

**Factors associated with initiating Cannabis use
after legalization in Canada: a cross-sectional
study**

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Conflicts of Interest

- I have no conflicts of interest in relation to this presentation
- Michael G. DeGroote Centre for Medicinal Cannabis Research supported my postdoc fellowship

Introduction

- Cannabis is the most widely used illicit substance in the world
- Nearly half of Canadians report having used cannabis at some time in their lives
- Legalization of possession, sale and use of Non-medicinal Cannabis in Oct 2018, to:
 - Promote responsible use
 - Deter criminal activity
 - Protect public health and safety
 - Reduce access to cannabis among youth
- National Cannabis Survey (NCS) launched in 2018
 - Better understanding the frequency of cannabis usage in Canada
 - Monitoring changes in behaviour as a result of the legalization of cannabis for non-medical use
 - In 2019, the NCS found that more than 5.1 million Canadians (16.9% of the population) reported use of cannabis,
 - An increase from 4.6 million (15.2%) just prior to legalization
 - Proportion of first-time users doubled from the first quarter of 2018 to the same period in 2019

Under estimating risk of Cannabis use

- The general public, on average, underestimates the harms associated with cannabis use
- A 2019 survey in Canada
 - 24% of people reported cannabis smoke was not harmful
 - 13% believed that Cannabis was not harmful during pregnancy and breastfeeding
- A 2017 survey of 16,280 US adults found that 22.4% believe cannabis is not addictive and 9% believe there are no risks associated with cannabis use.
- A qualitative study of 76 Canadian youth (aged 14–19 years) found they were unaware about the potential harms of cannabis use
- The perception that cannabis is less harmful correlates with the intention to use more frequently among non-users

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<https://www.canada.ca/en/health-canada/services/publications/drugs-health-products/canadian-cannabis-survey-2019-summary.html>

Some Health Adverse effect of recreational Cannabis

- There is evidence that cannabis is associated with health adverse effect
 - Impaired ability to drive
 - Respiratory and cardiovascular disease
 - Impaired fetal development if used in Pregnancy
 - Increase the risk of developing mental illnesses such
 - Psychological effect
 - Psychosis
 - Schizophrenia
 - Especially in those who start using cannabis at a young age
 - Use cannabis frequently
 - Have a personal or family history of psychosis and/or schizophrenia.
 - An increased risk of suicide
 - Depression
 - Anxiety disorders
- There is a growing consensus that heavy and long-term cannabis use can harm adolescent brains and is associated with poorer educational outcomes

Characteristics of Canadians likely to try or increase cannabis use following legalization for nonmedical purposes: a cross-sectional study

Harman S. Sandhu HBSc, Laura N. Anderson PhD, Jason W. Busse PhD DC

Abstract

Background: The Government of Canada legalized nonmedical use of cannabis in October 2018. Our objectives were to determine the percentage of Canadians intending to try or increase their cannabis use following legalization and to explore characteristics associated with this intent.

Methods: We used data from the 2018 National Cannabis Survey and constructed multivariable regression models. Respondents' data were weighted and bootstrapped. We report relative measures of association as adjusted odds ratios (ORs) and absolute measures of association as adjusted risk increases (RIs).

Results: Among the 39 000 households selected for recruitment for the survey, 17 089 respondents provided complete data (43.8%) and our weighted analysis represented 27 808 081 Canadians aged 15 years and older. An estimated 18.5% of respondents (95% confidence interval [CI] 17.6%–19.5%) indicated they intended to try or increase cannabis use following legalization. Being more likely to try or increase cannabis use was associated with younger age (15–24 yr v. > 65 yr; adjusted OR 3.8, 95% CI 2.6–5.6; adjusted RI 20.1%, 95% CI 13.9%–26.2%), cannabis use in the past 3 months versus no use (adjusted OR 3.3, 95% CI 2.8–3.9; adjusted RI 20.4%, 95% CI 17.1%–23.6%), higher income (≥ \$80 000 v. < \$40 000; adjusted OR 1.5, 95% CI 1.3–1.9; adjusted RI 6.1%, 95% CI 3.2%–9.0%) and poor or fair mental health versus good to excellent mental health (adjusted OR 2.0, 95% CI 1.6–2.6; adjusted RI 11.5%, 95% CI 6.7%–16.2%).

Interpretation: Nearly 1 in 5 respondents reported that they intended to try or increase cannabis use after legalization; however, intention may not translate into behaviour. Continued monitoring should help to establish rates and patterns of cannabis use among Canadians following legalization.

According to the 2017 Canadian Tobacco Alcohol and Drugs Survey, 15% of Canadians aged 15 years and older reported using cannabis in the past year, the same percentage as for current cigarette use.¹ Approximately 78% of respondents reported consuming alcohol in the past year and 24% reported heavy drinking.² Overall, substance use was highest among males aged 20–24 years.¹ There is substantial evidence that cannabis use is associated with motor vehicle collisions, decreased birthweight (if consumed during pregnancy), chronic bronchitis episodes (if cannabis is inhaled), psychotic symptoms and disorders, and cannabis addiction.^{3–6} The lifetime risk of cannabis abuse (recurrent use) or dependence (symptoms of tolerance and withdrawal) among Canadians was 6.8% in 2012, and 1.3% of Canadians met criteria for cannabis abuse or dependence in the past year.⁶ Moreover, the potency of illicit cannabis increased from 4% in 1995 to 12% in 2014, with higher potency associated with increased risk of adverse health outcomes.^{7–11} In general, people who use cannabis more frequently and at a younger age are at higher risk for harm.^{11,12}

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- An estimated 18.5% of respondents intended to try or increase cannabis use following legalization
- Being more likely to try or increase cannabis use was associated with:
 - Younger age (15–24 yr v. > 65 yr; adjusted OR 3.8, 95% CI 2.6–5.6; ARI 20.1%)
 - Used Cannabis in the past 3 months versus no use (adjusted OR 3.3, 95% CI 2.8–3.9; ARI 20.4%)
 - Higher income (≥ \$80 000 v. < \$40 000; adjusted OR 1.5, 95% CI 1.3–1.9; ARI 6.1%)
 - Poor or fair mental health versus good to excellent mental health (adjusted OR 2.0, 95% CI 1.6–2.6; ARI 11.5%)

Characteristics of Canadians likely to try or increase cannabis use following legalization for nonmedical purposes: a cross-sectional study

Harman S. Sandhu HBSc, Laura N. Anderson PhD, Jason W. Busse PhD DC

Abstract

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12% in 2014, with higher potency associated with increased risk of adverse health outcomes.^{7–11} In general, people who use cannabis more frequently and at a younger age are at higher risk for harm.^{11,12}

In an effort to promote responsible use, deter criminal activity and protect public health and safety, the federal government legalized nonmedical use of cannabis on Oct. 17, 2018.¹³ Cannabis use for medical purposes has been legal in Canada since 2001.¹⁴ The evidence from the United States

Competing interests: None declared.

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Objective of study

- To explore factors associated with initiating cannabis use following legalization for non-medical use in Canada
- Our results will facilitate
 - Identification of vulnerable group of people who may start cannabis following legalization
 - Guide the design of interventional studies to prevent bio-psycho-social consequences of cannabis use.
- These factors could be targeted in health education campaigns directed toward at risk people to deter the uptake or harmful consequences associated with cannabis use.

Method

- Cross-sectional study involving analysis of data from the NCS master file collected after legalization of nonmedical use of cannabis:
 - The 4th wave of 2018
 - All four waves in 2019.
- Participation in the NCS was voluntary and data was collected through
 - An electronic questionnaire
 - Computer-assisted telephone interview.
- Our study population consisted of
 - Non-institutionalized Canadians
 - Aged ≥ 15 years
 - Residence in Canada's 10 provinces or 3 territorial capital cities.
- The sampling method
 - Two-stage simple random sample of dwellings and people stratified by province or territory, which aimed to represent the Canadian population

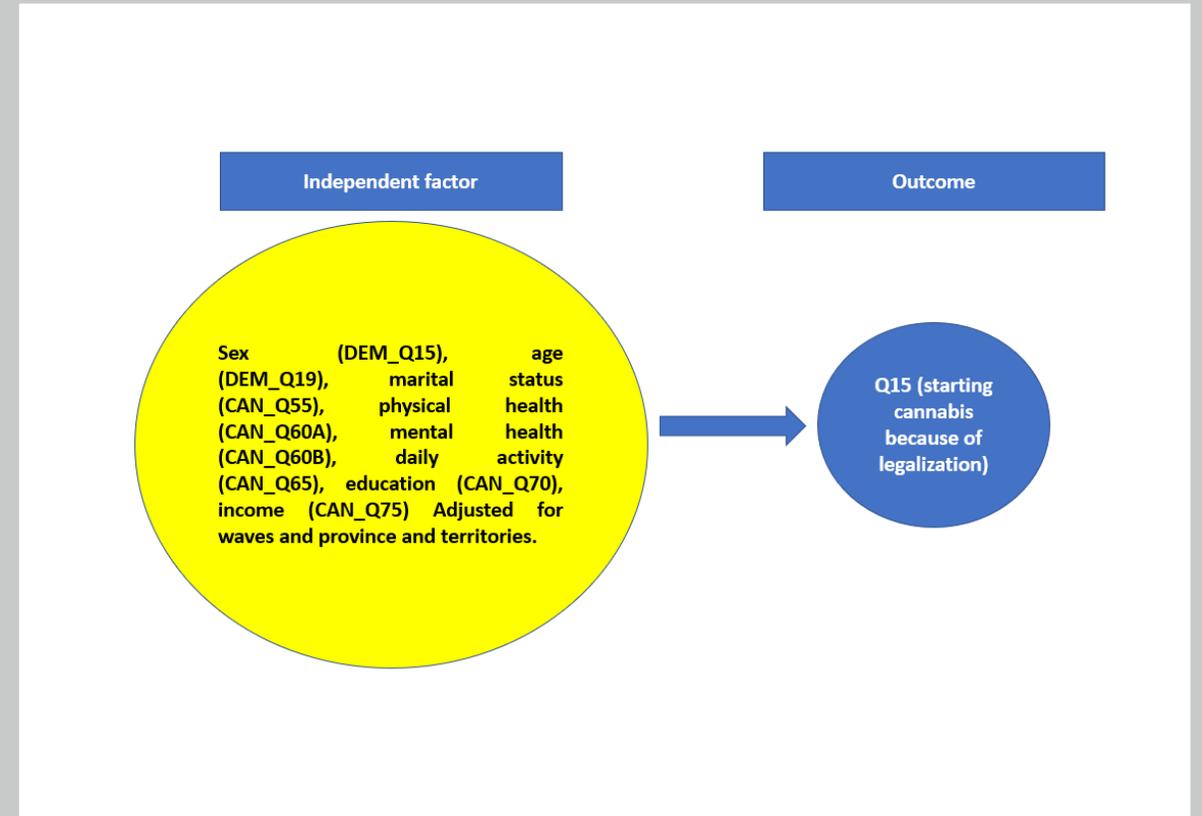
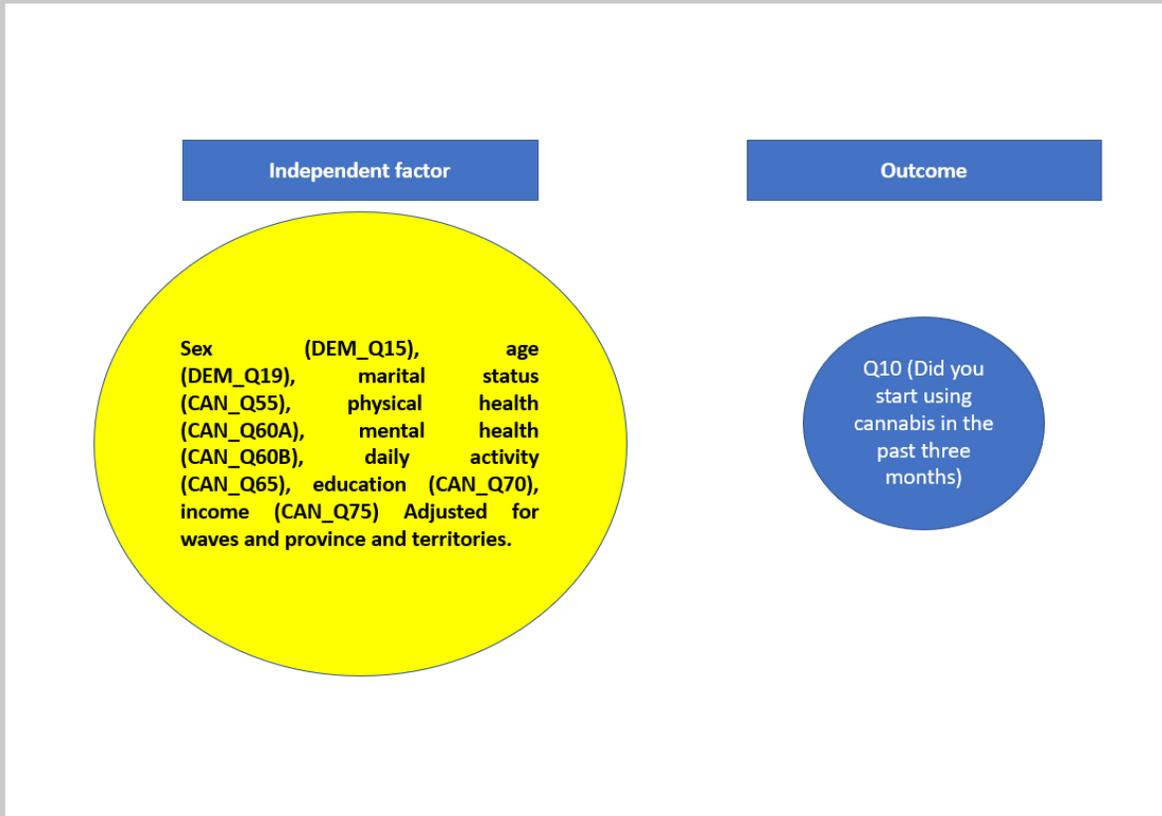
Method (Cont.)

- A total of 58,000 households were selected to receive the 4th NCS wave in 2018 and all 4 waves in 2019.
- A total of 29,000 respondents (49.1%) replied to the questionnaire
- Respondent to Q10: Did you start using cannabis in the past three months?
24,000 (83.2%)
- Respondent to Q15: Did you use or try cannabis for the first time because it is now legal? 23,000 (80.1%)

Statistical Analysis

- We used descriptive statistics to summarize data as percentages and 95% confidence intervals (CIs) and two constructed multivariable logistic regression models to explore factors associated with:
 - (1) initiating cannabis use in the past 3-months (Model 1)
 - (2) initiating cannabis use because of legalization (Model 2)
- We used both significant and not-significant variables in univariate analysis in the multivariable logistic models
- We applied bootstrap weights to convert unweighted frequencies to
 - Represent the Canadian household population
 - Adjust for nonresponse bias in the survey sampling design
- We excluded missing data from our multivariable regression analyses using listwise deletion.

Statistical Analysis (Cont.)



Results

- Weighted Number(n = 27,904,258)
- Age range: 15- 101 years old ,weighted mean 52.7 (SD=18)
- Female: 50.9% (50.8- 51)
- Married: 61.7% (95%CI: 61-62.4)
- Following legalization of nonmedical cannabis
 - 1.9% Canadians initiated use over past three months
 - 1% attributed their decision to start using cannabis to legalization

Results

Reason(s) for cannabis use	% (95%CI)
Non-user	80.2 (79.5-81.0)
Medical use only	4.4 (4.1-4.8)
Nonmedical use only	9.5 (9.0-10.1)
Medical and nonmedical use	5.8 (5.3-6.4)

Methods of consumption in 2019 & 2018

Method of Use	2019	2018
Smoke	84%	89%
Eating in food	46%	42%
Vaping (Pen or e-cigarette)	27%	15%

Results: Q10: Did you start using cannabis in the past three months?

Table 2. Factors associated with initiating cannabis use in the past 3 months (n = 27,906,388)

Predictor		Unadjusted OR (95% CI)	Adjusted OR (95% CI)	p Value	Adjusted risk Increase, % (95% CI)
Age, yr	65<			Ref	
	15-24	1.7 (1.1-2.7) *	1.5 (0.8-2.9)	0.261	0.7 (-0.6 to 1.9)
	25-34	1.9 (1.3-2.8) *	1.7 (1.1-2.8)	0.028	1.1 (0.1 to 2.0)
	35-44	1.4 (1.0-2.1)	1.3 (0.8-2.1)	0.97	0.4 (-0.4 to 1.2)
	45-64	1.3 (0.9-1.8)	1.2 (0.8-1.8)	0.78	0.3 (-0.4 to 0.9)
Sex	Female			Ref	
	Male	1.1 (0.9-1.4)	1.1 (0.9-1.5)	0.373	0.2 (-0.3 to 0.7)
Marital Status	Married			Ref	
	Single	1.3 (1.0-1.7)	1.3 (0.9-1.7)	0.134	0.5 (-0.2 to 1.1)
Physical Health	Good to excellent			Ref	
	Fair to poor	2.1 (1.5-2.8)	2.0 (1.3-3.1)	0.002	1.7 (0.3 to 3.1)
Mental Health	Good to excellent			Ref	
	Fair to poor	2.0 (1.4-2.9)	1.3 (0.8-2.1)	0.297	0.6 (-0.6 to 1.7)
Daily Activity	Employed/Looking for work			Ref	
	Student	1.0 (0.6-1.7)	0.9 (0.4-1.8)	0.758	-0.2 (-1.5 to 1.0)
	Caregiving/housework	1.1 (0.7-1.7)	1.1 (0.7-1.9)	0.470	0.3 (-0.9 to 1.4)
	Retired/ Long-term illness	0.7 (0.5-0.9)	0.8 (0.5-1.2)	0.265	-0.4 (-1.1 to 0.3)
	Other	0.8 (0.5-1.2)	0.7 (0.4-1.2)	0.205	-0.6 (-1.4 to 0.2)
Formal education	High School diploma or less			Ref.	
	College and Higher	1.0 (0.8-1.3)	1.0 (0.7-1.4)	0.971	0.0 (-0.6 to 0.6)
Income	< \$40,000			Ref	
	\$40,000 to \$79,999	1.0 (0.7-1.4)	1.1 (0.7-1.6)	0.801	0.1 (-0.6 to 0.8)
	≥\$80,000	1.1 (0.8-1.6)	1.2 (0.8-1.7)	0.352	0.3 (-0.3 to 1.0)
Residence	Quebec			Ref	
	Outside of Quebec	1.5 (1.0-2.2)	1.4 (1.06-2.0)	0.011	0.6 (0.0 to 1.1)

*Bold numbers had significant association, p value ≤ 0.05

Results: Q15: Did you use or try cannabis for the first time because it is now legal?

Table 3. Factors associated with initiating cannabis use due to legalization (n = 27,904,258)

Predictor		Unadjusted OR (95% CI)	Adjusted OR (95% CI)	pValue	Adjusted risk increase, % (95% CI)
Age	≥65	Ref.			
	15-24	2.6 (1.4-4.9) *	1.5 (0.6-3.5)	0.348	0.4 (-0.4 to 1.1)
	25-34	2.8 (1.6-4.9)	1.8 (0.9-3.6)	0.109	0.6 (-0.1 to 1.2)
	35-44	1.7 (1.0-2.9)	1.1 (0.5-2.1)	0.918	0.0 (-0.5 to 0.5)
	45-64	1.9 (1.2-3.2)	1.4 (0.8-2.7)	0.255	0.3 (-0.2 to 0.8)
Sex	Female	Ref.			
	Male	1.0 (0.7-1.5)	1.0 (0.7-1.5)	0.852	0.0 (-0.3 to 0.4)
Marital Status	Married	Ref.			
	Single	1.2 (0.9-1.8)	1.1 (0.7-1.8)	0.622	0.1 (-0.4 to 0.6)
Physical Health	Good to Excellent	Ref.			
	Fair to poor	1.5 (1.0-2.2)	1.3 (0.8-2.3)	0.317	0.3 (-0.4 to 1.0)
Mental Health	Good to Excellent	Ref.			
	Fair to poor	2.3 (1.4-3.7)	1.8 (1.0-3.4)	0.068	0.8 (-0.3 to 1.8)
Daily Activity	Employed/Looking for work	Ref.			
	Student	1.2 (0.6-2.5)	1.1 (0.5-2.5)	0.789	0.1 (-0.7 to 1.0)
	Caregiving/housework	1.2 (0.6-2.6)	1.3 (0.6-2.8)	0.75	0.3 (-0.6 to 1.2)
	Retired/ Long-term illness	0.5 (0.3 -0.8)	0.7 (0.4-1.2)	0.22	-0.3 (-0.8 to 0.1)
	Other	0.6 (0.3-1.3)	0.5 (0.2-1.2)	0.118	-0.6 (-1.0 to -0.1)
Education	High School diploma or lower	Ref.			
	College and Higher	1.0 (0.7-1.5)	1.0 (0.7-1.4)	0.838	-0.1 (-0.4 to 0.3)
Income	< \$40,000	Ref.			
	\$40,000 to \$79,999	1.1 (0.7-1.9)	1.1 (0.6-2.0)	0.712	0.1 (-0.4 to 0.6)
	≥\$80,000	1.2 (0.8 - 2.0)	1.2 (0.7-2.0)	0.588	0.2 (-0.4 to 0.7)
Residence	Quebec	Ref.			
	Outside of Quebec	2.0 (1.1-3.5)	1.9 (1.1-3.2)	0.001	0.5 (0.2 to 0.9)

*Bold numbers had significant association, p value ≤ 0.05

Discussion

- Following legalization of nonmedical cannabis
 - 1 in 50 Canadians initiated use over past three months
 - 1 in 100 attributed their decision to start using cannabis to legalization.
- Illegality of Cannabis did deter some people (albeit a small proportion) from using Cannabis
- An analysis of NCS data just prior to legalization of nonmedical cannabis found that
 - 18.5% Try or increase consumption
- Emphasizing that intentions do not necessarily translate into changes in behavior

Discussion(cont.)

- Our finding that endorsing worse physical health was associated with initiating cannabis use
- 4% of respondents reported using cannabis for therapeutic reasons
- 6% for both medical and nonmedical purposes
- Re-enforces the importance of providing guidance regarding evidence-based therapeutic indications for cannabis
- Respondents who resided in Quebec were less likely to initiate cannabis use because of legalization
 - Policy decisions in this province
 - The minimum legal age for purchasing and consuming cannabis
 - Quebec is 21 years,
 - Alberta is 18 years
 - Rest of Canada 19 years

Limitations

- More than half (51%) of the eligible households did not participate in survey, and it is also possible that our respondents may have under-reported use of cannabis
- The NCS does not collect information on people in institutions and our findings may not be generalizable to this population

Take home message

- Following legalization of nonmedical cannabis,
 - 1 in 50 Canadians initiated use
 - and 1 in 100 attributed their decision to start using cannabis due to legalization.
- Canadians initiating cannabis use were likely to be
 - Younger
 - Endorse worse physical health
 - Half of those using cannabis reported use for therapeutic purposes.
- Policies implemented in Quebec appear to have been effective in curtailing initiation of cannabis use after legalization.

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