

Might cannabis Legalization Have Affected Public Health-Relevant Alcohol- and Tobacco-use Outcomes in Canada?

Benedikt Fischer^{1,2,3,4,5,6} , Wayne Hall⁷, Didier Jutras-Aswad^{8,9} , and Bernard Le Foll^{1,3,10,11,12} 

Abstract

Canada legalized the non-medical use and supply of cannabis in 2018. The public health-relevant outcomes of cannabis legalization documented to date have been mixed, with decreases in cannabis-related crime and illegal distribution markets, while with increases for many – acute and chronic – health problem indicators. One public health-relevant aspect of legalization that has not been adequately assessed to date are its potential effects on alcohol and/or tobacco use and related outcomes in the population. Existing literature suggests that cannabis legalization

¹Waypoint Research Institute, Waypoint Centre for Mental Health Care, Penetanguishene, Ontario, Canada

²Research & Graduate Studies, University of the Fraser Valley, Abbotsford, BC, Canada

³Department of Psychiatry, University of Toronto, Toronto, Canada

⁴Faculty of Health Sciences, Simon Fraser University, Vancouver, British Columbia, Canada

⁵Department of Psychiatry, Federal University of Sao Paulo, São Paulo, Brazil

⁶School of Population Health, University of Auckland, Auckland, New Zealand

⁷National Centre for Youth Substance Use Research, Faculty of Health and Behavioural Sciences, University of Queensland, St Lucia, Australia

⁸Research Centre, Centre Hospitalier de l'Université de Montréal, Montreal, Quebec, Canada

⁹Department of Psychiatry & Addictology, Université de Montréal, Montreal, Quebec, Canada

¹⁰Department of Pharmacology & Toxicology, University of Toronto, Toronto, Ontario, Canada

¹¹Department of Family & Community Medicine, University of Toronto, Toronto, Ontario, Canada

¹²Translational Addiction Research Laboratory, Campbell Family Mental Health Research Institute, Center for Addiction & Mental Health, Toronto, Ontario, Canada

Corresponding Author:

Benedikt Fischer, Waypoint Research Institute, Waypoint Centre for Mental Health Care, Penetanguishene, Ontario, Canada; Research & Graduate Studies, University of the Fraser Valley, Abbotsford, BC, Canada; Department of Psychiatry, University of Toronto, Toronto, Canada; Faculty of Health Sciences, Simon Fraser University, Vancouver, British Columbia, Canada; Department of Psychiatry, Federal University of Sao Paulo, São Paulo, Brazil; School of Population Health, University of Auckland, Auckland, New Zealand.

Email: bfischer@sfu.ca



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-NonCommercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission provided the original work is attributed as specified on the SAGE and Open Access page (<https://us.sagepub.com/en-us/nam/open-access-at-sage>).

may impact alcohol and/or tobacco use in different ways and directions, through both 'substitution'- and/or 'complementarity'-type dynamics. While cannabis use prevalence has markedly increased through legalization, recent epidemiological indicators suggest the possibility of (small) changes in respective other substance use, yet it is empirically unclear whether these developments are causally interrelated. Also considering the substantial adverse public health burden arising from alcohol and tobacco use in the Canadian population, this Commentary makes the case for systemic examination of the potential impacts of cannabis legalization on alcohol and/or tobacco use outcomes by way of rigorous analytical methods as part of assessing the overall public health-related effects of cannabis legalization in Canada as well as other jurisdictions where cannabis has been legalized.

Keywords

Cannabis, legalization policy, public health, outcomes, evaluation, alcohol, tobacco, substitution, complementarity, Canada

Received: August 14, 2026; accepted: September 2, 2026

In 2018, Canada legalized and regulated adult non-medical use of cannabis and commercialized the production and supply of cannabis to adults (Fischer et al., 2023). The legalization policy's main objectives were to reduce cannabis-related adverse effects on public health, reduce the size of illicit cannabis markets and improve the prevention of cannabis use by youth (Fischer et al., 2023). This policy liberalization reform rendered cannabis the third legally available psychoactive substance after alcohol and tobacco that is now widely used in the Canadian population (Health Canada, 2024).

A rapidly expanding evaluation literature shows distinctly mixed outcomes for cannabis legalization in Canada. Rates of illegal cannabis procurement have steadily decreased and now involve only a small minority (e.g., <20%) of adult population users, while, conversely, many indicators of adverse – acute and chronic – mental and physical health outcomes related to cannabis use have substantially increased; in addition, cannabis use among youth has remained at high rates (e.g., 40% or more; Fischer et al., 2023; Fischer et al., 2026; Mekonen Yimer et al., 2025). Altogether, the latter findings suggest that while the

crime-related social burden related to cannabis appears to have decreased, the corresponding disease burden has increased since legalization.

In this context of a markedly mixed picture for outcomes, there is good reason to consider potential indirect effects that the legalization of cannabis may have on other public health outcomes, specifically by affecting the use of alcohol and tobacco and related measures in the population (Fischer et al., 2019). Alcohol and tobacco have long produced the proportionally greatest disease burden related to psychoactive substance use in Canada. In recent years, these two substances were responsible for an attributable toll of 17,000–18,000 and 45,000–48,000 annual deaths respectively, and they account for 40% and 23% respectively of the estimated economic costs from health and social harms caused by substance use in Canada as assessed in 2020, compared to only 5% for cannabis (CSUCH, no date; Fischer et al., 2025).

Legalized cannabis availability may influence alcohol and/or tobacco use, for better or worse, in multiple ways and directions. In instances where the relationship is considered 'complementary', any increase in cannabis use could increase their co-use; if the relationship is one of 'substitutes',

then increased cannabis use could decrease alcohol and/or tobacco use and their related adverse health outcomes in the population (Gunn et al., 2022; Subbaraman, 2016). These interactive dynamics between cannabis use and other substances – including so-called ‘gateway’ pathways, where the use of one substance may lead to use of others – may arise from their psycho-pharmacological effects, behavioral or economic preferences, or socio-ecological exposure, norms or attitudes (Gunn et al., 2022; Pince et al., 2026; Subbaraman, 2016; Thrul et al., 2020; Wang et al., 2025). For example, when cannabis use is legal, some adults may prefer to use cannabis as a presumably safer/healthier consumption product than alcohol or tobacco. Conversely, cannabis use could also conceivably increase the use of tobacco if it is primarily smoked in ‘joints’ comprised of combined cannabis and tobacco, or if cannabis users engage in more ‘social’ tobacco smoking or alcohol consumption.

Recent reviews of that mainly involve US-based data have examined findings from studies using a variety of approaches to study the dynamics specifically between cannabis liberalization policies and use and health outcomes for other substances, primarily alcohol. In their recent review, Pacula et al. (2022) found a mixed picture of evidence including positive, negative and no associations. Specifically, they suggested that there is “insufficient evidence – in quantity and quality – to conclude that cannabis liberalization [in the US] is associated with either increases or decreases in alcohol use or alcohol-related outcomes” (Pacula et al., 2022). Other recent reviews examining the general relationship between cannabis and alcohol use presented similarly heterogeneous findings. These included “compelling evidence for both substitution and complementary effects” (Gunn et al., 2022) as well as “mixed evidence regarding complementarity and substitution” (Risso et al., 2020). However, all of the reviews acknowledged that the effects observed may vary across different age groups, study populations and study measures of alcohol and cannabis use.

There is less research on the relationship between cannabis liberalization and tobacco

smoking, and it is also largely inconclusive. A recent systematic review/meta-analysis found that baseline cannabis use among adults and youth was positively associated with an about four-fold risk for the initiation of any nicotine use at follow-up (Yimer et al., 2024). This may suggest that the prevalence of cigarette smoking might increase in liberalized cannabis policy environments. Other reviews and key studies identified a “strongly intertwined” relationship between cannabis and tobacco use that may overall amplify their complementary use in contexts of cannabis legalization (Lemyre et al., 2019). Additional study data have shown substantial associations between cannabis use and the prevalence and incidence of both tobacco and e-cigarette use specifically for youth as a key risk population (Weinberger et al., 2020).

Select epidemiological data suggest the possibility of inter-related changes in cannabis use, and alcohol and/or tobacco use outcomes since the legalization of cannabis was implemented nearly a decade ago in Canada. The prevalence of cannabis (past year) use in general population surveys has substantially increased since legalization, for example, from 13% in 2015 to 32% 2023 in the national general adult population (ages 15+) (Health Canada, 2024). In the province of Ontario’s general adult population (ages 18+), cannabis use increased from 14.5% (2015) to 29.3% (2025) (Nigatu and Hamilton, 2025). These changes markedly expanded the size of the cannabis-using population and so may have amplified possible cannabis use-related effects on other substance use.

In contrast, the corresponding national prevalence of alcohol use has remained generally steady at about 80% (78% in 2015 to 79% in 2023) while recently showing a modest decline in Ontario (from 80% in 2015 and 2022, to 76% in 2025) in the years after cannabis legalization. The national prevalence of tobacco smoking has generally declined from 13% in 2015, to 10% in 2020 and 11% in 2022. In Ontario, by contrast, there has been a slight increase in smoking prevalence since legalization, from 13% in 2015 to 17% in

2020 and 16% in 2025, after consistent annual declines before cannabis legalisation. The specific drivers behind these trends are unclear.

There are select data insights into the possible relationship dynamics between cannabis and alcohol and/or smoking-related substance use behaviors. Throughout the national Canadian Cannabis Survey (CCS), the annual use prevalence of ‘smoked’ cannabis products (e.g., dried flower/herbal, 82% to 63%; hashish/kief, 26% to 16%; concentrates/extracts, 19% to 13%) somewhat decreased from 2018 to 2024, however the use of vape-pens/cartridges doubled (16% to 37%), overall retaining ‘smoking’-based administration as the by far most common cannabis use behavior in a – substantially growing – total cannabis user population (Health Canada, 2025). Moreover, the proportion of past-year cannabis users who reported combining cannabis and alcohol use post-legalization decreased from 44% in 2018 to 38% in 2024. Conversely, the proportion of cannabis users who reported combining cannabis and tobacco use remained steady (30%/2018 to 29%/2024) (Health Canada, 2025).

A time series-based analysis of changes in volumes of alcohol sales before and after cannabis legalization (2004–2022) found a slight but significant decrease in sales volumes for beer (95%CI: -0.08 to -0.04 ; $p = 0.001$) but a similar increase in volumes for other alcoholic beverages (95%CI: 0.04 – 0.07 ; $p = 0.001$), leaving no significant change in the overall trend for alcohol sales (Armstrong, 2025). A population-level study comparing the co-use of cannabis and alcohol in Canada from just before (2018) until just after (2019) legalization and using as controls US states in which cannabis was legal and illegal found increases in co-use in all three jurisdictions. The authors interpreted this as evidence of increasing cannabis use that was unrelated to policy status (Hobin et al., 2023).

The direct and indirect public health-relevant outcomes of cannabis legalization policy remain of active interest and relevance in Canada; in addition, they are relevant in the growing number of other jurisdictions where such policy

liberalization has been implemented or is considered. As suggested, there are plausible reasons why cannabis legalization and its associated substantial increases in cannabis use prevalence may indirectly affect alcohol and tobacco use outcomes in the population. The – albeit rather limited – available data might suggest that cannabis legalization may have coincided with modest declines in alcohol use while modest increase in tobacco smoking in Canada. Related developments may or may not be causally related to cannabis legalization, or alternatively reflect a variety of other secular dynamics, including COVID-related effects, alcohol- or tobacco-focused interventions or social attitude changes that do not relevantly relate to cannabis use and its control policy.

Overall, there is need to improve our understanding of possible effects of cannabis legalization on the public health-burden of alcohol and tobacco use and related outcomes as an essential possible aspect of cannabis legalization policy outcomes in North America and/or other settings where this has been implemented (Fischer et al. 2019; Fischer et al., 2026; Pacula et al., 2022). Such assessments will require the use of better data and rigorous statistical analysis methods, such as longitudinal time series and modelling studies of population-based substance use, pattern/initiation and outcome (e.g., morbidity and mortality) indicators for cannabis, alcohol and tobacco, and their possible inter-relational dynamics, as has been used in comparable other areas of investigation.

ORCID iDs

Benedikt Fischer  <https://orcid.org/0000-0002-2186-4030>

Didier Jutras-Aswad  <https://orcid.org/0000-0002-8474-508X>

Bernard Le Foll  <https://orcid.org/0000-0002-6406-4973>

Author Contributions

Benedikt Fischer: Conceptualization (lead); Investigation; Writing – Original Draft; *Wayne*

Hall: Conceptualization (contributed); Investigation; Writing – Review and Editing; *Didier Jutras-Aswad*: Conceptualization (contributed); Investigation; Writing – Review and Editing. *Bernard Le Foll*: Conceptualization (contributed); Investigation; Writing – Review and Editing.

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

Declaration of Conflicting Interests

Dr. Fischer has held research- and policy-related support grants and/or contracts in the areas of substance use, health, crime from public funding and/or government organizations (i.e., public-only sources) in the last three years; he acknowledges institutional research support from the Waypoint Centre for Mental Health Care/Waypoint Research Institute and the University of the Fraser Valley. Dr. Hall has provided expert advice to WHO on the adverse health effects of cannabis and expert testimony in a criminal trial on the harms of adolescent cannabis use in the past five years. Dr. Jutras-Aswad acknowledges a clinical scientist career award from Fonds de Recherche du Québec (FRQS); he has received study materials from Cardiol Therapeutics for clinical trials. Dr. Le Foll declares research (e.g., research funding/in-kind) supports received from Indivior, Indiva, Canopy Growth Corporation, research consultancies from and/or science advisory roles with ThirdBridge, Shinogi, Changemark, NFL Biosciences, and travel support from Bioprojet. Dr. Le Foll acknowledges employment-based research support from the Centre for Addiction & Mental Health (CAMH), the Waypoint Centre for Mental Health Care, in addition to a clinician-scientist award from the Department of Family and Community Medicine, and the Chair in Addiction Psychiatry from the Department of Psychiatry, University of Toronto.

Data Availability Statement

All data presented in this manuscript are accessible in the public domain (e.g., in the form of journal articles, reports, websites).

Supplemental Material

Supplemental material for this article is available online.

References

- Armstrong, M. (2025). Alcohol sales changes in a Canadian province after recreational cannabis legalization. *The International Journal on Drug Policy*, 142, 104840. <https://doi.org/10.1016/j.drugpo.2025.104840>
- Canadian Substance Use Costs and Harms. (CSUCH; no date). *Substance Use Costs and Harms Reports*. Retrieved June 5, 2026, from <https://csuch.ca/resources/costs-and-harms/>
- Fischer, B., Hall, W., Jutras-Aswad, D., Le Foll, B., & Myran, D. T. (2026). Cannabis Legalization Outcomes in Canada: Trading Off Increased Health Problem for Reduced Crime Burdens Is Not Good Enough. *Canadian Journal of Psychiatry. Revue Canadienne de Psychiatrie*, 07067437261454772, <https://doi.org/10.1177/07067437261454772>
- Fischer, B., Hall, W., Le Foll, B., & Conrod, P. (2025). Strategic approaches to reducing the substance use-related burden of disease in Canada. *Lancet Regional Health. Americas*, 53, 101289. <https://doi.org/10.1016/j.lana.2025.101289>
- Fischer, B., Jutras-Aswad, D., & Hall, W. (2023). Outcomes associated with nonmedical cannabis legalization policy in Canada: Taking stock at the 5-year mark. *Canadian Medical Association Journal*, 195(39), E1351–E1353. <https://doi.org/10.1503/cmaj.230808>
- Fischer, B., Russell, C., Rehm, J., & Leece, P. (2019). Assessing the public health impact of cannabis legalization in Canada: Core outcome indicators towards an ‘index’ for monitoring and evaluation. *Journal of Public Health*, 41(2), 412–421. <https://doi.org/10.1093/pubmed/fdy090>
- Health Canada. (2024). *Canadian Alcohol and Drugs Survey (CADS): Summary of results for 2023*. <https://www.canada.ca/en/health-canada/services/canadian-alcohol-drugs-survey/2023-summary.html>
- Health Canada. (2025). *Canadian Cannabis Survey 2024: Summary*. <https://www.canada.ca/en/health->

- canada/services/drugs-medication/cannabis/research-data/canadian-cannabis-survey-2024-summary.html
- Gunn, R. L., Aston, E. R., & Metrik, J. (2022). Patterns of Cannabis and alcohol co-use: Substitution versus complementary effects. *Alcohol Research: Current Reviews*, 42(1), 04. <https://doi.org/10.35946/arcr.v42.1.04>
- Hobin, E., Weerasinghe, A., Boniface, S., Englund, A., Wadsworth, E., & Hammond, D. (2023). Co-use of cannabis and alcohol before and after Canada legalized nonmedical cannabis: A repeat cross-sectional study. *Journal of Psychopharmacology*, 37(5), 462–471. <https://doi.org/10.1177/02698811231161583>
- Lemyre, A., Poliakova, N., & Bélanger, R. E. (2019). The relationship between tobacco and Cannabis use: A review. *Substance Use & Misuse*, 54(1), 130–145. <https://doi.org/10.1080/10826084.2018.1512623>
- Mekonen Yimer, T., Hoch, E., Fischer, B., Dawson, D., & Hall, W. (2025). The adverse public health effects of non-medical cannabis legalisation in Canada and the USA. *The Lancet. Public Health*, 10(2), e148–e159. [https://doi.org/10.1016/S2468-2667\(24\)00299-8](https://doi.org/10.1016/S2468-2667(24)00299-8)
- Nigatu, Y., & Hamilton, H. CAMH Monitor e-Report. (2025). Substance use, mental health and well-being among Ontario adults 2025. Available from: https://www.camh.ca/-/media/research-files/monitor/camh-monitor-2025-full-report-final-version_jan072026-pdf.pdf&ved=2ahUKEwiowL-82YaTAxUiFDQIHR3ZGqIQFnoECB0QAQ&usg=AOvVaw02F36i4V6Qt-ysj873WQ8T
- Pacula, R. L., Smart, R., Lira, M. C., Pessar, S. C., Blanchette, J. G., & Naimi, T. S. (2022). Relationships of Cannabis policy liberalization with alcohol use and co-use with Cannabis: A narrative review. *Alcohol Research: Current Reviews*, 42(1), 06. <https://doi.org/10.35946/arcr.v42.1.06>
- Pince, C. L., Piercey, C. J., Stallsmith, V. T., et al. (2026). Behavioral phenotypes associated with cannabis and alcohol substitution. *Harm Reduction Journal*, 23, 74. <https://doi.org/10.1186/s12954-026-01432-y>
- Risso, C., Boniface, S., Subbaraman, M. S., & Englund, A. (2020). Does cannabis complement or substitute alcohol consumption? A systematic review of human and animal studies. *Journal of Psychopharmacology*, 34(9), 938–954. <https://doi.org/10.1177/0269881120919970>
- Subbaraman, M. S. (2016). Substitution and complementarity of alcohol and cannabis: A review of the literature. *Substance Use & Misuse*, 51(11), 1399–1414. <https://doi.org/10.3109/10826084.2016.1170145>
- Thrul, J., Vijayaraghavan, M., Kalkhoran, S., & Satterfield, J. M. (2020). Patterns of cigarette, e-cigarette, and cannabis use among adult smokers in primary care 2014-2015. *Addictive Behaviors*, 100, 106109. <https://doi.org/10.1016/j.addbeh.2019.106109>
- Wang, Y., Cavazos-Rehg, P. A., Cui, Y., Speer, M., LoParco, C. R., McCready, D. M., Yang, Y. T., & Berg, C. J. (2025). The gateway effect of cigarette, e-cigarette, cigar, and alcohol use vs. Cannabis use. *Addictive Behaviors*, 170, 108451. <https://doi.org/10.1016/j.addbeh.2025.108451>
- Weinberger, A. H., Delnevo, C. D., Wyka, K., Gbedemah, M., Lee, J., Copeland, J., & Goodwin, R. D. (2020). Cannabis use is associated with increased risk of cigarette smoking initiation, persistence, and relapse among adults in the United States. *Nicotine & Tobacco Research: Official Journal of the Society for Research on Nicotine and Tobacco*, 22(8), 1404–1408. <https://doi.org/10.1093/ntr/ntz085>
- Yimer, T. M., McClure-Thomas, C., Stjepanovic, D., Wilson, J., Chan, G. C. K., Hall, W. D., & Leung, J. (2024). The relationship between cannabis and nicotine use: A systematic review and meta-analysis. *Addiction*, 119(12), 2076–2087. <https://doi.org/10.1111/add.16642>