



Prevalence of cannabis use and the frequency, types, and sources of cannabis products used in northern remote territories of the Canadian legal cannabis market

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Abstract

Objective The Cannabis Policy Study in the Territories (CPST) is an annual repeat cross-sectional study aiming to evaluate the impacts of cannabis legalization in the Canadian territories (Yukon, Northwest Territories, and Nunavut), where there is a paucity of data on cannabis use. This current study's objective was to describe the 2022 CPST, including methods, population prevalence estimates of cannabis use, and legal cannabis sources and perceptions in the territories.

Methods The 2022 CPST includes 2462 respondents (aged 16+) residing in the territories who either use or do not use cannabis. Respondents were recruited through mail-push-to-web invitations sent via licensed mailing lists, sampling from a near census of households in the territories. Population-weighted indicators of cannabis use are described.

Results Past 12-month cannabis use was self-reported by 46.1%, and 21.8% self-reported daily/almost daily use. The most commonly used product types among past 12-month consumers were dried flower (73.4%), edibles (59.0%), and vape oils (35.7%). On average, 74.8% of cannabis products used in the past 12 months were from legal sources, though legal sourcing varied by product type (54.4–92.2%). Cannabis consumers reported favourable perceptions of legal compared to illegal cannabis products regarding quality, convenience, and safety, but a lesser extent for price.

Conclusion Cannabis use is highly prevalent in the territories, particularly daily/almost daily use, and legal market penetration is high despite region remoteness. Following cannabis legalization, monitoring cannabis use prevalence and patterns in remote regions is important for informing the development of harm reduction and prevention initiatives that consider the unique needs of these regions.

Résumé

Objectif L'Étude sur les politiques relatives au cannabis dans les territoires (Cannabis Policy Study in the Territories – CPST) est une étude transversale annuelle qui a pour but d'évaluer les répercussions de la légalisation du cannabis dans les territoires canadiens (Yukon, Territoires du Nord-Ouest et Nunavut), où il existe peu de données sur la consommation de cannabis. L'objectif de la présente étude était de décrire l'étude CPST de 2022, y compris la méthodologie, les estimations de la prévalence de la consommation de cannabis au sein de la population, ainsi que les sources et les perceptions du cannabis vendu légalement dans les territoires.

Méthodes L'étude CPST menée en 2022 a consisté à interroger 2 462 personnes âgées de 16 ans et plus qui résident dans les territoires. Les répondants incluent des personnes qui consomment du cannabis et d'autres qui n'en consomment pas. Les répondants ont été recrutés au moyen d'invitations envoyées par la poste à partir de listes d'envoi autorisées. Les échantillons

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ont été effectués à partir d'un quasi-recensement des ménages qui résident dans les territoires. Les indicateurs pondérés en population de la consommation de cannabis sont décrits.

Résultats Au cours des 12 derniers mois, le pourcentage d'autodéclarations de consommation de cannabis était de 46,1 %, et 21,8 % des répondants ont déclaré consommer quotidiennement ou presque. Les produits les plus couramment utilisés par les consommateurs au cours des 12 derniers mois étaient les fleurs séchées (73,4 %), les produits comestibles (59,0 %) et les huiles de vapotage (35,7 %). En moyenne, 74,8 % des produits de cannabis consommés au cours des 12 derniers mois provenaient de sources légales, bien que l'approvisionnement légal varie selon le type de produit (de 54,4 % à 92,2 %). Les consommateurs de cannabis ont déclaré percevoir favorablement les produits de cannabis vendus légalement comparativement aux produits vendus illégalement en ce qui a trait à la qualité, à la commodité et à la sécurité, mais dans une moindre mesure en matière de prix.

Conclusion La consommation de cannabis est très répandue dans les territoires, en particulier la consommation quotidienne ou presque quotidienne. De plus, la pénétration du marché des produits vendus légalement est élevée malgré l'éloignement des régions. À la suite de la légalisation du cannabis, la surveillance de la prévalence et des tendances de consommation du cannabis dans les régions éloignées fournit des renseignements importants pour l'élaboration d'initiatives de réduction des méfaits et de prévention qui tiennent compte des besoins uniques de ces régions.

Keywords Cannabis legalization · Prevalence · Legal sourcing · Product type · Perceptions · Priority populations · Northern populations

Mots-clés Légalisation du cannabis · prévalence · approvisionnement légal · type de produit · perceptions · populations prioritaires · populations nordiques

Introduction

Non-medical cannabis was legalized in Canada in October 2018 through the *Cannabis Act*. The *Cannabis Act* includes public health and safety objectives to transition consumers from the illegal to the legal cannabis market and protect youth (Government of Canada, 2018). Cannabis remains one of the most widely used substances in Canada. Self-reported past 12-month cannabis use among Canadians aged 16+ increased from 22% in 2018 (pre-legalization) to 27% in 2022, whereas daily/almost daily cannabis use remained at 7% (Health Canada, 2022a). In 2021/2022, Canada's legal sales of non-medical cannabis totaled \$4 billion (Statistics Canada, 2023a).

Canada's territories, Yukon, Northwest Territories (NWT), and Nunavut, are remote, northern regions with a higher prevalence of males, young adults, and Indigenous Peoples than in the 10 provinces—three priority groups for evaluating cannabis legalization (Wennberg et al., 2021). The territories have higher rates of substance use and substance-attributable harms (Canadian Centre on Substance Use and Addiction, 2020; Canadian Institute for Health Information, 2019). In the 2022 Canadian Cannabis Survey (CCS), self-reported past 12-month cannabis use was estimated at 41% in the territories, higher than the Canadian average of 27% (Health Canada, 2022a). Territorial governments and Indigenous organizations have identified the need for improved surveillance of cannabis use (Indigenous Services Canada, 2019; Auditor General of Canada, 2022; Yukon Liquor Corporation, 2022).

There is a paucity of data on cannabis use to guide policy decisions in the territories. Several population-based national surveys routinely collect data on cannabis use in Canada; however, the territories are commonly excluded or under-sampled. The Canadian Alcohol and Drugs Survey does not include the territories (Health Canada, 2019a). The Canadian Community Health Survey samples the territories, but suppresses these data in published annual results due to small sample sizes (Statistics Canada, 2023b). The National Cannabis Survey (NCS) sampled the territories, though only the three territorial capital cities, and sampling in the territories concluded in 2019 (Statistics Canada, 2019). Finally, the 2022 CCS includes ~200 respondents from across the three territories (Health Canada, 2022a), an inadequate sample size for providing estimates by key socio-demographic factors and cannabis use indicators based on guidelines used by Health Canada (e.g., suppress data when $n < 50$; Health Canada, 2022b). The last comprehensive surveys to provide population-based territorial estimates of cannabis use in Yukon and in NWT, respectively, were in 2005 (Government of Yukon, 2005) and 2018, pre-legalization (NWT Bureau of Statistics, 2018).

As legal cannabis markets in Canada evolve, it is important to examine the extent to which consumers are purchasing different products from the legal market. Dried flower has historically been the predominant cannabis product type in Canada (Hammond et al., 2022). Alternative product types, including edibles, topicals, and solid concentrates, were first made available in legal retailers in December 2019 (Health Canada, 2019b). Recent evidence suggests increasing use of

alternative products, including solid edibles, vaped oils, and cannabis drinks (Wadsworth et al., 2023).

In Canada, the majority of cannabis consumers have reported accessing cannabis from a legal storefront (Health Canada, 2022a). The extent to which consumers are purchasing cannabis from legal markets in the territories has not been previously reported. This is essential to understand in remote regions with less access to in-person licensed retailers. Both Yukon and Nunavut use a hybrid sales model with public and private retailers, whereas NWT has a private sales model. As of June 2023, Yukon and NWT each had a total of six licensed cannabis retailers, and Nunavut had one. All territories offer legal online retail, though delivery fees amount to \$10–\$40, and may include minimum order amounts, limited product availability, and regional restrictions on delivery (Government of Nunavut, 2023; Government of Yukon, 2023; Northwest Territories Liquor & Cannabis Commission, 2023).

This study's objective is to provide detailed population prevalence estimates on cannabis use and legal cannabis sources and perceptions in the territories, through the administration of a population-based survey, the 2022 Cannabis Policy Study in the Territories. Although the territories have relatively high proportions of First Nations, Inuit, and Métis Peoples compared to the rest of Canada, the current study does not assess differences in cannabis use between Indigenous and non-Indigenous people. Sharp disparities in substance use and health outcomes between Indigenous and non-Indigenous people are well documented in Canada's North (Public Health Agency of Canada, 2018). These disparities are largely attributable to the history of colonization, residential schools, and continued experiences with systemic and structural racism (Public Health Agency of Canada, 2018). As the current study does not assess the historical and current experiences of trauma and their contributions to disparities in substance use, nor Indigenous-specific indicators of wellness, such as connections to culture, language, and land, cannabis experiences of Indigenous People cannot be fully understood.

Methods

The Cannabis Policy Study in the Territories (CPST) is an annual repeat cross-sectional study of individuals aged 16+, who use or do not use cannabis, have internet access, and reside in Yukon, NWT, or Nunavut. The territories are located in northern Canada, with a combined total population of approximately 118,000 in 2021, with 23%, 51%, and 86% identifying as Indigenous in Yukon, NWT, and Nunavut, respectively (Statistics Canada, 2023c).

This study reports on results from the 2022 CPST conducted in September–October 2022. Data were collected via an online survey available in English, French, and two Inuit languages, Inuktitut and Inuinnaqtun. The survey

was adapted from the International Cannabis Policy Study (ICPS), with the majority of measures identical between the studies (Hammond et al., 2023). The ICPS survey measures were developed following consultation with subject matter experts, extensive pilot testing, and cognitive interviewing. The ICPS study methodology has been described elsewhere (Hammond et al., 2020). A full description of the study methods for the 2022 CPST is available at <http://cannabisproject.ca/territories/> (Schwartz et al., 2023). The first study year was 2022, with the methods and materials piloted in 2021 with 993 respondents.

The project received ethics clearance from the University of Waterloo Research Ethics Committee (ORE #42,817). In addition, the project was reviewed by three territorial research licensing offices as a requirement to conduct research in the territories.

Community engagement

As part of the research license processes, the research team connected with territorial governments and Indigenous organizations across the territories to solicit feedback at study initiation and throughout the study. Annual territory-specific reports summarizing results were shared with partners to promote transparency and assist in interpreting findings (International Cannabis Policy Study, 2023). To facilitate community engagement and study participation in Nunavut, an Advisory Council including members residing or working in Nunavut was established in 2022. The Nunavut Advisory Council provided feedback on survey content, participant recruitment strategies and materials, and the interpretation and dissemination of results.

Recruitment

Recruitment occurred from September 12 to October 27, 2022, using a mail push-to-web approach. Postcards were mailed to 36,619 residential mailboxes, a near census of households across the territories, providing study information and an invitation for one individual per household aged 16+ to complete the online survey using a unique password. Residential mailbox information was obtained from Canada Post, the government postal operator in Canada, including a licensed list containing 24,729 residential addresses across the territories, and 11,890 mailboxes not covered by the addressed mail list to maximize coverage. This second list did not include a specific delivery address, but rather postcards were sent in bulk to all households in a neighbourhood. Respondents received an e-transfer of \$20 as remuneration.

Several strategies were used to raise awareness of the study, including hiring local research assistants to distribute study information, inviting Indigenous and government organizations to share study information with their networks,

and promoting the study through social media, unpaid media interviews, and paid ads of local media outlets.

Sample

Of the 36,619 households invited, 3684 accessed the online survey link (Fig. 1), of whom 2789 (75.7%) fully completed the survey, 773 (21.0%) partially completed the survey (completed < 80% of universal survey questions), and 122 (3.3%) were terminated from completing the survey due to ineligibility, failing to answer mandatory survey questions (e.g., cannabis use frequency) or not providing consent. The survey had a participation rate of 7.6% (2789/36,619). Participants were excluded from the final analytic sample if they were confirmed as repeat respondents (e.g., identical email), or failed data integrity checks, such as incorrectly identifying the current month.

Measures

Cannabis use

Cannabis use prevalence was assessed through the questions, “Have you ever tried cannabis?” (Yes/No/Don’t know), “When was the last time you used cannabis?” (More than 12 months ago/More than 3 months ago but less than 12 months ago/More than 30 days ago but less than 3 months ago/Within the past 30 days/Don’t know), and “How often do you use cannabis?” (Less than once per month/One or more times per month/One or more times per week/Every day or almost every day/Don’t know). Responses were categorized to “Lifetime use”, “Past 12-month use” (inclusive

of more frequent use), “Past 30-day use”, and “Daily/almost daily use”.

Cannabis product use

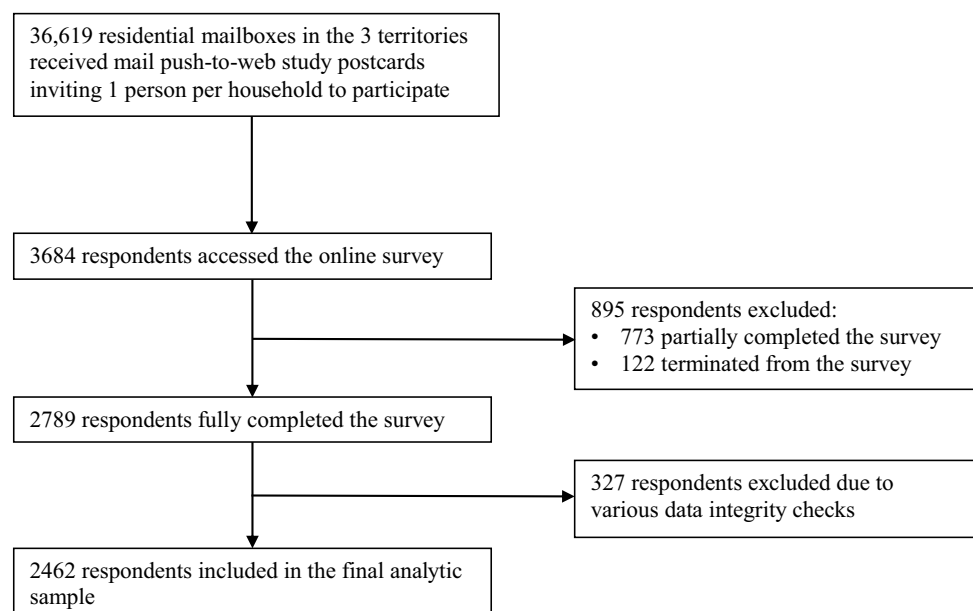
Past 12-month cannabis consumers were asked whether they used each of the 10 cannabis product types in the past 12 months (No; Yes, but not in past 12 months; Yes, in past 12 months): dried flower (smoked or vaped); oils/liquids taken orally (e.g., drops); oils/liquids for vaping; edibles/foods; drinks; solid concentrates (e.g., wax, shatter); hash or kief; tinctures; and topicals. Respondents who reported using a specific product in the past 12 months were asked to provide their frequency of using each product: Less than monthly; Monthly/weekly; and Daily/almost daily.

Legal sourcing of cannabis products

Past 12-month cannabis consumers were asked to report the percentage of cannabis products used in the past 12 months from legal/authorized sources for each cannabis product type. Respondents could enter a numerical value between 0 and 100.

Respondents were asked where they purchased their last product in the past 12 months for each cannabis product type (from a dealer, internet delivery, store/co-operative/dispensary, family or friend), and subsequently, if from a store or internet service, whether this was a legal/authorized store or website. Respondents reporting their last purchase source from a dealer, unauthorized store or internet service, or family or friends, or who were under the minimum legal purchase age (19 years old), were classified as accessing

Fig. 1 Flowchart of participant recruitment in Canada’s territories



from illegal sources. Those accessing from a legal/authorized store or internet delivery and aged 19+ were classified as purchasing from legal sources. Those obtaining from unknown source were classified as missing.

Perceptions of cannabis from legal sources

Participants were queried: “We would like to know how cannabis products from legal/authorized sources compare to products from illegal/unauthorized sources” with options (1) quality of legal cannabis (Higher quality/No difference/Lower quality/Don’t know), (2) price of legal cannabis (More expensive/No difference/Less expensive/Don’t know), (3) convenience of buying legal cannabis (More convenient to buy/No difference/Less convenient to buy/Don’t know), (4) safety of using legal cannabis (Safer to use/No difference/Less safe to use/Don’t know), and (5) safety of buying legal cannabis (Safer to buy/No difference/Less safe to buy/Don’t know).

Socio-demographics

Socio-demographic information collected included age (categorized by 10-year age groups; and age bands 16–24, 25–39, 40+), race/ethnicity and Indigenous status (any Indigenous ethnicity or status identified), education level, perceived income adequacy (how difficult or easy is it to make ends meet), and territory of residence. Both gender and sex at birth were collected separately. Sex at birth was included in the current study to retain all respondents (gender included missing data [$n = 30$] and small cell sizes for non-cis individuals [$n = 32$], which could not be included in analyses). For race/ethnicity, perceived income adequacy, and education level, those who answered, Don’t know or Refuse were categorized as Unstated.

Data analysis

Post-stratification sample weights were constructed based on 2021 Canadian Census estimates by territory. Respondents were classified into age-by-sex-by-territory and education groups. Correspondingly grouped population count and proportion estimates were obtained from Statistics Canada (Statistics Canada, 2023c). A raking algorithm was applied to the final analytic sample ($n = 2462$) to compute weights calibrated to these groupings. Weights were then rescaled to the sample size for the three territories. All prevalence measures were calculated using weighted frequencies and 95% confidence intervals (CIs) are provided to indicate variability around estimates. Analyses were conducted using SAS Enterprise Guide version 8.2.

Results

The final analytic sample included 2462 participants (Fig. 1). Overall, 2380 (96.7%) surveys were completed in English, 81 (3.3%) in French, and 1 (<0.1%) in Inuktitut. Median survey times were 43.5 and 27.1 min among those who had or had not used cannabis in the past 12 months, respectively.

Socio-demographic profile

The weighted and unweighted samples of respondents are presented in Table 1. The unweighted sample was similar, though slightly younger and more female than the populations of the territories in the 2021 Canadian Census (Statistics Canada, 2023c). The highest percent of respondents (unweighted) were aged 26–35 (25.5%) and 36–45 (22.7%), and were female (55.6%). By territory, 57.5% ($n = 1415$) of sampled respondents resided in Yukon, 37.1% ($n = 913$) in NWT, and 5.4% ($n = 134$) in Nunavut.

Of the unweighted sample, 18.8% identified as Indigenous, less than the 52% in the 2021 Census (Statistics Canada, 2023c). Respondents in the survey skewed more highly educated, with 51.7% having a Bachelor’s degree or higher, compared to 20.9% in the Census (Statistics Canada, 2023c). Nearly half of the unweighted sample identified perceived income adequacy as very easy (18.5%) or easy (27.7%), suggesting high socio-economic status among sampled respondents.

Cannabis use

The prevalence of lifetime cannabis use was 80.3% (Table 2). The percentage self-reporting lifetime use was slightly higher in males than in females, and was highest in respondents aged 25–39. Overall, 46.1% self-reported past 12-month cannabis use, and 35.3% past 30-day use. The percentages self-reporting past 12-month and past 30-day use were higher in males as compared to females and in those aged 16–24 and 25–39 as compared to those aged 40+. Daily/almost daily use was prevalent in 21.8% of the population. Self-reported prevalence of daily/almost daily use was highest among those aged 16–24.

Cannabis product type

Dried flower was the most prevalent cannabis product type, used by 73.4% of past 12-month consumers. The next most prevalent product types used were solid edibles (59.0%), vape oils (35.7%), and hash or kief (28.6%) (Table 3). Among past 12-month consumers of dried flower, nearly half (45.8%) used dried flower daily/almost daily with

Table 1 Sample characteristics of respondents in Canada's territories ($n = 2462$)

	Weighted %	Unweighted % (sample size)
Age group		
16–25	14.5%	10.9% (269)
26–35	23.7%	25.5% (628)
36–45	19.6%	22.7% (558)
46–55	15.5%	15.7% (387)
56–65	14.6%	12.8% (315)
66+	12.1%	12.4% (305)
Age [mean(SD)]	43.3 (16.3)	43.7 (15.8)
Sex at birth		
Female	49.8%	55.6% (1369)
Male	50.2%	44.4% (1093)
Race/ethnicity		
White	56.2%	67.1% (1651)
Indigenous ^a	32.0%	18.8% (463)
•First Nations	10.7%	8.8% (217)
•Inuk (Inuit)	16.5%	5.2% (129)
•Métis	4.1%	4.1% (101)
•Unidentified Indigenous	0.7%	0.6% (16)
Other/Mixed/Unstated	11.9%	14.1% (348)
Education		
Less than high school	18.1%	9.5% (233)
High school diploma or equivalent	12.2%	7.1% (175)
College/vocational training/trade certificate/diploma	48.2%	31.0% (762)
Bachelor's degree or higher	20.8%	51.7% (1273)
Not stated	0.7%	0.6% (19)
Perceived income adequacy		
Very difficult	7.6%	4.7% (116)
Difficult	15.5%	13.5% (333)
Neither easy nor difficult	35.6%	31.9% (785)
Easy	22.2%	27.7% (682)
Very easy	13.6%	18.5% (455)
Not stated	5.5%	3.7% (91)
Territory of residence		
Yukon	37.6%	57.5% (1415)
Northwest Territories	36.6%	37.1% (913)
Nunavut	25.8%	5.4% (134)

^aAny Indigenous ethnicity or status identified in part or exclusively

another 25.2% using monthly/weekly. The prevalence of use for vape oils and concentrates were similar, with over half of consumers using these products either daily/almost daily or monthly/weekly. Solid edibles, drinks, drops, topicals, and tinctures were used less frequently, with a majority using these products less than once a month.

Cannabis from legal sources

Past 12-month cannabis consumers self-reported, on average, that 74.8% of the cannabis they used in the past 12 months was from legal sources. The percent of legally sourced cannabis varied by product type, though the majority of all product types on average were self-reported to be legally sourced (Fig. 2). A high percent of past 12-month use was self-reported to be from legal sources for cannabis drinks (92.2%), topicals (85.4%), and drops (84.8%). In contrast, a lower percent from legal sources was self-reported for cannabis solid concentrates (54.4%), hash or kief (60.9%), and dried flower (66.2%). For comparison, the percent of consumers self-reporting a legal source for their last cannabis purchase indicated a similar pattern of legal sourcing (Supplementary Table 1, Supplementary Fig. 1).

Perceptions of cannabis from legal sources

Legal cannabis was perceived favourably, with generally higher or similar quality of legal compared to illegal cannabis perceived by one third of respondents, higher or similar convenience by two thirds, and higher safety of using and buying legal cannabis by over half of respondents (Table 4). For perceived price, half of past 12-month cannabis consumers reported that legal was more expensive than illegal cannabis.

Discussion

This study provides the first comprehensive evidence of prevalence and patterns of cannabis use, types of products used, and purchase sources in Canada's territories since legalization in 2018, filling a substantial gap in routinely collected data. Four years following legalization of non-medical cannabis, estimates of cannabis use in the territories were substantially higher than national estimates, particularly the prevalence of daily/almost daily use. Almost one quarter of all respondents (22%), nearly half of past 12-month cannabis consumers, reported using cannabis daily/almost daily. This value is approximately 10% higher than the 12% daily/almost daily use across the 10 provinces in the 2022 ICPS (Hammond et al., 2023). Differences between the territories and the Canadian average were similarly reported in the 2022 CCS and the 2018 NCS, the latter only having sampled in the territories' capital cities (Health Canada, 2022a; Statistics Canada, 2018). Past 12-month cannabis use was similar to the 2022 CCS territorial average (41%), though daily/almost daily cannabis use was almost 10% higher than the territorial average

Table 2 Prevalence of cannabis use overall, and by sex and age group, in Canada’s northern territories

	Sex			Age group		
	Total <i>n</i> = 2462 % (95% CI)	Male <i>n</i> = 1093 % (95% CI)	Female <i>n</i> = 1369 % (95% CI)	16–24 <i>n</i> = 230 % (95% CI)	25–39 <i>n</i> = 914 % (95% CI)	40+ <i>n</i> = 1318 % (95% CI)
Lifetime use	80.3% (78.0–82.6)	81.7% (78.4–85.1)	78.8% (75.6–81.9)	65.9% (58.1–73.6)	84.7% (80.8–88.6)	81.0% (78.1–84.0)
Past 12-month use	46.1% (43.2–49.1)	49.3% (45.1–53.6)	42.8% (38.8–46.9)	56.1% (47.9–64.4)	54.2% (48.9–59.6)	38.6% (34.8–42.4)
Past 30-day use	35.3% (32.4–38.2)	38.1% (34.0–42.3)	32.5% (28.5–36.4)	42.8% (34.1–51.4)	42.1% (36.8–47.4)	29.3% (25.7–32.8)
Daily/almost daily use	21.8% (19.1–24.4)	22.3% (18.6–26.0)	21.2% (17.5–25.0)	28.3% (19.9–36.6)	25.9% (20.9–30.9)	17.6% (14.5–20.7)

All data except *n* are weighted

Table 3 Cannabis use frequency within past 12 months by cannabis product type in Canada’s territories

Cannabis product type	Past 12-month use % (95% CI)	Use frequency within past 12 months by cannabis product type ^c		
		< Once a month % (95% CI)	Monthly/Weekly % (95% CI)	Daily/Almost daily % (95% CI)
Dried flower, <i>n</i> = 746	73.4% (69.6–77.1)	26.9% (22.6–31.3)	25.2% (20.9–29.6)	45.8% (40.5–51.1)
Edibles (solids), <i>n</i> = 697	59.0% (54.5–63.4)	63.8% (58.7–68.9)	29.3% (24.4–34.1)	3.7% (2.0–5.3) ^a
Vape oils, <i>n</i> = 325	35.7% (31.4–40.0)	42.0% (34.4–49.7)	33.8% (26.6–41.0)	17.9% (12.0–23.8) ^a
Hash or kief, <i>n</i> = 210	28.6% (24.2–33.0)	49.1% (39.3–58.9)	25.9% (17.0–34.8) ^a	– ^b
Concentrates, <i>n</i> = 163	21.7% (17.8–25.7)	44.0% (33.6–54.4)	34.3% (23.6–45.0)	8.5% (3.0–14.1) ^a
Drinks, <i>n</i> = 245	20.6% (17.2–24.0)	82.4% (75.7–89.1)	9.8% (4.1–15.6) ^a	– ^b
Drops, <i>n</i> = 236	19.6% (16.4–22.8)	55.9% (47.2–64.7)	26.8% (19.0–34.6)	15.8% (10.0–21.5) ^a
Topicals, <i>n</i> = 173	14.7% (11.7–17.7)	53.5% (42.4–64.5)	30.4% (20.3–40.4) ^a	7.0% (2.6–11.3) ^a
Tinctures, <i>n</i> = 97	10.1% (7.5–12.7)	57.8% (44.2–71.3)	12.6% (4.9–20.3) ^a	18.0% (6.8–29.3) ^a

All data except *n* are weighted

^aInterpret with caution due to coefficient of variation ≥ 16.6%

^bSuppressed due to high coefficient of variation > 33.3%

^cCategories do not include “Don’t know”, and may not add up to 100%

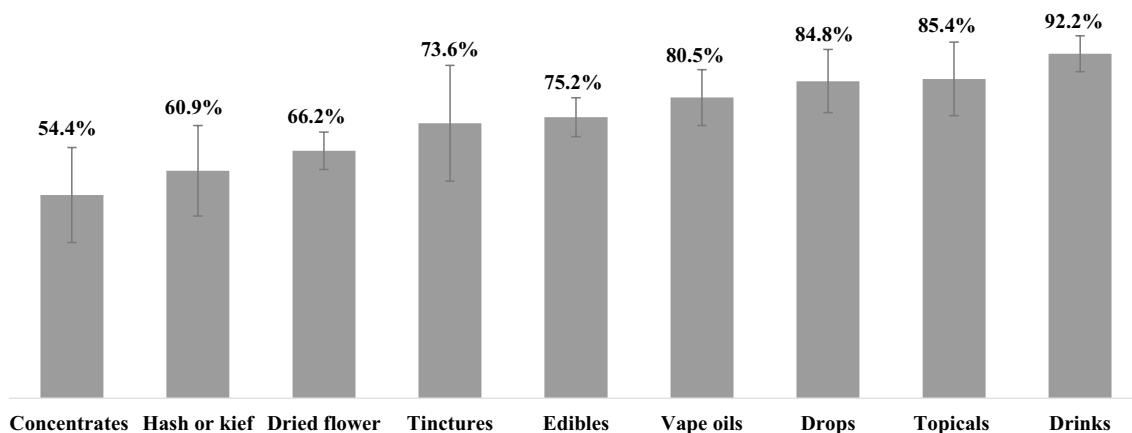


Fig. 2 Mean percent of reported cannabis used from legal sources in past 12 months, by cannabis product type in Canada’s territories. All data are weighted. Denominator is among respondents who consumed the respective cannabis products in the past 12 months and provided

a response to the sourcing question. Sample sizes for each product type were as follows: concentrates, *n* = 96; hash or kief, *n* = 118; dried flower, *n* = 588; tinctures, *n* = 66; edibles (food), *n* = 590; vape oils, *n* = 237; drops, *n* = 214; topicals, *n* = 133; drinks, *n* = 199

Table 4 Perceptions of cannabis from legal vs illegal sources in Canada's territories

	Past 12-month consumers % (95% CI)
Quality of legal cannabis	<i>n</i> = 1053
Higher quality	18.4% (15.0–21.8)
No difference	18.0% (14.5–21.6)
Lower quality	25.0% (21.1–29.0)
Don't know	38.6% (34.4–42.8)
Price of legal cannabis	<i>n</i> = 1053
More expensive	49.2% (44.8–53.6)
No difference	9.2% (6.3–12.1)
Less expensive	8.7% (6.0–11.3)
Don't know	33.0% (29.1–36.9)
Convenience of buying legal cannabis	<i>n</i> = 1059
More convenient	46.3% (41.9–50.6)
No difference	21.2% (17.4–25.1)
Less convenient	11.6% (8.4–14.7)
Don't know	20.9% (17.4–24.5)
Safety of using legal cannabis	<i>n</i> = 1058
Safer to use	48.6% (44.2–53.0)
No difference	29.4% (25.2–33.7)
Less safe to use	^b
Don't know	21.1% (17.6–24.6)
Safety of buying legal cannabis	<i>n</i> = 1059
Safer to buy	49.5% (45.1–53.8)
No difference	30.7% (26.5–35.0)
Less safe to buy	1.2% (0.4–1.9) ^a
Don't know	18.6% (15.3–22)

Weighted %, unweighted *n*. Sample sizes do not equate total sample size due to missing data in variables: quality of legal products (*n* = 2447); price of legal products (*n* = 2447); convenience of buying legal products (*n* = 2453); safety of using legal products (*n* = 2451); and safety of buying legal products (*n* = 2454)

^aInterpret with caution due to coefficient of variation $\geq 16.6\%$

^bSuppressed due to high coefficient of variation $> 33.3\%$

reported in the CCS (Health Canada, 2022a). Differences in daily/almost daily use found in the current study compared to the 2022 CCS territorial sample may be due to a larger, more representative sampling frame in the current study, and having provided remuneration. A higher prevalence in the territories is also consistent over time, with past 12-month cannabis use of 21% in the 2004 NWT (NWT Bureau of Statistics, 2004) and 2005 Yukon Addiction Survey (Government of Yukon, 2005), over 10% higher than past 12-month use in national estimates from the 2005 Canadian Tobacco Use Monitoring Survey (Rotermann, 2019). In the territories, daily/almost daily use appeared similar by sex, and higher among younger adults. High use prevalence, particularly daily/almost daily use, suggests the need for continued investment in understanding

trends in cannabis use in the territories, particularly among younger adults.

Dried flower (73%) was the most prevalent cannabis product type used in the past 12 months in the territories, followed by solid edibles, vape oils, and hash or kief. The relative popularity of these products is consistent with the ICPS results for the rest of Canada, with 73% having used dried flower in the past 12 months (Hammond et al., 2022), although a higher percentage of past 12-month consumers in the territories self-reported using hash or kief compared to the Canadian average in the CCS by 10% (Health Canada, 2022a). Annual surveys conducted in Canadian provinces suggest a continuing transition from dried flower to other processed forms of cannabis, including edibles and vaping liquids (Hammond et al., 2022); the current study suggests a similar transition is occurring in the territories.

Overall, participants self-reported sourcing most (75%) of their cannabis products from legal sources, similar to the 10 provinces in the 2022 ICPS (82%) (Hammond et al., 2023). These findings demonstrate accessibility of legal retail, despite the remoteness of the territories. Though proximity to legal retail is low in most areas of the territories, the majority of the population live in the capital cities (Statistics Canada, 2023c), proximate to legal retail locations. Legal online cannabis delivery is also widely available across the territories (Health Canada, 2022c), though may include high delivery fees. The percentage of cannabis products used in the past 12 months reported to be from legal sources varied by product type, ranging from approximately half of solid concentrates to 92% of cannabis drinks. These percentages of legally sourced cannabis products mirror patterns reported by consumers in Canadian provinces (Wadsworth et al., 2023). A higher percentage of cannabis drinks being sourced legally could be explained by drinks being a 'newer' product that requires considerable manufacturing capacity. The lower percentages of legal sourcing reported for concentrates (54%), hash or kief (61%), and dried flower (66%) suggest continued competition between the legal and illegal market for these products. This may be due to some consumers having contacts with dealers for these products, and lower access to legal physical retail stores in the territories, particularly outside capital cities. Access to legal online retailers may also be limited due to financial barriers, such as the high delivery fees. Additionally, it may be owing to the relatively lower prices of cannabis from illegal sources. Although Canadian evidence shows the average price of legal dried flower has decreased since legalization including relative to the price of illegal dried flower, it remains more expensive in many cases (Hammond et al., 2023).

Finally, 4 years since legalization in Canada, cannabis consumers in the territories reported having generally favourable perceptions of legal compared to illegal cannabis

products regarding quality, convenience, and safety, but to a lesser extent for price. These results are consistent with data from Canadian provinces (Hammond et al., 2023). Favourable results are notable, particularly perceptions of convenience, despite there being relatively few legal storefronts.

This study represents the only comprehensive cannabis survey in the territories with adequate territory-wide samples to examine outcomes across key socio-demographic groups. This study partnered and was supported by government and Indigenous organizational and community partners in the territories, enabling high participation, and knowledge translation of local evidence to relevant regions.

Limitations of the study

Some limitations must be noted. This study used an online survey format which may have excluded people without access to broadband or with slower internet access speeds, particularly in smaller communities and Nunavut (Canadian Radio-television and Telecommunications Commission, 2020). However, online data collections offer several advantages, allowing for the use of skip logic to capture differential patterns of cannabis use, use of images to better assess cannabis consumption and purchasing (Goodman et al., 2019; Groves, 2009), and reduce social desirability bias, including greater anonymity compared to interviewer-assisted in-person or telephone surveys for sensitive topics such as substance use (Krumpal, 2013). Despite lower social desirability bias in online surveys, these biases may still influence survey responses. Nunavut's sample is small in this study, and so results are less representative for the population in Nunavut. Respondents to this survey were more educated than the population overall in the territories, and Indigenous populations, though nearly a fifth of the sample, were under-represented (Statistics Canada, 2023c). Populations outside capital cities, particularly in Yukon, were also low. While weighting the sample by education may account for this, some populations are possibly not well represented.

Conclusion

This study indicates a high prevalence of cannabis use, particularly for daily/almost daily use, in Canada's northern territories 4 years after legalization of non-medical cannabis. To our knowledge, the prevalence rates recorded in this study are among the highest recorded of any jurisdiction in the world, with almost half self-reporting cannabis use in the past 12 months and one in five self-reporting daily/almost daily use. Uniquely high prevalence and cannabis use frequency suggest the necessity of regular surveillance of cannabis use. Ongoing monitoring of prevalence and patterns of cannabis use is important to determine potentially

distinct impacts of cannabis legalization in remote, northern communities and inform the development of targeted harm reduction and prevention initiatives by providing accurate data across different population subgroups and social strata.

Contributions to knowledge

What does this study add to existing knowledge?

- This study is the first comprehensive survey of cannabis use in the Canadian territories since non-medical cannabis legalization in 2018, filling a substantial gap in routinely collected data on cannabis use in Canada's northern remote regions.
- This study finds that daily/almost daily cannabis use is highly prevalent in the territories, estimated to be greater than in the 10 provinces.
- Findings show high penetration and favourable perceptions of legal cannabis in the territories, despite the remoteness of the region, as well as expansions to use of more varied product types (e.g., edibles, vaped oils, drinks).

What are the key implications for public health interventions, practice, or policy?

- Given the high prevalence of daily/almost daily cannabis use, this study indicates the need for continued and routine monitoring of cannabis use in the Canadian territories.
- Evidence from this study can inform targeted harm reduction and prevention initiatives in the territories by providing accurate data across different population subgroups and social strata.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.17269/s41997-024-00891-9>.

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Author contributions Hobin: conceptualization, methodology, writing — original draft, writing — review and editing, supervision, funding acquisition.

Schwartz: formal analysis, writing — original draft, writing — review and editing.

Poon: writing — original draft, writing — review and editing, project administration.

Hammond: conceptualization, methodology, writing — review and editing, supervision, funding acquisition.

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Availability of data and material Not applicable.

Code availability Not applicable.

Declarations

Ethics approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee (University of Waterloo Research Ethics Committee ORE #42817) and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Consent to participate Informed consent was obtained from all individual participants included in the study.

Consent for publication Not applicable.

Conflict of interest Hammond has served as a paid Expert Witness on behalf of public health authorities in response to industry legal challenges to cannabis, tobacco, and vaping regulations in Canada. All other authors have no conflicts to declare.

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