

Outcomes associated with nonmedical cannabis legalization policy in Canada: taking stock at the 5-year mark

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In October 2018, Canada was the first G-20 nation to implement the legalization of nonmedical cannabis use and supply for adults.¹ Cannabis legalization in Canada had the primary objectives of improving cannabis-related public health and safety; reducing youth access to cannabis; and reducing cannabis-related crime and illegal markets, mainly by allowing adult cannabis use and related behaviours as a legal, regulated activity. We discuss whether, 5 years on, these objectives have been met, drawing on systematic reviews and recent primary studies for our observations.¹⁻³

The Canadian legalization framework comprises a federal law (*Cannabis Act*) and related regulations, some of which are subject to provincial refinements. Some of the main parameters of legal cannabis use and access are a personal possession limit of 30 g of dried cannabis (or equivalents) in public by adults (with a minimum age of 18–21 yr, depending on the province); restricting use to nonpublic settings (in most provinces); incremental retail sale of flower, extracts or liquids, and ingestible cannabis products; cannabis sales by commercial or public retail systems (or both, in some provinces) and via the Internet; limited home cultivation (in most provinces); and national *per se* law- and threshold-based restrictions of cannabis-impaired driving.

National survey data monitoring cannabis usage before and after cannabis legalization showed an increase in the prevalence of cannabis use (from 22% in 2017 to 27% in 2022), although rates of near-daily to daily use remained relatively stable (24%–25%).⁴ In contrast, significant increases in the prevalence of cannabis use (adjusted odds ratio [OR] 1.62, 95% confidence interval [CI] 1.40–1.86), daily cannabis use (adjusted OR 1.59, 95% CI 1.21–2.07) and cannabis use-related problems (adjusted OR 1.53, 95% CI 1.20–1.95) from 2001 to 2019 were shown in a study of the Ontario adult population.⁵ The prevalence of cannabis use among youth (30%–50%, depending on the survey) and perceived access to cannabis by minors have remained mostly stable at the high levels observed before legalization.^{1,4}

Studies have mostly shown increased cannabis-related emergency department presentations and admissions to hospital over the course of legalization. For example, a time-series analysis

Key points

- In October 2018, recreational use of cannabis was legalized in Canada with the primary objectives of improving cannabis-related public health and safety, reducing youth access to cannabis, and reducing cannabis-related crime and illegal markets.
- Five years after policy implementation, available evidence suggests that outcomes related to health — such as the prevalence of cannabis use, cannabis-related emergency department visits and admissions to hospital and cannabis-impaired driving — have mostly increased or remained steady.
- Data on some important health indicators are unavailable.
- Substantial reductions in criminal arrests and charges related to cannabis use — and related stigma and other personal burdens — among both adults and youth should be noted as related positive social justice and possibly indirect public health outcomes.
- Continued measurement of key health and social outcomes, as well as robust ways to integrate diverse data when evaluating policy outcomes, are needed to inform evidence-based adjustments to regulatory parameters that will more effectively serve the declared public health objectives of cannabis legalization in Canada.

found a 20.0% (95% CI 6.2%–33.9%) increase in emergency department presentations for cannabis-related disorders and poisonings among youth in Ontario and Alberta.⁶ One population-based study in Ontario found a 12%–22% increase in cannabis-attributable adult emergency department visits since legalization to May 2021.⁷ Other Ontario studies have shown a 13-fold increase (0.26/100 000 people to 3.43/100 000 people) in monthly rates of emergency department presentations for cannabis hyperemesis syndrome, an increase in rates of emergency department visits for cannabis-induced psychosis (incidence rate ratio 1.30, 95% CI 1.02–1.66) and a near doubling (11.0/100 000 people to 20.0/100 000 people) in acute episodes of pregnancy care in which cannabis was present, predominantly associated with legalization's commercialization phase in Ontario (from March 2020 onward).⁸⁻¹⁰ A recent repeated cross-sectional study reported an almost threefold increase in rates of emergency

department visits related to cannabis poisoning among children (aged 0–9 yr) in 4 provinces in the year immediately after legalization, with further increases thereafter in those provinces allowing the sale of edible products.¹¹

In parallel, the observed proportions of consumers obtaining cannabis legally have steadily increased; most recently, data have shown that about two-thirds of cannabis users purchase from legal sources, with levels varying between 50% and 80%, depending on the cannabis product type.^{1,12} However, the prevalence of cannabis-related driving impairment appears to have remained stable or slightly decreased while, in British Columbia, the proportions of drivers admitted to hospital after motor vehicle accidents who tested positive for tetrahydrocannabinol (THC) increased after legalization (November 2018 to March 2020), with adjusted prevalence ratios in 3-level categories ranging from 1.33 (95% CI 1.05–1.68) to 2.29 (95% CI 1.52–3.45), compared with before legalization (January 2013 to September 2018).^{1,13}

Several aspects of the evidence presented warrant discussion. Some of the changing indicator rates or trends were evident before legalization, and the possibility that study findings represent an extension of these trends has not been assessed by all investigations.^{14,15} A substantial proportion of the phase following legalization of cannabis in Canada also included the COVID-19 pandemic, which may have influenced patterns and outcomes of substance use more broadly, although the possible directions for these influences are equivocal.^{14,15} Canada-wide data on important outcome indicators, such as on cannabis use disorders and their treatment demand, or the degree to which cannabis legalization may have effectively substituted for alcohol and other psychoactive substance use and related harm, are lacking. Regulatory variations between Canada's provinces and territories may also have affected some of the observed outcome trends. For example, Quebec has a lower prevalence or trends for some indicators than other provinces, possibly reflecting its more restrictive regulations (e.g., a public sales monopoly, limited range of cannabis products, no home cultivation, older minimum age [21 yr] at which cannabis can be legally purchased).^{1,3,11}

The available evidence, with the qualifications duly noted, presents a mixed picture of changes in public health outcomes after legalization. Although trends in some primary public health indicators have suggested adverse effects of legalization, some others have remained stable.^{1–3} Limited evidence exists to support benefits as they relate to the original stated policy objectives of improving cannabis users' and public health. At this stage, cannabis legalization in Canada appears not to have been the public health disaster anticipated by some of its opponents, but it cannot be described as a comprehensive or unequivocal success for public health either.

It is too early to draw conclusions on the impact of cannabis legalization in Canada that can robustly inform policy reform. Assessments of cannabis legalization in the United States also concluded that 5 years is early to evaluate the full effects of such a fundamental policy change.¹⁶ The relative novelty of legal cannabis, marketing efforts and the legal availability and regulation of cannabis as a consumption good may still be affecting consumer attitudes and behaviour after decades of prohibition.^{1,3}

Crucially, other important policy outcomes beyond those focusing on health need to be considered in comprehensive assessments of policy impacts. In addition to the substantial reductions in illegal sourcing of cannabis products,^{1,13} legalization has produced several fundamental and tangible improvements in social justice. Concretely, legalization significantly reduced enforced cannabis offences and arrests for adults (–74% females and –83% males, $p < 0.001$) and for youth, although to a lesser degree (–62% females and –53% males, $p < 0.0001$), from 2015 to 2021.^{17,18} Before legalization, many criminal cannabis arrests were the result of highly arbitrary or discriminatory (e.g., racialized) enforcement practices, with many focusing on circumstances of personal cannabis consumption.^{19,20} The reduction in cannabis-related enforcement translates into substantive prevention of criminal penalties and criminal records — and the personal stigma and other adversities (e.g., restrictions on work, travel, social opportunities) arising from them for tens of thousands of Canadians — that occurred when use of recreational cannabis was legally prohibited in Canada. These major societal benefits of legalization must be included in any systematic assessments of the policy reform's impacts. Unfortunately, the methodological approaches for such comprehensive, integrated policy assessments, including the relative valuations of health vis-à-vis social outcomes, are underdeveloped.

Canada's legalization of nonmedical cannabis has been a contested policy reform that has been watched closely from within and beyond its borders. A consideration of the evidence 5 years after implementation suggests that success in meeting policy objectives has been mixed, with social justice benefits appearing to be more tangibly substantive than health benefits.^{1–3,17,18} Therefore, rigorous, continued monitoring of key policy outcome indicators — such as the prevalence of adult, youth and high-risk use, and major acute and long-term health harms (e.g., cannabis use disorder; cannabis-related injuries, hospital admissions or emergency department visits), in addition to primary social, crime (e.g., concerning cannabis markets) and other socioeconomic indicators — is essential. Robust ways to integrate diverse data when evaluating policy outcomes are also needed to inform evidence-based adjustments to regulatory parameters that may be necessary to more effectively serve and achieve the declared public health objectives of cannabis legalization in Canada going forward.

References

1. Boury H, Hall W, Fischer B. Developments and changes in primary public health outcome indicators associated with the legalization of non-medical cannabis use and supply in Canada (2018): a comprehensive overview. *Int J Ment Health Addict* 2022;1–15. doi: 10.1007/s11469-022-00986-9.
2. Farrelly KN, Wardell JD, Marsden E, et al. The impact of recreational cannabis legalization on cannabis use and associated outcomes: a systematic review. *Subst Abuse* 2023;17:11782218231172054.
3. Myran DT, Imtiaz S, Konikoff L, et al. Changes in health harms due to cannabis following legalisation of non-medical cannabis in Canada in context of cannabis commercialisation: a scoping review. *Drug Alcohol Rev* 2023;42:277–98.
4. Canadian Cannabis Survey 2022: summary. Ottawa: Health Canada; modified 2022 Dec. 16. Available: <https://www.canada.ca/en/health-canada/services/drugs-medication/cannabis/research-data/canadian-cannabis-survey-2022-summary.html> (accessed 2023 Aug. 18).
5. Imtiaz S, Nigatu YT, Ali F, et al. Cannabis legalization and cannabis use, daily cannabis use and cannabis-related problems among adults in Ontario, Canada (2001–2019). *Drug Alcohol Depend* 2023;244:109765.

6. Callaghan RC, Sanches M, Vander Heiden J, et al. Impact of Canada's cannabis legalisation on youth emergency department visits for cannabis-related disorders and poisoning in Ontario and Alberta, 2015–2019. *Drug Alcohol Rev* 2023;42:1104-13.
7. Myran DT, Pugliese M, Tanuseputro P, et al. The association between recreational cannabis legalization, commercialization and cannabis-attributable emergency department visits in Ontario, Canada: an interrupted time-series analysis. *Addiction* 2022;117:1952-60.
8. Myran DT, Roberts R, Pugliese M, et al. Acute care related to cannabis use during pregnancy after the legalization of nonmedical cannabis in Ontario. *CMAJ* 2023;195:E699-708.
9. Myran DT, Roberts R, Pugliese M, et al. Changes in emergency department visits for cannabis hyperemesis syndrome following recreational cannabis legalization and subsequent commercialization in Ontario, Canada. *JAMA Netw Open* 2022;5:e2231937.
10. Myran DT, Pugliese M, Roberts RL, et al. Association between non-medical cannabis legalization and emergency department visits for cannabis-induced psychosis. *Mol Psychiatry* 2023 July 17 [Epub ahead of print]. doi: 10.1038/s41380-023-02185-x.
11. Myran DT, Tanuseputro P, Auger N, et al. Pediatric hospitalizations for unintentional cannabis poisonings and all-cause poisonings associated with edible cannabis product legalization and sales in Canada. *JAMA Health Forum* 2023;4:e225041.
12. Wadsworth E, Rynard V, Driezen P, et al. Legal sourcing of ten cannabis products in the Canadian cannabis market, 2019–2021: a repeat cross-sectional study. *Harm Reduct J* 2023;20:19.
13. Brubacher JR, Chan H, Erdelyi S, et al. Cannabis legalization and detection of tetrahydrocannabinol in injured drivers. *N Engl J Med* 2022;386:148-56.
14. Layman HM, Thorisdottir IE, Halldorsdottir T, et al. Substance use among youth during the COVID-19 pandemic: a systematic review. *Curr Psychiatry Rep* 2022;24:307-24.
15. Bonnet U, Specka M, Roser P, et al. Cannabis use, abuse and dependence during the COVID-19 pandemic: a scoping review. *J Neural Transm* 2023;130:7-18.
16. Hall W, Lynskey M. Assessing the public health impacts of legalizing recreational cannabis use: the US experience. *World Psychiatry* 2020;19:179-86.
17. Callaghan RC, Sanches M, Hathaway A, et al. Canada's cannabis legalization and adult crime patterns, 2015–2021: a time series study. *Addict Behav* 2023;146:107813.
18. Callaghan RC, Sanches M, Hathaway A, et al. Canada's cannabis legalization and police-reported cannabis-related criminal incidents among youth, 2015–2021. *Drug Alcohol Depend* 2023 Apr. 23 [Epub ahead of print];109892. doi: 10.1016/j.drugalcdep.2023.109892.
19. Owusu-Bempah A, Luscombe A. Race, cannabis and the Canadian war on drugs: an examination of cannabis arrest data by race in five cities. *Int J Drug Policy* 2021;91:102937.
20. Room R, Fischer B, Hall W, et al. Cannabis policy: moving beyond stalemate. New York: Oxford University Press; 2010.

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