

Health Reports

Prevalence and correlates of non-medical only compared to self-defined medical and non-medical cannabis use, Canada, 2015

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Release date: July 18, 2018



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Prevalence and correlates of non-medical only compared to self-defined medical and non-medical cannabis use, Canada, 2015

by Michelle Rotermann and Marie-Michèle Pagé

Abstract

Background: The Canadian federal government has committed to legalizing non-medical cannabis use by adults in 2018. Medical use was legalized in 2001; however, not all people reporting medical use have medical authorization. To prepare for monitoring the effects of the policy change, a greater understanding of the prevalence of cannabis use and the characteristics of all cannabis users is needed.

Data and methods: Data from the 2015 Canadian Tobacco, Alcohol and Drugs Survey (CTADS) were used to estimate prevalence and examine reasons for medical use and factors associated with people who reported using cannabis Non-Medically Only (NMO), compared with people who reported Self-Defined Medical and Non-Medical use (SDMNM), including use of other drugs and the non-therapeutic use of psychoactive pharmaceuticals.

Results: In 2015, 9.5% of Canadians aged 15 and older reported NMO cannabis use, while another 2.8% reported SDMNM use. Half of Canadians reporting some self-defined medical use cited pain as the primary reason. Daily and near-daily use was significantly more common among SDMNM users (47.2%) than among individuals considered NMO users (26.4%). Past-year cannabis users of any type were more likely to be male and younger, to have used other illicit drugs and at least one of three classes of psychoactive pharmaceutical drugs non-therapeutically, and to be daily smokers or heavy drinkers. SDMNM cannabis use was more common among people reporting worse health (general and mental), use of psychoactive pharmaceuticals, and living in lower-income households.

Interpretation: Because non-medical cannabis use is common to both user groups analyzed, many similarities were anticipated. Nevertheless, SDMNM users also had several unique characteristics consistent with use to address medical problems. However, because the CTADS does not collect information about whether the individual has received a health care practitioner's authorization to use cannabis for a medical purpose this analysis should not be interpreted as an evaluation of people who access cannabis through Health Canada's medical access program, the Access Cannabis for Medical Purposes Regulations (ACMPR).

Keywords: controlled drugs, illegal drug, marijuana, substance use.

The Canadian federal government has committed to legalizing, regulating and restricting the non-medical use of cannabis by adults in 2018. To prepare for this change, Statistics Canada has been adapting the national statistical system to measure the social and economic impacts of legalized cannabis, in addition to undertaking various analytical projects.¹ Since 2001 medical access to cannabis has been available in Canada.²⁻⁵ High-quality scientific evidence on cannabis use continues to expand, demonstrating the benefits of cannabis for a variety of medical purposes, including as a treatment for chronic pain in adults,⁶⁻⁸ as well as other research demonstrating its physical and mental harms, such as risks of dependency and the induction or worsening of severe psychiatric illnesses (schizophrenia), particularly among frequent users, long-term users, and youth.^{6, 9-14}

Considerably less is known about the prevalence of cannabis use among people reporting medical use (either exclusively or combined with non-medical use) and these individuals' characteristics as well as how the characteristics and use patterns of medical users compare with those of non-medical users. There is also little known about how legalizing non-medical use will affect reported use for medical or therapeutic purposes. Much of the existing research on medical cannabis users is American,¹⁵⁻²⁵ British,²⁶ or based on data from one Canadian province—Ontario.²⁷⁻³⁰ The data collected tend to come from population-based surveys,^{15,17,20,22,27-29} clinical trials,¹⁸ consumer

panels,²⁵ as well as convenience (self-selected) samples of patients of medical clinics and dispensaries.^{16,19,21,23-24,26-27,30} As a result, these findings may not entirely reflect the current experience of cannabis users in Canada.

This analysis examines the prevalence of, and the factors associated with people who reported using cannabis exclusively non-medically, and compares these results with those for people who reported some medical use in combination with non-medical use. This includes the use of other illicit drugs and the non-therapeutic use of at least one of three classes of psychoactive pharmaceuticals, in addition to the frequency of cannabis use (any purpose) in the past three months, as well as cannabis-related interference/harms, by the household population aged 15 and older in 2015.

Methods

Data

The data are from the cross-sectional 2015 Canadian Tobacco, Alcohol and Drugs Survey (CTADS), which provides estimates on tobacco, alcohol and drug use as well as related issues.³¹ The survey was conducted by Statistics Canada and sponsored by Health Canada.

The target population of the CTADS was the household population aged 15 and older in each province. Data were collected from February 2015 to December 2015. The CTADS excluded

What is already known on this subject?

- Cannabis remains the most widely used illicit drug in Canada.
- Cannabis use has been associated with adverse effects, including dependency.

What does this study add?

- This study uses the most recent national data available to examine the similarities among, and the differences between, Canadians who reported exclusively non-medical use of cannabis (NMO) compared with Canadians who reported at least some self-defined medical use in addition to non-medical use (SDMNM).
- Past-year cannabis users of any type were more likely to be male and younger, to have used other illicit drugs and at least one of three classes of psychoactive pharmaceutical drugs non-therapeutically, and to be daily smokers or heavy drinkers.
- SDMNM cannabis use was more common among people reporting worse general and mental health, as was use of psychoactive pharmaceuticals, and living in lower-income households.
- Daily and near-daily use was considerably more common among SDMNM cannabis users than among NMO users.

residents of the territories and full-time residents of institutions. The response rate of 48.3% yielded a sample of 15,154 individuals, representing nearly 30 million Canadians.³² In 2015, the survey became more inclusive by using cell-phone numbers and thereby allowing residents of cellphone-only households to participate. This is significant because more than 1 in 5 households rely exclusively on cellular service. This proportion

increases to over 60% when all household members are under age 35.³³

Study sample

The main study sample consisted of 14,978 respondents aged 15 and older at the time of the 2015 CTADS who were living in the provinces and provided valid responses. Of these respondents, 1,622 reported exclusive non-medical cannabis use in the past year, 454 reported medical as well as non-medical use, and the remaining 12,902 reported no cannabis use (Appendix Chart A). A secondary sample was also created, in which exclusive non-medical cannabis users were further broken down into repeat users only (i.e., the 99 one-time users were excluded).

Definitions

Past-year *non-medical only (NMO)* cannabis use was based on responses to the following two questions: “During the past 12 months have you used marijuana?” and “In the past 12 months, have you used or tried marijuana (hashish, hash oil or other cannabis derivatives) for medical purposes?” NMO (past-year) cannabis users were further divided into repeat users (i.e., excluding one-time users) primarily to facilitate comparisons with SDMNM group who were also required to have reported using cannabis more than one time.

Past-year *self-defined medical and non-medical (SDMNM)* cannabis use was based on responses to the following three questions: “During the past 12 months have you used marijuana?”; “Have you used marijuana just once or more than once?”; and “In the past 12 months, have you used or tried marijuana (hashish, hash oil or other cannabis derivatives) for medical purposes?” SDMNM cannabis users were required to indicate that they had used cannabis during the past 12 months and that it was used at least once during the period for a medical purpose. Only individuals who reported having used cannabis more than once were asked the questions on medical use. As a result of a flow and edit problem with the questionnaire, 10 respondents

indicated that they had not used cannabis in the past 12 months, but that they had used cannabis for medical purposes. These respondents were not included in the study sample because this response pattern exempted them from being asked other cannabis-related questions about frequency of use, harms, etc.

Population centres are continuously built-up areas with 1,000 or more inhabitants and a population density of 400 or more people per square kilometre, based on current census population counts. Rural areas have fewer inhabitants and lower population density.

The CTADS did not collect data on household income. Instead, respondents were assigned income quintiles according to their postal code and neighborhood income data from the 2006 Census (i.e., the most recent dissemination-area census income data available).³⁴ The use of area-based income measures is accepted as a valid substitute in health research, especially when data are not collected through direct measures.³⁵⁻³⁶ *Household income quintiles* were collapsed into lowest 20% income households versus not lowest (i.e., the remaining 80%).

The *self-perceived health* of respondents was classified as good, very good or excellent versus fair or poor. Self-perceived health was chosen as a covariate on account of its reliability and validity, and because it is strongly correlated with various aspects of health status, including functional ability, chronic diseases, and psychological well-being.³⁷ *Self-perceived mental health* was also included, following the same approach.

Current daily smokers were compared with all others (occasional smokers, former smokers, and individuals who had never smoked). *Heavy drinking* (alcohol) refers to having consumed four or more (females) or five or more (males) drinks, per occasion, at least once per month during the previous year.

Reasons for using cannabis for medical purposes were based on the following question: “For what main condition did you use marijuana?” Nine response categories were provided, including “Other/Specify.” To permit analysis by age

group and sex, the responses were collapsed into four categories (including three leading categories and an “Other” option): (1) Pain—acute and chronic; (2) Anxiety, nerves or depression, including stress; (3) Insomnia; and (4) “Other”, including nausea/vomiting, lack of appetite/weight loss, multiple sclerosis/spinal cord injury, epilepsy, etc. The 77 “Other” responses provided were manually reviewed and recoded (where possible). If more than one reason was provided by the “Other” respondents, the response was recoded according to the first reason listed.

In assessing cannabis-related problems, the CTADS included several items from the World Health Organization (WHO) ASSIST screener.³⁸ Respondents who reported having used cannabis (any purpose) before the survey and who had used it more than once in their lives were asked 10 additional questions: 5 referenced lifetime use and 5 referenced the 3-month period preceding the interview. Each set of five addressed the following: (1) how often the individual had experienced a strong desire or urge to use cannabis; (2) how often the individual’s use of cannabis had led to health, social, legal or financial problems; (3) whether using cannabis had caused the individual to fail to do what was normally expected of him/her; (4) whether a friend, relative or anyone else had ever expressed concern about the individual’s use of cannabis; and (5) whether the individual had ever tried, but failed, to control, cut down or stop using cannabis. For this analysis, the questions pertaining to the recent three-month period preceding the interview were selected in order to ensure consistency with the cannabis use frequency questions.

Analytical techniques

The prevalence of past-year NMO (including and excluding one-time users) and SDMNM cannabis use, as well as the prevalence of no past-year use, were examined by sex, age, province (age-standardized to the average provincial household population in 2015 using five age groups), residence (rural area

versus population centre), household income (dichotomized: lowest 20% quintile versus not lowest), self-perceived general and mental health (fair/poor versus good, very good, excellent), daily smoking status, heavy drinking, and use of other drugs in the past 12 months, including: cocaine/heroin, speed/methamphetamine, ecstasy, hallucinogens (including salvia) and inhalants/solvents, and three classes of psychoactive pharmaceuticals: (1) sedatives or tranquilizers (e.g., Xanax or Ativan); (2) stimulants (e.g., Ritalin or Adderall); and (3) opioid pain relievers (e.g., fentanyl, codeine, oxycodone or other opioid products). Additional questions were asked to people who reported using any of the 3 psychoactive pharmaceutical classes during the past 12 months to assess whether the drug use was for non-therapeutic purposes, including questions about adherence to prescribed dosage or frequency and reasons for using other than why the drug was prescribed, e.g., to get high, improve mood, or to stay awake to study/work. A copy of the questionnaire is available online.³¹ The selection of covariates was guided by the literature and data availability.

The cannabis use (any purpose) frequency in the past three months was compared by type of cannabis user as well as by age and sex. It was also examined whether NMO and SDMNM users had experienced any of the five cannabis-related harms during the same three months. Past-year frequency was not asked.

Analyses were performed using SAS-callable SUDAAN v.11.0.1. Survey sampling weights were applied so that the analyses would be representative of the Canadian population. Variance estimation (95% confidence intervals) and significance testing by t-test statistic were done using bootstrap replicate weights to account for the survey’s complex sampling design. All differences between the covariate categories and the comparison groups presented are statistically significant at the $p < 0.05$ unless stated otherwise.

Results

Past-year cannabis users, regardless of reason for use, are more likely to be young, male, daily cigarette smokers, and heavy drinkers

According to the 2015 Canadian Tobacco, Alcohol and Drugs Survey (CTADS), 9.5% of Canadians aged 15 and older (2.8 million) used cannabis in the previous year for non-medical purposes exclusively, while another 2.8% of Canadians (830,900) reported some cannabis use for self-defined medical purposes in addition to non-medical use (Table 1). To ensure clarity in the comparisons and to facilitate readability, Non-medical only (NMO) refers to people who use cannabis for non-medical purposes exclusively, while Self-defined medical / non-medical (SDMNM) refers to people who reported at least some cannabis use for medical purposes (self-defined) in addition to non-medical use.

Over 1 in 5 Canadians aged 15 to 24, or 22.1%, are considered past-year NMO cannabis users, with another 3.4% considered SDMNM users according to their use over the previous year (Table 1). This generally exceeded the past-year prevalence of cannabis use reported by people in the older age groups: 13.7% of NMO users aged 25 to 44, 3.1% of NMO users aged 45 and older, and 1.9% of SDMNM also aged 45 and older. In both user groups, males were more likely than females to report past-year use.

In 2015, 11.8% of British Columbians reported NMO cannabis use in the previous year, and 5.4% of British Columbians reported SDMNM use over the same period. Both of these percentages are statistically significantly above the corresponding NMO and SDMNM prevalence for the rest of Canada (other provinces combined). At 5.5% to 7.0%, residents of Prince Edward Island and the three Prairie provinces had lower-than-average NMO use, while only Quebec had levels of SDMNM use significantly lower than those observed in the rest of Canada. People living in rural areas were

Table 1**Distribution of socio-demographics, health status and health behaviours, by cannabis user type, household population aged 15 and older, Canada excluding territories, 2015**

	Non-user				Non-medical only (NMO)				Self-defined medical / non-medical (SDMNM)			
	'000	%	95% confidence interval		'000	%	95% confidence interval		'000	%	95% confidence interval	
			from	to			from	to			from	to
Total	25,734.1	87.7	86.7	88.7	2,776.8	9.5	8.6	10.4	830.9	2.8	2.4	3.4
Sex												
Male	12,283.7	85.1*	83.5	86.5	1,572.1	10.9*	9.6	12.3	587.0	4.1*	3.3	5.0
Female†	13,450.4	90.3	89.0	91.4	1,204.8	8.1	7.1	9.2	243.9	1.6	1.2	2.2
Age group (years)												
15 to 24†	3,324.7	74.5	72.1	76.7	987.1	22.1	20.0	24.4	152.8	3.4	2.6	4.5
25 to 44	7,872.7	82.3*	79.8	84.5	1,313.4	13.7*	11.7	16.1	381.1	4.0	3.0	5.3
45 and older	14,536.8	94.9*	94.0	95.8	476.3	3.1*	2.5	3.9	297.0	1.9*	1.4	2.6
Province (age-standardized)‡												
Newfoundland and Labrador	394.6	89.7	87.5	91.5	33.6	8.5	6.8	10.5	8.2	1.9 ^E	1.2	2.9
Prince Edward Island	110.3	91.8*	90.0	93.3	6.2	5.5*	4.4	6.8	3.0	2.7 ^E	1.7	4.4
Nova Scotia	679.0	85.0*	82.3	87.3	79.0	10.9	8.9	13.1	31.1	4.1 ^E	2.9	5.8
New Brunswick	572.0	90.5*	88.2	92.4	42.9	7.4	5.6	9.7	12.1	2.1 ^E	1.3	3.4
Quebec	6,168.9	89.9*	88.0	91.6	569.8	8.7	7.2	10.5	91.4	1.4 ^{E*}	0.8	2.4
Ontario	9,863.4	87.7	85.4	89.6	1,090.2	9.7	8.0	11.7	301.8	2.7 ^E	1.8	3.8
Manitoba	914.8	89.2	87.1	91.1	75.1	7.0*	5.6	8.6	40.0	3.8 ^E	2.6	5.4
Saskatchewan	807.5	90.5*	88.7	92.1	64.8	6.9*	5.6	8.5	24.0	2.6 ^E	1.8	3.7
Alberta	2,982.1	90.0*	88.2	91.6	249.2	6.9*	5.6	8.4	110.6	3.1	2.3	4.2
British Columbia	3,241.5	82.7*	80.4	84.8	451.9	11.8*	9.9	14.1	208.5	5.4*	4.1	7.2
Residence												
Population centre†	20,399.5	87.4	86.2	88.5	2,311.5	9.9	8.9	11.0	626.0	2.7	2.2	3.3
Rural	5,334.6	88.8	86.6	90.7	465.3	7.7*	6.2	9.7	204.9	3.4	2.5	4.7
Household income quintile												
Lowest 20%†	3,865.1	86.468	83.8	88.8	408.2	9.1	7.3	11.4	196.8	4.4 ^{E*}	3.1	6.3
Not lowest 20%	21,869.0	87.927	86.8	89.0	2,368.7	9.5	8.6	10.5	634.2	2.5	2.1	3.1
Self-perceived health												
Fair/poor	2,116.4	90.7*	87.8	93.0	84.6	3.6 ^{E*}	2.5	5.3	132.7	5.7 ^{E*}	3.9	8.2
Good/very good/excellent†	23,575.8	87.4	86.3	88.5	2,692.1	10.0	9.1	11.0	695.9	2.6	2.1	3.1
Self-perceived mental health												
Fair/poor	1,098.4	78.6*	71.6	84.2	195.0	13.9 ^E	9.3	20.5	104.6	7.5 ^{E*}	4.8	11.4
Good/very good/excellent†	24,573.8	88.2	87.2	89.2	2,581.7	9.3	8.4	10.2	696.7	2.5	2.1	3.0
Daily smoker												
Yes	1,896.4	69.6*	64.6	74.1	555.1	20.4*	16.6	24.8	274.2	10.1*	7.5	13.4
No†	23,837.7	89.6	88.5	90.5	2,221.7	8.3	7.5	9.3	556.7	2.1	1.7	2.6
Heavy drinking												
Yes	4,644.2	70.6*	67.4	73.6	1,562.0	23.7*	21.1	26.7	371.5	5.6*	4.2	7.5
No†	20,965.6	92.7	91.7	93.6	1,208.0	5.3	4.6	6.2	446.6	2.0	1.6	2.5
Used other illicit drugs												
Yes	75.0	11.0 ^E	7.0	16.7	462.3	67.5*	57.9	75.8	147.6	21.5 ^{E*}	14.4	30.9
No†	25,555.2	89.6	88.6	90.5	2,309.5	8.1	7.3	9.0	669.2	2.3	1.9	2.8
Used at least one class of psychoactive pharmaceuticals												
Yes	5,156.3	83.3*	80.9	85.5	652.0	10.5	8.9	12.5	381.0	6.2*	4.8	7.8
No†	20,156.4	89.1	87.9	90.2	2,051.2	9.1	8.1	10.2	422.6	1.9	1.4	2.4
Used at least one class of psychoactive pharmaceuticals non-therapeutically												
Yes	251.9	57.4	45.2	68.7	129.5	29.5 ^{E*}	19.8	41.4	57.8	13.2 ^{E*}	7.0	23.3
No†	25,394.9	88.2	87.2	89.2	2,620.0	9.1	8.3	10.0	762.5	2.6	2.2	3.2

^E use with caution

* significantly different from the reference category (p<0.05)

† reference category

‡ reference category is the rest of Canada (e.g., Ontario compared with nine other provinces combined)

Note: Non-medical only category includes one-time users.**Source:** 2015 Canadian Tobacco Alcohol and Drugs Survey.

less likely than residents of population centres to report past-year NMO cannabis use, while rates for SDMNM use did not differ by residence rurality. Conversely, the prevalence of past-year cannabis use among NMO users was comparable by income level. Among SDMNM users, however, people living in the lowest 20% income households were more likely to report past-year cannabis use than those with higher incomes.

The prevalence of cannabis use also differed by self-reported health status and behaviours within cannabis user types. For example, SDMNM use was higher among people with fair-poor physical or mental health, daily cigarette smokers and/or heavy drinkers compared to their SDMNM counterparts reporting better health (general or mental), not (daily) smoking and/or less frequent alcohol consumption. More than 20% of daily cigarette smokers and heavy drinkers reported also using cannabis NMO in the previous year. This is 2.5 times the level observed among non-daily smokers and more than 4 times the level observed among NMO people who reported less frequent alcohol consumption. Among NMO users, no statistically significant difference in the prevalence of cannabis use according to mental health status was found. Conversely, NMO users who rated their general health as good, very good or excellent were more likely (10%) to report using cannabis in the previous year than those who assessed it as worse (3.6%). The analysis was repeated excluding one-time NMO users, and the results remain virtually unchanged (data not shown).

Daily and near-daily cannabis use is common among self-defined medical / non-medical (SDMNM) cannabis users

The frequency of cannabis use has been shown to be related to the risk of addiction⁹⁻¹⁰, worse mental health^{10,39}, and reduced educational achievement and longer-term personal disadvantage.^{13,40} With the majority of past-year NMO and SDMNM users (71.9% and 93.4%, respectively) reporting using in the

3-month period preceding their interview and with no differences in the percentages reporting by age or sex, cannabis use frequency in the past 3-months was examined by cannabis-user type established using the 12-month definitions (data not shown).

Daily or near daily use in the previous 3 months was reported by 26.4% of NMO users, another 22.4% reported using weekly, 16.9% monthly, and the remaining 34.3% once or twice (Table 2). For SDMNM users, the breakdown was as follows: 47.2% reported using cannabis daily or near-daily, 35.5% reported using weekly, 11.7% reported using monthly, and 5.6% reported using once or twice. An additional analysis was done to confirm that the observed difference between the NMO and SDMNM user groups was not the result of a difference in the eligibility criteria: SDMNM users were required to have used cannabis more than one time to be asked about cannabis use for medical purposes, but a similar criterion was not required of NMO users. To rule out this possibility, a second NMO user group, with the one-time users excluded, was produced, and results were compared to those for SDMNM users: the results remained nearly identical.

Daily or near-daily use by NMO users was also more common among males (31.1%) and people aged 25 to 44 (32.4%) than among females (19.3%) and people aged 45 and older (16.1%). Likely as a result of the lower prevalence and smaller sample, many age and sex differences pertaining to the SDMNM users failed to reach statistical significance. The only exception was that more than half of SDMNM users aged 25 to 44 reported using cannabis daily-near daily compared to about one-third of SDMNM users aged 45 or older (55.3% versus 33.7%).

For the majority of users, cannabis use does not result in dependency, interference or other harms.⁹⁻¹⁰ To examine the ways in which cannabis negatively affects users, the CTADS asked several additional questions to the more experienced cannabis users (i.e., one-time

users were excluded). These included questions about (1) having a strong desire or urge to use cannabis, as well as other indicators of cannabis dependence and problematic use, such as (2) having experienced health, social, legal and financial problems, (3) an inability to meet expectations, (4) family and friends expressing concern, or (5) an inability to reduce consumption or stop using. All of the harm-related questions included pertain to the three months preceding the respondent's CTADS interview. The most common of the five: was having a strong desire or urge to use, which was reported by 14.1% of NMO users and by 22.8% of SDMNM users (Table 3). Most users who reported an urge or desire to use were daily or near-daily users (61.6% of NMO users and 69.4% of SDMNM users) (data not shown). Among NMO users, the 4 other indicators of dependence and/or possible problematic use ranged in prevalence from 1.9% to 4.1%. Estimates for SDMNM users were too small to publish.

Pain is the main medical reason for using cannabis

Over half (52.9%) of the past-year SDMNM cannabis users identified alleviating pain as the primary purpose for their medical use (Table 4). Other common reasons included treating anxiety, nerves and depression (18.6%) or insomnia (18.3%). Perhaps owing to sample sizes, no other statistically significant differences were found.

Use of other illicit drugs is common among cannabis users, regardless of user type

Close to one in six NMO and SDMNM past-year cannabis users reported using other illicit drugs (e.g., ecstasy, hallucinogens, cocaine) in the previous year, a substantially higher proportion than that observed for individuals who did not report cannabis use (less than 0.5%) (Table 5). Nearly half of all SDMNM cannabis users reported using at least one psychoactive medication (with sedatives and opioid pain relievers accounting for the majority). This is 2-to 2.3 times the

Table 2

Frequency of past-3-months cannabis use (any purpose) among non-medical only (NMO) and self-defined medical / non-medical (SDMNM) users, by sex and age group, household population aged 15 and older, Canada excluding territories, 2015

	Once or twice			Monthly			Weekly			Daily or near-daily		
	95% confidence interval			95% confidence interval			95% confidence interval			95% confidence interval		
	%	from	to	%	from	to	%	from	to	%	from	to
Non-medical only (NMO) users (one-time users included)												
Total	34.3*	28.4	40.6	16.9	13.1	21.7	22.4*	17.9	27.7	26.4 *	20.7	32.9
Sex												
Male	26.2*	20.0	33.5	17.0 ^F	11.9	23.6	25.7	19.5	33.2	31.1 *	23.4	40.1
Female	46.2* [†]	36.4	56.3	16.9 ^F	11.5	24.1	17.6 ^F	11.8	25.3	19.3 ^{E*†}	12.6	28.4
Age group (years)												
15 to 24	29.5*	24.2	35.4	21.4	16.3	27.5	25.4	19.6	32.2	23.7 *	18.3	30.0
25 to 44	34.5	24.4	46.2	13.7 ^F	8.0	22.6	19.4 ^F	12.3	29.1	32.4 ^{E*}	22.3	44.5
45 and older	43.4*	30.6	57.3	16.2 ^F	9.3	26.7	24.3 ^F	15.8	35.6	16.1 ^{E*†}	9.1	26.8
Non-medical only (NMO) users (one-time users excluded)												
Total	33.2*	27.3	39.7	17.2	13.3	22.0	22.8*	18.2	28.1	26.8 *	21.1	33.4
Sex												
Male	25.6*	19.4	33.0	17.1 ^F	12.0	23.8	25.9	19.6	33.4	31.3 *	23.6	40.3
Female	44.6* [†]	34.6	55.1	17.4 ^F	11.9	24.8	18.1 ^F	12.1	26.1	19.9 ^{E*}	13.0	29.3
Age group (years)												
15 to 24	27.7*	22.6	33.5	22.0	16.8	28.2	26.1	20.1	33.0	24.3 *	18.9	30.7
25 to 44	33.6 ^E	23.5	45.5	13.9 ^F	8.1	22.9	19.6 ^F	12.5	29.5	32.8 ^{E*}	22.5	45.1
45 and older	43.3* [§]	30.4	57.2	16.2 ^F	9.3	26.8	24.4 ^F	15.8	35.7	16.1 ^{E*†}	9.1	26.8
Self-defined medical / non-medical (SDMNM) users												
Total	5.6 ^E	3.8	8.4	11.7 ^F	6.7	19.6	35.5	26.2	46.1	47.2	37.6	56.9
Sex												
Male	4.7 ^F	2.7	8.1	F	...	...	36.7 ^F	25.2	50.0	51.3	38.8	63.6
Female	8.0 ^F	4.4	14.0	F	...	...	32.6 ^F	19.2	49.6	37.3 ^E	24.1	52.6
Age group (years)												
15 to 24	5.6 ^F	2.9	10.5	F	...	...	29.8 ^F	17.5	45.8	53.4	39.2	67.1
25 to 44	F	...	...	F	...	...	31.1 ^F	18.4	47.6	55.3	40.0	69.8
45 and older	6.6 ^F	3.5	12.1	F	...	...	43.9 ^F	28.4	60.6	33.7 ^{E†}	21.2	49.0

... not applicable

^E use with caution

F too unreliable to be published

* significantly different from the same age group and/or sex SDMNM cannabis using counterparts (p<0.05)

[†] significantly different from males (p<0.05)[‡] significantly different from individuals aged 25 to 44 (p<0.05)[§] significantly different from individuals aged 15 to 24 (p<0.05)

Source: 2015 Canadian Tobacco Alcohol and Drugs Survey.

Table 3

Percentage of cannabis-related interference or harms experienced in the past 3 months, by type of cannabis user, household population aged 15 or older, Canada excluding territories, 2015

Cannabis-related interference or harms:	Non-medical only (NMO) user ^{†§}			Self-defined medical / non-medical (SDMNM) user		
	95% confidence interval			95% confidence interval		
	%	from	to	%	from	to
Had a strong desire or urge to use cannabis	14.1	10.6	18.6	22.8 ^F	16.1	31.2
Experienced health, social, legal or financial problems because of cannabis use	3.4 ^E	2.0	5.7	F	...	...
Could not do what was normally expected of them because of their cannabis use	4.2 ^E	2.6	6.8	F	...	...
Received expressions of concern about their use of cannabis from friends, family or other	4.0 ^E	2.7	5.7	F	...	...
Tried to control, cut down or stop using cannabis but discovered that they were not able to do so	1.9 ^E	1.1	3.3	F	...	...

... not applicable

^E use with caution

F too unreliable to be published

[†] reference category[§] excludes one-time users as interference and harm questions not asked of one-time users

Source: 2015 Canadian Tobacco, Alcohol and Drugs Survey.

Table 4
Main reasons for using cannabis for a medical purpose, by age and sex, household population aged 15 or older, Canada excluding territories, 2015

	Pain			Anxiety, nerves or depression			Insomnia			Other		
	95% confidence interval			95% confidence interval			95% confidence interval			95% confidence interval		
	%	from	to	%	from	to	%	from	to	%	from	to
Total	52.5	43.6	61.2	18.8 ^E	13.0	26.5	18.3 ^E	11.7	27.6	10.3 ^F	6.7	15.5
Age group (years)												
15 to 24 [†]	53.9	39.2	68.0	22.1 ^E	13.0	35.0	10.3 ^F	5.3	19.0	F	...	...
25 to 44	45.4	31.9	59.6	24.4 ^E	14.2	38.8	22.2 ^E	11.7	37.9	F	...	...
45 and older	60.9	45.3	74.5	F	...	...	F	...	...	11.6 ^F	6.1	21.1
Male	49.3	38.4	60.2	19.8 ^E	12.4	29.9	20.8 ^E	12.0	33.5	10.2 ^F	5.8	17.3
Age group (years)												
15 to 24 [†]	53.3 ^E	35.1	70.7	22.4 ^E	11.5	39.1	F	...	...	F	...	...
25 to 44	46.8 ^E	30.7	63.6	F	...	...	F	...	...	F	...	...
45 and older	51.0 ^E	32.0	69.7	F	...	...	F	...	...	F	...	...
Female	60.3	46.5	72.7	F	...	...	12.5 ^F	6.7	22.1	10.6 ^F	5.7	18.9
Age group (years)												
15 to 24 [†]	55.1 ^E	31.1	76.9	...	...	...	F	...	...	F	...	...
25 to 44	40.7 ^E	20.2	65.0	F	...	...	F	...	...	F	...	...
45 and older	78.7	60.3	90.0	F	...	...	F	...	...	F	...	...

... not applicable
^E use with caution
^F too unreliable to be published
[†] reference category

Note: Limited to SDMNM cannabis users only.
Source: 2015 Canadian Tobacco Alcohol and Drugs Survey.

rate for NMO cannabis users and for who did not use cannabis. As well, NMO and SDMNM cannabis users were more likely than those who do not use cannabis to admit using these medications for reasons other than the prescribed therapeutic purposes, such as to get high or improve their mood. Daily smoking and heavy drinking were also considerably more common among cannabis users of any type than among those who did not use cannabis.

Discussion

For the first-time, it was possible to distinguish NMO cannabis users from SDMNM users in CTADS. Results for Canadians aged 15 and older in 2015 include 9.5% reporting using cannabis NMO and nearly 3% indicating at least some use for a self-defined medical purpose (i.e. SDMNM users). Individuals reporting some medical use are consistently found to be in the minority among cannabis users.^{15,17,22,28,41} Other Statistics Canada research also shows

that the majority of household spending on cannabis is for non-medical use.⁴²

Several of the sociodemographic differences, including a higher rate of past-year cannabis use among males, adolescents and younger adults, as well as residents of British Columbia, were observed in previous studies.^{41,43-44} The lower SDMNM use that was reported in Quebec might reflect the Quebec-specific Cannabis Registry requiring the prescribing physician to monitor the effects of the drug; this requirement might deter physicians from prescribing it.⁴⁵ Of course, SDMNM use as reported in a survey and enrolment in a medical cannabis access program are not the same and therefore, results based on self-reporting may not be expected to fully align with enrolment. Other studies that have compared self-reported numbers of medical cannabis users to self-reported numbers of medically authorized suggest that the majority of medical users may not have official medical approval.²⁹ This could also mean that many health care practitioners may be unaware that their

patients use cannabis in addition to other prescription medication—a potentially dangerous situation.

According to the 2015 CTADS, higher percentages of people who reported their mental and physical health as fair or poor also reported using cannabis at least some of the time for medical purposes in the previous year. The association between worse health and medical use of cannabis has been found repeatedly.^{17-19, 22, 24, 27, 29} However, the question as to whether cannabis use contributes to their worse health or people with poorer health and more disability use cannabis for symptom management remains unresolved.

This study also finds that cannabis users, regardless of user type, are considerably more likely to smoke cigarettes daily, drink heavily, or use other illicit drugs than those who do not use cannabis. The association between health behaviours known to negatively influence one's health and cannabis use is also well-established.^{17,27-28,43,46} Two theories may explain this. First, early exposure to cannabis and other drugs, including

Table 5**Past year prevalence of cigarette smoking, heavy drinking, other illicit drugs, and use of three classes of psychoactive pharmaceuticals, by cannabis-user type, household population aged 15 or older, Canada excluding territories, 2015**

	Non-user			Non-medical only (NMO) [‡]			Self-defined medical / non-medical (SDMNM)		
	95% confidence interval			95% confidence interval			95% confidence interval		
	%	from	to	%	from	to	%	from	to
Daily cigarette smoking	7.4	6.5	8.3	20.7*	16.6	25.4	33.0*†	25.1	41.9
Heavy drinking	18.1	16.9	19.5	57.1*	51.6	62.4	45.4*†	36.0	55.2
Other illicit drugs	0.3 [‡]	0.2	0.5	17.4*	13.7	21.7	18.1 [‡] *	12.1	26.1
Cocaine or heroin	0.2 [‡]	0.1	0.3	8.7*	6.5	11.6	9.2 [‡] *	5.2	15.7
Speed or methamphetamine	F	...	...	1.5 [‡]	0.8	2.9	F	...	...
Ecstasy	0.1 [‡]	0.0	0.2	6.5*	4.7	8.9	2.4 [‡] *†	1.3	4.3
Hallucinogens (including salvia)	0.1 [‡]	0.0	0.2	8.9*†	5.9	13.2	10.8*†	6.4	17.9
Inhalants or solvents	F	...	...	0.0	0.0	0.0	0.0	0.0	0.0
Psychoactive pharmaceuticals									
Used at least one type	20.4	19.0	21.8	24.1	20.2	28.5	47.4*†	38.5	56.5
Used at least one type for non-therapeutic purposes	1.0 [‡]	0.7	1.4	4.8*†	3.2	7.4	7.0*†	3.7	13.0
Sedatives or tranquilizers									
Any use	10.0	9.0	11.0	11.6	9.0	14.7	22.0 [‡] *†	15.3	30.5
Non-therapeutic use	0.4 [‡]	0.3	0.7	1.5*†	0.8	2.8	F	...	...
Stimulants									
Any use	0.7	0.5	0.9	4.1 [‡] *	2.9	5.9	6.0 [‡] *	3.2	11.2
Non-therapeutic use	F	...	...	1.2 [‡]	0.7	2.0	F	...	...
Opioid pain relievers[§]									
Any use	12.4	11.2	13.7	12.4	9.6	16.0	32.6*†	24.9	41.3
Non-therapeutic use	0.6 [‡]	0.3	1.0	3.3*†	1.8	5.8	F	...	...

... not applicable

[‡] use with caution

F too unreliable to be published

* significantly different from the non-user category (p<0.05)

† significantly different from the Non-Medical Only (NMO) users category (p<0.05)

[‡] one-time users excluded[§] Composite combining information from four questions about products containing codeine, oxycodone, fentanyl and other opioids

Source: 2015 Canadian Tobacco Alcohol and Drugs Survey.

alcohol and nicotine, has been predictive of use and misuse of other drugs and of dependence later in life. Second, the Correlated Vulnerabilities theory suggests that some people may have a general predisposition to use drugs or engage in other risky behaviours.^{9,11,47} Additionally, past-year SDMNM cannabis use was found to be more common among people living in lower- as compared to higher-income households. The correlation between lower socio-demographic status (variously defined, including using the type of health insurance, e.g. Medicaid, as a proxy for low income) and medical use has been found before.^{15,17,27,30} In the absence of longitudinal data, it is, however, unclear as to whether medical use of cannabis contributes to lower income.

Although individuals who reported using cannabis for therapeutic or medical purposes cite conditions that may not always be supported by scientific evidence⁶, generally, they remain in near-universal agreement on the types of leading conditions or co-morbidities. These conditions include pain, various mental disorders, and insomnia or difficulty sleeping.^{16,19,23-24,26,30}

Data from the 2015 CTADS, as with that of other research, indicates that significantly higher proportions of SDMNM users than NMO users consume cannabis for any purpose daily or near-daily.^{18,22} This consumption may be related to the use of cannabis as medication or as an effort to manage and alleviate symptoms. It might also be that more experienced users develop a tolerance, requiring more frequent use and larger doses.⁴⁷

Limitations

This study, of a nationally representative sample of Canadians from all provinces, has many strengths, including an in-depth analysis of the prevalence of cannabis use and factors associated with use by cannabis-user type. This is the first time this type of analysis could be conducted using the CTADS, since the first cycle and its precursor, the Canadian Tobacco Use Monitoring Survey (CTUMS), did not include questions about cannabis use for medical purposes. Nonetheless, results of this study should be interpreted in light of several limitations.

Ideally, a third user group of exclusive medical users would have been precisely identifiable. However, the survey questions did not permit such a differentiation. As such, differences between NMO and

SDMNM cannabis users may be less than if it had been possible to make this distinction. Information regarding the source of medical recommendation, whether advice from a health care practitioner was sought and/or obtained, or how much of the cannabis used was for the treatment of the medical condition versus for non-medical purposes was also unavailable.

The information is self-reported and has not been validated. Social desirability and fear of punishment, both of which are potential sources of bias, may be especially relevant to this analysis. Social desirability is a tendency for respondents to modify their answers in an effort to construct a favourable image of themselves.⁴⁸ Perceptions of what is “desirable” may also differ depending on a respondent’s age, sex and other socioeconomic characteristics. Some respondents may under-report their drug use, while others may exaggerate it. It is also possible that medical use could be over-reported, particularly if people perceive this type of cannabis use to be more acceptable or legitimate.³⁰

The primary purpose of the CTADS is monitoring of tobacco, alcohol and

select aspects of drug use.³² As such, the sample sizes are sometimes small thereby requiring more general variable definitions or combined categories and variables (e.g., past-year heroin and cocaine use was combined to prevent cell suppression). Small sample sizes for some analyses may also have reduced the ability to reach statistical significance. Moreover, not all relevant covariates were available, such as the intensity or duration of cannabis use, quantities consumed, the amount and level of active ingredients, intensity of pain, and whether cannabis was used as a substitute for other medication. In addition, an area-based census proxy of household income was substituted because data on individual household income were not collected.

The data are cross-sectional—and thus causality—cannot be established. Additionally, the CTADS excludes people not living in private households, such as the homeless and inmates. Therefore, estimates of cannabis use might be lower than if these populations had been included. The CTADS is not conducted in the territories.

Conclusion

This is the first national, comprehensive study of the characteristics and use patterns of cannabis users by type of use (NMO or SDMNM) in Canada. Changing policies related to legalization, regulation and restriction of non-medical cannabis and shifting social acceptance of cannabis use will continue to affect patterns of use and reported reasons for using. The results provide a detailed picture of not only the factors common to both cannabis user types studied, but also those more common to SDMNM cannabis users. These factors include worse general and mental health, lower income, and use of other psychoactive pharmaceuticals. A better understanding of all users can inform programs aimed at identifying people at risk of cannabis dependence and related problems, and assist in developing strategies to minimize the potential harms of cannabis, regardless of purpose of use. Additional information about medical use, including authorization, recommendation and/or participation in the Access Cannabis for Medical Purposes Regulations (ACMPR) program as well as frequency of cannabis use for medical purposes, would aid future study. ■

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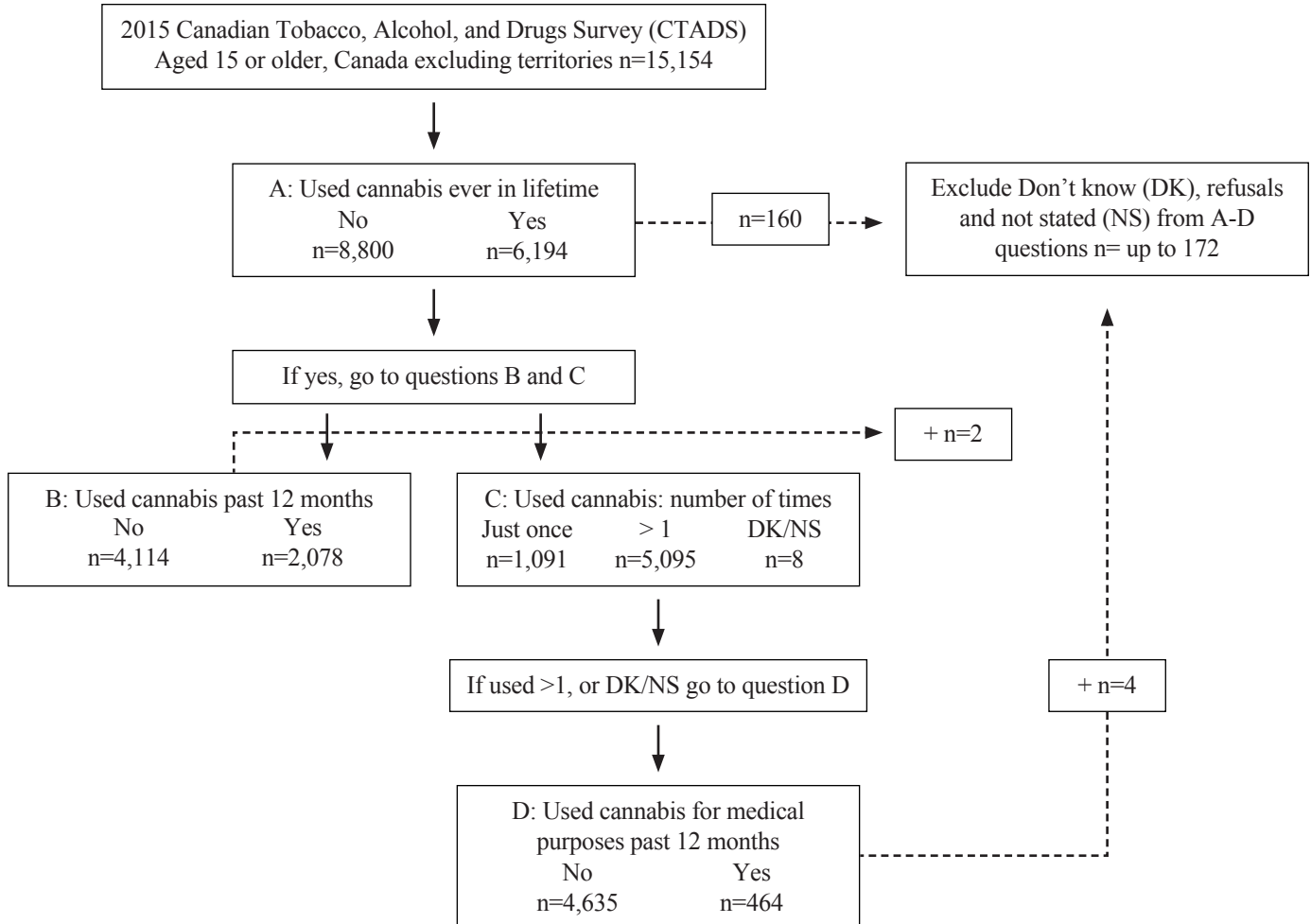
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Prevalence and correlates of non-medical only compared to self-defined medical and non-medical cannabis use, Canada, 2015 • Research Article

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Appendix

Chart A: Main study sample diagram and exclusion criteria



Main study sample n=14,978

(includes all non-medical users, including one-time only users)

Non-user past year	Non-medical only (NMO) user past year	Self-defined medical / non-medical user past year
n=12,902	n=1,622	n=454
question A=no or question B=no	question B=yes and question D=no	question B=yes and question D=yes*

Note: *10 respondents who indicated that they did not use cannabis in the past 12 months but that they used cannabis for a self-defined medical purpose were dropped from the study sample as this questionnaire flow pattern was in error and resulted in them not being asked most other cannabis-related questions, including frequency of use and harms, etc.

A secondary sample (n=14,879) was also created in which NMO cannabis users were further subdivided into repeat users (one-time users excluded n=99).