

International Cannabis Policy Study

TECHNICAL REPORT WAVE 2 (2019)



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INTRODUCTION

The primary objective of the International Cannabis Policy Study (ICPS) is to examine the impact of cannabis legalization. On October 17, 2018, Canada became the second country to legalize non-medical cannabis at the national level. An increasing number of US states have also legalized non-medical cannabis. The ICPS study seeks to evaluate the overall impact of legalization to examine the effectiveness of specific policy measures.

The study examined five primary research questions, including the extent to which legalization is associated with changes in:

- prevalence, consumption, and patterns of cannabis use;
- commercial retail environment, price and purchasing;
- risk behaviours, including driving after cannabis use and use in 'high risk' occupational settings;
- perceptions of risk and social norms; and
- effectiveness of specific regulatory policies, including advertising restrictions, product labelling and warnings, public education campaigns, and the use of cannabis in public spaces.

The ICPS study is an online survey that will be conducted annually with participants aged 16–65 years living in Canada and the USA. The survey will be repeated annually at 12-, 24- and 36-months follow-up to monitor changes over time, as well as key mediators and moderators of use, in each of three jurisdictions: Canada (all provinces); US states that have legalized non-medical cannabis (US 'legal' states) and those that have not (US 'illegal' states). Analyses will also examine changes between Canadian provinces over time to examine differences in policy implementation, particularly with respect to the retail market.

This technical report describes the methods for the second wave of the ICPS study conducted from Sept-Oct 2019. The methodology of the ICPS is also described in the study's methodology paper.¹

STUDY PROTOCOL

OVERVIEW

Data were collected via a web-based survey between September 13 and October 31, 2019. Respondents completed an online survey in English or French. Median survey time was 25.1 minutes, including 37.2 minutes among past 12-month cannabis users and 20.1 minutes among those who had never used cannabis or not used it in the past 12 months.

QUESTIONNAIRE DEVELOPMENT

Survey measures were drawn or adapted from national surveys or selected based on previous research. Development included focus groups with youth and young adults aged 16–24, as well as an extensive pilot study conducted in October 2017 with 1,045 Canadians aged 16–30.² Cognitive interviewing was conducted with 10 cannabis users in January–February 2018³ and August 2019 to evaluate and improve survey items.

LANGUAGE

The survey was written in English and translated to French by *Sirois Translation Services*. Canadian respondents were able to complete the survey in French or English. Overall, 6.4% of the analytic sample completed the survey in French (n=3,058).

SURVEY CONTENT

The survey document is available at: <u>http://cannabisproject.ca/methods/</u>. The survey includes models on the following content areas:

- prevalence and patterns of cannabis use
- cannabis purchasing and price
- cannabis consumption and modes of use
- commercial retail environment
- risk behaviours
- cannabis knowledge, perceptions of risk and social norms
- exposure to health warnings and public educational campaigns
- exposure to cannabis marketing and branding
- substance use and other risk behaviours
- socio-demographics, postal code, and socio-economic status

SAMPLE RECRUITMENT

SAMPLE ELIGIBILITY

Individuals were eligible to participate if they resided in a Canadian province or US state, were 16–65 years of age at the time of recruitment, and had access to the internet.

RECRUITMENT AND CONSENT

Respondents from Canadian provinces and US states were recruited using the *Nielsen Consumer Insights Global Panel*, which maintains panels in Canada and the US (<u>http://www.nielsen.com/ca/en/about-us.html</u>). Email invitations (with a unique link) were sent to a random sample of panelists (after targeting for age and country criteria); panelists known to be ineligible were not invited. Respondents from Wave 1 were identified using their unique panel ID and invited by email. The Nielsen panels are recruited using both probability and nonprobability sampling methods in each country. For the current project, Nielsen drew stratified random samples from the online panels in each country, based on known proportions in each age group. To account for differential response rates, Nielsen modified these sampling proportions to place greater weight on sub-groups with lower response rates. Comparisons between the sample profile and national estimates from benchmark population-based surveys are provided herein.

RESPONSE RATES

In total, 2,433,278 respondents were sent an email invitation to the main survey. Table 1 shows outcomes for respondents sent the email invitation, in terms of completion of the survey. Overall, 81,263 respondents accessed the survey link, of whom 17,152 (21.1%) partially completed the survey and 51,087 (62.9%) completed the survey.

As shown in Table 1, 5,497 respondents were terminated. Reasons included 'forced' termination due to residence in countries other than Canada or the US (n=165), age <16 (n=82) or >65 (n=47), and lack of consent (n=4,347); mandatory survey questions: sex at birth (n=37), province (n=38) or state (n=4), 'Have you ever tried marijuana?' (n=207), 'When was the last time you used marijuana?' (n=136), and 'How often do you use marijuana?' (n=37); because of duplicate entries (n=361) and other data quality issues flagged by Nielsen (n=30); or because the respondent opted out of the commercial panel after the invitation was sent.

Disposition	Total		Canada		USA	
	n	%	n	%	n	%
Total invitations	2,433,278	100%	472,779	100%	1,960,499	100%
Accessed survey ^a	81,263	3.3%	24,607	5.2%	54,596	2.8%
Survey terminated ^a	5,497	0.2%	1,318	0.3%	4,014	0.2%
Over quota ^b	7,527	0.3%	1,566	0.3%	5,961	0.3%
Survey partially completed ^a	17,152	0.7%	4,210	0.9%	11,047	0.6%
Qualified completes	51,087	2.1%	17,513	3.7%	33,574	1.7%
Excluded – dishonesty ^c	717	1.4%	247	1.4%	470	1.4%
Excluded – data quality ^d	2,235	4.4%	805	4.6%	1,430	4.3%
Excluded – unidentified sex	11	<0.1%	2	<0.1%	9	<0.1%
e						
Excluded – speeding ^f	16	<0.1%	7	<0.1%	9	<0.1%
Excluded – duplicates ^g	361	0.7%	167	1.0%	194	0.6%
Final analytic sample	47,747		16,285		31,462	
		% of 2018		% of 2018		% of 2018
		sample		sample		sample
Returning cohort	2,012	7.4%	1,029	10.2%	983	5.7%
New cross-sectional sample	45,735		15,256		30,479	

Table 1: Dispositions of potential respondents, by country, in the International Cannabis Policy Study(ICPS) 2019

^a Because 165 respondents who reported residing in 'other' countries were terminated and 1,895 respondents who partially completed the survey did not indicate their country of residence, frequencies for Canada and the US do not sum to 'totals' that accessed, terminated, and partially completed the survey. Terminated respondents also include those screened ineligible due to residence outside the 10 Canadian provinces (n=29) or with unstated province (n=9) or state (n=4). ^b Respondents screened ineligible for exceeding the designated quota for their sub-population (i.e., age group, sex, province/state). ^c Respondents who answered 'no' to the question, "Were you able to provide 'honest' answers about your marijuana use during the survey?" were excluded. ⁴ A total of 2,227 respondents incorrectly answered the data quality check question, "What is the current month?" Note that respondents who indicated a month \leq 2 days of the correct month (i.e., respondents who completed the survey on October 1-2 but selected September or who completed the survey on Oct 30-31 but selected November) were retained. An additional 7 respondents were excluded; 3 from Canada and 1 from the US who correctly answered the data quality (month) question but consistently entered invalid/gibberish responses to open-ended questions and provided poor-quality/straight-lining responses to quantitative questions and another 3 from the US that were duplicate entries. ^e For weighting and analytical purposes, individuals identifying as 'intersex' were assigned their gender identity if they selected woman/female or man/male. The remaining 11 respondents were excluded if their sea as 'intersex' and their gender identity as 'other'/unstated were excluded due to insufficient cell counts for weighting. ^fRespondents were excluded in their set as 'intersex' and their gender identity as complete the survey more quickly due to skip logic). ^g A total of 701 duplicate or triplicate cases who matched on 20 sociodemographic variables (including post

DEVICE USE

Nielsen collects data on suspected browser type. Overall, over half of respondents are believed to have completed the survey on a smartphone (48.6%) or tablet (7.9%), and the remainder on a desktop/laptop computer (43.4%). Age, sex and lifetime cannabis use all differed significantly by device type, such that females were more likely to use smartphones and tablets, whereas males were more likely to use PCs; younger respondents were more likely to use smartphones, whereas older respondents were more likely to use tablets and PCS. 'Ever' cannabis users were more likely to use smartphones, whereas 'never' cannabis users were more likely to use tablets and PCs, even after adjustment for age and sex (p<0.001 for all).

PARTICIPANT COMPENSATION

Monetary incentives have been shown to increase response rates and to decrease response bias among sub-groups commonly under-represented in surveys, including disadvantaged subgroups. Respondents from Canadian provinces and US states were provided with incentives according to Nielsen's regular remuneration structure.

ETHICS CLEARANCE

The project has been reviewed by and received ethics clearance through a University of Waterloo Research Ethics Committee (ORE#31330).

DATA MANAGEMENT

DATA INTEGRITY CHECK

Due to the sensitive nature of the subject matter (cannabis was classified as an illegal substance federally in Canada and the USA at the time of the survey), at the end of the survey, respondents were asked whether they felt they were able to answer the questions honestly. The 717 respondents who selected 'no' were excluded from the analytic sample. Towards the end of the survey, respondents were also asked to select the current month from a list. The month selected by the respondent was compared to the month the respondent completed the survey. Respondents with discrepant responses were excluded from the analytic sample, unless the selected month was within 2 days of the date the survey was submitted (e.g., survey completed on Oct 1-2 but respondent selected September). A total of 2,235 respondents were excluded from the analytic sample due to discrepancies with the month selected or poor data quality. Those who identified as intersex and an unknown gender identity (n=11) were also excluded due to cell counts insufficient for weighting, and a final 16 were excluded for speeding. The final analytic sample included 47,747 respondents.

DATA CLEANING

The survey asked respondents about their current frequency of use in two ways: as a categorical variable (less than once per month, 1+ times per month, 1+ times per week, every day/almost every day) and also as an open-ended variable where the respondent entered the number of days they use cannabis per week/month/in the past 12 months. Where large discrepancies between responses to these two variables existed (e.g., respondent selected "less than once per month" but indicated that they used cannabis on 365 days in the past 12 months), the current frequency of cannabis use was reclassified. This affected 4.5% (n=729) of past 12-month cannabis users.

SURVEY WEIGHTS

Post-stratification sample weights were constructed based on the Canadian and US Census estimates. Respondents from Canada were classified into age-by-sex-by-province, education, and age-by-smoking status groups. Respondents from the US legal states were classified into age-by-sex-by-legal state, education-by-legal state, region-by-race, and age-by-smoking status groups, while those from the illegal states were classified into age-by-sex, education, region-by-race, and age-by-smoking status groups, where for both the legal and illegal states the region refers to the US Census Division, which groups the states into nine groups (New England, Middle Atlantic, East North Central, West North Central, South Atlantic, East South Central, West South Central, Mountain or Pacific). Correspondingly grouped population count and proportion estimates were obtained from Statistics Canada^{4,5} and the U.S. Census Bureau.^{6,7} For Canada, US legal states, and US illegal states, the smoking status from ICPS 2018 was used. For US legal states, the four smallest states (Alaska, Maine, Vermont, and the District of Columbia) were merged for the education-by-legal state variable. Separately for Canada, US legal states, and US illegal states, and US illegal states, a raking algorithm was applied to the cross-sectional analytic sample (n=45,735) to compute weights that were calibrated to these groupings. Weights were rescaled to the sample size for Canada, US legal states and US illegal states.

An alternate version of the survey weights described above were constructed where respondents from Canada and the US legal states were classified into sub-province or sub-state geographical regions in addition to the other classification variables. Cannabis use estimates resulting from these alternate weights were no different from the

estimates resulting from the weights computed without sub-province or sub-state geography; therefore, the subprovince and sub-state geography was not used in the computation of the survey weights.

SAMPLE SOCIODEMOGRAPHIC PROFILE

The demographic characteristics of the cross-sectional and returning cohort samples are shown in Tables 2 and 3; frequencies by state and province are shown in Table 4.

Table 2: International Cannabis Policy Study (ICPS) 2019 cross-sectional sample characteristics by study condition^a (n=45,735)

	Canada (1	uda (n=15,256) US 'illegal' states (n=10,275)		US 'legal' states (n=20,204)		
Characteristic	Unweighted	Weighted ^b	Unweighted	Weighted ^b	Unweighted	Weighted ^b
	% (n)	% (n)	-	-	_	-
Sex						
Female	61.4% (9,373)	49.7% (7,583)	72.6% (7,462)	50.3% (5,168)	74.3%	49.8% (10,053)
					(15,017)	
Male	38.6% (5,883)	50.3% (7,673)	27.4% (2,813)	49.7% (5,107)	25.7%	50.2% (10,151)
					(5,187)	
Age (years)						
mean (SD)	42.9 (14.3)	40.7 (14.7)	40.1 (15.0)	40.1 (10,275)	42.1 (14.2)	40.1 (20,204)
Age group						
16-25	14.8% (2,251)	18.8% (2,867)	19.9% (2,043)	19.9% (2,042)	14.8%	19.8% (3,999)
					(2,991)	
26-35	18.8% (2,863)	20.9% (3,191)	22.0% (2,260)	21.5% (2,212)	23.0%	22.7% (4,577)
					(4,653)	
36-45	20.3% (3,102)	19.8% (3,014)	19.3% (1,985)	19.1% (1,959)	19.7%	19.4% (3,912)
					(3,979)	
46-55	20.7% (3,165)	19.9% (3,038)	17.2% (1,763)	19.8% (2,038)	3631 (18.0%)	19.4% (3,916)
56-65	25.4% (3,875)	20.6% (3,147)	21.6% (2,224)	19.7% (2,024)	24.5%	18.8% (3,799)
					(4,950)	
Ethnicity						
White	76.1%	73.2%	79.0% (8,122)	75.9% (7,802)	77.7%	76.1% (15,380)
	(11,617)	(11,161)			(15,692)	
Other/Mixed/Unstated	23.9% (3,639)	26.8% (4,095)	21.0% (2,153)	24.1% (2,473)	22.3%	23.9% (4,824)
					(4.512)	

SD, standard deviation. ^aThe 10 states + District of Columbia that had legalized non-medical cannabis as of September 2019 were considered 'legal' states. ^bData weighted using variable WEIGHT_RESC, which are the inflation weights scaled back to the sample size of Canada and the sample size in the legal states as a group and separately in the illegal states as a group.

	Canada (n=1,029)	US 'illegal' states (n=158)	US 'legal' states (n=825)
Characteristic	Unweighted	Unweighted	Unweighted
	% (n)	% (n)	% (n)
Sex			
Female	55.6% (572)	63.9% (101)	61.8% (510)
Male	44.4% (457)	36.1% (57)	38.2% (315)
Age (years)			
mean (SD)	50.6 (12.4)	48.3 (15.7)	53.5 (10.6)
Age group			
16-25	4.2% (43)	13.3% (21)	1.2% (10)
26-35	10.3% (106)	7.6% (12)	7.0% (58)
36-45	16.8% (173)	10.1% (16)	13.7% (113)
46-55	21.8% (224)	24.1% (38)	22.2% (183)
56-65	46.9% (483)	44.9% (71)	55.9% (461)
Ethnicity			
White	84.8% (873)	93.7% (148)	90.4% (746)
	15.2% (156)	6.3% (10)	9.6% (79)
Other Mine J /II. stated			

Table 3: International Cannabis Policy Study (ICPS) 2019 returning cohort sample characteristics, by study condition^a (n=2,012)

Other/Mixed/Unstated

SD, standard deviation. ^aThe 11 states/district that had legalized non-medical cannabis as of Sept 2019 were considered 'legal' states. ^bData weighted using variable WEIGHT_RESC, which are the inflation weights scaled back to the sample size of Canada and the sample size in the legal states as a group and separately in the illegal states as a group.

Jurisdiction	Unweighted	Weighted ^b
Canada (n=15,256)	% (II)	% (II)
British Columbia	14.5% (2,211)	13.7% (2,094)
Alberta	14.4% (2,200)	11.9% (1,813)
Saskatchewan	5.5% (843)	3.0% (464)
Manitoba	5.7% (877)	3.6% (547)
Ontario	21.7% (3,315)	39.2% (5,983)
Quebec	23.7% (3,612)	22.2% (3,387)
New Brunswick	4.6% (697)	2.0% (308)
Nova Scotia	5.6% (855)	2.6% (390)
Prince Edward Island	1.0% (145)	0.4% (62)
Newfoundland & Labrador	3.3% (501)	1.4% (209)
USA (n=30,479)		
Alaska	0.6% (171)	0.6% (187)
California	23.9% (7,271)	32.8% (9,984)
Colorado	6.6% (2,003)	4.8% (1,453)
Maine	1.5% (456)	1.1% (327)
Massachusetts	8.1% (2,476)	5.8% (1,762)
Michigan	7.4% (2,265)	2.5% (751)
Nevada	3.5% (1,067)	3.4% (1,036)
Oregon	5.8% (1,763)	0.5% (156)
Vermont	0.7% (225)	6.2% (1,889)
Washington State	7.7% (2,359́)	8.1% (2,466)
District of Columbia	0.5% (148)	0.6% (192)
'Illegal' states	33.7% (10,275)	33.7% (10,275)

Table 4: Proportion of International Cannabis Policy Study (ICPS) 2019 cross-sectional respondents by province or state of residence^a (n=45,735)

^a US states were classified as 'legal' (11) or 'illegal' (40), based on the legal status of recreational cannabis at the time of the study (Sept 2019). The 11 US 'legal' states were oversampled compared to US 'illegal' states to ensure sufficient representation. In Canada, Alberta, British Columbia, Ontario and Quebec were also oversampled; in the USA, California, Colorado, Massachusetts, Oregon and Washington State were oversampled. ^bData are weighted to the national population using the variable WEIGHT_RESC, which are the inflation weights scaled back to the sample size of Canada, US legal states as a group, and US illegal states as a group. Note that using the variable WEIGHT_RESC_REGION would provide identical sample sizes (%, n) for unweighted and weighted data.

COMPARISONS WITH NATIONAL BENCHMARKS

The weighted International Cannabis Policy Study sample was compared with national Canadian and US estimates for socio-demographic factors and cannabis use (see Tables 5-11). The Canadian sample was similar to the national population in terms of education level, and had more non-Caucasian respondents than the national population. Compared to the national US population, the US sample had fewer respondents with less than a high school education, but a similar percentage with a bachelor's degree or higher. The US sample aligned fairly well with the national population in terms of ethnicity, with the exception that it had fewer Hispanic respondents. The ICPS sample had poorer self-reported general health compared to the national populations in both countries, which is a feature of many non-probability samples,⁸ and may be partly due to the use of web surveys, which provide greater perceived anonymity than the in-person or telephone-assisted interviews often used in national surveys.⁹

Table 5: Education, ethnicity and health among ICPS 2019 Canada cross-sectional respondents and national surveys

	Census <mark>2017ª, age ≥15</mark>	ICPS 2019, Canada, age 16-65 (n=15,25)	
	%	Unweighted % (n)	Weighted ^d % (n)
Education (age 15+)			
Less than high school	16.1%	8.1% (1,241)	15.4% (2,355)
High school diploma or equivalent	20.3%	16.5% (2,516)	26.4% (4,035)
Some college or technical training or	38.4%	41.8% (6,382)	32.4% (4,936)
diploma			
Bachelor's degree or higher	25.2%	32.6% (4,968)	24.6% (3,755)
	Census <mark>2016</mark> b	ICPS 2019, Canada,	age 16-65 (n=15,256)
	%	Unweighted	Weighted ^d
		% (n)	% (n)
Ethnicity (non-exclusive categories)			
White/European/North	91.1%	77.6% (11,845)	75.0% (11,440)
American/Oceanic			
East/Southeast Asian/Other Asian	9.2%	8.1% (1,236)	8.7% (1,321)
Indigenous/North American Aboriginal	6.2%	3.5% (537)	3.8% (586)
South Asian	5.7%	3.1% (474)	3.7% (557)
Black/Caribbean/African	5.3%	3.4% (520)	4.3% (663)
Latino/Latin American/Hispanic	2.0%	1.6% (238)	1.9% (294)
Middle Eastern/West Central Asian	2.9%	1.5% (235)	1.7% (263)
Other/Unstated		4.7% (722)	5.2% (803)
	CCHS <mark>2018</mark> ¢	ICPS 2019, Canada, age 16-65 (n=15,256)	
		Unweighted	Weighted ^d
	% (n)	% (n)	% (n)
Perceived health			
Excellent or Very good			
18-34	68.2%	46.2% (1,948)	44.1% (2,053)
35-49	64.0%	45.6% (2,110)	44.8% (2,028)
50-64	56.5%	40.5% (2,241)	37.2% (1,788)
Fair or Poor			
18-34	6.9%	16.2% (685)	17.9% (836)
35-49	8.2%	17.4% (804)	19.1% (866)
50-64	13.5%	21.9% (1.213)	24.2% (1.163)

^aData obtained from the Canada Census 2017; values from ICPS 2019 exclude Don't know/Refuse to answer (n=156, 1.0%); ^bdata obtained from the Canada Census 2016; respondents could select all that apply; therefore, numbers sum to >100%; ^cdata obtained from the 2018 Canadian Community Health Survey (CCHS); values from ICPS 2019 exclude Don't know/Refuse to answer (n=125, 0.8%). ^aData weighted using the variable WEIGHT_RESC, which are the inflation weights scaled back to the sample size of Canada. Sources: Education: Statistics Canada. Canada at a Glance 2018 – Education. Table 8. Educational attainment of working-age population (2017). Available at <u>https://www150.statcan.gc.ca/n1/pub/12-581-x/2018000/edu-eng.htm</u>. Ethnicity: Statistics Canada. 2017. Census Profile. 2016 Census. Statistics Canada Catalogue no. 98-316-X2016001. Ottawa. Released November 29, 2017. <u>https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E</u>. Perceived health: Statistics Canada. Table 13-10-0096-02. Perceived health, by age group. DOI: <u>https://doi.org/10.25318/1310009601-eng</u>

С	PS	ICPS 2019 US total	ICPS 2019 'illegal' states		ICPS 2019 'legal states'	
20	18ª,	age 18-65, weighted ^b	age 18-65 ((n=9,254)	age 18-65 (n=19,780)	
age	18-64	(n=28,047) ^c			_	
Education	%	% (n)	Unweighted	Weighted ^d	Unweighted	Weighted ^d
			% (n)	% (n)	% (n)	% (n)
Less than high school 10	.2%	3.9% (1,102)	4.0% (378)	4.1% (381)	3.0% (602)	3.4% (674)
High school diploma or 27	.6%	23.4% (6,557)	23.8% (2,224)	24.4% (2,260)	18.6% (3,710)	20.5% (4,051)
equivalent						
Some college, no degree 29	.1%	40.5% (11,346)	38.9% (3,628)	39.7% (3,676)	40.4% (8,082).	42.5% (8,406)
Bachelor's degree or higher 33	.0%	31.9% (8,940)	32.9% (3,072)	31.4% (2,907)	37.6% (7,515)	33.2% (6,560)
CPS2	2018 ^a	ICPS 2019 US total	ICPS 2019 'il	llegal' states	ICPS 201	9 'legal states'
age	18-64	age 18-65, weighted ^b	age 18-65	(n=9,254)	age 18-6	55 (n=19,780)
		(n=28,047)				
C	%	% (n)	Unweighted	Weighted ^d	Unweighted	Weighted ^d
	_		% (n)	% (n)	% (n)	% (n)
Ethnicity (exclusive categories)						
White 76	.3%	75.6% (21,207)	78.7% (7,353)	75.5% (6,983)	77.6% (15,532)	76.0% (15,039)
Black or African American 13	.5%	14.0% (3,915)	12.2% (1,137)	16.2% (1,503)	5.9% (1,177)	7.6% (1,510)
Asian 6.	6%	4.2% (1,174)	3.1% (290)	3.1% (290)	6.7% (1,347)	7.1% (1,406)
American Indian or Alaskan 1.	2%	1.3% (359)	1.0% (95)	1.0% (95)	1.7% (348)	2.0% (393)
Native						
Native Hawaiian or Pacific 0.4	4%	0.3% (98)	0.4% (33)	0.3% (26)	0.5% (106)	0.5% (105)
Islander						
Other/ \geq 2 races/ unstated 2.	0%	4.6% (1,294)	4.6% (427)	3.9% (357)	7.4% (1,490)	6.7% (1,326)
Hispanic origin 18	.3%	12.5% (3,512)	9.7% (909)	10.5% (971)	14.2% (2,847)	18.1% (3,590)
NI	HIS	ICPS 2019 US total	ICPS 2019 'illegal'	ICPS 2019 'legal	NHIS 2018 ^a	ICPS 2019 US total,
20	18 ^a	age 18-65, weighted ^{0}	states, age 18-65	states' age 18-	age ≥18	age 18-65, weighted [®]
age	218	(n=28,047) ^c	(n=9,254)	65 (n=19,780)	TT	(n=28,047) ^c
	/0	% (n)	Unweighted		Unweighted	weighted ^u
	_		% (II)	% (II)	% (II)	% (II)
Sell-rated health	F0/	14.00/ (2.024)	12 /0/ (1 1(1)	14.20/(1.217)	11 00/ (2 207)	$12 E_{0} (2 6 6 1)$
Voru good 21	.5%0	14.0% (3,934) 20.204 (9.10E)	12.4% (1,101)	14.2% (1,317) 29.7% (2.656)	11.9% (2,307) 21.20/ (6.220)	13.3% (2,001)
Cood 31	.1 70	29.2% (0,193)	20.0% (2,072) 25 204 (2 201)	20.1 % (2,030) 21 104 (2 104)	31.270 (0,237) 25 704 (7 141)	30.7% (0,003) 25 204 (6 072)
Enir 23	.7%	34.0% (9,/1/) 17 106 (4 702)	33.3% (3,291) 10 106 (1 600)	34.4% (3,180) 17.40/ (1.612)	33./ % (/,141) 16 20/ (2 262)	33.3% (0,773) 16 00% (2 170)
Poor 2	4%	4 4% (1 248)	4 8% (447)	4 6% (429)	4 3% (852)	3 9% (779)

Table 6: Education, ethnicity and health among ICPS 2019 US cross-sectional respondents and national surveys

^aData obtained from the 2018 Current Population Survey (CPS); ^bNational data weighted using WEIGHT_US_NATIONAL, which are the inflation weights scaled back to the US sample size as a whole. ^dIllegal and legal state data weighted using variable WEIGHT_RESC, which are the inflation weights scaled back to the sample size in the legal states as a group and separately in the illegal states as a group. Source: Current Population Survey (CPS) 2018. CPS Table Creator. Education: Source: Current Population Survey (CPS) 2018. CPS Table Creator. Education: Source: Current Population Survey (CPS) 2018. CPS Table Creator. Education: Source: Current Population Survey (CPS) 2018. CPS Table Creator: Education – detailed by Age. Available at: https://www.census.gov/cps/data/cpstablecreator.html Ethnicity: Table created using the variables Race by Age. Hispanic origin: Table created using the variables Hispanic origin by Age. Available at: https://www.census.gov/cps/data/cpstablecreator.html Health: 2018 National Health Interview Survey (NHIS) Person Public Use File. FHS Variables Thursday, June 13, 2019, Unweighted Frequencies. FHS.500_00.000: Reported health status. Available at: https://tp.cdc.gov/pub/Health Statistics/NCHS/Dataset_Documentation/NHIS/2018/personsx_freq.pdf

CANNABIS USE – COMPARISONS WITH NATIONAL BENCHMARK SURVEYS

Indicators of cannabis use among all respondents and among past 12-month cannabis users are displayed in Table 7. Comparisons between W1 and W2 ICPS data are shown in Tables 9 and 11; cannabis use increased in all jurisdictions from 2018 to 2019.

Comparisons with national benchmarks are shown in Tables 8 and 10. In the Canadian sample, lifetime and past 12-month cannabis use were within the range of national estimates for 16-19 and 20-24-year-olds. Estimates among the full ICPS sample were generally higher than national surveys, likely because unlike the national surveys, the ICPS was capped at age 65, and older age groups are known to have lower rates of cannabis use. In specific age groups (e.g., 16-19, 20-24), ICPS estimates fell within the range of national surveys. Mean age of initiation to cannabis use was similar to national estimates. Prevalence of use of most cannabis products also aligned with national estimates, with the exception of oils for oral ingestion, topical ointments and beverages.

In the US sample, lifetime and past 12-month cannabis use were higher than national estimates. Past-month use was similar to national estimates for among age 16-19 and 20-25-year-olds, whereas it was higher for older age groups. However, it is worth noting that national 2019 data were unavailable at the time of writing; comparisons to 2018 data may not reflect secular increases in cannabis use from 2018-2019 in the USA.

Table 7: Indicators of cannabis use among International Cannabis Policy Study (ICPS) 2019 cross-sectional respondents by condition, weighted^a (%,n)

Indicator	All respondents (n=45,735)			Past 12-mon	th cannabis users	(n=14,452)
	Canada	US 'illegal' state	US 'legal' state	Canada	US 'illegal'	US 'legal' state
	(n=15,256)	(n=10,275)	(n=20,204)	(n=5,381)	state	(n=7,880)
					(n=3,139)	
Ever tried cannabis						
Yes	62.0% (9,457)	62.3% (6,402)	69.3% (13,993)	100% (5,381)	100% (3,139)	100% (7,880)
Cannabis use status ^b						
Never user	38.0% (5,799)	37.7% (3,873)	30.7% (6,211)	0%	0%	0%
Used >12 months ago	26.7% (4,076)	31.7% (3,262)	30.3% (6,113)	0%	0%	0%
Used in past 12 months	11.3% (1,729)	8.1% (837)	10.0% (2,028)	32.1% (1,729)	26.7% (837)	25.7% (2,028)
Monthly user	7.0% (1,064)	6.1% (627)	6.3% (1,279)	19.8% (1,064)	20.0% (627)	16.2% (1,279)
Weekly user	5.7% (863)	4.7% (485)	6.3% (1,263)	16.0% (863)	15.4% (485)	16.0% (1,263)
Daily/almost daily user	11.3% (1,724)	11.6% (1,191)	16.4% (3,309)	32.0% (1,724)	37.9% (1,191)	42.0% (3,309)

SD, standard deviation. ^aData are weighted to the national population using the variable WEIGHT_RESC, which are the inflation weights scaled back to the sample size of Canada, US legal states as a group, and US illegal states as a group. ^bExclusive categories ('Used in past 12 months' does not include monthly, weekly, or daily/almost daily users).

	CCS 2019ª, <mark>age</mark> <mark>≥16</mark> (n=12,023)	NCS 2019 ^b , reporting age 15-64	ICPS 2019, Canada, age 16-65 (n=15,256)	
	% (95% CI)	% (95% CI)	Unweighted % (n)	Weighted ^c % (n)
Lifetime (ever) use	58.5% (57.5-59.5)	49.5%	62.3% (9,502)	62.0% (9,457)
16-19	53.3% (49.6-56.9)		38.9% (410)	36.1% (620)
16-24 (NCS: 15-24)		40.7%	49.7% (990)	45.1% (1,194)
20-24	69.3% (66.9-71.5)		61.8% (580)	61.6% (574)
25-44		57.4%	68.2% (4,034)	69.4% (4,242)
45-64		44.5%	60.9% (4,258)	61.7% (3,832)
Past 12-month use Age 16-19	24.6% (23.7-25.4) 44.3% (40.7-48.0)		33.2% (5,069) 31.5% (332)	35.3% (5,381) 29.3% (503)
Age 20-24 Past 30-day use	51.3% (48.8-53.8) 16.9% (16.2-17.6)		46.9% (440) 21.4% (3,270)	46.1% (429) 23.6% (3,595)
Age 16-19	29.3% (26.1-32.7)		16.5% (174)	15.5% (267)
Age 20-24 Current (past 3-month) use	35.0% (32.7-37.4) 	 17.1% (15.7-18.6)	27.6% (259) 26.0% (3,970)	28.5% (266) 28.1% (4,287)
Frequency of cannabis use (fu	ıll sample)			
Monthly				
16-24 (NCS: 15-24) 25-44		3.3% 3.8%	8.3% (166) 8.0% (476)	7.8% (206) 8.7% (530)
45-64		1.1%	4.7% (326)	5.2% (320)
Weekly				
16-24 (NCS: 15-24)		5.0%	5.4% (108)	4.9% (129)
25-44		5.2%	6.6% (392)	6.9% (425)
45-64		2.0%	4.1% (286)	4.6% (288)
Daily/almost daily				0 (0) (000)
16-24 (NCS: 15-24)		7.8%	8.6% (171)	8.6% (228)
25-44		9.2%	12.8% (758)	15.1% (920)
45-64		4.2%	7.8% (543)	8.8% (545)
Frequency of cannabis use (co	20.004 (19 = 21 =)	12 004	10 20/ (070)	10 00/ (1 06/)
Wookly	20.0% (10.3-21.3) 21 50% (20 0 22 1)	20.4%	15.3% (576)	19.0% (1,004)
Daily/almost daily	23.9% (20.0-23.1)	20.4%	29 5% (1 493)	32.0% (1.724)
Initiation to cannabis use	20.770 (22.0-20.0)	50.770	27.570 (1,755)	52.070 (1,727)
Mean age (years)	19.2 (19.0-19.4)		20.1 (8.9)	19.9 (8.8)
16-19	15.6 (15.4-15.9)		15.6 (2.0)	15.6 (1.8)

 Table 8: Cannabis use in Canada among ICPS 2019 cross-sectional respondents and national surveys

20-24	17.1 (16.9-17.2)	 17.2 (3.3)	17.0 (3.5)
Products used (current users)			
Dried flower/leaf	77.5% (75.7-79.1)	 74.5% (3,777)	75.5% (4,064)
Edibles (foods)	44.4% (42.5-46.4)	 43.2% (2,191)	44.2% (2,381)
Vape oils	26.0% (24.4-27.7)	 21.6% (1,094)	23.1% (1,241)
Hash/kief	23.1% (21.5-24.8)	 19.9% (1,011)	22.2% (1,197)
Oils for oral ingestion	22.9% (21.3-24.5)	 33.5% (1,696)	31.4% (1,691)
Concentrates (e.g., wax, shatter)	17.3% (16.0-27.7)	 15.3% (778)	16.8% (903)
Topical ointments	8.0% (7.0-9.0)	 13.9% (707)	13.4% (720)
Beverages	4.3% (3.6-5.1)	 7.3% (370)	8.3% (447)

^aData obtained from the 2019 Canadian Cannabis Survey (CCS) in which cannabis users may have been more likely to complete the study compared to other surveys such as CSTADS; ^bdata obtained from the National Cannabis Survey (NCS), third quarter 2018; ^cdata weighted using the variable WEIGHT_RESC, which are the inflation weights scaled back to the sample size of Canada Sources: Cannabis use and mode of use: Canadian Cannabis Survey 2019 Detailed Data Tables. Available at: <u>http://epe.lac-bac.gc.ca/100/200/301/pwgsc-tpsgc/por-ef/health/2019/130-18-e/index.html</u> Frequency of cannabis use: Statistics Canada. National Cannabis Survey, third quarter 2018. The Daily, 11 October 2018. Available at: <u>https://www150.statcan.gc.ca/n1/daily-quotidien/181011/dq181011b-eng.htm</u>. Lifetime cannabis use: Statistics Canada. National Cannabis Survey, Table 1. Number and percentage of people reporting never having used, formerly using, currently using cannabis by frequency, by age group, household population aged 15 or older, Canada (provinces only), second and third quarters combined 2019. Available at: <u>https://www150.statcan.gc.ca/n1/daily-quotidien/191030/t001a-eng.htm</u>. Frequency of cannabis use; Statistics Canada. Chart 3. Frequency of cannabis use by age group, household population aged 15 years and older, Canada, second and third quarters combined 2019. Available at: <u>https://www150.statcan.gc.ca/n1/daily-quotidien/191030/cg-a003-eng.htm</u>. Past 3-month use: Statistics Canada. National Cannabis Survey. Table 5. Number and percentage of people reporting cannabis use by quarter and other selected characteristics, household population aged 15 years or older, Canada (provinces only), third quarter 2018. Available at: <u>https://www150.statcan.gc.ca/n1/daily-quotidien/191030/cg-a003-eng.htm</u>. Past 3-month use: Statistics Canada. National Cannabis Survey. Table 5. Number and percentage of people reporting cannabis use by quarter and other selected characteristics, household population aged 15 years or older, Canada (provinces

Indicator of cannabis	ICPS Canada	ICPS Canada	ICPS Canada (age 16-	CCS	NCS
use	2018	2019	65) 2019 2010 relative	(age ≥16) 2019-2010	$(age \ge 15)$
	(11-10,057)	(11-15,250)	change	2010-2019 relative change	Q2&Q3 2018- 02&03 2019
			change	relative change	relative change
Ever tried cannabis					
All respondents	56.5%	62.0% (9,457)			
-	(5,682)		9.7%	-0.5%	
Age 16-19	32.0% (449)	36.1% (620)	12.8%	15.6%	
Age 20-24	57.2% (228)	61.6% (574)	7.7%	5.0%	
Age 25-44	61.8%	69.4% (4,242)			
	(2,453)		12.3%		
Age 45-64	59.8%	61.7% (3,832)			
	(1,650)		3.2%		
Past 12-month use					
All respondents	27.5%	35.3% (5,381)		12.3%	
	(2,768)		28.4%		
Age 16-19	25.9% (363)	29.3% (503)	13.1%	21.4%	
Age 20-24	40.5% (161)	46.1% (429)	13.8%	17.1%	
Age 25-44	34.8%	43.6% (2,662)			
	(1,381)		25.3%		
Age 45-64	20.5% (841)	27.6% (1,714)	34.6%		
Past 30-day use					
All respondents	18.7%	23.6% (3,595)			
	(1,881)		26.2%	12.7%	
Age 16-19	15.1% (211)	15.5% (267)	2.6%	27.4%	
Age 20-24	25.5% (101)	28.5% (266)	11.8%	16.3%	
Age 25-44	24.1% (958)	30.0% (1,834)	24.5%		
Age 45-64	14.5% (595)	18.8% (1,168)	29.7%		
Daily/almost daily use					
All respondents	8.9% (893)	11.3% (1,724)	27.0%	-5.9%	3.4%
Age 16-19	5.4% (75)	5.5% (95)	1.9%	N/A	
Age 20-24	11.6% (46)	14.3% (133)	23.3%	-30.1%	
Age 25-44	11.5% (458)	15.1% (920)	31.3%		7.0%
Age 45-64	7.5% (306)	8.8% (545)	17.3%		

Table 9: International Cannabis Policy Study 2018-2019 cross-sectional sample comparison, Canada, weighted^a (%,n)

^aData are weighted to the national population using the variable WEIGHT_NATIONAL, which are the national inflation weights scaled back to the sample size of Canada.

	NSDUH	ICPS 2019 US	ICPS 2019 'illegal' states		ICPS 2019 'le	gal states'
	2018 ^a	total	age 16	6-65	age 16	-65
	age 16-64	age 16-65,	(n=10,	275)	(n=20,2	204)
	(n=43,601)	weighted ^b	, , , , , , , , , , , , , , , , , , ,	,		,
		(n=30,479)				
Cannabis use	%	% (n)	Unweighted	Weighted ^d	Unweighted	Weighted ^d
			% (n)	% (n)	% (n)	% (n)
Ever (lifetime)						
use						
Age 16-19	36.0%	41.3% (1,407)	42.6% (532)	40.3% (526)	50.3% (447)	46.9% (625)
Age 20-25	55.0%	60.6% (1,602)	58.5% (464)	58.4% (431)	67.4% (1,416)	64.1% (1,708)
Age 26-49	54.4%	68.2% (10,126)	67.5% (3,352)	66.8% (3,334)	71.7% (7,130)	72.4% (7,181).
Age 50-64	54.8%	67.1% (6,033)	64.5% (1,969)	65.7% (2,003)	71.3% (4,793)	71.3% (4,180)
Past 12-month						
use						
Age 16-19	28.4%	31.6% (1,076)	32.9% (411)	30.9% (403)	39.5% (351)	35.7% (476)
Age 20-25	33.5%	40.0% (1,056)	36.1% (286)	36.8% (271)	48.2% (1,014)	45.2% (1,205)
Age 26-49	19.9%	37.1% (5,514)	34.9% (1,733)	34.9% (1,744)	42.5% (4,229)	43.7% (4,334)
Age 50-64	11.3%	24.6% (2,216)	21.4% (652)	22.8% (696)	29.2% (1,959)	30.2% (1,773)
Past 30-day use						
Age 16-19	16.8%	16.4% (559)	17.3% (216)	15.4% (201)	25.3% (225)	22.1% (295)
Age 20-25	21.7%	25.3% (669)	22.3% (177)	22.6% (167)	32.0% (673)	29.7% (792)
Age 26-49	12.8%	25.7% (3,809)	23.3% (1,157)	23.6% (1,180)	30.5% (3,032)	31.7% (3,143)
Age 50-64	7.5%	17.3% (1,553)	14.1% (429)	15.8% (481)	20.4% (1,370)	21.9% (1,284)

Table 10: Cannabis use in the USA among ICPS 2019 cross-sectional respondents and national surveys

^aData obtained from the 2018 National Survey on Drug Use and Health (NSDUH); ^bNational data weighted using WEIGHT_US_NATIONAL, which are the inflation weights scaled back to the US sample size as a whole. ^d Illegal and legal state data weighted using variable WEIGHT_RESC, which are the inflation weights scaled back to the sample size in the legal states as a group and separately in the illegal states as a group. Source: Cannabis use: Substance abuse and Mental Health Services Administration (SAMHSA). National Survey on Drug Use and Health (NSDUH), 2018. Frequencies computed using the variables MJEVER and MJREC by AGE2. Dataset available at: <u>https://www.datafiles.samhsa.gov/study-dataset/national-survey-drug-use-and-health-2018-nsduh-2018-nsduh-2018-states</u>

Indicator of cannabis	ICPS USA 2018	ICPS USA 2019	ICPS USA	NSDUH <mark>(≥12 years)</mark>
use	(n=17,112)	(n=30,479)	2018-2019 relative	2018-2019 relative
			change	change
				<mark>not yet available</mark>
Ever tried cannabis				
All respondents	56.1% (9,605)	64.0% (19,518)	14.1%	
Age 16-19	31.9% (847)	41.3% (1,407)	29.5%	
Age 20-25	52.7% (393)	60.6% (1,602)	15.0%	
Age 26-49	57.4% (4,667)	68.2% (10,126)	18.8%	
Age 50-64	66.1% (3,436)	67.1% (6,033)	1.5%	
Past 12-month use				
All respondents	26.0% (4,455)	32.7% (9,955)	25.8%	
Age 16-19	26.0% (691)	31.6% (1,076)	21.5%	
Age 20-25	38.5% (287)	40.0% (1,056)	3.9%	
Age 26-49	28.6% (2,321)	37.1% (5,514)	29.7%	
Age 50-64	21.1% (1,100)	24.6% (2,216)	16.6%	
Past 30-day use				
All respondents	16.2% (2,775)	21.8% (6,652)	34.6%	
Age 16-19	12.7% (337)	16.4% (559)	29.1%	
Age 20-25	22.4% (167)	25.3% (669)	12.9%	
Age 26-49	18.0% (1,463)	25.7% (3,809)	42.8%	
Age 50-64	14.7% (764)	17.3% (1,553)	17.7%	
Daily/almost daily use				
All respondents	8.3% (1,415)	12.8% (3,897)	54.2%	
Age 16-19	4.0% (106)	7.4% (252)	85.0%	
Age 20-25	10.0% (74)	16.7% (442)	67.0%	
Age 26-49	9.7% (788)	16.1% (2,385)	66.0%	
Age 50-64	8.1% (420)	8.8% (790)	8.6%	

Table 11: International Cannabis Policy Study 2018-2019 cross-sectional sample comparison, USA, weighted^a (%,n)

^aData are weighted to the national population using the variable WEIGHT_NATIONAL, which are the national inflation weights scaled back to the sample size of the USA.

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- ⁹ Hays RD, Liu H, Kapteyn A. Use of Internet panels to conduct surveys. Behav Res, 2015; 47: 685–690. doi: 10.3758/s13428-015-0617-9