	Passage of the *Tobacco Products Control Act* which introduced a ban on tobacco advertising
1989	Introduction of health warnings covering 20% of the front and back sides of packages
1991	Largest increase in federal tobacco taxes in Canada to that date ($6 per carton)
1993	Passage of the *Tobacco Sales to Young Persons Act* increased the minimum age to purchase tobacco from 16 to 18 years
2000	Introduction of graphic health warnings that cover 50% of the front and back sides of the package
2001-2011	Launch of *Federal Tobacco Control Strategy* (first multi-year strategy)
2012-2018	Renewal of the *Federal Tobacco Control Strategy*
2018	Passage of the *Tobacco and Vaping Products Act*
2019	Introduction of *Canada's Tobacco Strategy* with a goal of reducing tobacco use to below 5% by 2035
2019	Regulations for plain and standardized packaging for tobacco products promulgated with implementation in 2020

Canadian Legislation and Regulation

A matrix of federal, provincial and territorial (FPT) acts and regulations have been promulgated to reduce the prevalence of tobacco consumption in Canada, while municipal by-laws augment the provincial and territorial (PT) legislation and regulation. The Canadian Cancer Society has developed an overview, to 2017, of the FPT legislation and regulations.[12] PT legislation and regulation address a range of activities including health promotion and smoking cessation programs, restrictions of where smoking may occur, limitations on the sale of and access to tobacco products, and PT taxation. Federal legislation further supports health promotion and smoking cessation programming, while limiting smoking in federally-regulated locations, limiting advertising, packaging and labelling of tobacco products, prohibiting the use of flavourings, and taxation.

Since 2017, the federal government has instituted two measures to strengthen tobacco control in Canada: promulgation of the *Tobacco and Vaping Products Act*, including regulations concerning plain and standardized packaging; and implementation of *Canada's Tobacco Strategy*,[13] which is supported by a $330 million funding allocation over five years. The goal of the strategy is to reduce tobacco use to less than 5% by 2035 with programs to:[14]

- Help Canadians quit tobacco;
- Protect youth and non-tobacco-users from nicotine addiction;
- Support Indigenous groups to develop specific plans for Indigenous Peoples; and
- Strengthen science, surveillance and partnerships.

The current strategy also notes that tobacco use is not equal among the population thereby causing health and social inequities, and committed to reaching those groups of Canadians who have higher tobacco usage rates.

A horizontal evaluation of the 2001-2011 Federal Tobacco Control Strategy[15] noted that the prevalence of smoking had declined significantly over the duration of the Strategy and was among the lowest in higher income countries. The evaluation also noted that a "stretch" target of 12% smoking prevalence rate among adults was not met (the daily smoking prevalence rate in 2012 was 13%) while the target of a 9% prevalence rate for youth smoking was met. Furthermore, by 2007, all provinces had developed Acts that enhanced what was once only federal legislation in the area, and PT spending on tobacco control strategies had more than doubled. The evaluation also recognized that the federal government had distinct responsibilities in this area. Other points considered were:

- The small contribution to the decline in smoking caused by labelling and youth access regulations;
- Federal support of the second-hand smoking bans at the PT level;
- The effect of external influences as predictors of smoking participation and tobacco consumption (i.e., level of education achieved, and PT and excise taxes); and
- Effect of retail display bans and the legal age for purchase of cigarettes.

An evaluation was also conducted of the Federal Tobacco Control Strategy for the period 2012-2016.[16] The results included a recognition of the continued need for federal activities to reduce the prevalence of tobacco consumption, and that these responsibilities were in alignment with government priorities and federal roles and responsibilities. The evaluation also noted that progress was being made to reduce the prevalence of smoking, but had slowed. In addition, the lack of a prevalence target made it difficult to measure overall success although many activities appeared to be achieving improvements in their areas of concern. Four overarching recommendations included:

- Explore the setting of (realistic) targets for the reduction of smoking prevalence rates, both for

the general population and populations with higher tobacco use rates;
- Identify and articulate the areas for federal leadership in tobacco control, particularly in light of the existing provincial, territorial and municipal responsibilities;
- Explore options for regulating new and emerging tobacco control issues; and
- Examine the feasibility of integrated reporting (with PTs) on contraband tobacco to facilitate Canada-wide analysis.

Tobacco Use and its Costs

Health Canada and Statistics Canada conduct national surveys (the Canadian Community Health Survey (CCHS) and the Canadian Tobacco, Alcohol and Drugs Survey (CTADS)) concerning the prevalence of tobacco use in Canada. It should be noted that the CCHS and CTADS results will vary due to differing methodologies. In addition, CTADS focuses on the 10 provinces, while the CCHS includes information for the PTs. In addition, the data collection methodologies do not include gathering information concerning ethnicity/racialization or socio-economic status thereby limiting its applicability for a health equity discussion. The Propel Centre for Population Health Impact (University of Waterloo, closed 2019) used these data to prepare reports entitled *Tobacco Use in Canada: Patterns and Trends*. The most recent version (2019) contains information up to 2017. Reports are also available for the preceding seven years.

Data concerning the costs and harms of substance use in Canada, including tobacco use, have been compiled by the Canadian Institute for Substance Use Research (University of Victoria) and the Canadian Centre on Substance Use and Addiction (CCSA), covering two periods: 2007-2014 (report dated 2018) and 2015-2017 (report dated 2019). The data in those two reports provide the basis for this section, and are supplemented, as necessary, with other more recently available information (e.g., the most recent results of CCHS and CTADS). Information concerning smoking among First Nations Peoples living on-reserve is found in the *First Nations Regional Health Survey*. These studies, however, use different methodologies, thus the results cannot be compared directly.

Current Status

Results from the CCHS are presented in Table 2. The CTADS results showed that 15.1% of the population used tobacco products in 2017, down from 31% in 2007, and below the global average (21.9%) and the average for the Americas (16.9%).[17] Of these individuals 10.8% smoked daily, while 4.3% were non-daily smokers. In 2018, 15.8% of the population were current smokers (10.9% smoked daily, and 4.9% non-daily smokers) while, in 2019, 14.8% (10% daily smokers and 4.8% non-daily smokers) were current smokers. In 2020, about 11% of Canadians reported being regular smokers.[18] As such, there is an apparent slowing of the reduction in the prevalence of tobacco-use over the period 2013-2017.[19]

Cigarettes were the most consumed tobacco product, while 1.9% of Canadians reported smoking cigars and cigarillos (little cigars) and 1% (15 years-of-age and older) reported using smokeless tobacco. In 2017, the daily average consumption was 13.7 cigarettes per day among daily smokers, unchanged from the 2015 estimate, but a decline of 3 cigarettes per day since 1999.

Table 2: Smoking rates in Canada based on CCHS data

Date	Percent Total Current Smokers	Percent Daily smokers
2013	19%	14%
2014	18%	13.5%
2015	18%	13%
2016	17%	12%
2017	16%	12%
2018	15.8%	10.9%
2019	14.8%	10.0%

In 2012, the economic costs in Canada associated with smoking included $6.5 billion in direct costs* and $9.5 billion in indirect costs.[20] Tobacco use was responsible for an estimated 45,464 deaths, leading to 599,390 potential-years-of-life-lost from premature mortality. Data from 2017 showed that tobacco use was the highest ranked risk factor resulting in death and disability in Canada, a position it also held in 2007; however, the disability-adjusted-life-years (DALY's) decreased by 0.7% over that period.[21] Lung cancer was the second leading cause of pre-mature death in Canada with an incidence that increased 5.3% from 2007 to 2017.[1] Similarly, 51% of substance-use-attributable-hospitalizations were the result of tobacco use with estimated health care costs of $6.1 billion in 2017.[22] The overall costs associated with tobacco use were $12 billion in 2014,[23] and $12.3 billion in 2017.[7] These data, however, are not directly comparable due to the differing methodologies used by the various studies. In addition, further examination of the data is required to understand who is smoking and why.

Age and Sex

In 1965, about 50% of the people living in Canada over 15 years old were current smokers (daily and occasional use). Since then, the prevalence of smoking for all age groups has declined steadily. Men throughout this period have a higher prevalence of current smoking than women (men: 16.7%; women: 13.5% in 2015). In 2018, roughly 4.9 million people living in Canada aged 12 years and older smoked cigarettes either daily or occasionally, with 18.6% of males and 13.0% of females smoking.[24] In 2015, adults 20-24 years old had the highest prevalence of current smoking (18.5%);[25] whereas in 2017 adults 45-54 years old had the highest prevalence (19.9%, an increase of 6.9% since 2015 for this age group),[19] while the prevalence of current smoking within the group aged 20-24 years had decreased to 16.0%. Results from a 2018 survey were similar to those from 2017.[19] Available information also showed that persons aged 50 to 64 years had a smoking prevalence of 18.4% for 2018 and 2019, while those over the age of 65 years had a smoking prevalence of 9.7% in 2018 and 9.1% in 2019.

Youth still access tobacco products in spite of the age restriction on the sale of tobacco products in their province or territory of residence. Overall, the prevalence of current smokers among students aged 11-14 years in 2014/15 was less than 2% and remained below 2% in 2016/17 (at 1% among youth in grades 7-9). For youth aged 15-19 years, the overall smoking prevalence was 7.9% in 2017 with age-specific differences ranging from as low as 4.1% among those aged 15 and 16 years to as high as 14.4% among 19 year olds. Students in grades 7-12 were included in the study, but it may not be representative of smoking prevalence among all youth as it did not include those who were absent from or had dropped out of school. In 2018, 3.2% of youth aged 12-17 years smoked, while over 15% of those aged 18-19 years smoked.[19] Among the 19-24 age group, the number of current smokers declined between 2015 and 2018 (from 20.4 to 18.6% for males; 15 to 13% for females). In 2020, 3% of those 15 to 19 years of age reported regular smoking.[18] Similarly, the number of 20-24 year olds who had never smoked a whole cigarette had increased from 57.9% in 2015 to 62.6% in 2018.[26]

An additional group of concern is women who smoke while pregnant, as smoking during pregnancy can result in stillbirth, premature birth, low birth weight and infant death. While Canadian data on the health care costs for these children are limited, one study from the United Kingdom showed that they had increased health care costs, which were largely driven by hospital in-patient care, from birth to five years-of-age. Similarly, there is limited current data available on smoking rates of pregnant women in Canada;

* Direct cost includes costs of inpatient care, outpatient visits, drugs and diagnostic tests as well as transportation costs. Indirect costs include productivity lost, the cost of premature retirement and morbidity costs.

however, studies conducted during the period 1992-1995 showed that approximately 22% of pregnant women smoked, while during the period 2005-2008 this rate decreased to 12%. In addition, 50% of those who started pregnancy as smokers quit by the third trimester, while about 50% of those who quit relapsed following birth.

The studies identified above used different methodologies, so the results may not be directly comparable. Certain trends, however, are evident, including:

- Tobacco consumption has decreased over the period of data collection, but these reductions appear to be slowing;
- More men than women smoke; and
- The prevalence of smoking increases among youth aged 17-19 years when compared to youth aged 15-16 years.

Provincial Differences

Smoking prevalence has decreased in all provinces since 1999 but significant variation in smoking prevalence exists among the provinces.[27] The largest declines noted were in Quebec (from 30.3% in 1999 to 15.7% in 2017) and Prince Edward Island (PEI) (from 25.6% in 1999 to 11.8% in 2017) while British Columbia had the lowest overall reduction in smoking prevalence (from 20% in 1999 to 15.6% in 2017). In 2017, PEI had the lowest prevalence (11.8%) while Newfoundland and Labrador had the highest (20.1%). Four provinces had smoking prevalence rates below the Canadian average (about 15% in 2018) including PEI, Ontario, New Brunswick, and Manitoba. Similarly, the average number of cigarettes consumed daily by smokers varied by province with Newfoundland and Labrador, Manitoba, Nova Scotia, British Columbia, and PEI having cigarette consumption rates above the national average.

Smoking prevalence among Canadian youth (15-19 years old) also varies by province. Four provinces fell below the Canadian average of 7.9% in 2017, including Alberta (7.0%), British Columbia (6.5%), Ontario (6.4%), and New Brunswick (5.8%). Saskatchewan had the highest smoking prevalence among youth at 21.9% followed by PEI (15.8%) and Manitoba (14.2%).[21]

The statistics outlined above, unless otherwise identified, are from the CTADS survey that does not include the smoking prevalence in the Canadian territories. Data from the CCHS, however, indicate that smoking rates among people over the age of 12 are consistently higher in the territories with rates of 13% for the Yukon, 25% for the Northwest Territories, and 57% for Nunavut during 2017/18.[28] Similar prevalence rates are evident in all age groups for the available time points in Nunavut.

Overall, the data shows that:

- More people living in the territories smoke than those in the provinces; and
- Four provinces have smoking prevalence lower than the Canadian average.

Tobacco Use by Specific Populations

In addition to the trends noted above, the available information shows that certain sub-populations have a higher prevalence of tobacco use.[29] These populations include:

- *Individuals diagnosed with a mental illness, but the prevalence differs by diagnosis*[30,31]

  In Canada, tobacco consumption rates ranged from 40% to 90% depending on the diagnosis with higher prevalence of use for people living with schizophrenia, mania and depression. Similarly, research from the United States notes that people living with mental health disorders have a higher likelihood of smoking because they are more likely to have stressful living conditions, lower annual household income, and limited access to cessation programs.[32]

- *Individuals who use cannabis, alcohol or other substances*[28]
  In Canada, smoking prevalence rates for those who use cannabis, or suffer from alcohol use disorder or substance use disorder are greater than those who do not.

- *Members of the LGBTQ2S+ community*[33]
  Smoking prevalence rates among this community in 2017 were estimated at between 25% and 55%, while in 2019 this rate was 35% for LGBTQ2S+ young adults (18 to 24 years-of-age) compared to 23% of heterosexual individuals in the same age group in Canada. Reasons presented for this elevated rate included:
  - Stigma, discrimination and oppression;
  - Social norms in the LGBTQ2S+ communities;
  - Targeted marketing from the tobacco industry; and
  - Access and adequacy of health services for the LGBTQ2S+ community.

- *Construction, mining, oil, and gas extraction workers, and transportation and warehousing workers*[22]
  Limited recent information is available for Canadian workers; however, a 1998 study showed that smoking prevalence and intensity were lowest among white-collar workers and highest among blue-collar workers.[34] This result was reaffirmed in a more recent study.[28] One study from the United States showed that tobacco smoking prevalence ranged from 11% in educational services workers to 34.3% for those working in construction and extraction industries.[35]

- *Incarcerated individuals*[36]
  Canadian federal prisons became smoke-free environments in 2008, but it is estimated that smoking rates among inmates, prior to incarceration, are between 50% and 93%. Reasons for these high rates are that many suffer from conditions that favour tobacco use such as substance use, psychiatric disorders, poor impulse control and low socioeconomic backgrounds.[37]

- *Individuals of lower socio-economic status (SES)*[38]
  Results from the 2017 CCHS showed that those in the first (lowest) household income quintile had a smoking prevalence in excess of 20% while those in the fifth (highest) quintile had a prevalence of less than 15%.[39]

- *Indigenous Peoples*[40]
  Results from the First Nations Regional Health Survey show that 53.5% of First Nations adults smoke cigarettes (40.3% smoked daily and 13.1% smoked occasionally) while adults smoked on average 11.6 cigarettes per day.[41] A study examining smoking among First Nations in Ontario provided similar results, where 50% of First Nations living on-reserve smoked compared to 43% living off-reserve. Similarly, 67% of young adults (20-29 years old) living on-reserve smoked compared to 47% of those who lived off-reserve.[42]

  In 2012, 75% of Inuit men and 74% of Inuit women aged 18 or older in Inuit Nunangat reported that they smoked. Most were daily smokers (64% of men and 64 % of women); while 11% of men, and 9% of women smoked occasionally.[43] Similarly, 92% of Inuit women who are pregnant have been shown to smoke.[44]

  Recent data for Métis people is limited, however, one publication from Ontario has shown that tobacco consumption declined significantly from 32% of the population in 2007 to 21% in 2012.[45]

Limited information is available concerning smoking prevalence among immigrant populations and refugees, although one analysis has shown that these populations had lower prevalence rates than non-immigrants, although data is not available to assess smoking prevalence according to ethnicity in Canada.[28]

Data from the United States also show that about 73% of those who experience homelessness smoke;[46] however, recent data for Canada is limited.

The underlying challenge is that to effectively support sub-populations in reducing their use of tobacco products, knowledge is required of the reasons why those individuals use tobacco. One study has shown that smoking is initiated as a result of psycho-social motives (i.e., perception of adulthood, having a background that favours smoking, having parents or a peer group who smoke) or as a result of a perception of limited success in society.[47] The activity is supported through pharmacological factors and then reinforcing behaviours within society. Further detail is provided elsewhere.[48] The question is whether the current approaches to tobacco cessation address the underlying reasons that individuals smoke, and continue to be effective in supporting those who wish to stop tobacco use.

Considerations

The current mix of approaches used to reduce the likelihood and prevalence of tobacco use range from health protection and promotion programs to limits on where smoking behaviours can take place. Overall, this mix of methods have proven successful, but limited information is available concerning the contribution of each component. A detailed analysis of the relative success of each component is required to better target future activities. Similarly, differences in smoking prevalence exist based on age, gender, geography, employment, Indigenous status and socio-economic status. Programs targeted to the needs of each group are required to reduce smoking prevalence among those sub-populations.

Within this cadre of actions, two tools have been core to federal smoking cessation activities: the labelling and packaging of smoking materials, and taxation. Both appear successful in the past, but require closer consideration moving forward.

Labelling and Packaging

For the purpose of this discussion, the use of graphic (visual) health warning labels (pictures of illness caused by smoking) and plain packaging (use of similar package shapes, colours and consistent fonts for product identification on packaging materials) are considered together.

Article 11 of the WHO FCTC requires each signatory to adopt and implement effective measures to prohibit misleading tobacco packaging and labelling. In addition, tobacco product packages should carry large health warnings and messages describing the harmful effects of tobacco use that cover 50% or more, but not less than 30%, of principal display areas. Article 13 addresses the use of plain packaging, noting that its purpose is to: reduce the attractiveness of tobacco products; eliminate the effects of tobacco packaging as a form of advertising and promotion; and increase the noticeability and effectiveness of health warnings.[49] A 2014 WHO evidence brief indicated that plain packaging reduces the attractiveness of the product, particularly to women and young people. It also shows that, when combined with large pictorial health warnings, plain-packaging measures increase awareness about the risks related to tobacco consumption, encouraging more people to quit and fewer to start.[50] These studies were generally for populations with higher smoking rates than found in Canada, and may not be fully applicable to the Canadian situation. A more recent systematic review has indicated that the evidence in support of plain packaging is "not strong."[51] A statistical analysis will be required to determine the contribution of plain packaging to reductions in smoking prevalence in Canada during the coming years.

Graphic warning labels have been required on cigarette packages sold in Canada since 1989, when they were to cover 20% of the package. The size of these warnings increased to 50% of the package in 2000 and 75% in 2012. The intent is to induce a fear response leading to increased motivation to quit smoking.[52] A comparison

of Canadian and United States packaging requirements supported this notion, although the effect of visual warnings diminished over time. The authors noted that pictorial warnings should change periodically.[53] A recent study also looked at the effect of socio-economic status on susceptibility to tobacco advertising. Exposure to multiple advertisements designed to evoke a negative response had greater effect on low-income participants than those of higher income, while hope-evoking advertisements had greater effect on those of high income but not lower.[54]

The studies noted above demonstrate short-term effect; however, limited information has been found concerning the long-term effectiveness of graphic warnings at inducing individuals to quit smoking in Canada. A proxy for such a longitudinal study may be to examine the change in smoking prevalence over time, paying specific attention to any deviation from the trend in prevalence for the years when graphic labelling requirements were introduced. A recent graph of the change in smoking rates in Canada over time[18] showed that the introduction of health warning labels (1989) and their subsequent modifications (2000 and 2012) resulted in a greater drop in prevalence of tobacco consumption for the year following the change; however, the results returned to the expected trend in subsequent years. Statistical analysis is required to verify this observation. In addition, the decrease in tobacco consumption appears to have slowed between 2013, the year following the last increase in warning size, and 2017. Unfortunately, a fulsome analysis of current information is not available to clarify the contribution of visual health warnings to continuing the decrease in tobacco consumption in Canada.

Taxation

The viewpoint of many researchers and advocates is that tobacco pricing is elastic* in nature and that increases in the price of tobacco products will result in a reduction in the prevalence of smoking, while Article 6 of the WHO FCTC recommends that signatories establish pricing structures that impede tobacco use. One study (2006) showed that lower cigarette prices resulted in higher rates of smoking prevalence among young adults (aged 20-24 years) living in Canada.[55] A subsequent international study (2011) showed that increased taxation had reduced the rates of smoking in youth, young adults and low socio-economic status individuals, but that there was insufficient evidence to demonstrate effectiveness for heavy/long-term smokers, people with dual diagnoses (individuals who use tobacco products and have mental health and/or non-nicotine substance use disorders) and Indigenous Peoples. That analysis also showed that, on average, a price increase of 10% per package of cigarettes should reduce demand by 4% in the general adult population in high-income countries.[56] A 2012 study for the United States, however, showed that for adults, the association between cigarette taxes and either smoking participation or smoking intensity is negative, small and not usually statistically significant.[57] A review of the available information concerning smoking prevalence and tax increases between 2002 and 2012 indicated increases in taxation resulted in reduction in smoking.[18]

Within Canada, the prevalence of smoking has continually decreased since the 1960s. This reduction is presumably the effect of health promotion and smoking cessation programs, labelling and advertising regulation, as well as taxation policy. The prevalence data, however, does not differentiate the influence of taxation from that of health promotion and smoking cessation programs. In addition, an examination of the influence of total tax per carton of cigarettes versus prevalence of smoking in Ontario and BC[18] showed that, for the period from 2009 to 2012, taxation rates were constant but smoking prevalence continued to decrease. Similarly, for the period 2013 to 2018 smoking prevalence was approximately constant at 15%, while CCHS data showed a slow decrease in

* Price elasticity of demand, or elasticity, is the degree to which the effective desire for something changes as its price changes.

prevalence from 19% to approximately 15%. Similarly, the average number of cigarettes consumed daily was consistent at approximately 14 per day in Canada over the period 2013-2017. Over the period 2014-2019, manufacturers increased their net-of-tax prices by $17.40 per package of 200 cigarettes, while federal tax increases totaled $7.30 per carton and provincial taxes increased, depending on province. This information suggests that the demand for cigarettes may have become increasingly inelastic irrespective of price increase, and as a result, other options should be investigated to reduce tobacco consumption. Similarly, an argument can be made that continuing tax increases will unjustly affect those of low SES (with higher prevalence of tobacco consumption) and further contribute to health inequity in Canada.

While these results are not conclusive, they suggest that an increasingly inelastic relationship or threshold price (beyond which smoking prevalence is not affected) exists between taxation and smoking cessation in Canada. Further analysis, however, is required at both the national and PT levels to understand the current relationship between taxation policy, health promotion and protection activities, advertising and labelling controls and smoking cessation in Canada. Those activities that exhibit the greatest positive effects should be supported, while those with limited effectiveness curtailed or eliminated.

VAPING

In March 2018, CPHA released a position statement on nicotine-containing vaping devices where the Association called for governments to:

- approve and implement Bill S-5, now the *Tobacco and Vaping Products Act*;
- support research on vaping devices;
- limit the sale and advertising of nicotine-containing vaping devices;
- establish pricing structures; and
- support health promotion activities.[2]

Much has been accomplished since the release of the position statement, including legalization of nicotine-containing vaping devices, and controls on flavours, packaging and labelling of those products. It is time, however, to assess those efforts.

Background

Vaping devices, also known as e-cigarettes (electronic cigarettes) or electronic nicotine delivery systems (ENDS), heat a liquid consisting of a carrying solution and a combination of flavourings and/or nicotine. The resultant vapour is inhaled. There are two categories of vaping devices: those that contain nicotine and those that do not. In 2019, the global market was estimated at $19.3 billion (USD), up from $6.9 billion USD in 2014[58] and is anticipated to continue increasing based on current usage trends. Similar trends are expected in Canada. Most traditional tobacco companies have investments in the vaping device industry.

Vaping devices first entered the Asian marketplace in 2004 and the North American marketplace in 2007[59] as an unregulated product. In 2009, Health Canada issued an advisory against the nicotine-containing product, as insufficient evidence was available to support its sale. The Advisory, however, was rarely enforced. In May 2018, the federal government passed Bill S-5, the Tobacco and Vaping Products Act (TVPA)

with the purpose of, in part, providing the legal framework to regulate the manufacture, sale, labelling and promotion of nicotine-containing vaping products sold in Canada. Its emphasis is to protect young people from nicotine addiction and possibly tobacco use, while allowing adults access to vaping products as a less harmful alternative to smoking.[53]

Current Use

In Canada, about 15% of Canadians aged 15-19 have reported vaping in the past 30 days, while 36% have ever tried vaping. In young adults aged 20-24 years, 15% reported vaping in the last 30 days, with almost 50% reporting ever-trying vaping in 2019.[60] Alternately, less than 3% of adults over the age of 25 reported vaping in the last 30 days, with 12% having ever-tried vaping. In general, more men vape than women. Similar results were obtained from the 2020 survey, although these results further indicated that about 15% of all adults who reported vaping (about 15% of the population) vaped on a daily basis, or about 2.25% of the population.[18] Further disaggregation of this data is not possible, as information is not collected at the national level concerning race, ethnicity or socio-economic status.

In addition, 87% of youth (aged 15-19 years) that vaped in the last 30 days chose a product with nicotine, as did 86% of young adults aged 20-24 years.[55] Of youth that report vaping, almost one third of those aged 15-19 years vape on a daily basis. Of adults that had used a vaping device in the last 30 days, 42% reported using a fruit flavour the last time they used an e-cigarette.[61] Most youth aged 15-19 years (69%)[62] and young adults aged 20-24 years (62%) who vaped also reported using a fruit flavor.[56] Similarly, one US study revealed that 98% of students who vaped reported that their first experience was with flavoured products.[63]

Another survey of Canadian students found that vaping rates have increased among youth.[57] The number of Canadian students in grades 7-12 who had used an e-cigarette in the past 30 days doubled from 10% in 2017 to 20% in 2019, while 34% of students in grades 7-12 reported ever trying a vaping product. Of students who reported using a vaping product in the last 30 days, 90% reported using a product with nicotine. This increase has raised concern that vaping may be a possible gateway to tobacco use, as one systematic literature review indicated that e-cigarette use may lead to tobacco consumption.[64] Subsequent research noted that trying vaping devices may causally increase smoking among some youth but the aggregate effect at the population level appeared negligible given the overall reduction in smoking initiation.[65] Similarly, research from New Zealand suggested that vaping might be displacing tobacco use by youth, but further work was necessary to evaluate the effect of increased availability and marketing on long-term patterns of daily vaping and cigarette use.[66]

Research Update

The 2018 CPHA position statement provided a review of the available information concerning vaping to 2017, but noted that research was expanding rapidly. Since then, a 2017 Cochrane Review[67] stated that nicotine-containing electronic cigarettes were effective in the long-term to help smokers quit smoking when compared to placebo electronic cigarettes, but there was not enough evidence to compare them to other nicotine-replacement therapies. The review concluded that more research was needed.

In August 2019, the United States' National Academies of Science, Engineering, and Medicine (NASEM) published a consensus report concerning the health effects of electronic nicotine delivery systems.[63] This review examined over 800 peer-reviewed scientific studies and provided summaries of evidence regarding the:

- constituents of and exposures associated with e-cigarette devices,
- effects of e-cigarettes on health, and
- public health implications of e-cigarettes.

Appendix 3 presents a summary of the results from the consensus report. The main findings were that e-cigarettes could not be categorized as beneficial or harmful to health, and that the public health implications depend on the context with which this product is used.* They concluded that:

- e-cigarette aerosol contains fewer numbers and lower levels of toxicants than smoke from combustible tobacco cigarettes;
- the nicotine amounts in e-cigarettes can be highly variable and are dependent on the device and user, but when used in a similar manner to tobacco cigarettes, the nicotine exposure is similar;
- although there appears to be a health risk with e-cigarettes, the long-term implications on morbidity and mortality are unclear as long-term research is lacking;
- there is consensus that use of e-cigarettes in place of combustible tobacco cigarettes is less harmful for those with existing respiratory disease;
- e-cigarettes may be effective in increasing adult cessation of combustible tobacco cigarette use;
- youth who use e-cigarettes may be more likely to transition to combustible tobacco cigarettes; and
- there is no available evidence on the effects of e-cigarette use on pregnancy and maternal outcomes.

Overall, the review concluded that e-cigarettes pose less risk to an individual than combustible tobacco cigarettes and may be an effective harm reduction approach. However, longer-term research is required to evaluate the short and long-term health outcomes associated with the use of nicotine-containing vaping devices.

Nicotine Toxicity

Underlying this discussion is the potential toxicity of vaping nicotine. Nicotine is not a known carcinogen, but exposure to it elevates cardiovascular risk in people with existing disease.[60] When consumed through smoking or vaping, nicotine:

- Increases heart rate and blood pressure,
- Causes blood vessels to constrict, with a resultant temperature drop in hands and feet,
- Alters brain waves, and
- Relaxes muscles.

Further description of the potential health effects of nicotine are presented elsewhere,[63,68] as is the influence of nicotine on growth and brain development of youth.[69]

Of additional concern is that nicotine is addictive and cessation of use causes withdrawal symptoms. The pathway to addiction through tobacco consumption is described elsewhere.[70] Liquid nicotine is also toxic when ingested orally, with serious health effects, potentially including death.[60] Health Canada's regulations include updates to the *Canada Consumer Product Safety Act* to require child-resistant packaging for vaping devices and their parts to prevent accidental or intentional ingestion of vaping liquid by children.

In 2019, there were cases of vaping-related lung illnesses (also called "e-cigarette, or vaping, product use-associated lung injury (EVALI)").[71] EVALI cases in the United States were linked to vaping liquid containing tetrahydrocannabinol (THC) and vitamin E acetate. Vitamin E acetate is added as a thickener for THC-containing vape fluid, and it is not approved for this use in Canada.[72] In Canada, the presumptive cases of EVALI are self-reported and remain under investigation.[73]

* Since the completion of the NASEM study two additional large scale studies have examined the effects of e-cigarettes on respiratory disorders in adults. One study based on an analysis of survey data in Hawaii showed an independent association of e-cigarette use with chronic respiratory disorder (Wills, T.A., et al. 2019. *Drug Alcohol Depend* 194: 363-370), while the second was a prospective cohort study using data from the Population Assessment of Tobacco and Health (PATH) study which concluded that e-cigarette use was associated with increased risk of developing respiratory disease (Xie, W. et al., 2020. *JAMA Network Open* 3(11): e2020816). Neither study compared the increased risk from e-cigarette use to that of cigarette smoking.

Current Regulatory Situation

Several countries have moved to regulate nicotine-containing vaping devices:

- The United States has developed regulations that include provisions regarding ingredients, warning labels, and age restrictions on sales. In January 2020, the FDA also finalized an enforcement policy on unauthorized flavours that appeal to children, including fruit and mint;[74]
- The United Kingdom provides regulations under general product safety laws, and provides the option for applying for a "medicines license" for a vaping device as a smoking cessation aid.[75] In addition, a recent review of evidence concerning vaping was completed by Public Health England;[76]
- The 2016 European Union Tobacco Products Directive requires member states to prohibit advertising, and to add warning labels and meet purity standards;[77] and
- Australia prohibits the sale of all e-cigarettes.[78]

In addition to the *Tobacco and Vaping Products Act* and its associated regulations, several provinces have placed restrictions on vaping device use, many of which include restricting age of purchase, place of sale, sale of flavoured products, and setting maximum nicotine levels. Additionally, many municipalities, local school boards and boards of health have enacted by-laws and policies to limit vaping in their jurisdictions. The question remains, however, whether these legislations and regulations will be effective at reducing the likelihood of youth and young adults consuming nicotine-containing vaping devices. Further research is required to understand this relationship.

LOOKING TO THE FUTURE

Tobacco products and nicotine-containing vaping devices are used to provide nicotine, an addictive substance; however, both products have differing health effects. The use of combustible tobacco products results in the inhalation of a mix of compounds many of which are carcinogenic and have resulted in illness, suffering and death from various cancers, heart disease and lung disease. Various programs have successfully reduced the prevalence of tobacco consumption to approximately 15% of the Canadian population aged 15 years and older. Overall, the packet of programs has succeeded; however, it is difficult to separate out the effectiveness of each component. As such, consideration must be given to evaluating the effectiveness of the component parts of this effort, supporting those components that work or show signs of working, while eliminating those that do not work.

Evaluation is needed of the continuing effectiveness of graphic warning labelling and plain packaging on tobacco consumption and vaping. Both approaches appear effective in the short- to mid-term for reducing tobacco consumption, but data from 2013 to 2018 suggest that these approaches have reached their point of diminishing returns. Similarly, further increasing taxation may be having minimal effect in reducing smoking prevalence, while further price increases may contribute to inequities for those of lower SES. Further analyses, however, are required to evaluate the continued price elasticity of tobacco products to taxation increases, and the effectiveness of graphic warnings and plain packaging.

Work is needed to reinvigorate the actions to continue reducing the prevalence of tobacco use if Canada is to meet its target of less than 5% smoking by 2035. Attention should be placed on targeted initiatives that meet the needs of the sub-populations that are more likely to smoke. These include Indigenous Peoples, those living in the North, and people with mental illness, among others. Underlying these initiatives is the need to better understand why people smoke, and then identify how to address those considerations.

The use of vaping devices is a relatively new consideration, which seems to be of greatest concern among youth and young adults. In both groups, the issues focus on the potential effect of nicotine addiction on their development, and the possibility of vaping acting as a gateway to tobacco consumption. To address these concerns the broad-brushed approaches to tobacco regulation have been applied without understanding the health effects of vaping devices, or the applicability or effectiveness of these regulatory approaches. Underlying this concern is the question of why individuals would use a vaping device, and the need to develop approaches that address those concerns.

APPENDIX 1

Recommendations from "The Winnable Battle – Ending Tobacco Use in Canada"[1]

CPHA calls on the federal government:

- to implement all of the provisions of the Framework Convention on Tobacco Control (FCTC) and related guidelines to the highest degree possible, including fulfilling its obligations to global tobacco control
- to implement and fund fully on an annual and consistent basis an adequately-resourced, multi-year (10-year) Federal Tobacco Control Strategy (FTCS), which would include an endgame goal and milestone targets, to come into effect no later than April 1, 2012, to include:
  - nationwide social marketing / social media campaigns to further de-normalize tobacco use, especially among youth
  - a ban on all remaining forms of tobacco advertising and promotion in movies, on the Internet and elsewhere
  - legislation to increase the graphic health warnings to 90% of the surface of cigarette packages
  - legislation governing plain packaging for tobacco products
  - adding menthol to the list of banned flavourings in tobacco products
  - expanding the current ban on flavourings in certain tobacco products to all smokeless tobacco products
  - a moratorium on all new tobacco products and all new packaging of existing tobacco products
- to revitalize the First Nations and Inuit Tobacco Control Strategy (FNITCS) and engage in nation- to-nation dialogue with First Nations and other Aboriginal communities to develop community-led tobacco control strategies that will reduce the social disparities that contribute to poor health outcomes
- to work in partnership with and support of the efforts of Canadian stakeholders and their overseas partners to develop and implement effective tobacco control strategies and deter counter-tobacco control efforts by the tobacco industry in low- and middle-income countries and to put into place sustained and predictable funding and multi-year funding mechanisms for global tobacco control initiatives

CPHA calls upon the federal, provincial and territorial governments:

- to include tobacco control (with time-specific targets and indicators) as components in future multi-year agreements on health and health care, such as the forthcoming federal/provincial/territorial health fund transfer agreement to begin in 2014
- to consider new fiscal mechanisms involving pricing and taxation to discourage the sale of cigarettes at reduced rates
- for the immediate adoption and support by the federal, provincial and territorial governments for a national quit-line and support to maximizing accessibility for all Canadians to cessation services and resources
- to support community-identified and led tobacco control initiatives for population-based approaches
- to reach and respond to the needs of disadvantaged and particularly vulnerable population groups with respect to smoking cessation and tobacco product use prevention
- to allocate government revenues from tobacco product taxes or tobacco industry sources (e.g., penalties resulting from regulatory or legal actions) to support tobacco control research and knowledge generation/exchange activities that produce evidence used to design effective tobacco control strategies and interventions

CPHA calls on all provincial and territorial governments:

- to broaden the categories of outlets that are prohibited from selling tobacco products
- to cap the number of tobacco retail licenses at the current level, with the goal of significantly reducing the number of outlets in each province and territory within five years

- to develop and maintain an accurate database of retailers of tobacco products, require licencing of all wholesalers and retailers of tobacco products administered by the Ministry of Health, and implement as soon as possible a graduated penalty structure with substantial fines, licence suspension and permanent revocation of a retailer's licence to sell tobacco
- to enable municipalities to implement licencing fee systems for the retail sale of tobacco products as a means to reduce the number and density of retail outlets that sell tobacco products
- to apply and enforce a minimum age limit to retail outlets and establishments which sell tobacco products, similar to that in place for employees serving alcoholic beverages

CPHA calls on municipalities to enact by-laws to ban smokeless tobacco, including hookahs, from public places including bars and restaurants.

CPHA encourages all jurisdictions:

- to ban the sale of tobacco products in retail outlets within 500 metres of registered child day-care centres, primary and secondary schools, and encourage all universities and colleges to ban the sale of tobacco products on campus
- to enact laws ensuring full protection from second-hand smoke in areas where young people gather, especially in school settings including post-secondary institutions

CPHA calls upon the public health community:

- to promote the adoption and use of national cessation guidelines in clinical practice and population-based strategies (CANADAPTT guidelines)
- to assess opportunities for systematically incorporating brief contact cessation interventions into their existing one-on-one programs and services
- to collaborate with the tobacco control and economic communities to explore innovative strategies for effective supply side responses for tobacco control

CPHA calls on colleges, universities, professional associations, federal, provincial, regional and local governments to work together to build the capacity of health workers by ensuring that tobacco control principles are embedded within core curricula and continuing education offerings and by enhancing tobacco control learning opportunities for both public health and the allied health professions within their curricula. Additionally, the Public Health Agency of Canada should embed tobacco examples within the relevant Skills Enhancement for Public Health online modules.

CPHA should

- seek opportunities to cooperate and collaborate with the Canadian mental health community on issues related to tobacco control as it affects people with mental health issues
- in association with the Provincial/Territorial Public Health Associations, as appropriate, seek opportunities to cooperate and collaborate with Aboriginal peoples' organizations and communities on tobacco-related issues and strategies
- establish and facilitate a tobacco control community of practice within the Public Health KnowledgeCentre™ as a means of supporting greater horizontal knowledge exchange among researchers and local/regional public health organizations across provinces and territories to promote and improve the use of evidence to strengthen tobacco control
- address tobacco control during its annual conferences

APPENDIX 2

Recommendations from "A Public Health Approach to Nicotine-Containing Vaping Devices"[2]

CPHA Call to Action		Current Status (as of March 2020)
FEDERAL GOVERNMENT		
Approve and implement the provisions of Bill S-5 and develop regulations to permit the sale of nicotine-containing vaping devices in Canada, should health and safety provisions be met, including:	Establish a legal age for the purchase of nicotine-containing vaping devices in line with that for tobacco products	Bill S-5 was enacted as law by Government of Canada May 23, 2018. This act amended the existing *Tobacco Act and Non-smokers' Health Act* to become the *Tobacco and Vaping Products Act* (TVPA) and established a legislation framework in Canada that regulates both tobacco and vaping products. **TVPA** • Vaping products cannot be sold or given to anyone under 18 years of age **Provincially** • PE passed a bill that comes into force 27 March 2020 with a minimum age of 21 for tobacco and e-cigarette sales • BC regulates vaping products the same as tobacco, and legal age of purchase for both is 19
	Apply restrictions, based on toxicity, on the flavours and carrying fluid used in vaping devices	**TVPA** • Does not address the sale of flavoured products, nor does proposed 2019 regulations. • Prohibits certain types of vaping product promotion, such as sponsorship promotion, testimonials or endorsements and the promotion of flavour descriptors that are appealing to youth
	Limit the use of flavours that could be appealing to children and youth	**TVPA** • Does not address **Provincially** • As of January 2019, several provinces have proposed and enacted province-specific legislation for e-cigarettes. • PE, BC, YT, NT, ON, and NS have proposed or enacted bills that restrict the sale of flavours in e-cigarettes (some restrictions include only selling flavoured e-cigarette products on adult only premises and some provinces have proposed outright flavour bans or restrictions on available flavours with exemptions).* • Additionally, the provinces of AB and QC, and NU announced plans to address e-cigarettes in the near future.
	Develop and implement regulations and guidelines that address safety concerns associated with the manufacture of these products	**TVPA** • No manufacturer shall manufacture or sell a vaping product that does not conform with the standards established by the regulations • No manufacturer shall use an ingredient set out in column 1 of Schedule 2 in the manufacture of a vaping product set out in column 2 • Every manufacturer shall submit to the Minister, in the prescribed form and manner and within the prescribed time, information that is required by the regulations about vaping products, their emissions and any research and development related to vaping products and their emissions, whether the vaping products are for sale or not.
	Subject the products to the provisions of the Food and Drugs Act, should the manufacturer wish to make claims regarding their use as smoking cessation devices	**TVPA** • The *Food and Drugs Act* (FDA) applies to vaping products that make a health claim (help quit smoking). This includes products that contain nicotine or any other drugs as defined by the FDA. These products must receive an authorization from Health Canada before they can be: — advertised — sold in Canada — commercially imported

CPHA Call to Action		Current Status (as of March 2020)
Support research concerning vaping devices, including:	Investigate their effect on health, especially in relation to particulate emissions and carcinogens, notably 1,3-butadiene;	**Health Canada and the Public Health Agency of Canada** • Tracking vaping associated lung illness, also known as severe pulmonary illness associated with vaping
	Conduct comparative research on the toxicity of nicotine-containing vaping devices compared to that of tobacco products;	**Health Canada** • Website references National Academies of Science, Engineering, and Medicine Consensus Report on the Public Health Consequences of E-Cigarettes (2018) and states on website: — Completely replacing cigarette smoking with vaping will reduce your exposure to harmful chemicals — Vaping is less harmful than smoking. Many of the toxic and cancer-causing chemicals in tobacco and the tobacco smoke form when tobacco is burned
	Investigate the use of nicotine-containing vaping devices as smoking cessation devices;	**Health Canada** • Website references Public Health England e-cigarette evidence review: using e-cigarettes is linked to improved rates of success of quitting smoking
	Examine the societal influences that lead youth and adolescents to start using nicotine-containing products, and develop programs to address these issues.	**Health Canada** • Exploratory consultation on Reducing Youth Access and Appeal of Vaping Products received 24,000 submissions from parents, educators, general public, provinces and territories, health authorities, health professionals and their associations, NGOs, tobacco control coalitions, consumer associations, academia, industry/retailers and the association that represent them and nearly 23,000 postcards and 1,450 emails from people who reported using vaping products to quit smoking — The consultation had several themes including that many people felt vaping is an effective harm reduction technique in adults, but acknowledge that youth vaping is a concern, particularly flavoured vaping products • Vaping has been included in the Canadian Tobacco, Alcohol and Drugs Survey (CTADS) which includes questions on youth use of electronic cigarettes (stats), e-cigarette sources and reasons for use, and perceived risk of harm of cigarettes and e-cigarettes • Commissioned a 2019 Qualitative and Quantitative Research on Perceptions of Nicotine: Final Report that assessed societal influences for vaping use and found that social media, particularly SnapChat were seen to be promotional of vaping products by youth, and that youth found flavours an enticing reason to begin or sustain vaping
Limit the sale and advertising of nicotine-containing vaping devices by:	Prohibiting their use, including in-store testing, in all enclosed public spaces, workplaces and other specified outdoor areas;	**TVPA** • Prohibits use of vaping products where tobacco products are prohibited
	Prohibiting the sale of vaping devices in all places where the sale of tobacco products is also prohibited;	**TVPA** • Bans sales of vaping products where tobacco products are prohibited • No manufacturer or retailer shall sell a vaping product unless the product and the package containing it display, in the prescribed form and manner, the information required by the regulations about the product and its emissions and about the health hazards and health effects arising from the use of the product and from its emissions. **Provincially** • PE: starting 27 March 2020 e-cigarettes may only be sold in speciality stores and not convenience stores
	Establishing regulations for the display and promotion of vaping devices at places where they are sold.	**TVPA** • Does not permit the sale of vaping products that appeal to youth in how they look or work • No person shall promote a vaping product or a vaping product-related brand element by means of advertising unless it conveys, in the prescribed form and manner, the information required by the regulations about the product and its emissions and about the health hazards and health effects arising from the use of the product and from its emissions.

CPHA Call to Action		Current Status (as of March 2020)
PROVINCIAL/TERRITORIAL GOVERNMENTS		
Establish a pricing structure that acts as a deterrent to the purchase of the nicotine-containing products, similar to that used for tobacco products.		**Provincially** • BC: starting 1 January 2020 sale tax on e-cigarettes increased from 7 to 20%
ALL GOVERNMENTS		
Support health promotion activities, including:	Increase public education and information around smoking cessation in general, and the use of vaping devices in particular, and fund access to evidence-based smoking cessation products and services;	**Health Canada** • Has created a public campaign on the risks of vaping including a website that includes access to videos, resources for parents, youth prevention materials and general information, which was last updated November 2019 **Provincially** Most provinces have basic information on vaping available on their government websites. • BC: public campaign available via government website that includes info for youth, adults, tools for schools, overview of laws and regulations, vaping and quitting smoking, etc. • AB: albertaquits.ca has a page on electronic cigarettes that includes FAQs (did not find vaping info on Government of Alberta or Alberta Health Services websites) • SK: public campaign available via government website that includes information for schools, parents and guardians and links to the Health Canada website • MB: very basic information on second hand smoke from vaping, and information on electronic cigarettes with links to quitnow.ca, government website and features a video on "To Vape or not to Vape" by the Ontario Tobacco Research Unit and links to CDC fact sheet • ON: Public Health Ontario has a public campaign available on its website • QC: links broken on website but possible education campaign • NB: public campaign available on website that includes some basic information, link to HC video on vaping, and legislation • PE: no information on website other than on legislation • NS: public campaign available via government website that includes info on legislation, talking with your teen, health risk of vaping, and links to additional resources • NL: information available on the Newfoundland and Labrador Alliance for the Control of Tobacco website (which is funded partially by the government of NL) that contains letters to teachers, FAQs, school posters, presentations for students, links to videos and other resources • NU: www.nuquits.ca • NT: info graph available on government website that does not recommend vaping as cessation aide • YT: no information available
	Restrict advertising related to these nicotine-containing products, similar to the restrictions on the advertising of tobacco products.	**TVPA** • prohibits promoting vaping products, vaping product-related brand elements or things that display vaping-product related brand elements by means of advertising if there are reasonable grounds to believe that the advertising could be appealing to young persons • prohibits other advertising the same as tobacco products (cannot make health claims, use testimonials, lifestyle advertising, sponsorship, etc.)

APPENDIX 3

Scientific Evidence Summary*

The National Academies of Science, Engineering, and Medicine "Public Health Consequences of E-cigarettes" consensus report concludes that:[63]

Conclusive Evidence	• exposure to nicotine from e-cigarettes is highly variable and depends on product characteristics and how the device is operated.
	• in addition to nicotine, most e-cigarette products contain and emit numerous potentially toxic substances.
	• other than nicotine, the number, quality, and characteristics of potentially toxic substances emitted from e-cigarettes are highly variable and depend on product characteristics and how the device is operated.
	• e-cigarette devices can explode and cause burns and projectile injuries.
	• intentional or accidental exposure to e-liquids can result in adverse health effects including but not limited to seizures, anoxic brain injury, vomiting and lactic acidosis.
	• intentionally or unintentionally drinking or injecting e-liquids can be fatal.
	• completely substituting e-cigarettes for combustible tobacco cigarettes reduces users' exposure to numerous toxicants and carcinogens present in combustible tobacco cigarettes.
Substantial Evidence	• nicotine intake from e-cigarette devices among experienced adult e-cigarette users can be comparable to that from combustible tobacco cigarettes.
	• except for nicotine, under typical conditions of use, exposure to potentially toxic substances from e-cigarettes is significantly lower compared to combustible tobacco cigarettes.
	• e-cigarette aerosol contains metals. The origin of the metals could be the metallic coil used to heat the e-liquid, other parts of the e-cigarette device, or the e-liquids.
	• e-cigarette aerosols can induce acute endothelial cell dysfunction, although the long-term consequences and outcomes on these parameters with long-term exposure to e-cigarette aerosol are uncertain.
	• components of e-cigarette aerosols can promote formation of reactive oxygen species/oxidative stress. Although this supports the biological plausibility of tissue injury and disease from long-term exposure to e-cigarette aerosols, generation of reactive oxygen species and oxidative stress induction is generally lower from e-cigarettes than from combustible tobacco cigarette smoke.
	• e-cigarette use results in symptoms of dependence on e-cigarettes.
	• heart rate increases shortly after nicotine intake from e-cigarettes.
	• some chemicals present in e-cigarette aerosols (e.g., formaldehyde, acrolein) are capable of causing DNA damage and mutagenesis. This supports the biological plausibility that long-term exposure to e-cigarette aerosols could increase risk of cancer and adverse reproductive outcomes. Whether or not the levels of exposure are high enough to contribute to human carcinogenesis remains to be determined.
	• e-cigarette use increases risk of ever using combustible tobacco cigarettes among youth and young adults.
	• completely switching from regular use of combustible tobacco cigarettes to e-cigarettes results in reduced short-term adverse health outcomes in several organ systems.
Moderate Evidence	• risk and severity of dependence are lower for e-cigarettes than combustible tobacco cigarettes.
	• variability in e-cigarette product characteristics (nicotine concentration, flavoring, device type, and brand) is an important determinant of risk and severity of e-cigarette dependence.
	• diastolic blood pressure increases shortly after nicotine intake from e-cigarettes.
	• increased cough and wheeze in adolescents who use e-cigarettes and an association with e-cigarette use and an increase in asthma exacerbations.
	• among youth and young adult e-cigarette users who ever use combustible tobacco cigarettes, there is moderate evidence that e-cigarette use increases the frequency and intensity of subsequent combustible tobacco cigarette smoking.
	• e-cigarettes with nicotine are more effective than e-cigarettes without nicotine for smoking cessation.
	• while the overall evidence from observational trials is mixed, there is moderate evidence from observational studies that more frequent use of e-cigarettes is associated with an increased likelihood of cessation
	• second-hand exposure to nicotine and particulates is lower from e-cigarettes compared with combustible tobacco cigarettes.

* A description of the terms used for the quality of evidence is presented in the source document and at the end of this appendix.

Limited Evidence	• e-cigarette use increases levels of nicotine and other e-cigarette constituents on a variety of indoor surfaces compared with background levels.
	• the number of metals in e-cigarette aerosol could be greater than the number of metals in combustible tobacco cigarettes, except for cadmium, which is markedly lower in e-cigarettes compared with combustible tobacco cigarettes.
	• e-cigarette use is associated with a short-term increase in systolic blood pressure, changes in biomarkers of oxidative stress, increased endothelial dysfunction and arterial stiffness, and autonomic control.
	• from in vivo animal studies using intermediate biomarkers of cancer to support the hypothesis that long-term e-cigarette use could increase the risk of cancer; there is no available evidence from adequate long-term animal bioassays of e-cigarette aerosol exposures to inform cancer risk.
	• e-cigarette aerosol can be mutagenic or cause DNA damage in humans, animal models, and human cells in culture.
	• for improvement in lung function and respiratory symptoms among adult smokers with asthma who switch to e-cigarettes completely or in part (dual use).
	• for reduction of chronic obstructive pulmonary disease (COPD) exacerbations among adult smokers with COPD who switch to e-cigarettes completely or in part (dual use).
	• of adverse effects of e-cigarette exposure on the respiratory system from animal and in vitro studies.
	• suggesting that switching to e-cigarettes will improve periodontal disease in smokers.
	• nicotine- and non-nicotine–containing e-cigarette aerosol can adversely affect cell viability and cause cell damage of oral tissue in non-smokers.
	• Among youth and young adult e-cigarette users who ever use combustible tobacco cigarettes, there is limited evidence that e-cigarette use increases, in the near term, the duration of subsequent combustible tobacco cigarette smoking.
Insufficient Evidence	• whether or not maternal e-cigarette use affects fetal development.
	• from randomized controlled trials about the effectiveness of e-cigarettes as cessation aids compared with no treatment or to Food and Drug Administration–approved smoking cessation treatments.
No Available Evidence	• whether or not e-cigarette use is associated with clinical cardiovascular outcomes (coronary heart disease, stroke, and peripheral artery disease) and subclinical atherosclerosis (carotid intima-media thickness and coronary artery calcification).
	• whether or not e-cigarette use is associated with intermediate cancer endpoints in humans. This holds true for e-cigarette use compared with use of combustible tobacco cigarettes and e-cigarette use compared with non-use of tobacco products.
	• whether or not e-cigarettes cause respiratory diseases in humans.
	• whether or not e-cigarettes affect pregnancy outcomes.
	• whether or not long-term e-cigarette use among smokers (dual use) changes morbidity or mortality compared with those who only smoke combustible tobacco cigarettes.

Levels of Evidence Framework for Conclusions[63]

- *Conclusive evidence:* There are many supportive findings from good-quality controlled studies (including randomized and non-randomized controlled trials) with no credible opposing findings. A firm conclusion can be made, and the limitations to the evidence, including chance, bias, and confounding factors, can be ruled out with reasonable confidence.
- *Substantial evidence:* There are several supportive findings from good-quality observational studies or controlled trials with few or no credible opposing findings. A firm conclusion can be made, but minor limitations, including chance, bias, and confounding factors, cannot be ruled out with reasonable confidence.
- *Moderate evidence:* There are several supportive findings from fair-quality studies with few or no credible opposing findings. A general conclusion can be made, but limitations, including chance, bias, and confounding factors, cannot be ruled out with reasonable confidence.
- *Limited evidence:* There are supportive findings from fair-quality studies or mixed findings with most favoring one conclusion. A conclusion can be made, but there is significant uncertainty due to chance, bias, and confounding factors.
- *Insufficient evidence:* There are mixed findings or a single poor study. No conclusion can be made because of substantial uncertainty due to chance, bias, and confounding factors.
- *No available evidence:* There are no available studies; health endpoint has not been studied at all. No conclusion can be made.

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