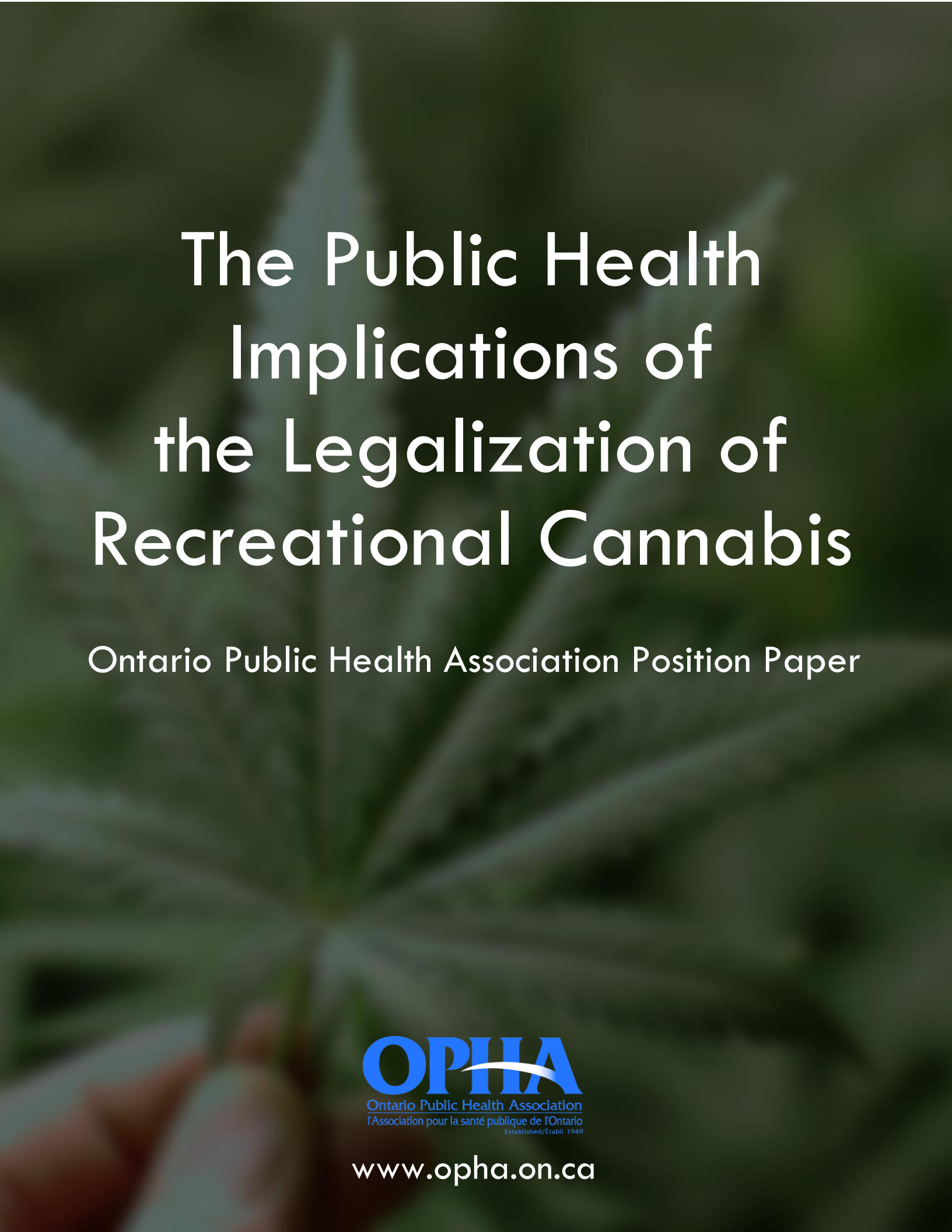

The Public Health Implications of the Legalization of Recreational Cannabis

Ontario Public Health Association Position Paper

OPHA
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About OPHA

The Ontario Public Health Association (OPHA) is a member-based, not-for-profit association that provides leadership on issues affecting the public's health and strengthens the impact of those who are active in public and community health throughout Ontario. OPHA has multiple active work groups and task forces that focus on particular public health issues. OPHA's Cannabis Task Group has focused on developing a comprehensive analysis and literature review to inform the development of a policy position statement on the public health impacts of the upcoming legalization of cannabis in Ontario and Canada. Specific reference and considerations were paid to the context, populations, potential challenges and health equity as they relate to Ontario.

Executive Summary

Background

Canada's Task Force on Cannabis Legislation and Legalization was first assembled in June of 2016 to consult and provide advice on the design of a new legislative and regulatory framework for legal access to cannabis, consistent with the Federal Government's commitment to "legalize, regulate, and restrict access." A Cannabis Act has now been tabled in the House of Commons and is expected to become law in July, 2018. Under this new law, Canada's provinces and territories will be responsible to license and oversee the distribution and sale of cannabis, subject to Federal conditions, and will have the power to:

- increase the minimum age in their province or territory (but not lower it)
- lower the personal possession limit in their jurisdiction
- create additional rules for growing cannabis at home, such as lowering the number of plants per residence; and
- restrict where adults can consume cannabis, such as in public or in vehicles.

While medicinal uses for cannabis is gaining acceptance, there are public health implications associated with cannabis use. Specifically, the following are potential harms:

- risk of toxicity
- unintended exposure to children
- high mortality and morbidity attributable to cannabis, including motor vehicle accidents, lung cancer and substance use disorders
- occupational safety risks
- negative mental health outcomes
- respiratory health impacts
- impaired child and youth development

- equity implications considering differential usage rates across gender and income levels

In light of these developments and the potential harms above, OPHA calls on both the Federal and Provincial government to put health considerations at the forefront and adopt a public health approach to mitigate these harms. This would entail:

- Using public health strategies including:
    - Health promotion to reduce the likelihood of use and problematic use;
    - Health protection to reduce the harms associated with use;
    - Prevention and harm reduction to reduce the likelihood of problematic use and overdose;
    - Population health assessment to understand the extent of the situation, and the potential impact of the interventions, policies, and programs on the population (evaluation);
    - Disease, injury and disability surveillance to understand the effect on society and to evaluate the effects of these activities; and
    - Evidence-based services to help protect people who are at risk of developing, or have developed problems with substances.
- Applying principles of social justice, attention to human rights and equity, evidence-informed policy and practice, and addressing the underlying determinants of health

OPHA calls for a Federal and Provincial regulatory regime that advances the goals outlined in the Federal Task Force on Cannabis Legalization and Regulation's 2016 discussion paper. These include:

- **Protect young Canadians** by keeping marijuana out of the hands of children and youth.
- **Protect public health and safety** by strengthening, where appropriate, laws and enforcement measures that deter and punish more serious marijuana offences, particularly selling and distributing to children and youth, selling outside of the

regulatory framework and operating a motor vehicle while under the influence of marijuana.

- **Ensure Canadians are well-informed** through sustained and appropriate public health campaigns, and, for youth in particular, ensure that risks are understood.
- **Establish and enforce a system of strict production, distribution and sales**, taking a public health approach, with regulation of quality and safety (e.g., child-proof packaging, warning labels), restriction of access, and application of taxes, with programmatic support for addiction treatment, mental health support and education programs.
- **Conduct ongoing data collection**, including gathering baseline data to monitor the impact of the new framework.

Recommendations

In accordance with the objectives of Canada's Task Force on Cannabis Legalization and Regulation, OPHA proposes the following recommendations for the Ontario context. Some of these recommendations could also apply to other levels of government.

Recommendation 1: Protect young Canadians

Access

- Prohibit cannabis-containing products that could be attractive to minors (e.g., THC-infused candy or drinks), and require childproof packaging for other edible products
- Set the minimum age for purchasing and possessing cannabis at 21 years of age and have a consistent minimum age for purchasing and possessing cannabis across Canada in order to provide clear policy direction and eliminate cross-border variations, which limit the effectiveness of minimum legal age regulations to protect young people.

Education and Enforcement

- Direct Provincial education ministries to work with public health to update and provide supports for health and physical education curriculums, embedding key evidence-based messages about risky use, especially for youth.
- Develop and implement health promotion campaigns targeted to youth describing the harms of cannabis prior to the initial sale of these products, and continue funding such campaigns through cannabis-product taxation to provide youth with on-going reliable information on the risks and harms associated with cannabis use.

Recommendation 2: Protect public health and safety

Impaired Driving

- Develop a comprehensive framework which includes prevention, education and enforcement to address and prevent marijuana-impaired driving with a focus on groups at higher risk of harm, such as youth. This includes the development and implementation of standardized roadside sobriety tests, tools and devices for use in all Canadian jurisdictions.

Exposure

- Prohibit the co-location of sales of cannabis, alcohol and tobacco products.
- Adopt all relevant smoke-free bylaws for public spaces to include cannabis consumption. Including relevant workplace tobacco and alcohol consumption policies.
- Include limitations on outdoor signage, and any kind of promotional activity.
- Prohibit advertising and sponsorships associated with the sale of cannabis-containing products.

Recommendation 3: Ensure Canadians are well-informed

Communication

- Require all cannabis and cannabis-containing product labels to include evidence-informed health warnings, contraindications, harm reduction messages and

information on accessing support services. In addition, subject all cannabis and cannabis-containing products to plain packaging regulations.

- Develop a comprehensive strategy to clearly communicate details of the regulations prior to implementation, so that the public and other stakeholders understand what is permitted, and so that individuals can make informed choices.

Training

- Ensure training of sales staff and education of consumers at point of sale, including promotion of health risks.
- Continue with public health support for local law enforcement activities through education and awareness raising efforts on the dangers of marijuana-impaired driving.

Health Promotion

- Develop and implement health promotion campaigns describing the harms of cannabis prior to the initial sale of these products, and continue funding such campaigns through cannabis-product taxation to provide Canadians with on-going reliable information on the risks associated with cannabis use.
- Invest in evidence-based health promotion, prevention, awareness and education, targeted at both youth and parents, with a secondary focus on other vulnerable groups (pregnant and lactating women, people with personal or family history of mental illness, and individuals experiencing issues with substance abuse) as well as harm-reduction messaging for those who choose to use marijuana.

Recommendation 4: Establish and enforce a system of strict production, distribution and sales

Production

- Create and enforce legislation to ensure that cannabis products meet quality and safety standards. This includes ensuring approved fertilizers and pesticides are used, and that hazardous moulds are not present in cannabis products.
- Mandate food safety training for producers of edible marijuana products.

Distribution

- Expand regulations to include a wider variety of marijuana products (e.g., edibles, concentrates, and tinctures).
- Strengthen requirements set out in the MMPR (ACMPR as of Aug. 24, 2016) to develop a more comprehensive regulatory system, including: Development of national standards for production, packaging, storage, distribution and testing of marijuana products. This is an important strategy for public health and safety.
- Establish a government-controlled monopoly on marijuana production.

Sales

- Limit the number, density (geographic density or population density), and type of retail outlets. Restrict hours and days of operation and locations of retail outlets
- Allow for broad zoning powers at the Municipal level
- Provide government resources for inspection and other accountability functions.
- Develop market information concerning the development of cannabis retail sales centres and ensure their operation by non-commercial entities. Restrict marketing, promotion and displays.
- Should a decision be made to permit storefront retail sales, establish detailed recommendations regarding their location and operation, with specific reference to the criteria established in Washington State, including limits on the distance between retail operations and areas where minors congregate (see more under subsection “Sales and Commercialization”).

Taxation

- Have governments establish (a) taxation rate(s) based on an analysis of price elasticity for these product(s).
- Establish a variable taxation rate system for all THC-containing products that is based on the concentration of THC, with higher-concentration products having a higher tax rate.
- Direct tax revenues from the sale of cannabis and related products back to support the establishment and management of the programs and activities necessary to manage its legalization and regulation and public health programs that will work to mitigate harms.
- Allocate a portion of cannabis tax revenues to strengthen the ongoing efforts of law enforcement agencies to limit the illegal growth, production and sale of cannabis, and to ensure that officers have the necessary training to assess and prosecute those who drive under the influence of cannabis.

Recommendation 5: Conduct ongoing data collection

- Invest proactively in a collaborative public health approach that prioritizes investment in a continuum of evidence-informed prevention and treatment services to prevent and respond to problematic use.

We call on all levels of government to ensure a comprehensive strategy is in place to mitigate the potential harms from the legalization and sale of recreational cannabis. An effective public health approach will require collaboration among multiple sectors (e.g. law enforcement, occupational health, education, health, municipalities, government ministries/departments) to ensure the needed supports are in place to promote and protect the health of Ontarians and Canadians.

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Introduction

Cannabis is the generic name for illegal drugs derived from the female *Cannabis sativa*, *Cannabis indica* and less commonly *Cannabis ruderalis* plants. The main psychoactive ingredient is delta-9-tetrahydrocannabinol, commonly known as THC, which when consumed causes a high by acting on endogenous cannabis receptors in the brain. Cannabidiol (CBD) is the second cannabinoid, which is associated with medicinal properties. Cannabis comes in three main forms:

- marijuana, which is a herbal preparation of dried leaves and flowering tops,
- hashish, which is produced from the resin of the flowering tops, and
- hash oil, produced by solvent extraction of marijuana or hashish.

For the specifics of this paper, we will be using the term cannabis for consistency. Cannabis is most commonly inhaled via combustion (e.g. hand-rolled cigarettes with or without tobacco ("joints"), pipes, bongs) or e-cigarettes and less commonly eaten in baked goods or other forms (1).

Cannabis toxicity induces symptoms such as euphoria, increased hunger, dry mouth and impaired reaction time (1). Smoking cannabis stimulates rapid onset of symptoms, with a peak THC serum concentration after 15-30 minutes and duration of 2-3 hours; ingesting cannabis delays the onset of action by 30-45 minutes. THC concentration has increased sharply over time across all preparations of cannabis, from approximately 2% in 1980 to 20% or higher recently (1). Cannabis has a dose-response relationship, with heavy use more strongly associated with health and social impact (1).

Cannabis is classified as a schedule II drug under the *Controlled Drugs and Substances Act*[i] (S.C. 1996, c.19), making it a criminal offense to produce, distribute or use, except for provisions made for medical use that were introduced in 2001 (2). Despite strict legal prohibition, cannabis is the most commonly used illegal drug globally with an estimated 181.8 million people aged 15−64 years using it for non-medicinal purposes (1). The Canadian prevalence of cannabis use within the past year is

approximately 3.4 million individuals or 12% of the population, with males having double the use of females (3). Canadian youth have the highest reported rate of cannabis use among developed countries according to a UNICEF Report on Child Wellbeing, with 28% of children aged 11, 13 and 15 reporting use in the past 12 months (4). In 2013, cannabis accounted for two-thirds of all drug-related offences, with 80% of charges related to possession. Since the "War on Drugs (WOD)" started in the 1980's, charges for simple possession have increased dramatically, while those related to trafficking, supply and distribution have decreased (5). Approximately 60,000 Canadians are arrested every year for cannabis possession with enforcement costs approximating $1.2 billion/year (5,6).

Risk of acute toxicity due to overdose of cannabis is rare; most of the health risks are related to long-term use (1,7). The Canadian mortality and morbidity rate attributable to cannabis is high. Conservative estimates of burden are attributed mainly to motor vehicle accidents (MVA), with an estimated 89-267 deaths/year and 6,825-20,475 injuries/year; lung cancer, with an estimated 130-280 deaths/year; and substance use disorders, which affects approximately 5-10% of users (7). In Ontario, cannabis accounts for approximately 30% of hospital admissions for substance abuse disorders at an estimated 33,000 cases per year (7).

On April 20, 2016, while attending a special session of the UN General Assembly, Canada's Minister of Health, The Honorable Jane Philpott, announced that the Federal Government plans to introduce legislation to legalize recreational marijuana by spring 2017 (8). The Liberal Party's plan is to eliminate marijuana possession from the criminal code and control distribution through regulation, while increasing penalties for illegal production and/or distribution of cannabis (8). The announcement has created public confusion about the legality of recreational cannabis use and has stimulated a sharp increase in commercially available cannabis within shops operating illegally.

It was announced that a Federal, Provincial, and Territorial Task Force on cannabis would be created to provide recommendations for the legislative and

regulatory framework (8) (the Task Force on Cannabis Legalization and Regulation). Bill Blair, Member of Parliament for Scarborough Southwest and the Parliamentary Secretary to the Minister of Justice, would lead the Task Force in reviewing cannabis distribution, labeling and issues on public safety (8). The Honourable A. Anne McLellan would serve as chair of this Task Force and Dr. Mark Ware will serve as vice chair (9). The following three departments are currently tasked with developing regulations and legislation on cannabis: Health Canada, Public Safety and Emergency Preparedness and Justice and the Attorney General of Canada (10). Between June 30 and August 29, 2016, the Task Force provided an opportunity for Canadians to engage in the discussion of legalizing, regulating and restricting access to marijuana through an online consultation (11).

It was also announced at an Canadian Public Health Association (CPHA) conference in June of 2016 that CPHA would collate all recommendations regarding the legalization of cannabis made by stakeholders attending the conference, which included members of the public, to submit for the online consultation (12). In August of 2016, CPHA released a report titled *A Public Health Approach to the Legalization, Regulation and Restriction of Access to Cannabis* as their submission to the Task Force on Cannabis Legalization and Regulation (12). A list of CPHA's recommendations can be found in **Appendix 1**. Upon review of CPHA's recommendation, OPHA would like to endorse specific recommendations made by CPHA throughout this paper. The Ontario Public Health Unit Collaboration on Cannabis (OPHUCC) also submitted a list of recommendations to the Task Force on Cannabis Legalization and Regulation (13). The OPHUCC is a group of substance misuse professionals from 32 public health units who have joined together to promote a comprehensive public health approach to marijuana legalization (13). A list of their recommendations can be found in **Appendix 2**. Upon review, OPHA would also like to endorse specific recommendations made by OPHUCC throughout this paper.

Public Health Relevance

Studies have found that cannabis causes both physical and mental harm to health (14). Acute cannabis consumption is associated with an increased risk of MVA (15). Cannabis is the most common illicit drug reported in MVA and the second most commonly detected substance among Canadian drivers who die in traffic crashes (16). There is clear evidence that cannabis, like alcohol, impairs the psychomotor skills required for safe driving, and slows drivers' reaction times (14, 16, 17, 18). Colorado recorded a 32% increase in cannabis-related traffic fatalities one year after legalizing recreational cannabis and 92% four years later (14, 19).

Regular cannabis users are more likely to use other illicit drugs as well as tobacco and alcohol, further increasing harms to health, and studies have found that the harmful effects of smoking cannabis and tobacco appear to be additive (1, 20, 21). Youth are more likely to suffer negative mental health outcomes from cannabis use, and people with mental illnesses are at least 7 times more likely to use cannabis weekly and 10 times more likely to have a cannabis use disorder (22).

In addition, cannabis also has adverse respiratory health impacts. Strong evidence suggests that cannabis and tobacco smoke are equally carcinogenic; they both contain bronchial irritants, tumour promoters and carcinogens, and negative respiratory outcomes may appear earlier in cannabis users than tobacco users. Long-term cannabis smoking is associated with increased risk of respiratory problems similar to that of tobacco smoking or worse (18, 20).

The research about cannabis legalization and crime is mixed; cannabis possession accounted for 67% of police-reported drug offences in 2013 in Canada (14). Cannabis use is more likely to be reported by Canadians than other illicit drugs. An increase in illegal cannabis trading activities has been reported in Toronto, raising concerns over potential cannabis trafficking and criminal activities around cannabis dispensaries. Some jurisdictions with legalized recreational cannabis policy have experienced similar trends (14).

Methods

In order to meet the objective of providing an environmental scan of the public health implications for impending recreational cannabis legalization in Canada, a systematic review of position statements, consensus documents and review articles on the topic was carried out.

Step 1 – Identifying the Main Issues

A systematic review of peer-reviewed consensus statements on this topic was undertaken in April of 2016 by searching Pubmed/medline using the search terms “recreational marijuana” AND “public health” AND “legalization” with no limits. A similar search was performed using the online Google Scholar function for the same terms in an effort to identify additional reviews/consensus statements published in non-peer-reviewed locations.

All potentially included papers were reviewed by two members of the working group, independently. If unclear by title the statement was downloaded and the abstract or executive summary reviewed directly to determine eligibility. Each included paper was then read and analyzed. The main themes and/or sub-headings from each paper were extracted. On two occasions this task-group met and reviewed this list of themes. Each group member was then afforded the opportunity to add additional themes they felt were of relevance to the topic. The final paper included the most commonly identified themes.

Step 2 – Identifying, Compiling and Summarizing Data in Each Theme

Once each theme was established via the methodology described above, literature searches and reviews were performed to identify the most relevant peer-reviewed literature with a focus on data for recreational cannabis. Other utilized sources included the reference lists from each included statement. This portion was not meant to be a complete or exhaustive list, and the detail of each relevant paper limited to 1 or 2 key sentences.

Results

Our initial review of article titles identified 24 relevant resources. Further review of abstracts resulted in the inclusion of 7 articles for further examination (22-28). The Google Scholar search was limited to 2012 to present and yielded 3,570 potential websites. Only the first 100 articles were examined directly, which yielded an additional 7 relevant statements (29 -34) and also identified all 7 of those found on Pubmed. The main themes were extracted from each section by multiple author review, and are listed in **Appendix 3**. From these themes, we decided to focus the discussions of our paper around community and access control, sale and commercialization, social determinants of health, public health relevance, the impact of cannabis exposure through the life span, occupational health and safety, and research and surveillance.

Community and Access Control

The legalization of recreational cannabis necessitates policy consideration in terms of where cannabis products will be sold and consumed. These concerns are driven by unintended cannabis exposure and the health risks associated with use.

Unintended Exposure

The unintended exposure of children, especially under 6 years of age, to cannabis is a highly likely sequelae of recreational legalization. Current survey data suggests that edible forms of cannabis account for ~16% of use, and that this proportion increases after recreational use legalization (35). It is these edible forms that pose the greatest risk to children who mistake them for regular food products such as brownies or cookies – ingestion accounts for at least 75% of child exposures (36). Surveillance of poison control centres and hospital admissions in Colorado support this relationship; cannabis-related exposure in children 0-5 years of age increased 138% following medical marijuana legalization and 225% following recreational legalization (37). Cannabis-related hospital admissions for children increased three-fold after legalization and poison center calls mentioning “marijuana” increased 0.8% per month (38, 39). Across the United States, hospital admissions for exposure to marijuana in children

increased on average 26.5% in states after either medicinal or recreational legalization (24).

For cannabis-related hospital visits and poison control centre cases for children 9 years and younger in Colorado, hospital visits increased 100.4% (p value = 0.02) from 2012 – 2013, two years prior to legalization (1.2 per 100 000 population), to 2014 – 2015, two years after legalization (2.3 per 100 000 population) (40). The median age of patients admitted was 2.4 years (40). Poison control cases increased 135.6% (p value < 0.001) from 2012 – 2013, two years prior to legalization (2.7 per 100 000 population), to 2014 – 2015, two years after legalization (6.3 per 100 000 population) (40). The median age of cannabis poison control cases was 2 years (40).

One policy intervention that has shown promise in reducing child exposure is the use of mandatory childproof packaging for edible products (38, 41). This will be discussed in further detail later on in this paper.

OPHA recommends:

- Cannabis-containing products that could be attractive to minors (e.g., THC-infused candy or drinks) be prohibited, and that other edible products be enclosed in childproof packaging.
- That education on proper storage of cannabis products is included in public education campaigns.

Quality Control

Another concern to the legalization of recreational cannabis is the potential for the introduction of hazardous fertilizers, pesticides and moulds that could be present during the cannabis cultivation process (11). In 2016, the Globe and Mail tested nine samples of medical cannabis purchased from dispensaries in Toronto. When tested in a federally certified laboratory, a third of the sample did not pass Health Canada guidelines for licensed marijuana growers and retailers (42). Harmful contaminants were found in these samples that include chemicals, moulds and bacteria (42). One sample even contained *Citrobacter freundii*, a pathogen that could lead to serious infection (42).

OPHA recommends:

- Legislation is created and enforced to ensure that cannabis products meet quality and safety standards. This includes ensuring approved fertilizers and pesticides are used, and that hazardous moulds are not present in cannabis products.
- Expansion to include regulation of a wider variety of marijuana products (e.g., edibles, concentrates, and tinctures).
- Provision of government resources for inspection and other accountability functions.
- Mandating food safety training for producers of edible marijuana products.

Places of Sale

Surveillance in Colorado has demonstrated a dramatic rise in the number of cannabis dispensaries following legalization – currently there are more dispensaries than pharmacies – and a similar proliferation would be expected in Canada. Many factors should be considered in the discussion on dispensary location and volume. In their review of cannabis for medical purposes, Sznitman and Zolotov summarized the evidence for an association between dispensaries and crime (43). While the quality of evidence is inadequate, most studies have not found a correlation while a few found that dispensaries were situated preferentially in neighbourhoods with baseline higher crime rates or greater disadvantage (44). One cross-sectional study from California examined health consequences by dispensary distribution, and demonstrated an increase of 6.8% in hospitalizations for cannabis abuse with each additional dispensary per square mile (45). This evidence suggests that the placement and density of dispensaries may influence risky use patterns, and potentially threaten marginalized populations the most.

In addition, a common concern among stakeholders who contributed to the online submissions for the Task Force on Cannabis Legalization and Regulation was that selling cannabis in combination, or in the same location, with alcohol and tobacco products could increase the negative health risks associated with each substance (11).

In all of the American states that have legalized cannabis, there currently exists a ban on co-location sales with cannabis and alcohol (11). The simultaneous use of cannabis and alcohol can increase THC levels in the blood, and may contribute to behaviours while intoxicated; including impaired driving (11). Cannabis use has also be strongly associated with problem drinking in adolescents (46). In addition, selling cannabis and alcohol in the same location may be seen as encouraging co-use (11).

The *Canadian Community Health Survey* found that tobacco smoking among cannabis users is more than double that of tobacco users who do not use cannabis (11). Another study also found that 80% of young cannabis users also reported using smoke tobacco (46). This are concerns that selling cannabis and tobacco in the same location may increase tobacco use along with nicotine dependence (11). The consumption of cannabis and cigarettes at the age of 18 have also been found to be predictive of heavy drinking at the age of 35 (46). Cannabis use has been linked to mulling, the addition of tobacco to cannabis (46). The combustion of the two substances creates a significant exposure to nicotine and can cause cannabis dependence, as withdrawal symptoms are more severe from the two substances than experienced from one substance alone (46).

OPHA recommends:

- Should a decision be made to permit storefront retail sales, detailed recommendations regarding their location and operation should be established, with specific reference to the criteria established in Washington State, including limits on the distance between retail operations and areas where minors congregate.
- Prohibiting the co-location sales of cannabis, alcohol and tobacco products.

Places of Consumption

Combustion remains the most common form of recreational cannabis use (35). This has public health implications for places of consumption much like cigarette smoking. How cannabis consumption will fit into the ‘Smoke-Free Ontario’ legislation will require careful consideration as there are risks of both second-hand smoke exposure

and potentially second-hand intoxication with cannabis. Both Colorado and Washington states have formal policies of no allowable public use (47). Proposals from California suggest a number of further regulatory options to mitigate the risk of youth exposure. These include on-site consumption ban at dispensaries, places that sell alcohol and cigarettes and special licensing requirements for legal use venues (48). There is little empirical data on the risk of increased youth consumption based on proximity to sale or consumption, but this poses a theoretical risk.

OPHA recommends:

- All relevant smoke-free bylaws for public spaces should be adapted to include cannabis consumption.

Sale and Commercialization

The sale and commercialization of recreational cannabis once legalized is a concern for public health. Upon legalization and implementation of recreational cannabis regulations, clear and restrictive requirements for the mitigation of sale and promotion of products to youth, considerations for unintended exposure, and retail licensing requirements are recommended as stated above. This is of particular importance for edible forms of cannabis products, such as gummy candy, brownies, cookies, etc. The Centre for Addiction and Mental Health (CAMH) *Cannabis Policy Framework* has advocated for plain packaging with warnings about risks of use and clearly displayed THC and cannabidiol content as minimum requirements for regulation (49). Although plain and childproof packaging may mitigate some risks of unintended exposure through regulation, it is important to note that this does not adequately mitigate risks for edibles, whereby products may be indistinguishable from their non-cannabis counterparts out of their packaging (50). Additionally, regulations regarding edibles must consider the impacts of products manufactured to resemble candies, cookies, gummies and other products typically marketed to children.

OPHA recommends:

- Strengthen requirements set out in the MMPR (ACMPR as of Aug. 24, 2016)

to develop a more comprehensive regulatory system, including: Development of national standards for production, packaging, storage, distribution and testing of marijuana products. This is an important strategy for public health and safety.

- All cannabis and cannabis-containing products be subjected to plain packaging regulations.
- Cannabis-containing products that could be attractive to minors (e.g., THC-infused candy or drinks) be prohibited, and that other edible products be enclosed in childproof packaging.
- All cannabis and cannabis-containing product labels include evidence-informed health warnings, contraindications, harm reduction messages and information on accessing support services.
- Cannabis-containing products that could be attractive to minors (e.g., THC-infused candy or drinks) be prohibited, as mentioned earlier in the unintended exposure section.

Ambiguity in current regulation and misperceptions of access to medicinal and recreational cannabis have led to a large increase in dispensaries in Toronto and clear guidance in the interim period before legalization is required (51). The current *Marijuana for Medical Purposes Regulations* (MMPR) (ACMPR as of Aug. 24, 2016) and *Narcotic Control Regulations* (NCR) do not allow for the marketing and promotion of cannabis products, however, a proposed regulatory framework for the marketing and promotion of cannabis products upon legalization remains unclear. Additionally, making medicinal or therapeutic claims is also a concern for Health Canada and must be considered in the marketing and promotion of recreational cannabis products in proposed regulations (52).

OPHA recommends:

- Regulations include limitations on outdoor signage, and any kind of promotional activity.

- Market information should also be developed concerning the development of cannabis retail sales centres. The model, if implemented, should be operated by non-commercial entities.
- Retail cannabis operations should not be co-located with existing alcohol retail operations or with existing retail pharmacy operations.
- Advertising and sponsorships associated with the sale of cannabis-containing products be prohibited.

The legalization of cannabis in Colorado and Washington offers many public health lessons in terms of taxation approaches and pricing (53). Additionally, approaches in the regulation of the alcohol and tobacco industries offer many opportunities for policy makers to prevent the establishment of marketing and promotional environments that put the public's health at risk (30). Studies have shown that raising excise taxes on cigarettes is one of the most effective strategies for reducing early initiation and use, discouraging heavy use and increasing likelihood of quitting even among youth groups. Similarly, higher alcohol taxes and prices have been shown to reduce initiation, binge drinking, drunk driving and traffic crash rates even among youths. Higher alcohol prices are also associated with lower violence and deaths from chronic diseases such as cirrhosis and certain cancers (30). Colorado and Washington State law-makers have taken an approach to recreational cannabis similar to what has shown to be effective in these states over the last fifty years: increased unit pricing by passing a 15% excise tax on wholesale products and a 10% sales tax (23). Ontario's current tax rates for tobacco products are 15.475¢ per cigarette or gram of tobacco product, and a similar taxing scheme to tobacco is recommended for unit prices of cannabis. However, the pricing of cannabis products must be thoroughly considered through a public health lens given its current association with the illegal drug trade and widespread use particularly among youth population in Ontario: pricing that is overly high may promote the continuation of an illegal market to undercut regulated sales, and overly low pricing may promote increased use particularly among vulnerable high-user groups, and youth (53).

OPHA recommends:

- Governments establish (a) taxation rate(s) based on an analysis of price elasticity for these product(s).
- All tax revenues from the sale of cannabis and related products be directed back to support the establishment and management of the programs and activities necessary to manage its legalization and regulation.
- A variable taxation rate system should be established for all THC-containing products that is based on the concentration of THC, with higher-concentration products having a higher tax rate.
- A portion of cannabis tax revenues be allocated to strengthen the ongoing efforts of law enforcement agencies to limit the illegal growth, production and sale of cannabis.

Cannabis related tourism is also a concern for the legalization of recreational cannabis, particularly given Canada's proximity to the United States, where most border states are currently under prohibition. There is a potential for an increase in cannabis-driven tourism upon legalization, although the literature lacks robust data sets in this area. Data from Colorado suggest upwards of a two-fold increase in emergency room visits possibly related to cannabis use in out-of-state residents from 85 per 10,000 visits in 2013 to 168 per 10,000 visits in 2014, while Colorado resident rates rose only marginally from 106 to 112 per 10, 000 visits in the same period (54). This is of particular concern for Ontario tourism that brings an estimated 8.2% of all American adults (~14,000,000) for at least an overnight trip, of whom 1/3 come multiple times annually (55).

Establishing a Safe and Responsible Supply Chain

To establish a safe and responsible supply chain, OPHA supports the OPHUCC's recommendation of a government-controlled monopoly instead of a commercial market model for the production of cannabis products (13). There are important public health implications for each of these models and strong evidence from

alcohol literature indicates that government-owned and controlled monopolies are better able to protect public health and safety.

The goal of a commercialized model of production is to "maximize the efficiency of production, the appeal of the products to consumers, and the size, scale and scope of the market" (56, p. 53). The likely result of these goals includes increased product innovation, driving down the costs of production and ultimately decreasing retail prices. Strong evidence from alcohol literature shows that lower retail prices leads to increased consumption (56). From a public health perspective, this would increase harms to the public especially high-risk groups such as youth, who would more likely purchase and consume cannabis products at lower prices.

In addition, one of the objectives of the Federal government in the legalization of cannabis is to keep it out of the hands of children and youth (11). By following a commercial model of production, increased market competition will likely lower production costs and retail prices, and this could result in increased access and consumption of marijuana in the youth and general population. In addition, in a commercial model, increased product innovation may also mean increased extraction of chemical concentrates, improving the appeal of the product such as innovation in edible forms, and increasing the potency of cannabis products (56). All of which can lead to increased harms to public health.

On the other hand, a government-controlled monopoly has been used for the production of other regulated products and can limit the influence of for-profit markets (56). A government-controlled monopoly would likely result in slower product innovation and any decreases in production costs should be redirected towards public health education, addiction services and programs. With less incentive to improve and maximize production, costs can remain high enough to reduce consumption from general public including high-risk groups such as youth. Higher price strategies have been shown to be an effective way to reduce consumption (57).

Table 1 (below) was adapted from Caulkins *et al.* (2015), and provides additional attributes to consider when comparing a government-controlled monopoly to a

commercial model of production. From a public health perspective, a government-controlled monopoly "controls diversion, eludes advertising, slows product innovation, maximizes tax revenue, decreases market competition and increases retail price" (13, p.16). In agreement with the OPHUCC, OPHA also recommends a government-controlled monopoly for production of cannabis products. This model would better meet the Federal government's objective to reduce consumption and harm to the public.

Additionally, it is important to consider the potential reversibility of government-run production models compared to the commercial model (56). Considering the large gaps in knowledge regarding health, social and economic implications of legalizing cannabis, it is much more difficult to revert to more restrictive models if initially the government chooses to implement a competitive market model of production (13).

Attributes	**Strategy**	
	Government Monopoly	Commercial Model
Production costs (without fees, taxes, regulation)	Low or medium	Very low
Product quality assurance and labeling	Very good	Good
Incentive for producers to promote use that is harmful to public health	Low	Very high
Government's ability to restrain suppliers	Very good	Low
Likelihood of promoting harmful use	Low or medium	Very high
Cost or effort for government control efforts	High	Low
Ability to generate government revenue	Very high	Fair

Table 1. Attributes of government monopoly and commercial production models. Adapted from Caulkins et al., 2015.

OPHA recommends:

- A government-controlled monopoly on marijuana production.

Distribution Models

OPHA supports the OPHUCC's stance on a government-operated distribution model, such as state-run storefronts and retail outlets as the best model to protect public health and safety by minimizing consumption and harms and by limiting youth access (13). Government-owned and -controlled store-fronts can have the ability to control access and availability of cannabis to the public, especially high-risk groups such as youth, by enforcing policies and regulations such as discouraging underage customers, ensuring proper staff training and education, enforcing restrictions on advertising and marketing and enforcing bans against the co-location of sales of cannabis with alcohol and tobacco (13). Additionally, state-controlled alcohol stores have been shown to maintain higher retail prices due to decreased market competition and are thus better able to prevent access to youth (58). OPHA supports the OPHUCC's recommendation that a more restrictive distribution model should be implemented to begin with, as it is more difficult to change policies once they have been socially accepted (13).

Free Enterprise Market for Cannabis Distribution

In the U.S. and other countries, privatization experiments for alcohol, which model the free enterprise market distribution model, showed increased numbers of retail alcohol stores; expansion of hours of operation of stores; increased promotion, sales, consumption, and use of alcohol (30). An association between alcohol availability and consumption was also demonstrated in studies where a change in retail availability of alcohol such as the reduction of hours or days of sales, limiting the number of retail stores and increasing restrictions on access led to decreased alcohol consumption and alcohol-related problems (57).

In a free enterprise market model of distribution, the aim is to maximize profits, which often means placing commercial interests above public health interests (13). Approximately 80% of marijuana purchases come from 20% of consumers in the U.S.; these constitute the heavy users (59). In a free market model, creating and maintaining heavy users would maximize profits at the expense of public health (13). There is also

less control in staff training in order to prevent youth access, and less accountability from companies to provide public health education to consumers, requiring increased government costs to implement interventions to prevent youth access (13).

OPHA recommends:

- A more restrictive distribution model to start and changes to policies over time.

Retail Outlets

To reduce the consumption and harms associated with the legalization of recreational cannabis, important safeguards can be implemented in retail outlets to protect public health and safety including the following: limiting the number, type, and locations of retail outlets; restricting hours of operation, density of retail outlets and types of products sold along with cannabis; training staff and educating consumers of potential health risks at point of sale; and restricting marketing and promotion of cannabis (13).

The OPHUCC suggests that the widespread availability of regulated substances such as alcohol and tobacco for purchase results in the normalization of their use and undermines the health risks associated with their use (13). Contextual cues can play a significant role in shaping one's perspective on the magnitude of harms associated with a regulated substance. For example, the widespread availability of tobacco and alcohol creates a dissonance between the health risk information conveyed by health authorities and the contextual cues that suggest a commonplace use for these substances (60).

Furthermore, easier access leads to reduced total costs required for purchasing including the costs of time, travel and actual price, and frequent contextual cues increases impulse purchases by experimental and occasional users, and users who trying to quit (60). Literature shows that more than one-third of smokers and younger smokers report that ease of access to purchasing cigarettes impacted their frequency of use (60). We can infer that the proliferation of cannabis retail outlets will have similar

effects on the public, resulting in increased consumption and access among youth and the general public. For these reasons, OPHA supports the OPHU's stance on recommending important safeguards on cannabis retail outlets to protect public health and safety and preventing youth access (13).

OPHA Recommends:

- Limiting the number and type of retail outlets
- Restricting hours and days of operation
- Restricting locations of retail outlets
- Restricting density of retail outlets (geographic density or population density)
- Allowing for broad zoning powers at the Municipal level
- Restricting the type of products that can be sold through outlets along with cannabis
- Restricting marketing, promotion and displays
- Training of staff/education of consumers at point of sale
- Training of staff/promotion of health risks through educational material at point of sale

Social Determinants of Health

Results from the 2012 Canadian Community Health Survey (CCHS) provide estimates of self-reported cannabis use by age, gender, income and frequency of use (3). Overall prevalence of 'cannabis use in the last year' is higher for males, but becomes double that of female use when asked about daily use. Self-reported use is also skewed with respect to age, with youth cannabis use 2.5 times higher than adults aged 25 and older (61). This places young men at increased risk according to the *Lower Risk Cannabis Use Guidelines for Canada,* which specifically caution against daily or near-daily use due to its association with poor social and health outcomes (62).

Overall prevalence of cannabis use, when measured as use during the past year, is equally distributed across income quintiles (3). When prevalence by income quintile is further stratified by sex, however, differences in distribution emerge, with males in the

highest two income quintiles reporting the highest use and females in the lowest two income quintiles reporting the highest use (3). High usage rates by low income females in child-bearing years has significant public health implications, and represents a sub-group of concern.

Criminal charges and penalties for cannabis range from fines for possession to lifetime imprisonment for trafficking, with convictions leading to criminal records. The War on Drugs (WOD), initiated in Canada in 1982 by Prime Minister Brian Mulroney, led to an increasing enforcement focus on the lesser offence of possession. Racial minorities, such as black Canadians, have been disproportionately impacted by the WOD, with incarceration rates increasing by 50% from 6.3% in 2003 to 9.5% in 2013 (63). Black students report similar rates of cannabis use and selling as white students yet experience 5 times the incarceration rate (63). This is believed to be due to the practice of racial profiling by law enforcement, as well as socioeconomic issues that limit effectiveness in addressing legal charges. Legalization would likely address this inequity by reducing the number of youth and young adults being charged, resulting in fewer people with criminal records, which is a known barrier to educational and employment success that reduces income and employment security.

While decriminalization would achieve the goal of reducing incarceration due to cannabis, CAMH, a key stakeholder, does not support this policy, seeing it as a half-measure. They believe that while it may reduce the incidence of criminal charges due to cannabis possession, which disproportionally impacts lower income and racial minorities, it does not provide any mechanism for governments to regulate production or distribution (49). It should be noted that student surveys reporting on alcohol consumption demonstrate that use among students is very high and exceed that of cannabis use for every age group, demonstrating little evidence that legalization will necessarily decrease access amongst young people (61).

The Impact of Cannabis Exposure through the Life Course

The life course perspective must be applied when investigating ways in which cannabis exposure may impact physical growth and development as well as social and

behavioural well-being. Assessing impact persistence of cannabis exposure is critical in order to understand its influence on an individual's life course trajectory, quality of life, and functionality within society. A scan of the literature was conducted to investigate the impact of cannabis exposure during fetal, infant, and childhood development as well as later on in life.

Currently in North America, it is estimated that half of all pregnancies are unplanned (18). Moreover, in 2011, 11% of women of childbearing age in Canada reported using cannabis within the past year (18). It is anticipated that legalization of recreational cannabis in Canada may result in increased usage among this cohort, increasing fetal and infant exposure with potential short and long-term effects. This is further compounded by the increasingly prevalent perception that cannabis is not harmful, as well as the fact that THC content in cannabis products has risen markedly over the past decade (18).

Existing evidence pertaining to fetal impacts of maternal cannabis use during pregnancy are conflicting. Some evidence supports an association between prenatal cannabis exposure and low birth weight, whereas other evidence shows no significant association (18, 64, 65). Limited, inconsistent evidence exists on cannabis use during pregnancy and risk of preterm birth, stillbirth or miscarriage (18, 64).

In terms of infant exposure through lactation and breastfeeding, an estimated 0.8% of the cannabis consumed by lactating mothers reaches the infant (64). Some evidence suggests that THC concentrates in breast milk due to its affinity for substances with a high fat content (66). It is unknown how long THC remains in breast milk after maternal cannabis use; however, prolonged infant exposure through breastfeeding is possible (66). Although limited evidence exists on the impacts of infant cannabis exposure through breastfeeding, some research suggests an association with impaired psychomotor development (64).

Prospective longitudinal studies provide evidence linking prenatal cannabis exposure with impaired neurological development, cognitive functioning and behavioural challenges throughout infancy, childhood and persisting into adolescence (18, 64). The

table below outlines the adverse effects of prenatal cannabis exposure by developmental stage observed during participant follow up in three studies (18, 64).

Developmental Stage	Noted Adverse Effects of Prenatal Cannabis Exposure
Infancy	Increased aggression and decreased attention span
Toddler	Hyperactivity, impulsivity and impaired verbal/visual reasoning, memory, and attention
Later Childhood	Hyperactivity, impulsivity, depression, anxiety, and impaired attention, reading, and spelling
Adolescence	Delinquency, reduced academic achievement, coordination, memory, and early onset of substance use/misuse

Table 2 Developmental stages and noted adverse effects of prenatal cannabis exposure.

It was reported that the brain continues to develop until the early twenties (11, 46). Some evidence suggests that cannabis dependence in adolescence may be associated with drops in intelligence and poorer employment outcomes in young adulthood (34, 67). Comparable levels of use do not appear to affect adults as significantly, suggesting that adolescents may be particularly vulnerable to the cognitive impacts of cannabis usage (34). Some research indicates that cognitive impairment from cannabis use during adolescent years may not be fully reversible, although this finding is controversial and disputed (34).

Although adults do not appear to experience the cognitive effects of cannabis usage to the same degree as younger age cohorts, cannabis exposure during adulthood may cause other detrimental physiological effects. Current evidence indicates that smoking cannabis may result in both short and long-term respiratory impacts (38). Research suggests that moderate cannabis smoking may improve lung airflow briefly following exposure (38). Conversely, heavy cannabis smoking may restrict airflow short-term and may be associated with chronic respiratory conditions as well as development of pre-malignant lesions in the airway (38). The evidence is inconclusive as to whether

smoking cannabis is associated with lung cancer development (38). An extremely limited body of evidence exists with respect to the extra-pulmonary effects of cannabis use, but some research does support an association with negative cardiovascular impacts as well as testicular and prostate cancers (38). Lastly, limited research supports a linkage between cannabis use and development of pre-diabetes in middle adulthood (68).

Currently, very little is known about interactions resulting from the concurrent use of cannabis and pharmaceuticals, and most existing information comes from case reports (69). This is an issue that could impact the entire population, but it is particularly concerning for the elderly due to their increased usage of pharmaceuticals (69). Concerns exist regarding contraindications in which cannabis use may interfere with the mechanisms of other drugs, either by dampening or facilitating their effects. In either case, the physiological repercussions could be severe.

OPHA recommends:

- The minimum age for purchasing and possessing cannabis should be 21.
- The minimum age for purchasing and possessing cannabis should be consistent across Canada in order to provide clear policy direction and eliminate cross-border variations, which limit the effectiveness of minimum legal age regulations to protect young people.

Occupational Health and Safety

Although much consideration has been factored into the legalization of cannabis, it is important to note that there is currently no strategy in place to address how the legalization of cannabis will impact employment and workplace issues, including: health, safety and accommodation (70). As part of the environmental scan conducted for the purposes of this report, there was extensive information found related to the implications of legalizing cannabis and the impacts in the workplace. There were recurrent themes outlined throughout the literature:

Safety

As defined by the *Canada Labour Code, Part II, IPG-080*, the employer has the duty to ensure that the health and safety at work of employee is protected. This poses ethical and legal questions for employers as there is a need for balance between an individual's rights and freedoms, and the duty to ensure safety for all workers (70). There is substantial evidence that indicates that the use of cannabis increases the likelihood of workplace incidents (27, 70, 71, 72).

Job Classification and Accommodation

Throughout the literature, there is discussion as to what job classifications should be "Safety Sensitive" in nature, and how those determinations are made (27). In the U.S., it appears that many workplaces have developed their own internal policies to supplement the Department of Transportation (DOT) list of "Safety Sensitive" positions. There is additional debate on whether a workplace should be forced to accommodate an employee if they are influenced by cannabis. Further, much discussion revolves around the detection and determination of intoxication from cannabis as there is not currently a non-invasive method to definitively determine impairment.

Occupational Health

In American states where cannabis has been legalized, there has been evidence of increased workplace injuries in cannabis industry workers (17). There appears to be very little literature related to the health and safety of workers involved in the production and refining on cannabis, including exposure limits and best practices for risk mitigation.

OPHA recommends:

- All relevant workplace tobacco and alcohol consumption policies should be adapted to include cannabis consumption.

Cannabis Research

Significant research evidence gaps exist due in part to limitations of existing cannabis studies. Researching the illicit psychoactive substance in cannabis poses

methodological challenges, including inability to extrapolate findings in addition to ethical barriers. Current research evidence is thus based mainly on observational data as research ethics precludes randomised experiments. This, in turn, hampers the ability to make confident causal inferences. Most cannabis studies use correlational methods that do not capture unmeasured data that may exist between users and nonusers (56). Additionally, validated survey questions and generally accepted definitions capturing prevalence, frequency and type of cannabis use are lacking; the use of other modes of cannabis consumption compounds the issue (23).

For this reason, a common recommendation from literature is to fund and support research on cannabis use, misuse and abuse (1, 38, 58). The World Health Organization (WHO) held meeting in April 2015 with world experts on cannabis (1). During this meeting, it was suggested that priorities of future research would include cannabis substance content and prevalence, neurobiology of cannabis use, health consequences, social costs, prevention and treatment (1).

One of the Canadian agencies currently researching the impact of cannabis is CAMH. CAMH has already published studies on the "relationship between cannabis use and body weight, quality of life, mood and mental illness" (73). Currently, there are no approved medications available on the market to treat cannabis dependence. For this reason, CAMH is collaborating with GW Pharma to evaluate the use of SATIVEX, a drug used for cannabis dependence, to explore the effectiveness of this drug in minimizing cannabis withdrawal and relapse (73).

Lastly, it was announced on February 24, 2016 at the Liberal Senate Forum Open Caucus on the Legalization of Cannabis that the Federal, Provincial and Territorial Task Force on cannabis would be created and would commission research on the impacts of cannabis use (8). In addition, the Canadian Society of Drugs and Forensic Science Drugs and Driving Committee will be used to provide scientific advice based on a review of legal limits of cannabis and other drugs while driving (8).

A major challenge in legalizing recreational cannabis is the lack of consensus on how much THC can impair users as well as the unavailability of a comprehensive

database of blood THC measurements. Having THC in your system may mean someone is too impaired to drive or it may not because of how the substance is metabolized in the body. Some experts propose a THC concentration in blood serum of 7 to 10 nanograms per milliliter, equivalent to 0.05% alcohol concentration while others disagree (30). The substance can last up to 7 days in the body but is only active for hours, posing testing challenges for impaired drivers (30).

Additionally, unlike alcohol and the breathalyzer, there is no universally accepted roadside test for cannabis impairment and most available tests can only detect smoked and not edible or other forms. Other forms of testing such as oral fluid and urine testing have so far remained unreliable (30). Testing is further complicated when cannabis and alcohol substances are both present in the blood. This is a challenge that the Canadian Society of Drugs and Forensic Science Drugs and Driving Committee will have to address, along with others. CAMH is also conducting research studies to measure the effects of cannabis while driving a simulator (74).

OPHA recommends:

- Standardized roadside sobriety tests, tools and devices be developed and implemented for use in all Canadian jurisdictions.
- A portion of taxation revenue from the sale of cannabis products be allocated to law enforcement to ensure that officers have the necessary training to assess and prosecute those who drive under the influence of cannabis.

Surveillance and Evaluation

One of the lessons learned from Colorado and Washington State on cannabis regulation was to have a rigorous surveillance system in place to gather baseline data on current cannabis use, and for the ongoing collection of data to monitor the impact of a regulatory framework (47). Surveillance data can then be used to inform and policy changes that need to be made and to reduce any negative impacts as a result of cannabis legalization (47). Fortunately, there are several Canadian databases available that are currently conducting surveillance on cannabis use.

In 2012 the CCHS – Mental Health Survey collected data on cannabis use in individuals 15 years of age and older (3). Questions on this survey include lifetime cannabis use, use in the past 12 months and frequency of use (3). In addition, the Canadian Tobacco, Alcohol and Drug Survey (CTADS), which is a telephone survey that was launched in 2013 to replace the Canadian Alcohol and Drug Use Monitoring Survey, asks questions about alcohol and drug use on a biennial basis (75). Currently there are questions on lifetime cannabis use, past-year use and average age of initiation for youth (75).

The Transport Canada's National Collision Database contains data on all reportable motor vehicle collisions in Canada. A report from the Canadian Centre on Substance Abuse was able to link coroner toxicology reports on victims of motor vehicle accidents to detailed information on the collision from the National Collision Database between 2000 and 2007 (76). In this study, it was determined that cannabis was the second common drug detected in these fatal accidents (76). It was present in 25.8% of drug only related fatalities, and in 36.1% in drug and alcohol related fatalities (76). A suggestion for the future is to create a surveillance system that links these two databases as done in this study. Other potential surveillance sources include police logs on charges due to driving under the influence of cannabis, and surveillance systems to monitor ski and recreational injuries related to cannabis use.

The Canadian Student Tobacco, Alcohol and Drugs Survey (CSTADS) tracks surveillance data on cannabis use for students in grades 6 to 12. This survey asks questions on lifetime use, use in the past year, frequency of use, and age of first use (77). On a more local level, for the province of Ontario, CAMH administers the Ontario Student Drug Use and Health Survey to students in grades 7 – 12. This survey asks the same questions as the CSTADS, with additional questions on driving after using cannabis, frequency of presentations on cannabis in school, number of friends using cannabis, being high in school and perception of risk of cannabis use (78).

In terms of maternal cannabis use during the prenatal period, the Ontario Antenatal Record that is also captured and stored in the Better Outcomes Registry

Network (BORN) Ontario database contains a question on maternal drug use (79, 80). Like the Ontario Antenatal Record and BORN Ontario, the Healthy Babies Healthy Children Screen also addresses maternal cannabis use through a general drug use question (81). One suggestion for future improvements to these records and screen is to ask a separate question about cannabis use and frequency of use, rather than combining this data with general drug use. This would help provide a more precise number of maternal cannabis users.

Emergency department visits can be monitored using Acute Care Enhanced Surveillance (ACES), which collects real-time data from ED visits such as date and time of visit, hospital, age and gender, postal code, chief complaint and CTAS Triage Score (82). However, not all hospitals are part of ACES. Hospitals need to voluntarily agree to participate in this surveillance network (82). A suggestion for the future is to increase buy-in of this system from non-participating hospitals. Similarly, poison control logs can be used to track accidental cannabis poisonings.

Lastly, another possible source of surveillance is the Rapid Risk Factor Surveillance System (RRFSS), which is a telephone survey that operates out of York University to assist health units in obtaining community health data on topics such as chronic disease prevention and environmental and family health, from the community (83). Currently, an RRFSS is creating cannabis use module, which contains a series of questions on the awareness of the health effects of cannabis among adolescents and young adults, and questions about support for cannabis policies (84).

Future Directions

We will end this paper with a list of recommendations for future directions, which is reflective of OPHA's mandate – advocacy, public awareness and representation of OPHA constituent societies and members. A fourth topic of research has been added, as it was a recurring recommendation from the literature.

Advocacy

Advocacy occurs at the Federal, Provincial, Territorial and municipal level. OPHA recommends that a consistent pan-Canadian legislative and regulatory approach be developed that reflects the concerns of all Federal, Provincial and Territorial jurisdictions. OPHA also recommends that this approach be comprehensive and evidence-based towards the legalization and regulation of recreational cannabis.

Canada's Task Force on Cannabis Legalization and Regulation provided a list of Federal objectives in their Terms of Reference that was used to guide their work. Based on this list, OPHA can play an integral role in providing support and advocating for the following Federal objectives:

- Protect young Canadians by keeping marijuana out of the hands of children and youth (85).
- Protect public health and safety by strengthening, where appropriate, laws and enforcement measures that deter and punish more serious marijuana offences, particularly selling and distributing to children and youth, selling outside of the regulatory framework and operating a motor vehicle while under the influence of marijuana (85).
- Ensure Canadians are well-informed through sustained and appropriate public health campaigns, and, for youth in particular, ensure that risks are understood (85).
- Establish and enforce a system of strict production, distribution and sales, taking a public health approach, with regulation of quality and safety (e.g., child-proof packaging, warning labels), restriction of access, and application of taxes, with programmatic support for addiction treatment, mental health support and education programs (85).
- Conduct ongoing data collection, including gathering baseline data to monitor the impact of the new framework (85).

Other recommended possible advocacy initiatives at the Federal level can include further research on regulation and access; packaging standards such as plain

packaging, mandatory childproof packaging, and warning labels; enhancement of surveillance systems; mandatory reporting for child poisoning to poison control and minimum age for purchase.

Provincial advocacy initiatives involve raising awareness and supporting regulations around the distribution, enforcement and marketing of cannabis and cannabis-containing products. The Use of prevention and intervention programs are essential in areas of concentrated disadvantage, and limiting the density of dispensaries. In addition, OPHA advocates for the introduction of policy considerations in the workplace that include clearly defined and outlined rights and responsibilities of employees and employers as it pertains to cannabis use in the workplace. In addition, work could be done to determine if certain occupations require stricter standards as it relates to cannabis.

Public Awareness

In terms of public awareness**,** OPHA recommends supporting the Task Force's call for the government to ensure public health campaigns around the impact of recreational cannabis use are implemented. This is particularly important to youth, as it has been identified that there is a decreased perceived risk of harm with cannabis use in this demographic (85). The Ontario Student Drug Use and Health Survey found 10% of Ontario students with a driver's license reported driving after using cannabis (86). Experts agree that driving while intoxicated with cannabis increases the risk of motor vehicle accidents (9). This information should be included in driver educational programs and policies to improve public safety. Additional programs to prevent and delay cannabis use among youth are recommended to improve impaired driving rates in this population.

Cannabis educational campaign programs and policies with clear messages about the risks of cannabis are recommended to address the link between daily cannabis use and poor mental health outcomes. However, further research is needed to improve methods to change attitudes and beliefs of youth and other frequent users.

OPHA recommends:

- Health promotion campaigns are developed with funding from cannabis-product taxation to provide Canadians with reliable information on the risks associated with cannabis use.
- Targeted health promotion and harm reduction messaging describing the harms of cannabis consumption be developed and implemented, prior to the initial sale of these products.
- Develop a comprehensive framework which includes prevention, education, and enforcement to address and prevent marijuana-impaired driving with a focus on groups at higher risk of harm, such as youth.
- Continue with public health support for local law enforcement activities through education and awareness raising efforts on the dangers of marijuana-impaired driving.
- Direct Provincial education ministries to work with public health to update and provide supports for health and physical education curriculums, embedding key evidence-based messages about risky use.
- Develop a comprehensive strategy to clearly communicate the risks and harms associated with marijuana use, particularly for youth as well as conveying details of the regulations prior to implementation, so that the public and other stakeholders understand what is permitted, and so that individuals can make informed choices.
- Invest in evidence-based health promotion, prevention, awareness and education, targeted at both youth and parents, with a secondary focus on other vulnerable groups (pregnant and lactating women, people with personal or family history of mental illness, and individuals experiencing issues with substance abuse) as well as harm-reduction messaging for those who choose to use marijuana.

Research

It was noted in the literature that there are several gaps to consider for future

research. There is a specific lack of evidence in the method of cannabis use. Cannabis may be smoked in joints, bowls and bongs or consumed in edibles or drinks, etc. It is pertinent, therefore, to know the prevalence of various methods of cannabis use, and type of usage (i.e. medical or recreational) in order to develop appropriate public policies and strategies to address potential health effects of cannabis. While surveillance data systems typically monitor current use by cannabis smokers, other cannabis consumption formats are rarely scrutinized.

Data collection is important to monitor how legalizing recreational cannabis may affect the prevalence of the drug in the general driving population. There is also currently insufficient knowledge about the impact of cannabis legalization on crime; further research is warranted in this area especially in light of recent increased illegal cannabis shops/trades in Toronto.

Further research is also recommended to investigate the following:

- Cannabis use and the impact on fertility.
- Maternal cannabis use during pregnancy and risk of preterm birth, stillbirth, miscarriage and other impacts on maternal, newborn and child health.
- Impacts of infant cannabis exposure through breastfeeding following maternal use.
- The relationship between cannabis use and development of extra-pulmonary conditions.
- Interactions between cannabis use and pharmaceuticals.
- The acceptable exposure limits, safety standards and best practices as it relates to the manufacturing of cannabis products.
- Improved testing methods for determining cannabis levels and/or impairment level.
- Determining if a difference exists in the health effects of in heavy, regular or occasional cannabis use.

Conclusion

OPHA is committed to engaging with key stakeholders and communities to advocate for the consideration of the public health impacts as Federal and Provincial governments develop their plans for the legalization and regulation of recreational cannabis.

OPHA will advocate for a comprehensive, evidence-based approach toward legalization and regulation of recreational cannabis that considers the harms and risks associated with cannabis use, especially for youth, and includes the following components:

- Further research on regulation and access; packaging standards such as plain packaging, mandatory childproof packaging, and warning labels; and the health effects of cannabis use.
- The enhancement of surveillance systems and mandatory reporting for child poisoning to poison control.
- The application of a health equity lens in addressing health impacts of legalization and accompanying regulations.
- The creation of Provincial regulations to include distribution, minimum age of cannabis purchase, enforcement, marketing, use of prevention and intervention programs (essential in areas of concentrated disadvantage), and limiting the density of dispensaries.
- The creation of clearly defined and outlined rights and responsibilities of employees and employers as it pertains to cannabis use in the workplace.
- The creation of a communication strategy that involves different pathways for target audiences to change perceptions of risks around cannabis use.
- The creation of educational campaign programs and policies, with clear evidence based key messages about the risks of cannabis.
- The creation of guidelines for curriculum in schools to include lesson plans on cannabis use, and guidelines for marketing and treatment.

Appendix 1: CPHA's Recommendations Listed in their Submission to the Task Force on Marijuana Legalization and Regulation

- A consistent pan-Canadian legislative and regulatory approach be developed that reflects the concerns of all Federal Provincial and Territorial jurisdictions.
- The minimum age for legal consumption be established at 19 years in each province and territory, regardless of the age of majority for the legal consumption of alcohol and tobacco.
- Advertising and sponsorships associated with the sale of cannabis-containing products be prohibited.
- Targeted health promotion and harm reduction messaging describing the harms of cannabis consumption be developed and implemented, prior to the initial sale of these products.
- Cannabis-containing products that could be attractive to minors (e.g., THC-infused candy or drinks) be prohibited.
- Governments establish (a) taxation rate(s) based on an analysis of price elasticity for these product(s).
- All tax revenues from the sale of cannabis and related products be directed back to support the establishment and management of the programs and activities necessary to manage its legalization and regulation.
- A variable taxation rate system should be established for all THC-containing products that is based on the concentration of THC, with higher-concentration products having a higher tax rate.
- A THC concentration of 15% should be established as the maximum permitted for usable cannabis products (including the dry product, edibles, creams, salves and oils) sold under this legislation and these regulations.
- Oils and other products having higher THC concentrations (greater than 15%), which are used for therapeutic purposes, should not be sold for recreational use. This point will be considered in a subsequent section of this submission.
- Governments establish a maximum purchase amount for personal consumption of 28 grams per day of dried usable products based on the relative THC concentrations.
- An e-commerce sales model be maintained and expanded to support the recreational regulatory framework.

- Should a decision be made to permit storefront retail sales, detailed recommendations regarding their location and operation should be established, with specific reference to the criteria established in Washington State, including limits on the distance between retail operations and areas where minors congregate.

- Regulations include limitations on outdoor signage, and any kind of promotional activity.

- That regulations and standards currently in place regarding the production and processing of cannabis products under the medical marijuana regulations should be maintained as part of the regulatory framework for recreational cannabis.

- Home production of cannabis plants should be permitted under specific controls, including prohibitions on the production of higher-THC-concentration products, the sale of home-grown products, and provision of home-grown cannabis to children.

- All cannabis and cannabis-containing products be subjected to plain packaging regulations.

- All cannabis and cannabis-containing product labels include evidence-informed health warnings, contraindications, harm reduction messages, and information on accessing support services.

- The e-commerce sales model currently established for the medical cannabis regime be maintained and expanded to support the recreational regulatory framework.

- Market information should also be developed concerning the development of cannabis retail sales centres. The model, if implemented, should be operated by non-commercial entities.

- Retail cannabis operations should not be co-located with existing alcohol retail operations or with existing retail pharmacy operations.

- A portion of cannabis tax revenues be allocated to strengthen the ongoing efforts of law enforcement agencies to limit the illegal growth, production and sale of cannabis.

- Standardized roadside sobriety tests, tools, and devices be developed and implemented for use in all Canadian jurisdictions.

- A portion of taxation revenue from the sale of cannabis products be allocated to law enforcement to ensure that officers have the necessary training to assess and prosecute those who drive under the influence of cannabis.

- Health promotion campaigns be developed with funding from cannabis-product taxation to provide Canadians with reliable information on the risks associated with cannabis use.

- All relevant smoke-free bylaws for public spaces, and workplace tobacco and alcohol consumption policies, should be adapted to include cannabis consumption.

- The recreational and medical cannabis systems be amalgamated where a product required by the medical user is accessible through the recreational use system.

- In certain situations, access to therapeutic cannabis products be permitted to minors and/or at higher THC concentrations than allowed by the recreational regulatory framework, and as recommended by a licensed physician. Products containing higher THC concentrations should be produced by specifically authorized manufacturers.

- All cannabis-containing products be subject to the same taxation policy.

Appendix 2: OPHUCC's Recommendations Listed in their Submission to the Task Force on Marijuana Legalization and Regulation

Section One: Minimizing harms of use

1(a). Do you believe that these measures are appropriate to achieve the overarching objectives to minimize harms, and in particular to protect children and youth?

(1) Minimum age for legal purchase.
Recommendation:

- The minimum age for purchasing and possessing marijuana should be 21.
- The minimum age for purchasing and possessing marijuana should be consistent across Canada in order to provide clear policy direction and eliminate cross-border variations which limit the effectiveness of minimum legal age regulations to protect young people.
- Regulations must be coupled with rigorous enforcement and penalties for violations in order to be effective.

(2) Advertising and marketing restrictions.
Recommendation:

- Prohibit all forms of marijuana advertising, marketing, and sponsorship through federal legislation, similar to that of the Tobacco Act and include language that addresses volume and content restrictions
- Adopt plain packaging regulations that restrict or prohibit the use of logos, colors, brand images, or other promotional information on packaging other than brand and product names displayed in a standard color and font style. Also require that packaging include health warnings.
- In the case that marketing, advertising and promotion of marijuana is made allowable within strict limitations, it is crucial that an effective advertising regulatory system be put in place. This system must apply to all forms of marketing and have the flexibility to adjust restrictions as needed.
- Given that there is strong evidence from tobacco research that promotion at the point of sale increases the likelihood that children and adolescents will start to smoke, it is recommended that federal legislation is enacted to prohibit youth under the minimum age for purchase of marijuana from entering marijuana retail outlets.
- Develop a supporting infrastructure to ensure accountability for these restrictions.

(3) Taxation and pricing
Recommendations:

- Index marijuana prices to inflation to ensure prices do not decrease relative to other goods over time.
- Further regulate marijuana prices through tax increases, while giving consideration to the level at which minimum prices should be set to curb demand and reduce consumption (especially among youth) , while minimizing the

opportunity for continuation of lucrative illicit markets.
- Base prices (including minimum prices) on THC content so that higher strength products are more expensive than lower strength products in order to create incentives for the production and consumption of safer, lower strength products.

(4) Limits of allowable THC potency in marijuana
Recommendation:
- Determine maximum THC limit, which balances the risk for harm against the need to minimize the attractiveness of illegal production and trafficking of higher potency products.
- Set regulations that mandate clear and visible labelling of THC content in products, accompanied by evidence-based health warnings.
- Establish government right to impose regulations related to marijuana from the beginning, since lessons from tobacco demonstrate how challenging it can be to expand regulatory scope after the fact. As research reveals better evidence about the harms and therapeutic uses related to marijuana, regulations should be adjusted.
- Conduct further research into the short and long term health effects associated with the use of higher potency marijuana products.

(5) Restrictions on marijuana products:
Recommendation:
- Set a maximum THC limit for all marijuana products, including specifying what constitutes a single serving size of edible product (e.g. 10 milligrams of THC) regulating the maximum number of serving to be allowed in a single packaged food item.
- Require that edible products have clearly marked serving sizes that are appropriate to the food being consumed. (For example a cookie should be one or two servings not ten)
- Prohibit production and sale of products that are attractive to youth (e.g., products which mimic popular brand-name snacks and candies (such as gummy bears), additives, flavorings and combinations with other substances (e.g., nicotine, caffeine, alcohol).
- Require that marijuana products be sold in a child-resistant container that conform to federal consumer product safety regulations and include specific warning statements (e.g., Keep all marijuana products away from children.)
- Require that products be sold in plain packaging and be marked with a universal symbol indicating the container holds marijuana.
- Require that edible products be labeled with all ingredients, if refrigeration is required, standard serving limit and expiration date (for edibles).
- Offer producers of edible products access to food safety training to help reduce the risk of foodborne illness.
- Ensure that a reliable system is put in place for product monitoring and testing to ensure production consistency and consumer safety.

(6) Limitations on quantities for personal possession.
Recommendation:

- Set limitations on quantities for personal possession that align with current practice in other jurisdictions, and with current definitions of quantities for personal possession under the criminal law in Canada.
- Limitations should include all types of marijuana products, including edibles.
- Consideration should be given to having lower limits for products containing higher levels of THC.

(7) Limitation on where marijuana can be sold.
See comments on "designing an appropriate distribution system."

1(b): Are there other actions which the Government should consider enacting alongside these measures?

We urge the task force to consider the following recommendations:
1) Develop a comprehensive strategy to clearly communicate the risks and harms associated with marijuana use, particularly for youth as well as conveying details of the regulations prior to implementation, so that the public and other stakeholders understand what is permitted, and so that individuals can make informed choices.

2) Invest in evidence-based health promotion, prevention, awareness and education, targeted at both youth and parents, with a secondary focus on other vulnerable groups (pregnant and lactating women, people with personal or family history of mental illness, and individuals experiencing issues with substance abuse) as well as harm-reduction messaging for those who choose to use marijuana.

3) Invest proactively in a collaborative public health approach that prioritizes investment in a continuum of evidence-informed prevention and treatment services to prevent and respond to problematic use.

4) Invest in research to address gaps in knowledge in order to better understand short and longer-term health impacts of both non-therapeutic and medical marijuana use and to guide best-practice policy development. The criminal status of marijuana has limited research opportunities up until now, leaving many gaps in knowledge, such as the full range of risks and therapeutic uses. Many recommendations for a regulatory framework have been made based on evidence borrowed from alcohol and tobacco research, and these should be substantiated by ongoing research specific to marijuana.

5) Conduct ongoing surveillance and monitoring on the patterns and trends associated with use, including the collection of baseline data prior to legalization. Stakeholders from Colorado and Washington expressed that they encountered challenges in monitoring impacts because no baseline data existed, particularly because marijuana was not reported separately from other illegal substances in many data systems. Canada is in a position whereby we can put systems in place beforehand to confidently measure impact moving forward. This data will be extremely valuable in making evidence based

decisions, regarding the impact of this new legislation and in making adjustments of this new system in years to come.

6) Restrict the sale of drug paraphernalia (e.g., pipes, bongs) in places where children and youth frequent and prohibit the sale of these products to minors. As experience with tobacco shows that the presence and availability of these products can undermine other regulations by serving to normalize or increase the social acceptability of marijuana use among youth.

2(a): What are your views on the minimum age for purchasing and possessing marijuana?
Recommendation:

- The minimum age for purchasing and possessing marijuana should be 21.
- Regulations must be coupled with penalties for violations and be strictly and consistently enforced in all situations in order to be effective.

2(b): Should the minimum age be consistent across Canada, or is it acceptable that there be variation amongst provinces and territories?
Recommendation:

- The minimum age for purchasing and possessing marijuana should be consistent across Canada in order to provide clear policy direction and eliminate cross-border variations which limit the effectiveness of minimum legal age regulations to protect young people.

Section Two: Establishing a Safe and Responsible Production System

1. What are your views on the most appropriate production model? Which production model would best meet consumer demand while ensuring that public health and safety objectives are achievable? What level and type of regulation is needed for producers?
Recommendation:

- A government controlled monopoly on marijuana production.
- Marijuana should not be regulated or treated as a food product in the context of the agricultural industry.

2. To what extent, if any, should home cultivation be allowed in a legalized system? What if any government oversight should be put in place?
Recommendation:

- Home cultivation is not recommended.

3. Should a system of licensing or other fees be introduced?
Recommendation:

- Licensing should be required and a licensing fee enacted to increase revenue to enhance public health and safety through increased producer compliance with regulatory standards, and to offset the health and social costs associated with legalization.

*4. The MMPR (*ACMPR as of Aug. 24, 2016) *sets out rigorous requirements over the production, packaging, storage and distribution of marijuana. Are these types of requirements appropriate for the new system? Are there features that you would add or remove?*

Production
Recommendation:

- Strengthen requirements set out in the ACMPR to develop a more comprehensive regulatory system, including: Development of national standards for production, packaging, storage, distribution and testing of marijuana products. This is an important strategy for public health and safety.
- Expansion to include regulation of a wider variety of marijuana products (e.g., edibles, concentrates, and tinctures).
- Provision of government resources for inspection and other accountability functions.
- Mandating food safety training for producers of edible marijuana products.
- Aligning marijuana production with public policy goals related to climate change.

Product Packaging
Recommendations:

- Develop and enforce product design requirements, including plain and standardized packaging regulations that prohibit branding and promotion of all marijuana products.
- Develop and enforce labelling requirements, including marijuana strain, dosage, and THC levels. Lessons can be learned from regulating product packaging of tobacco and alcohol and from other jurisdictions that have legalized marijuana.
- Commission research on the effectiveness of health warning labels on marijuana products and update labelling requirements as necessary.

Section Three: Designing an appropriate distribution system

1. Which distribution model makes the most sense and why?
Recommendation:

- A government owned and controlled store front system is the best model to emphasize health and safety over customer and profit generation and to prevent youth access, through:
    - controlling availability and accessibility of marijuana;
    - providing adequate staff training;
    - providing evidence-based information on the potential health effects of using cannabis to consumers;
    - restricting and enforcing limitations on marketing and advertising;
    - establishing and maintaining a minimum price; and
    - ensuring marijuana is not sold alongside other products that can have synergistic effects when combined with marijuana (e.g., alcohol and tobacco).

2. To what extent is variation across provinces in terms of distribution models acceptable?
Recommendation:

- A uniform distribution model consistent across Canada is important for public health.

3. Are there other models worthy of consideration?
Recommendation:

- A government monopoly with cross-border consistency is the preferred model for Ontario health units.

Section Four: Enforcing public safety and protection

1. How should governments approach designing laws that will reduce, eliminate and punish those who operate outside the boundaries of the new legal system for marijuana?
Recommendation:

- A federal legislative framework that sets out clear minimum standards that all provinces and territories must follow, including a minimum age for sale or provision, restrictions on labelling and promotion, and clear enforcement infrastructure, will result in a strong foundation upon which more restrictive provincial and municipal laws can be built, if required.

- Youth possession of marijuana should not be considered a criminal offense. The onus of compliance with the laws should be placed on the commercial supplier with increasing penalty with each infraction, and include prohibition of any sale or storage of product. This recommendation, however, should not preclude criminal charges of youth related to impaired-driving. Offences regarding youth access should be aligned with those in alcohol and tobacco control.

- Develop an enforcement infrastructure that prevents the diversion of marijuana products from the legal supply chain. This will require collaboration at all levels of government and enforcement bodies.

- Provide mandatory labelling or markings that easily identify permitted products thereby facilitating the removal of prohibited products from the supply chain. Ensure penalties are aligned with alcohol and tobacco contraband offences.

- Creating a new role of 'marijuana control officer' (similar to tobacco control officers) to help enforce regulations.

2. What specific tools, training and guidelines will be most effective in supporting enforcement measures to protect public health and safety, particularly for impaired driving?
Recommendation:

- Develop a comprehensive framework which includes prevention, education, and

enforcement to address and prevent marijuana-impaired driving with a focus on groups at higher risk of harm, such as youth.
- Continue with public health support for local law enforcement activities through education and awareness raising efforts on the dangers of marijuana-impaired driving.
- Direct provincial education ministries to work with public health to update and provide supports for health and physical education curriculums, embedding key evidence-based messages about risky use.
- Additional provincial funding to allow for the expansion of the role of public health inspectors by creating 'marijuana control officer positions (similar to tobacco control officers) to help enforce regulations.

3. Should consumption of marijuana be allowed in any publicly-accessible spaces outside the home? Under what conditions and circumstances?
Recommendation:
- A comprehensive ban of the consumption of marijuana in workplaces and in shared indoor and outdoor spaces at the federal level would prevent a patchwork approach similar to what is observed in tobacco control across Canada. A federal level ban positions marijuana use as having risk, and provides a minimum standard upon which provinces and municipalities can build. Enforcement of these regulations must be jointly shared at the federal, provincial and local levels.

Section Five: Accessing marijuana for medical purposes

1. What factors should the government consider in determining if appropriate access to medically authorized persons is provided once a system for legal access to marijuana is in place?
Recommendation:
- Utilizing a health equity lens, the government needs to provide regulations including price and accessibility to suit the needs of all Canadians who require medical

Appendix 3: Identified Themes from Literature Review

Reference	Organization	Theme I	Theme II	Theme III
Hall & Lynskey[24]	Independent university group (Queensland)	Cannabis related harms: DUI, ED visits, addiction, mental health/alcohol	Evaluation, surveillance (use & effects), research needs	Increasing the number of users
Ghosh et al.[24]	Colorado PH unit	Assessment = monitoring health effects, use prevalence	Education (of general public)	Assurance = the monitoring of production and packaging standards and safety
Wilkinson et al.[25]	Independent university group (Columbia, Yale)	Driving & intoxication	Unintentional ingestion	Health effects: dependence, addiction, psychosis, opioid concurrent use
Van Gerpen et al.[26]	Independent university group (South Dakota)	Psychiatric risks in youth	Perception of 'safety' due to legalization (speaks to education theme in my opinion)	Diversion of access to minors, such as that has occurred with medical marijuana legalization.
Phillips et al.[27]	American Assoc of Occ Health Nurses & American College of Occ & Env Medicine	Impairment – performance, safety	Detection – screening	Education – employment expectations, risks, health effects, coverage
Hall & Weier[28]	Independent university group (Queensland)	Control of market may influence usage rates (unknown)	Legalization increases use (uses alcohol as example)	
Stone[87]	Independent university (Oregon)	Use of pesticides in the legal growth of cannabis – occupational and consumer exposures		
Ghosh et al.[29]	Colorado PH unit	Access by minors	New forms of use	Increase in potency will require regulation secondary to risks (like alcohol)

Pacula et al.[30]	Independent university group	Health concerns: 1. minimizing access, availability, and use by youths, 2. minimizing drugged driving, 3. minimizing dependence and addiction, 4. minimizing consumption of marijuana products with unwanted contaminants and uncertain potency, and 5. minimizing concurrent use of marijuana and alcohol, particularly in public settings.	Lessons learned from tobacco & alcohol: 1. Keep prices artificially high 2. Create state monopoly 3. Restrict and monitor licenses and licensees; 4. Limit products sold; 5. Limit marketing; 6. Restrict public consumption; 7. Measure and prevent impaired driving	Has a really good table 1 we should use/adapt
Banys & Cermak[31]	California marijuana policy	Community controls – where it is sold and consumed	Protection of youth – labelling, advertising, etc.	Evaluation & Research – consumption rates, surveillance, etc.
Room[32]	Independent university (Melbourne)	Active commercialization (e.g., as for cigarettes and alcohol)	Regulation of sale – who controls, where sold, etc.	
Lenton[33]	National Drug Research Institute (Australia)	Economic models make a difference to PH impact – explores three different models of the sale of cannabis		
Hopfer[34]	National Institute on Drug Abuse (US)	Treatment and prevention	Public education of the harms	Research on effects (in infancy)

Appendix 4: Key Stakeholders & Recommended Level of Engagement

Political Stakeholders

Stakeholder	Level of Engagement	Evidence or Report Produced	Scope & Mandate
Jane Philpott, Minister of Health 6060 Main Street Stouffville, Ontario L4A 1B8 Telephone: 905-640-1125 E-mail: Jane.Philpott@parl.gc.ca	Collaborate		Minister of Health announced the decision to introduce legislation to legalize marijuana on April 20, 2015.
Bill Blair, M.P., Parliamentary Secretary to the Minister of Justice Jody Wilson-Raybould 2263 Kingston Road Scarborough, Ontario M1N 1T8 Telephone: 416-261-8613 E-mail: Bill.Blair@parl.gc.ca	Collaborate	Lobby Firm - Hill & Knowlton Strategies has produced a report on government stakeholders and activities:	Participating as a panelist in the Open Caucus meetings at the Liberal Senate Forum discussions. Federal Government has announced that he will "lead the taskforce to review distribution, labelling and public safety issues."

Current Public Health Advocates for the Legalization of Recreational Cannabis

Stakeholder	Level of Engagement	Evidence or Report Produced	Scope & Mandate
Canadian Centre on Substance Abuse (CCSA)	Collaborate	National Framework for Action to Reduce the Harms Associated with Alcohol and Other Drugs and Substances in Canada (2005) Canadian Drug Summary (2016)	The Canadian Centre on Substance Abuse changes lives by bringing people and knowledge together to reduce the harm of alcohol and other drugs on society. For 25 years, we have partnered with public, private and non-governmental organizations to improve the health and safety of Canadians. Participating panelist in the Open Caucus meetings at the Liberal Senate Forum discussions. Played a key role in developing the WHO's *The health and social effects of nonmedical cannabis use report* (2016).
Canadian Public Health Association (CPHA)	Collaborate	A Public Health Approach to the Legalization, Regulation and Restriction of Access to Cannabis (2016) Marijuana, is it safe? (2003)	Founded in 1910, the Canadian Public Health Association (CPHA) is the independent voice for public health in Canada with links to the international community. As the only Canadian non-governmental organization focused exclusively on public health, CPHA is uniquely positioned to advise decision-makers about public health system reform and to guide initiatives to help safeguard the personal and community health of Canadians and people around the world. The CPHA launched the Pot and Driving Campaign in 2005, and concluded the program in 2006.
Centre for Addiction and Mental Health (CAMH)	Collaborate	Cannabis Policy Framework (2014)	The Centre for Addiction and Mental Health (CAMH) is Canada's largest mental health and addiction teaching hospital, as well as one of the world's leading research centres in its field. CAMH is fully affiliated with the University of Toronto, and is a Pan American Health Organization/World Health Organization Collaborating Centre. Participating panelist in the Open Caucus meetings at the Liberal Senate Forum discussions. Played a key role in developing the WHO's *The health and social effects of nonmedical cannabis use report* (2016).

Key Public Health Stakeholders

Stakeholder	Level of Engagement	Evidence or Report Produced	Scope & Mandate
Association of Public Health Epidemiologists in Ontario (APHEO)	Inform	N/A	Association of Public Health Epidemiologists in Ontario is an organization of approximately 100 full members who practice epidemiology in Ontario's public health units, as well as more than 200 affiliate members. APHEO's first meeting was in 1991.
Association of Local Public Health Agencies (alPHa)	Inform	N/A	The Association of Local Public Health Agencies (alPHa) is a not-for-profit organization that provides leadership to the boards of health and public health units in Ontario.
Better Outcome Registry & Network Ontario (BORN)	Consult	N/A	BORN was established in 2009 to collect, interpret, share and rigorously protect critical data about pregnancy, birth and childhood in the province.
Canadian Drug Policy Coalition (CDPC)	Collaborate	Cannabis Regulation and the UN Drug Treaties: Strategies for Reform (2016) Cannabis Policy (2015)	The Canadian drug policy coalition is comprised of over 70 organizations and 3000 individuals working to support the development of a drug policy for Canada that is based in science, guided by public health principles, is respectful of the human rights of all, and seeks to include people who use drugs and those harmed by the war on drugs in moving towards a healthier Canadian society.
Canadian Pediatric Society (CPS)	Consult	Harm reduction: An approach to reducing risky health behaviours in adolescents (2016)	The Canadian Paediatric Society is the national association of paediatricians, committed to working together to advance the health of children and youth by nurturing excellence in health care, advocacy, education, research and support of its membership.

Canadian Pharmacists Association (CPA)	Consult	Improving Medical Marijuana Management in Canada (2016)	Since 1907 the Canadian Pharmacists Association has served as a national, non-profit organization charting the course through many developments in pharmacy, and continues to be the national voice of Canadian pharmacists.
Ministry of Education	Consult	Health & Physical Education Curriculum (2015)	The ministry that administers the system of publicly funded elementary and secondary school education in Ontario.
Municipal Drug Strategy Co-ordinator's Network Ontario (MDSCNO)	Inform	N/A	The Municipal Drug Strategy Co-ordinator's Network of Ontario (MDSCNO) was established in 2008 and members work in more than 155 municipalities, counties, townships, regions and First Nations throughout Ontario with a combined population of more than 7 million people.
Ophea	Collaborate	Ophea's Health & Physical Education Curriculum Supports (2015)	Since 1921, Ophea has been working to support the health and learning of children and youth in Ontario. Ophea is a not-for-profit organization led by the vision that all kids value and enjoy the lifelong benefits of healthy active living.
Ontario Provincial Police (OPP)	Inform	N/A	The OPP is a division of the Ministry of Community Safety and Correctional Services (MCSCS), the largest operational ministry in the province with a presence in every community across Ontario. We are the largest police service in Ontario and the second largest in Canada.

Ontario Public Health Unit Collaboration on Cannabis (OPHUCC)	Collaborate	Toward the Legalization, Regulation and Restriction of Access to Marijuana: Submission to Federal Task Force Ontario Public Health Unit Collaboration on Cannabis	The Ontario Public Health Unit Collaboration on Cannabis is a group of substance misuse professionals from 32 public health units who have joined together to promote a comprehensive public health approach to marijuana legalization. 19 of 32 public health units participated in the federal submission: **Participating Health Units include:** Algoma Public Health, Durham Public Health, Elgin St. Thomas Public Health, Grey Bruce Health Unit, Haliburton, Kawartha, Pine Ridge District Health Unit, Huron County Health Unit, KFL&A Public Health, Middlesex-London Health Unit, Niagara Region Public Health, Northwestern Health Unit, Ottawa Public Health, Perth District Health Unit, Peterborough Public Health, Peel Public Health, Sudbury & District Health Unit, Thunder Bay District Health Unit, Timiskaming Health Unit, Wellington-Dufferin-Guelph Public Health Unit, York Region Public Health
Rapid Risk Factor Surveillance System (RRFSS)	Collaborate	N/A	A group of Ontario health units are collecting information about health-related behaviours among Ontario adults 18 years of age and over. This ongoing survey is called the Rapid Risk Factor Surveillance System (RRFSS). Participants will be asked questions about smoking, physical activity, alcohol use, sun safety, women's health issues, bike helmet use, and more.
Sudbury & District Health Unit	Collaborate	Community Drug Strategy for the City of Greater Sudbury (2016)	The Health Unit is a progressive public health agency committed to improving health and reducing social inequities in health through evidence-informed practice.

Statistics Canada – Canadian Community Health Survey	Consult	N/A	The CCHS is a cross-sectional survey that collects information related to health status, health care utilization and health determinants for the Canadian population. It relies upon a large sample of respondents and is designed to provide reliable estimates at the health region level.
Toronto Board of Health	Collaborate	Board of Health discussion on recreational cannabis (2016) MP Background Document (2015)	Established under the Ontario Health Protection and Promotion Act, the Board of Health determines and sets public health policy and advises City Council on a broad range of health issues and services that include health assessment, health protection, disease prevention and health promotion.
Toronto Drug Strategy	Collaborate	Toronto Drug Strategy Status Report (2014) Drug Use Environmental Scan (2005)	The Toronto Drug Strategy (TDS) is a comprehensive drug strategy for the City of Toronto based on four integrated parts – prevention, harm reduction, treatment and enforcement. All four parts are needed to effectively reduce the harms of alcohol and other drug use.
Windsor-Essex Health Unit	Collaborate	Resolution on Marijuana Legalization (2016)	The Windsor-Essex County Health Unit works with the community to promote, protect, and improve health and well-being for all.
World Health Organization (WHO)	Consult	The Health and Social Effects of Non-medical Cannabis Use (2016)	WHO began when our Constitution came into force on 7 April 1948 – a date we now celebrate every year as World Health Day. We are now more than 7000 people working in 150 country offices, in 6 regional offices and at our headquarters in Geneva.

References

(1) World Health Organization. (2016). The health and social effects of nonmedical cannabis use. Geneva, Switzerland: World Health Organization [ISBN 978 92 4 151024 0] Retrieved from http://www.who.int/substance_abuse/publications/msb_cannabis_report.pdf?ua=1

(2)Controlled Drugs and Substances Act (S.C. 1996, c. 19), Current to April 28, 2016 last amended on February 9, 2016; Retrieved from http://laws-lois.justice.gc.ca/PDF/C-38.8.pdf

(3) Rotermann, M., & Langlois, K. (2015). Prevalence and correlates of marijuana use in Canada, 2012. *Health reports*, *26*(4), 10.Retrieved from http://www.statcan.gc.ca/pub/82-003-x/2015004/article/14158-eng.pdf

(4) UNICEF. (2014). *Child Well-Being in Rich Countries A Comparative Overview*. eSocialSciences, *Innocenti Report Card 11*, Florence, Italy: UNICEF Office of Research. Retrieved from https://www.unicef-irc.org/publications/pdf/rc11_eng.pdf

(5)Cotter, A., Greenland, J., & Karam, M. (2015). Drug-related offences in Canada, 2013. Statisitics Canada. [ISSN 1209-6393] Retrieved from http://www.statcan.gc.ca/pub/85-002-x/2015001/article/14201-eng.htm

(6) Rehm, J., Baliunas, D., Brochu, S., Fischer, B., Gnam, W., Patra, J., ... & Recel, M. (2006). The costs of substance abuse in Canada 2002. Ottawa, Canada*: Canadian Centre on Substance Abuse*

(7)Fischer, B., Imtiaz, S., Rudzinski, K., & Rehm, J. (2015). Crude estimates of cannabis-attributable mortality and morbidity in Canada–implications for public health focused intervention priorities. *Journal of Public Health*, fdv005.

(8)Liberal Senate Forum. *Legalization of Marijuana. Open Caucus Meeting (Feb 24, 2016).* Retrieved from http://liberalsenateforum.ca/open-caucus/february-24-2016-legalization-marijuana

(9)Government of Canada (2016). *Task Force on Marijuana Legalization and Regulation.* Retrieved from http://healthycanadians.gc.ca/task-force-marijuana-groupe-etude/task-force-bios-groupe-de-travail-eng.php

(10) Hill and Knowlton Strategies (2016). *Producing and Selling Marijuana in Canada.* Retrieved from http://hkstrategies.ca/insights/producing-and-selling-marijuana-in-canada/

(11) Government of Canada (2016). *Toward the Legalization, Regulation and Restriction of Access to Marijuana*. Retrieved from http://healthycanadians.gc.ca/health-system-systeme-sante/consultations/legalization-marijuana-legalisation/index-eng.php

(12) Canadian Public Health Association. (2016). *A Public Health Approach to the Legalization, Regulation and Restriction of Access to Cannabis Submission from the Canadian Public Health Association to the Task Force on Marijuana Legalization and Regulation.* Retrieved from http://www.cpha.ca/uploads/policy/cannabis_submission_e.pdf

(13) Ontario Public Health Unit Collaboration on Cannabis (OPHUCC). (2016). *Toward Legalization, Regulation and Restriction of Access to Marijuana: Submission to Federal Task Force.*

(14) Lin, T.Y., Chapman, S., Hartsig, S.M., & Smith, S.L. (2015). *Potential Health Effects of Legalizing Medical Marijuana in Kansas Kansas Health Impact Assessment Project.* Kansas: Kansas Health Institute. Retrieved from http://www.khi.org/assets/uploads/news/13904/marijuanahia_web.pdf

(15) Asbridge, M., Hayden, J. A., & Cartwright, J. L. (2012). Acute cannabis consumption and motor vehicle collision risk: systematic review of observational studies and meta-analysis. *Bmj*, *344*, e536

(16) Brubacher, J. R., Chan, H., Martz, W., Schreiber, W., Asbridge, M., Eppler, J., ... & Andolfatto, G. (2016). Prevalence of alcohol and drug use in injured British Columbia drivers. *BMJ open*, *6*(3), e009278.

(17) Rocky Mountain High Intensity Drug Trafficking Area, (2015). *The Legalization of Marijuana in Colorado: The Impact.* Retrieved from http://www.rmhidta.org/html/2015%20final%20legalization%20of%20marijuana%20in%20colorado%20the%20impact.pdf

(18) Porath-Waller, A.J, Beirness, D.J., Diplock, J., & Kalant, H. (2015). *Clearing the Smoke on Cannabis— Highlights.* Ottawa, ON: Canadian Centre on Substance Abuse. Retrieved from http://www.ccsa.ca/Resource%20Library/CCSA-Clearing-Smoke-on-Cannabis-Highlights-2015-en.pdf.

(19) Salomonsen-Sautel, S., Min, S. J., Sakai, J. T., Thurstone, C., & Hopfer, C. (2014). Trends in fatal motor vehicle crashes before and after marijuana commercialization in Colorado. *Drug and alcohol dependence*, *140*, 137-144.

(20) Howden, M. L., & Naughton, M. T. (2011). Pulmonary effects of marijuana inhalation. *Expert review of respiratory medicine*, *5*(1), 87-92.

(21) Cotter, A., Greenland, J., & Karam, M. (2015). Drug-Related Offences in Canada. Ottawa, Canada: *Statistic's Canada.* Retrieved from http://www.statcan.gc.ca/pub/85-002-x/2015001/article/14201-eng.htm#a12

(22) Haney, M., & Evins, A. E. (2016). Does Cannabis Cause, Exacerbate or Ameliorate Psychiatric Disorders? An Oversimplified Debate
Discussed. *Neuropsychopharmacology*, *41*(2), 393-401.

(23) Ghosh, T., Van Dyke, M., Maffey, A., Whitley, E., Gillim-Ross, L., & Wolk, L. (2016). The Public Health Framework of Legalized Marijuana in Colorado. *American journal of public health*, *106*(1), 21-27.

(24) Hall, W., & Lynskey, M. (2016). Evaluating the public health impacts of legalizing recreational cannabis use in the United States. *Addiction*.

(25) Wilkinson, S. T., Yarnell, S., Radhakrishnan, R., Ball, S. A., & D'Souza, D. C. (2016). Marijuana legalization: impact on physicians and public health. *Annual review of medicine*, *67*, 453-466.

(26) Van Gerpen, S., Vik, T., & Soundy, T. J. (2015). Medicinal and recreational marijuana: what are the risks? *South Dakota Medicine*; 58-62.

(27) Phillips, J. A., Holland, M. G., Baldwin, D. D., Meuleveld, L. G., Mueller, K. L., Perkison, B., ... & Dreger, M. (2015). Marijuana in the Workplace: Guidance for Occupational Health Professionals and Employers: Joint Guidance Statement of the American Association of Occupational Health Nurses and the American College of Occupational and Environmental Medicine. *Journal of Occupational and Environmental Medicine*, *57*(4), 459-475.

(28) Hall, W., & Weier, M. (2015). Assessing the public health impacts of legalizing recreational cannabis use in the USA. *Clinical Pharmacology & Therapeutics*, *97*(6), 607-615.

(29) Ghosh, T. S., Van Dyke, M., Maffey, A., Whitley, E., Erpelding, D., & Wolk, L. (2015). Medical marijuana's public health lessons—implications for retail marijuana in Colorado. *New England Journal of Medicine*, *372*(11), 991-993.

(30) Pacula, R. L., Kilmer, B., Wagenaar, A. C., Chaloupka, F. J., & Caulkins, J. P. (2014). Developing public health regulations for marijuana: lessons from alcohol and tobacco. *Journal Information*, *104*(6):1021-1028.

(31) Banys, P., & Cermak, T. L. (2016). Marijuana Legalization in California: Rational Implementation of the Adult Use of Marijuana Act (AUMA). *Journal of psychoactive drugs*, *48*(1), 63-65.

(32) Room, R. (2014). Cannabis legalization and public health: legal niceties, commercialization and countercultures. *Addiction*, *109*(3), 358-359.

(33) Lenton, S. (2014). New regulated markets for recreational cannabis: public health or private profit?. *Addiction*, *109*(3), 354-355.

(34) Hopfer, C. (2014). Implications of marijuana legalization for adolescent substance use. *Substance abuse*, *35*(4), 331-335.

(35) Schauer, G. L., King, B. A., Bunnell, R. E., Promoff, G., & McAfee, T. A. (2016). Toking, vaping, and eating for health or fun: Marijuana use patterns in adults, US, 2014. *American journal of preventive medicine*, *50*(1), 1-8.

(36) Onders, B., Casavant, M. J., Spiller, H. A., Chounthirath, T., & Smith, G. A. (2015). Marijuana exposure among children younger than six years in the United States. *Clinical pediatrics,* 55(5):428-436.

(37) Wilkinson, S. T., Yarnell, S., Radhakrishnan, R., Ball, S. A., & D'Souza, D. C. (2016). Marijuana legalization: impact on physicians and public health. *Annual review of medicine*, *67*, 453-466.

(38) Wolk, L. (2015). *Monitoring Health Concerns Related to Marijuana in Colorado: 2014. Changes in Marijuana Use Patterns, Systematic Literature Review, and Possible Marijuana-Related Health Effects. Colorado:* Colorado Department of Public Health & Environment. Retrieved from http://www2.cde.state.co.us/artemis/hemonos/he1282m332015internet/he1282m332015internet01.pdf.

(39) Davis, J. M., Mendelson, B., Berkes, J. J., Suleta, K., Corsi, K. F., & Booth, R. E. (2016). Public health effects of medical marijuana legalization in Colorado. *American journal of preventive medicine*, *50*(3), 373-379.

(40) Wang, G. S., Le Lait, M. C., Deakyne, S. J., Bronstein, A. C., Bajaj, L., & Roosevelt, G. (2016). Unintentional pediatric exposures to marijuana in Colorado, 2009-2015. *JAMA pediatrics*, *170*(9), e160971-e160971.

(41) Lin, T.Y., Chapman, S., Hartsig, S.M., & Smith, S.L. (2015). *Potential Health Effects of Legalizing Medical Marijuana in Kansas Kansas Health Impact Assessment Project.* Kansas: Kansas Health Institute. Retrieved from http://www.khi.org/assets/uploads/news/13904/marijuanahia_web.pdf

(42) Robertson, R. & McArthur, G. (2016). What's in your weed? *The Globe and Mail,* Retrieved from http://www.theglobeandmail.com/news/investigations/globe-investigation-whats-in-your-weed-we-tested-dispensary-marijuana-to-findout/article31144496/

(43) Sznitman, S. R., & Zolotov, Y. (2015). Cannabis for therapeutic purposes and public health and safety: a systematic and critical review. *International Journal of Drug Policy*, *26*(1), 20-29.

(44) Morrison, C., Gruenewald, P. J., Freisthler, B., Ponicki, W. R., & Remer, L. G. (2014). The economic geography of medical cannabis dispensaries in California. *International Journal of Drug Policy*, *25*(3), 508-515.

(45) Mair, C., Freisthler, B., Ponicki, W. R., & Gaidus, A. (2015). The impacts of marijuana dispensary density and neighborhood ecology on marijuana abuse and dependence. *Drug and alcohol dependence*, *154*, 111-116.

(46) Grant, C.N., & Belanger, R. (2016) Cannabis and Canada's children and youth. *Canadian Paediatric Society.* Retrieved from http://www.cps.ca/en/documents/position/cannabis-children-and-youth

(47) *Canadian Centre on Substance Abuse (2015). Cannabis Regulation: Lessons Learned in Colorado and Washington State. Ottawa, Canada: Canadian Centre on Substance Abuse. Retrieved from http://www.ccsa.ca/Resource%20Library/CCSA-Cannabis-Regulation-Lessons-Learned-Report-2015-en.pdf*

(48) *The Adult Use of Marijuana Act. California 2016;http://www.letsgetitrightca.org/pdfs/AUMA.Amended.12.7.15.Final.pdf.*

(49) Centre for Addiction and Mental Health. (2014). *Cannabis Policy Framework.* Toronto, Canada: CAMH. Retrieved from http://www.camh.ca/en/hospital/about_camh/influencing_public_policy/documents/camh cannabispolicyframework.pdf

(50) Monte, A. A., Zane, R. D., & Heard, K. J. (2015). The implications of marijuana legalization in Colorado. *JAMA*, *313*(3), 241-242.

(51) Toronto Board of Health (2016). Meeting minutes 2016-05-30 retrieved from: http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2016.HL12.2

(52) Health Canada (2014). *Advertising Prohibitions on Marijuana - Information Bulletin*, Retrieved from http://www.hc-sc.gc.ca/dhp-mps/marihuana/info/bulletin-eng.php.

(53) Kleiman, M. A. (2015). *Legal Commercial Cannabis Sales in Colorado and Washington: What Can We Learn.* Washington, DC: Brookings Institution.

(54) Kim, H. S., Hall, K. E., Genco, E. K., Van Dyke, M., Barker, E., & Monte, A. A. (2016). Marijuana Tourism and Emergency Department Visits in Colorado. *New England Journal of Medicine*, *374*(8), 797-798.

(55) Ontario Ministry of Tourism (2008). *U.S. Travelers to Ontario.* Retrieved from http://www.mtc.gov.on.ca/en/research/travel_activities/USTAMS2006_Travelers_to_Ontario.pdf

(56) Caulkins JP, Kilmer B, Kleiman MAR, MacCoun R., Midgette G, Oglesby P, Liccardo Pacula R, Reuter PH. Considering marijuana legalization: Insights for Vermont and other Jurisdictions. [Report online]. Santa Monica, CA: RAND Corporation; 2015 [Last accessed 2017 April 17]. Available from: http://www.rand.org/pubs/research_reports/RR864.html

(57) Babor T, Caetano R, Casswell S, Edwards G, Giesbrecht N, Graham K, et al. Alcohol No Ordinary Commodity: Research and Public Policy (Second Ed.). New York, USA: Oxford University Press; 2010.

(58) American Public Health Association. Regulating Commercially Legalized Marijuana as a Public Health Priority. [Policy statement online]. Washington, DC: American Public Health Association; 2015 [Last accessed 2017 April 17]. Retrieved from https://www.apha.org/policies-and-advocacy/public-health-policy-statements/policy-database/2015/01/23/10/17/regulating-commercially-legalized-marijuana-as-a-public-health-priority

(59) Kilmer B. The 10 Ps of Marijuana Legalization. [Commentary online]. Santa Monica, CA: RAND Corporation; 2015 [Last accessed 2017 April 17]. Retrieved from http://www.rand.org/blog/2015/06/the-10-ps-of-marijuana-legalization.html

(60) Tilson M. Reducing the Availability of Tobacco Products at Retail: Policy Analysis. [Report online]. Canada: Non-Smokers' Rights Association; 2011 [Last accessed 2016 Aug 18]. Available from: http://nsra-adnf.ca/wp-content/uploads/2016/07/Reducing_Retail_Availabilty_policy_analysis_final_2011.pdf

(61) Young, M.M., Saewyc, E., Boak, A., Jahrig, J., Anderson, B., Doiron, Y., Taylor, S., Pica, L., Laprise, P., & Clark, H. (2011). *Cross-Canada report on student alcohol and drug use: Technical report. Ottawa: Canadian Centre on Substance Abuse.* Retrieved from http://www.ccsa.ca/Resource%20Library/2011_CCSA_Student_Alcohol_and_Drug_Use_en.pdf

(62) Fischer, B., Jeffries, V., Hall, W., Room, R., Goldner, E., & Rehm, J. (2011). Lower Risk Cannabis Use Guidelines for Canada (LRCUG): a narrative review of evidence and recommendations. *Canadian Journal of Public Health/Revue Canadienne de Sante'e Publique*, 324-327.

(63) Khenti A (2014). The Canadian war on drugs: Structural violence and unequal treatment of Black Canadians. *International Journal of Drug Policy* 25: 190-195.

(64) Metz, T. D., & Stickrath, E. H. (2015). Marijuana use in pregnancy and lactation: a review of the evidence. *American journal of obstetrics and gynecology*, *213*(6), 761-778.

(65) Conner, S. N., Carter, E. B., Tuuli, M. G., Macones, G. A., & Cahill, A. G. (2015). Maternal marijuana use and neonatal morbidity. *American journal of obstetrics and gynecology*, *213*(3),1-4.

(66) Wang, G. S. (2016). Pediatric Concerns Due to Expanded Cannabis Use: Unintended Consequences of Legalization. *Journal of Medical Toxicology*, 1-7.

(67) Hall, W (2015). Challenges in minimizing the adverse effects of cannabis use after legalization. *Social psychiatry and psychiatric epidemiology.* 50(7),1013-1015.

(68) Bancks, M. P., Pletcher, M. J., Kertesz, S. G., Sidney, S., Rana, J. S., & Schreiner, P. J. (2015). Marijuana use and risk of prediabetes and diabetes by middle adulthood: the Coronary Artery Risk Development in Young Adults (CARDIA) study. *Diabetologia*, *58*(12), 2736-2744.

(69) Dean, A. (2006). Illicit drugs and drug interactions. Pharmacist, 25(9), 684-689.

(70) Mello, J. (2013). Employment and Public Policy Issues Surrounding Medical Marijuana in the Workplace. *Journal of business ethics*, 117, 659-666.

(71) National Institutes of Health. (1998). Workplace Interventions for Drug Abuse. Retrieved from http://archives.drugabuse.gov/about/organization/despr/hsr/da-pre/SteeleWorkplace.html.

(72) Goldsmith, R. S., Targino, M. C., Fanciullo, G. J., Martin, D. W., Hartenbaum, N. P., White, J. M., & Franklin, P. (2015). Medical marijuana in the workplace: challenges and management options for occupational physicians. *Journal of Occupational and Environmental Medicine*, *57*(5), 518.

(73) Centre for Addiction and Mental Health (2016). *Cannabis Research.* Retrieved from http://www.camh.ca/en/research/research_areas/campbell-institute/novel-therapeutics/translational-addiction-research/Pages/CannabisAddictionResearch.asp

(74) Ballingall, A. (Nov. 26, 2015). *Clinical study at CAMH tests how cannabis affects volunteer's driving skills.* The Star. Retrieved from https://www.thestar.com/news/gta/2015/11/26/clinical-study-at-camh-tests-how-cannabis-affects-volunteers-driving-skills.html

(75) Health Canada (2014). *Canadian Alcohol and Drug Use Monitoring Survey.* Retrieved from http://www.hc-sc.gc.ca/hc-ps/drugs-drogues/stat/_2012/summary-sommaire-eng.php

(76) Beasley, E., Porath-Waller, A. J., & Beirness, D. J. (2011). *A comparison of drug- and alcohol-involved motor vehicle driver fatalities*. Canadian Centre on Substance Abuse.

(77) University of Waterloo (2016). *CSTADS Canadian Student Tobacco, Alcohol and Drugs Survey.* Retrieved from https://uwaterloo.ca/canadian-student-tobacco-alcohol-drugs-survey/about

(78) Centre for Addiction and Mental Health (2016). *Ontario Student Drug Use and Health Survey.* Retrieved from

http://www.camh.ca/en/research/news_and_publications/ontario-student-drug-use-and-health-survey/Pages/default.aspx

(79) Ministry of Health and Long-Term Care, Ontario Medical Association (2006). *Antenatal Record 1.* Retrieved from http://ocfp.on.ca/docs/default-source/cme/new-antenatal-record-and-guidef9a835f1b72c.pdf?sfvrsn=0

(80) BORN Ontario (2016). *Birth (Mother).* Retrieved from http://datadictionary.bornontario.ca/encounters-and-alphabetical-lists/birth-mother/

(81) Ministry of Child and Youth Services. (2012). *Healthy Babies Healthy Children Guidance Document.* Retrieved from http://www.health.gov.on.ca/en/pro/programs/publichealth/oph_standards/docs/guidance/hbhc_gd.pdf

(82) KFL&A Public Health (2014). *Acute Care Enhanced Surveillance (ACES).* Retrieved from http://www.kflaphi.ca/wp-content/uploads/Presentation-First-meeting-Oct-27.pdf

(83) Rapid Risk Factor Surveillance System. (2016). *RRFSS Analysis Information Questionnaires.* Retrieved from http://www.rrfss.ca/index.php?pid=11

(84) J. Naidoo, personal communication, June 21, 2016.

(85) Task Force on Marijuana Legalization and Regulation (2016). *Toward the Legalization, Regulation and Restriction of Access to Marijuana Discussion Paper.* Retrieved from http://healthycanadians.gc.ca/health-system-systeme-sante/consultations/legalization-marijuana-legalisation/alt/legalization-marijuana-legalisation-eng.pdf

(86) Public Health Monitoring of Risk Factors in Ontario – Ontario Student Drug Use and Health Study (OSDUHS), 2014-2015. *Quick Facts: Driving After Using Cannabis or Drinking Alcohol (April 2016)* Retrieved from http://www.durham.ca/departments/health/health_statistics/quickFacts/DrivingAfterUsingCannabisOrDrinkingAlcohol.pdf

(87) Stone, D. (2014). Cannabis, pesticides and conflicting laws: The dilemma for legalized states and implications for public health. *Regulatory Toxicology and Pharmacology*, *69*(3), 284-288.