

# Non-Medical Cannabis in North America: An Overview of Regulatory Approaches

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## ABSTRACT

**Objectives:** To describe existing regulations of non-medical cannabis legalization in North America and to inform recommendations for future health policy.

**Study Design:** A review of online grey literature resources on regulatory approaches to non-medical cannabis legalization in North American jurisdictions.

**Methods:** We conducted an internet search in May 2018 (Montreal, Canada) for government and public health organization resources published after January 1, 2012. We identified 24 resources outlining legislative approaches to recreational cannabis legalization in North America. The eligibility of each resource was assessed independently by two reviewers and data were tabulated according to country and region (state/province).

**Results:** Our search revealed 9 U.S. states, the District of Columbia and Canada that have legalized recreational cannabis. The legal age of recreational cannabis possession matches the legal drinking age in all North American jurisdictions. The legal amount for personal possession is approximately 1oz. in all jurisdictions. Cannabis is only available for purchase in private retail stores in U.S. states, while Canada has also legalized online sale. Home growing of cannabis plants is legal in most jurisdictions. Impaired driving assessment relies on roadside observation in most U.S. states, while Canada has incorporated a new monitoring method.

**Conclusions:** Most regulations are heterogeneous across North America. Jurisdictions considering future recreational cannabis legalization might consider implementing existing regulatory policies. However, public health interventions will be crucial in ensuring public health and safety.

## **INTRODUCTION**

Since 2012, 9 U.S. states including Alaska, California, Colorado, Maine, Massachusetts, Nevada, Oregon, Vermont, Washington and the District of Columbia as well as the Canadian federal government have legalized non-medical cannabis. Following this trend, additional U.S. states are moving towards legalization of non-medical cannabis in the future.<sup>1-7</sup> Legalization in North America has led to questions about appropriate regulations concerning legal age of possession, online acquisition, home growing of cannabis plants and drugged-driving. Changing social norms and decreased pricing related to efficiency of legal production and deliberate undercutting of the illicit market will likely lead to increased trends in use in North America.<sup>8,9</sup> It is important to consider the public health implications from increased non-medical cannabis use and availability in North America, such as access to minors, illicit-market sales of non-medical cannabis and normalization of use. As long-term health outcomes will be influenced by legislative and regulatory policies, there is a critical need to conduct an up-to-date knowledge synthesis concerning legislative and regulatory approaches to non-medical cannabis use in North America. Our objective was to describe existing regulations of non-medical cannabis legalization in the U.S. and in Canada to inform recommendations for future health policy.

## **METHODS**

We conducted an internet search using Google as a search engine in May 2018 to identify resources from institutions, public health organizations and government agencies concerning legislative and regulatory approaches to non-medical cannabis legalization in North American jurisdictions published after January 1, 2012. We used media resources to identify which jurisdictions had legalized non-medical cannabis. Individual searches were conducted for each jurisdiction included in the review. Key search terms included “non-medical cannabis”,

“recreational cannabis”, “adult use”, “legislation”, “regulations” and “legalization”. Using a stop rule, we screened the first 30 results of each search for inclusion. All of the information included in the review was easily accessible and readily available through a limited number of government and public health resources, allowing us to achieve data saturation. The eligibility of each resource was assessed by two independent reviewers, with disagreements resolved by consensus, or a third investigator as necessary. All resources concerning regulatory approaches to non-medical cannabis use were included. Resources which only addressed medical use of cannabis were excluded. For each included resource, we extracted information concerning the jurisdiction (U.S. state or Canadian province) of origin, the legal age of non-medical cannabis possession, retail structure regarding distribution and acquisition of cannabis, laws for personal possession and home growing of cannabis plants as well as geographical restrictions on consumption. Data were tabulated by country and by state/province.

## **RESULTS**

### **United States**

Our search for the U.S. revealed 10 government documents, fact sheets and reports outlining enacted regulations and laws for non-medical cannabis regulation in 9 states and the District of Columbia (Table 1, See Appendix for references). Colorado and Washington were the first U.S. states to legalize non-medical cannabis in 2012, followed by Oregon, the District of Columbia, Alaska, California, Massachusetts, Nevada and Maine between 2014-2017, with Vermont most recently in 2018.

All U.S. states have set the minimum age of purchase at 21 years, in parallel with the legal age of alcohol purchase. Most states have set the legal amount of non-medical cannabis for personal possession at 1oz. (28 grams), with the exception of the District of Columbia (2 oz. /57

grams) and Maine (2.5 oz. /71 grams). Non-medical cannabis is only available for purchase in private retail stores licensed by the state in the U.S, with the exception of the District of Columbia, where it is currently illegal to purchase cannabis and thus no legal retail stores are operational. Retail of non-medical cannabis will be kept separate from alcohol in order to restrict youth access and limit combined use. All operational retail stores must follow strict zoning laws, including being a certain distance away from schools, youth centers, and religious or government buildings. Non-medical cannabis is still illegal at the federal level in the U.S. and thus, consumption of cannabis has been restricted to private property in all states.

Most U.S. states that have legalized non-medical cannabis allow home growing of 6 cannabis plants in each household, with some variations in the total number of plants and number of mature plants allowed at one time. There are restrictions on where the cannabis plants can be grown in the household. They must be grown within an enclosed area and have to be secured with a lock or security device. They cannot be visible to the public and therefore cannot be grown near or next to a window. Personal cultivation is prohibited in Washington.

Drugged-driving is illegal in all states. Nevada and Washington are the only 2 states that have *per se* driving limits for blood tetrahydrocannabinol (THC) levels; if a driver has a blood THC over 2 ng/mL in Nevada or 5 ng/mL in Washington, they will be charged with driving under the influence (DUI); the state does not have to prove that the driver was impaired, or that they failed a field sobriety test. Colorado is the only state with a reasonable inference law for blood THC concentration. This means that the state must prove that the driver was impaired with facts or evidence during a trial. All other U.S. states require law enforcement officers to make impaired driving arrests based on observations.

## **Canada**

Our search for Canada revealed 14 government documents, fact sheets and reports outlining existing regulations for non-medical cannabis legalization in 10 provinces and 3 territories (Table 2, See Appendix for references). Canada implemented a legalized cannabis regime at the federal and provincial level in fall 2018. While cultivation, processing and production of cannabis will be controlled federally, regulations regarding the distribution and sale of non-medical cannabis will be the responsibility of each province or territory.

The federal government has set the minimum age of non-medical cannabis purchase at 18 years. However, the provinces have set the minimum age to parallel that of alcohol purchase, with Alberta and Quebec maintaining a minimum age of 18 years and all other provinces and territories increasing the legal age of cannabis purchase to 19 years. The limit for personal possession has been set to 1.06 oz. (30 grams) across all provinces and territories except for Nunavut, where discussion of specific regulations is ongoing. Non-medical cannabis is sold through government-operated stores in New Brunswick, Northwest Territories, Nova Scotia, Nunavut, Ontario, Prince-Edward Island, Quebec, and Yukon, similar to each Canadian jurisdiction's already established liquor stores. Non-medical cannabis is sold in privately-run licensed retail stores in Alberta, Manitoba, Newfoundland and Labrador, and Saskatchewan. Both government-operated stores and private-retail stores are available in British Columbia. Discussion is ongoing in Ontario regarding privatized retail structures. Non-medical cannabis is available for purchase through online vendors in all provinces and territories. Furthermore, Canadian provinces and territories will enact legislation to incorporate these new types of store fronts and will decide on zoning restrictions. Unlike the rest of Canada, The Northwest Territories and Nova Scotia have decided to sell non-medical cannabis alongside alcohol in their established liquor stores. Certain provinces and territories allow consumption of non-medical

cannabis in some public spaces where tobacco is also permitted. These areas exclude those frequented by children or on the premises of health care facilities. All other provinces have restricted consumption of non-medical cannabis to private property to protect others from second-hand smoke and reduce exposure.

Most provinces and territories have set restrictions on personal cultivation to 4 plants per household, while Quebec and Manitoba have prohibited home grown cannabis plants. The restrictions on where cannabis plants can be grown in the household are the same as in U.S. states. All provinces have agreed that drugged-driving is illegal and Canada is considering a range of blood THC limits with corresponding penalties. A blood sample can be requested by law enforcement if a driver fails a standard sobriety test or an oral fluid test at roadside.

## **DISCUSSION**

Our study was designed to identify existing regulations of non-medical cannabis legalization in the U.S. and in Canada. Additional U.S. states are taking action to legalize non-medical cannabis in the future as well. Supporters in Michigan, Ohio and New Jersey are pushing for legalization of non-medical cannabis, by advocating for cannabis measures on 2018 state ballots.<sup>1-3</sup> Initiatives to legalize non-medical cannabis in Arizona and Maryland did not make state ballots in 2018, and recent votes in state House of Delaware failed, though efforts are ongoing to legalize non-medical cannabis in the future.<sup>4-6</sup> Discussion concerning legalization is still ongoing in Rhode Island.<sup>7</sup>

Regarding existing regulations, we found many parallels for distribution and acquisition of non-medical cannabis and the status of drugged-driving across jurisdictions. However, certain areas, such as legal age of possession, online acquisition and home growing of cannabis plants differ between North American jurisdictions. As more U.S. states move towards non-medical

cannabis legalization in the future, it is important to consider these differences to determine the most appropriate approach to limit access to minors and illicit-market sales in order to optimize public health and safety.

The government has two main objectives when deliberating the legal age of purchase for products such as alcohol, tobacco and now cannabis: to reduce the illicit market and restrict youth access. If the minimum age of legalization is set too high, younger consumers may be pushed towards illicit markets, while lowering the minimum age of legalization may increase availability, prevalence, and frequency of use and hence negative long-term health outcomes.<sup>10</sup>

In the U.S., each state has made the legal age of non-medical cannabis purchase 21 years, in parallel with the legal age of alcohol purchase. Canada has set the legal age of purchase at 18 years at the federal level. However, with the exception of Alberta and Quebec, all other provinces have decided to increase the legal age to 19 years old, in parallel with the legal age of purchase of alcohol and tobacco in these provinces and territories. During the initial discussions surrounding legalization of non-medical cannabis in Canada, a minimum age of purchase of 21 years was advocated for, based on research of adverse effects of cannabis on the developing brain.<sup>10</sup> However, deliberation concluded that this would not be feasible and would likely promote illicit-market activity, given the 2-year discrepancy with the legal age of alcohol purchase in the majority of Canadian provinces. The discrepancy between the federal and provincial ages for legal purchase creates a grey area that 18-year-old consumers can fall into and makes creating penalties for underage cannabis possession more complicated.<sup>11</sup>

Non-medical cannabis and alcohol are frequently consumed together. If the legal age of non-medical cannabis purchase matches the legal age of alcohol purchase in a jurisdiction, the odds of underage use of one substance decreases. U.S. states moving towards legalization in the



future should consider matching the legal age of non-medical cannabis purchase to the legal age of alcohol purchase to minimize illicit use and illicit-market activity of cannabis. Restricting access to minors would help to limit impaired youth development associated with cannabis use.

It is currently illegal to purchase non-medical cannabis outside of a private retail store in any U.S. state. Since non-medical cannabis is legalized at the federal level in Canada, distributors can offer online sales to potential clients who are in more rural areas and who may not have access to cannabis sold in retail stores. The specific legal policies that regulate the online distribution and acquisition of non-medical cannabis remain unclear. It will be important to outline how access to minors will be controlled online. Unique packaging and labeling as well as strict monitoring of delivery will be necessary to limit the risk of unintended public exposure. These additional precautions could potentially add to the cost of cannabis sold online, which could in turn deter buyers. Moving forward, the feasibility and suitability of online cannabis sales should be considered in terms of public health and safety. If online sales are successful in Canada, their specific regulatory policies could serve as a framework should non-medical cannabis one day be legalized federally in the U.S.

The home growing of cannabis plants is legal in most North American jurisdictions that have legalized, with approximately 4-6 plants allowed per household. Similar to Washington State, Quebec and Manitoba have prohibited the home-growing of cannabis plants. These jurisdictions are concerned that allowing residents to grow cannabis for their own consumption will lead to unintended exposure to children and to the normalization of cannabis use in youth. Youth below the minimum age of purchase who have access to cannabis plants in their home may be tempted to try cannabis, which could lead to impaired development, substance abuse at a young age and negative long-term health consequences. Another concern is personal selling of

non-medical cannabis, as there are no current regulations related to the monitoring of home growing of cannabis plants. Future studies should investigate current illicit-market activity in Washington State, Quebec, and Manitoba as compared to other jurisdictions that have legalized the home growing of cannabis plants in order to investigate the impact of restricting home growing as a deterrent to illicit-market sales. U.S. states moving towards future legalization might consider lowering the number of plants per residence in order to limit unintended exposure and cannabis use in youth as well as illicit market activity.

Another topic that is increasingly concerning with non-medical cannabis legalization is drugged-driving. While data is controversial, non-medical cannabis legalization does not seem to have led to an increase in the number of motor vehicle accidents that proved fatal in the U.S. since legalization, though cannabis use is associated with diminished driving ability and still poses a significant public safety concern.<sup>12, 13</sup> In the U.S., the initial evaluation of suspected cannabis impaired driving is currently predominantly based on visual assessment at roadside. Nevada and Washington have *per se* driving limits for blood THC levels; drivers with blood THC over 2 ng/mL and 5 ng/mL respectively will be charged with a DUI, while Colorado has a reasonable inference law for blood THC concentration. The other states depend on law enforcement officers to assess impaired driving by observation. This reliance on subjectivity poses a significant challenge to identifying intoxication in the field.

In Canada, if law enforcement suspects impairment and the driver fails both the standard field sobriety test and a drug recognition evaluation, law enforcement can demand a urine sample.<sup>14</sup> However, if cannabis is not detected in this fluid sample, the DUI charge is dropped. The Canadian government has proposed changes to the impaired-driving laws with Bill C-46, outlining suggested amendments to the criminal code.<sup>15</sup> Unlike the variation enacted by the

individual states, this bill will set a number of penalties of varying severity depending on blood THC levels, similar to that of blood alcohol levels. New roadside oral fluid testing devices will be available to detect impairment in drivers. The oral fluid test is a basic pass/fail test and cannot detect the actual level of THC in saliva.<sup>15</sup> If a driver fails either the standard field sobriety test or the saliva test, a blood sample can be demanded in order to detect the exact THC blood concentration. This blood test must be completed within 2 hours of suspected driving impairment and would be the final test to determine DUI charges.<sup>14</sup>

As many more U.S. states consider legalizing non-medical cannabis, the issue of properly assessing drugged-driving, and its corresponding penalties, should be discussed further. It will be important for the U.S. and Canada to monitor the efficacy of roadside oral fluid testing in Canada for possible incorporation into future U.S. legislation. More specific methods of detecting cannabis impairment in drivers could facilitate the enforcement of legislation and limit the incidence of drugged-driving, in turn increasing the safety of the population.

Much of the current data analyzing the impact of non-medical cannabis legalization are focused on Colorado and Washington, where non-medical use has been legal since 2012. Many studies have demonstrated an increase in reported non-medical cannabis use in the past months as well as cannabis-related hospital visits in both of these states since legalization.<sup>16, 17</sup> In anticipation of an increased prevalence in non-medical cannabis use, U.S. states moving towards legalization should consider implementing non-stigmatizing, evidence-based public health strategies such as educational interventions in schools, public awareness campaigns and advertisements for help hotlines as safe guards to educate about the effects and risks in order to deter negative long-term health outcomes related to use and to assist those who need support to quit or reduce use. The “Smart Colorado” advocacy group was created in 2012 to raise

awareness of the risks cannabis poses to youth.<sup>18</sup> The Washington State Department of Health similarly launched a youth cannabis prevention campaign in 2016.<sup>19</sup> Canada has also implemented such strategies; in 2017, the federal government initiated an anti-drug impaired driving campaign alongside efforts from Health Canada that began a public cannabis education and awareness campaign.<sup>20</sup> Going forward, it will be important for these efforts to be supported and developed at the individual state and community levels and informed by emerging evidence and experiences of each jurisdiction to ensure the well-being, health and safety of North American youth.

## **CONCLUSIONS**

Our study was designed to identify and describe enacted regulations of non-medical cannabis legalization in different North American jurisdictions. The non-medical cannabis regulatory policies adopted by North American jurisdictions will influence access to minors, illicit-market sales of cannabis and normalization of cannabis use, creating a lasting impact on long-term health outcomes. Both the U.S. and Canada have decided to match their legal age of possession to their respective legal drinking age. Canada has different regulations regarding online acquisition and home growing of cannabis plants, which will be important to consider for U.S. jurisdictions moving towards legalization in the future. While most other regulations are heterogeneous across North America, drugged driving remains a major issue; finding the most effective way to monitor impaired driving at roadside will be crucial to ensuring public health and safety. Moving forward, it will also be important to prospectively monitor the impact of legalization on access to minors, illicit-market sales of non-medical cannabis and trends in use to adjust regulatory policies and public health interventions accordingly.

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## REFERENCES

1. Borchardt J. Ohio recreational marijuana measure certified by Attorney General Mike DeWine. Cleveland.com 2018. [https://www.cleveland.com/open/2018/05/ohio\\_recreational\\_marijuana\\_me.html](https://www.cleveland.com/open/2018/05/ohio_recreational_marijuana_me.html) [accessed 29 May 2018].
2. MacDonald M. POLL: Vote on recreational marijuana use in Michigan is close. ClickOnDetroit.com 2018. <https://www.clickondetroit.com/michigan-marijuana/vote-on-recreational-marijuana-use-in-michigan-is-close> [accessed 4 July 2018].
3. Fox 29 News. New Jersey senators unveil legislation to legalize recreational marijuana. Fox News 2018. <http://www.fox29.com/news/local-news/new-jersey-senators-unveil-legislation-to-legalize-recreational-marijuana> [accessed 4 July 2018].
4. Marijuana Policy Project. Marijuana legalization not on the 2018 ballot, but lawmakers are. 2018. <https://www.mpp.org/states/maryland/> [accessed 4 July 2018].
5. Goss S. Bill to legalize marijuana in Delaware fails in House. Delaware Online 2018. <https://www.delawareonline.com/story/news/politics/2018/06/27/delaware-house-vote-recreational-marijuana-bill/737387002/> [accessed 4 July 2018].
6. Parfitt S. Arizona Recreational Marijuana Legalization Bill Dies in Statehouse. AZMarijuana.com 2018. <https://azmarijuana.com/arizona-medical-marijuana-news/az-recreational-marijuana-legalization-bill-dies-statehouse/> [accessed 4 July 2018].
7. Buteau W. Recreational marijuana legalization takes a blow with commission recommendation delay. WPRI.com 2018. <https://www.wpri.com/news/local-news/recreational-marijuana-legalization-takes-a-blow-with-commission-recommendation-delay/1082557355> [accessed 4 July 2018].
8. Hall W, Lynskey M. Evaluating the public health impacts of legalizing recreational cannabis use in the United States. *Addiction*. 2016; 111:1764-73.
9. Hasin DS, Sarvet AL, Cerdá M, et al. Us adult illicit cannabis use, cannabis use disorder, and medical marijuana laws: 1991-1992 to 2012-2013. *JAMA Psychiatry*. 2017; 74:579-88.
10. Dehaas J. Psychiatrists ask Liberals to keep cannabis illegal up to age 21. CTV News 2017. <https://www.ctvnews.ca/health/psychiatrists-ask-liberals-to-keep-cannabis-illegal-up-to-age-21-1.3366167> [accessed 12 June 2018].
11. Cain P. Setting the cannabis age at 19 is 'not practical at all,' lawyer says. Global News 2017. <https://globalnews.ca/news/3786997/marijuana-legalization-age-19-loopholes-ontario/> [accessed 12 June 2018].
12. Aydelotte JD, Brown LH, Luftman KM, Mardock AL, Teixeira PGR, Coopwood B, et al. Crash Fatality Rates After Recreational Marijuana Legalization in Washington and Colorado. *Am J Public Health*. 2017; 107:1329-31.
13. Insurance Institute for Highway Safety-Highway Loss Data Institute. Legalizing recreational marijuana is linked to increased crashes. 2017. <http://www.iihs.org/iihs/news/desktopnews/legalizing-recreational-marijuana-is-linked-to-increased-crashes> [accessed 30 May 2018].
14. Katsarov C. How will Canada's new drugged-driving rules actually work? The Globe and Mail 2018. <https://www.theglobeandmail.com/globe-drive/culture/commuting/how-will-canadas-new-drugged-driving-rules-actually-work/article37686547/> [accessed 11 April 2018].
15. Doucette ML, Frattaroli S, Vernick JS. Oral fluid testing for marijuana intoxication: enhancing objectivity for roadside DUI testing. *Inj Prev*. 2018; 24:78-80.

- 350 16. Wang GS, Davies SD, Halmo LS, Sass A, Mistry RD. Impact of Marijuana Legalization  
351 in Colorado on Adolescent Emergency and Urgent Care Visits. *J Adolesc Health*. 2018.
- 352 17. Cerda M, Wall M, Feng T, Keyes KM, Sarvet A, Schulenberg J, et al. Association of  
353 State Recreational Marijuana Laws With Adolescent Marijuana Use. *JAMA Pediatr*. 2017;  
354 171:142-9.
- 355 18. Smart Colorado. About. 2016. <http://smartcolorado.org/about/> [accessed 28 May 2018].
- 356 19. GMMB Inc. Youth Marijuana Prevention With the Washington State Department of  
357 Health. 2014. <https://gmmb.com/work/youth-marijuana-prevention#background> [accessed 29  
358 May 2018].
- 359 20. Government of Canada. Don't Drive High. 2018.  
360 <https://www.canada.ca/en/campaign/don-t-drive-high.html> [accessed 19 June 2018].