

International Cannabis Policy Study

TECHNICAL REPORT
WAVE 5 (2022)



UNIVERSITY OF
WATERLOO

FUNDING

FUNDING FOR THIS STUDY WAS PROVIDED BY A CANADIAN INSTITUTES OF HEALTH RESEARCH (CIHR) PROJECT GRANT.

ETHICS CLEARANCE

THE PROJECT HAS BEEN REVIEWED BY AND RECEIVED ETHICS CLEARANCE THROUGH A UNIVERSITY OF WATERLOO RESEARCH ETHICS COMMITTEE (ORE#31330).

SUGGESTED CITATION

CORSETTI D, FATAAR F, BURKHALTER R, HAMMOND D. INTERNATIONAL CANNABIS POLICY STUDY TECHNICAL REPORT – WAVE 5 (2022). UNIVERSITY OF WATERLOO; WATERLOO, ON, CANADA. 2023. AVAILABLE AT: <http://cannabisproject.ca/methods/>

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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, as well as the effectiveness of specific regulatory measures, for the following outcomes:

- 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 consists of annual repeat cross-sectional surveys conducted with participants aged 16–65 years living in Canada and the United States (US), as well as Australia and New Zealand (since 2021). This technical report describes the methods for the fifth wave of the ICPS study conducted from September to October 2022. The methodology of the ICPS is also described in the study’s methodology paper.¹

STUDY PROTOCOL

OVERVIEW

Data were collected between September 8 and October 31, 2022. Respondents completed an online survey in English or French. Median survey time was 23.3 minutes, including 35.9 minutes among past 12-month cannabis users and 19.2 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. The ICPS survey was developed over a 2-year period with dedicated grant funding, with subsequent refinements at each annual wave.² First, focus groups were conducted in April 2017 with youth and young adults to examine key concepts. Second, leading international experts were consulted to identify and refine existing survey measures. Third, an extensive pilot test of the ICPS survey was conducted with 1,000 youth and young adults in 2017.³ Fourth, cognitive interviews were conducted in October 2017 with cannabis consumers to examine comprehension and ease of use. A second round of cognitive interviewing was conducted in July and August 2019 to refine new measures related to emerging product types. Finally, in September 2021, a pilot test was conducted with 400 cannabis consumers to pilot the collection of product images through the ICPS survey. This work has yielded several methodological publications related to measurement of cannabis consumption.^{4,5,6,7,8}

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, 2.6% of the analytic sample completed the survey in French (n=1,654).

SURVEY CONTENT

The survey document is available at: <http://cannabisproject.ca/methods/>. The survey includes modules in 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; and

- socio-demographics, postal code, and socio-economic status.

SAMPLE RECRUITMENT

SAMPLE ELIGIBILITY

Individuals were eligible to participate if they resided in a Canadian province, US state, Australia, or New Zealand, were 16–65 years of age at the time of recruitment, and had access to the internet. In Canada, respondents 66 years and over were also eligible.

RECRUITMENT AND CONSENT

The ICPS sample was recruited using non-probability sampling methods using the *Nielsen Consumer Insights Global Panel*, which maintains panels in Canada, the US, Australia, and New Zealand (<http://www.nielsen.com/ca/en/about-us.html>). 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 previous waves were identified using their unique panel ID. The Nielsen panels are recruited using both probability and nonprobability sampling methods in each country. Comparisons between the sample profile and national estimates from benchmark population-based surveys are provided below.

RESPONSE RATES

Table 1 shows outcomes for respondent recruitment for the 2022 ICPS survey. Overall, 3,232,603 individuals were sent an email invitation to the main survey, of whom 116,591 respondents accessed the survey link. A total of 25,857 respondents of respondents who accessed the link (22.2%) partially completed the survey and 70,798 (60.7%) completed the survey.

As shown in Table 1, 8,603 respondents were terminated. Reasons included ‘forced’ termination due to residence in countries other than Canada, US, Australia, or New Zealand (n=306), residence in the Canadian territories (n=88), ineligible age (<16 in all countries (n=552) or >65 in all countries with the exception of Canada (n=56)), and failure to provide consent (n=5,813). Participants were also excluded if they did not provide a valid response to mandatory survey questions, including sex at birth (n=41), province (n=4) or state (n=6), ‘Have you ever tried marijuana?’ (n=337), ‘When was

the last time you used marijuana?’ (n=225), and ‘How often do you use marijuana?’ (n=62). In addition, participants were excluded due to duplicate entries and other data quality issues flagged by Nielsen; or because the respondent opted out of the commercial panel after the invitation was sent.

The total participation rate was 2.2%. As shown in Table 1, 3,232,603 invitations were sent to panelists; 116,591 potential respondents (3.6%) accessed the survey link; and 70,798 respondents (2.2%) completed the survey. For commercial panels that include non-probability based sample, the American Association for Public Opinion Research (AAPOR) recommends reporting the ‘participation rate’, also referred to a ‘completion rate’.⁹ The participation rate is defined as “the number of respondents who have provided a usable response divided by the total number of initial personal invitations requesting participation”.⁹ Participation rates are largely a product of sample management and the amount of sample that is ‘released’ prior to reaching target quotas. The cooperation rate represents the proportion of all cases interviewed of all eligible individuals ever contacted. Across all countries, the cooperation rate was 60.7%, which was calculated based on AAPOR Cooperation Rate #2 as the percentage of respondents who completed the survey (70,798) of eligible respondents those who accessed the survey link (116,591).

DATA INTEGRITY

Among the respondents who completed the survey, a further 6 who identified as intersex and an unknown gender identity were excluded due to cell counts insufficient for weighting, and an additional 752 were excluded for speeding (n=313), duplicate entries (n=409), or unidentified region (n=30).

Due to the potentially sensitive nature of the subject matter (e.g., non-medical cannabis was classified as an illegal substance federally in the USA, Australia and New Zealand at the time of the 2022 survey), at the end of the survey, respondents were asked whether they felt they were able to answer the questions honestly. The 1,595 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 5,227 respondents were excluded from the analytic sample due to discrepancies with the month selected or poor data quality. The final analytic sample included 63,218 total respondents and 62,126 respondents aged 16–65 years.

RETURNING COHORT

A total of 0.8% of the sample comprised cohort members from the first four survey waves (of the 0.8%, there are 0.7% from 2021 only). These respondents were retained in the 2022 analytic sample because no efforts were made to recruit returning cohort members in 2022.

Table 1: Dispositions of potential respondents in the International Cannabis Policy Study, by country (ICPS) 2022

Disposition	Total		Canada		USA		Australia		New Zealand	
	n	%	n	%	n	%	n	%	n	%
NIELSEN PANEL										
Total invitations	3,232,603	100%	497,423	100%	2,299,415	100%	240,623	100%	195,142	100%
Accessed survey ^a	116,591	3.6%	27,489	5.5%	70,993	3.1%	10,360	4.3%	4730	2.4%
Terminated survey ^a	8,603	0.3%	1,721	0.3%	5,278	0.2%	466	0.2%	192	0.1%
Over quota, excluded ^b	11,333	0.4%	1,355	0.3%	3,879	0.2%	5,649	2.3%	450	0.2%
Partially completed survey ^a	25,857	0.8%	5,372	1.1%	17,079	0.7%	745	0.3%	588	0.3%
Completed survey	70,798	2.2%	19,041	3.8%	44,757	1.9%	3500	1.5%	3500	1.8%
Excluded – dishonesty ^c	1,595	<0.1%	441	0.1%	878	<0.1%	119	<0.1%	157	0.1%
Excluded – data quality ^d	5,227	0.2%	1,314	0.3%	3,247	0.1%	349	0.1%	317	0.2%
Excluded – unidentified sex ^e	6	<0.1%	0	0%	5	<0.1%	1	<0.1%	0	0%
Excluded – speeding ^f	313	<0.1%	126	<0.1%	76	<0.1%	24	<0.1%	87	<0.1%
Excluded – duplicates ^g	409	<0.1%	126	<0.1%	131	<0.1%	112	<0.1%	40	<0.1%
Excluded – unidentified	30	<0.1%	0	0%	0	0%	29	<0.1%	1	<0.1%
region ^h										
TOTAL ANALYTIC SAMPLE (including 66+)	63,218		17,034		40,420		2,866		2,898	
TOTAL ANALYTIC SAMPLE (16–65 years)	62,126		15,942		40,420		2,866		2,898	

^a Because 306 respondents who reported residing in ‘other’ countries were terminated and an additional 2,713 respondents who were terminated or partially completed the survey did not indicate their country of residence, frequencies for 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=88) or with unstated province (n=4) or state (n=6). ^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. ^d A total of 5,227 respondents from the Nielsen panel who incorrectly answered the data quality check question, “What is the current month?” were excluded. Respondents who indicated a month ≤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. ^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 6 respondents who identified their sex as ‘intersex’ and their gender identity as ‘other’/unstated were excluded due to insufficient cell counts for weighting. ^f Respondents were excluded if their total survey time was <25% of the median survey time; this median value was calculated separately for two groups: those who *had* and had *not* used cannabis in the past 12 months (the latter was expected to complete the survey more quickly due to skip logic). ^g Duplicate cases who matched on 20 sociodemographic variables (including postal/zip code) were identified; the first entry for each was retained and the remaining 494 were excluded. ^h Thirty respondents in Australia and New Zealand were excluded due to an unidentified region

DEVICE USE

Data is collected on respondents' browser type. Overall, over half of all respondents (including those excluded for data integrity) completed the survey on a smartphone (57.5%) or tablet (2.9%), and the remainder on a desktop/laptop computer (39.6%). Age, sex and past 12-month cannabis use differed significantly by device type ($p < 0.001$ for all). In general, more females used smartphones and tablets, whereas more males used a computer. Younger respondents tended to use smartphones, whereas older respondents tended to use tablets and computers. Use of smartphones was more common among past 12-month cannabis consumers, whereas more non-consumers used tablets and computers.

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 all countries 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 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 in variable CURRENT_USE_DV. This affected 4.4% (n=970) of past 12-month cannabis users.

SURVEY WEIGHTS

Post-stratification sample weights were constructed based on the Canadian, US, Australian and New Zealand Census estimates and calibration to the trends over time for current smoking as indicated by benchmark national surveys. Respondents from Canada who were ages 16-65 were classified into age-by-sex-by-province, education, and age-by-smoking status groups. Starting in the 2022 wave, respondents from the US were classified into age-by-sex-by-state, education-by-state, region-by-race, and age-by-smoking status groups where state was grouped for all states with small samples and 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). Previous to the 2022 wave, US respondents were weighted separately by legal status of their state of residence. Respondents from Australia were classified into age-by-sex-by-state/territory, education, ethnicity-by-state/territory, and, starting in 2022, age-by-smoking status groups. There were seven state/territory groups, including six individual state/territories (New South Wales, Victoria, Queensland, South Australia, Western Australia, and Australian Capital Territory), and Tasmania and Northern Territory were merged. Respondents from New Zealand were classified into age-by-sex-by-region, education, ethnicity-by-region, and, starting in 2022, age-by-smoking status groups. In New Zealand, region was defined as the following six grouped regions (Northland/Auckland, Waikato/Bay of Plenty, Gisborne/Hawke's Bay/Taranaki/Manawatu-Wanganui, Wellington, Tasman/Nelson/Marlborough/West Coast/Southland/Otago, and Canterbury). Correspondingly grouped population count and proportion estimates were obtained from Statistics Canada,^{10,11} the U.S. Census Bureau^{12,13} the Australian Bureau of Statistics^{14,15,16} and Stats NZ.^{17,18,19} For Canada, the percent change in the smoking rate from the 2020 to 2021 Canadian Community Health Survey (CCHS)²⁰ was used to determine the smoking rate for the ICPS 2022 survey weights. It was assumed that the rate of decline in smoking between ICPS 2021 and 2022 was the same as that between CCHS 2020 and 2021. For the US, it was assumed that the rate of decline in smoking between ICPS 2021 and ICPS 2022 was the

same as the yearly rate of decline in the Behavioral Risk Factor Surveillance System (BRFSS) from 2019 to 2021.²¹ In Australia, it was assumed that the changes seen in both current and ever smoking between ICPS 2021 and ICPS 2022 was the same as yearly changes seen in the National Health Survey between 2014/15 and 2020/21.²² In New Zealand, it was assumed that the changes seen in both current and ever smoking between ICPS 2021 and ICPS 2022 was the same as yearly changes seen in the New Zealand Health Survey between 2019 and 2021.²³ Separately by country, a raking algorithm was applied to the cross-sectional analytic sample (n=63,218) to compute weights that were calibrated to these groupings. The SAS macro "RAKE_AND_TRIM_G4_V5"²⁴ was used, with trimming to 5 (rescaled) if necessary, in all jurisdictions except the US where the trimming was set to 12 (rescaled) due to differing sampling ratios by state. Weights were rescaled to the sample size for each country.

SAMPLE SOCIODEMOGRAPHIC PROFILE

The demographic characteristics of the cross-sectional sample are shown in Table 2. Frequencies by state/province/region are shown in Table 3.

Table 2: International Cannabis Policy Study (ICPS) 2022 cross-sectional sample characteristics 16–65 (n=62,126)

	Canada n=15,942		US n=40,420		Australia n=2,866		New Zealand n=2,898	
	Unweighted % (n)	Weighted ^a % (n)	Unweighted % (n)	Weighted ^a % (n)	Unweighted % (n)	Weighted ^a % (n)	Unweighted % (n)	Weighted ^a % (n)
Sex								
Female	62.9% (10,025)	49.6% (7,913)	69.8% (28,218)	49.9% (20,151)	53.2% (1,525)	50.2% (1,439)	54.1% (1,567)	50.2% (1,454)
Male	37.1% (5,917)	50.4% (8,029)	30.2% (12,202)	50.1% (20,269)	46.8% (1,341)	49.8% (1,427)	45.9% (1,331)	49.8% (1,444)
Age (years)								
mean (SD)	43.0 (14.1)	40.7 (14.5)	42.2 (14.5)	40.1 (14.9)	40.9 (14.2)	40.3 (13.9)	41.6 (13.6)	40.2 (14.1)
Age group								
16–25	13.6% (2,176)	18.6% (2,959)	15.8% (6,384)	19.8% (7,998)	20.3% (582)	19.4% (556)	15.3% (442)	19.8% (572)
26–35	20.0% (3,186)	21.5% (3,424)	18.7% (7,542)	21.5% (8,677)	19.0% (544)	22.1% (634)	23.2% (671)	22.7% (659)
36–45	21.6% (3,439)	20.5% (3,263)	22.1% (8,920)	19.9% (8,048)	22.2% (636)	21.1% (605)	21.4% (620)	19.3% (559)
46–55	19.0% (3,029)	18.8% (3,003)	19.3% (7,818)	19.0% (7,687)	17.1% (489)	19.3% (554)	18.9% (548)	19.7% (572)
56–65	25.8% (4,112)	20.7% (3,294)	24.1% (9,753)	19.8% (8,009)	21.5% (615)	18.0% (517)	21.3% (617)	18.5% (536)
Ethnicity								

Majority	69.0 % (11,003)	66.8% (10,656)	78.8% (31,831)	75.4 (30, 474)	75.0% (2,150)	74.3% (2,130)	62.8% (1,820)	58.4% (1,692)
Other/Mixed/ Unstated	31.0% (4,939)	33.2% (5,286)	21.2% (8,589)	24.6% (9,946)	25.0% (716)	25.7% (736)	37.2% (1,078)	41.6% (1,206)

SD, standard deviation. ^a Weighted data are scaled to the unweighted sample size in each country.

The weighted ICPS sample was compared with national census/benchmark estimates for Canada, the US, Australia, and New Zealand for socio-demographic profile (see Tables 4–7). The Canadian ICPS sample was similar to the national population in terms of education level, and fairly similar in terms of ethnicity. Compared to the national US population, the US sample had fewer respondents with less than a high school education, but a similar percentage with high school or more, and Bachelor’s 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 somewhat poorer self-reported general health compared to the national populations in the US, which is a feature of many non-probability samples,²⁵ 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.²⁶ The Australian ICPS sample was similar to the national population in terms of ethnicity and fairly similar in terms of education level. The ICPS New Zealand sample had fewer respondents with less than high school education and more with a high school diploma or equivalent, while ethnicity was similar to national estimates.

Table 3: Proportion of 2022 respondents aged 16–65 by region (n=62,126)

Canadian Province (n=15,942)	Unweighted % (n)	Weighted^b % (n)
Ontario	28.9% (4,602)	39.5% (6,291)
Quebec	14.7% (2,341)	21.8% (3,474)
British Columbia	11.9% (1,891)	13.9% (2,217)
Alberta	19.0% (3,030)	11.9% (1,898)
Nova Scotia	5.3% (839)	2.6% (414)
Manitoba	4.7% (748)	3.6% (570)
Saskatchewan	4.7% (746)	3.0% (475)
New Brunswick	5.1% (810)	2.0% (324)
Newfoundland & Labrador	4.3% (693)	1.3% (210)
Prince Edward Island	1.5% (242)	0.4% (70)
US State (n=40,420)		
Illinois	8.1% (3,261)	3.8% (1,552)
Washington State	7.7% (3,131)	2.4% (956)
New Jersey	4.4% (1,786)	2.8% (1,134)
Massachusetts	8.4% (3,389)	2.2% (876)
Colorado	4.5% (1,813)	1.8% (734)
Minnesota	8.4% (3,388)	1.7% (687)
Oregon	5.3% (2,139)	1.3% (517)
Texas	3.1% (1,268)	9.0% (3,633)

Florida	3.2% (1,302)	6.4% (2,571)
Virginia	2.0% (809)	2.6% (1,066)
Connecticut	1.9% (782)	1.1% (445)
Arizona	2.9% (804)	2.1% (866)
Nevada	1.9% (788)	1.0% (384)
Michigan	2.0% (813)	3.0% (1,216)
New York	8.5% (3,444)	6.0% (2,436)
California	2.2% (874)	12.1% (4,880)
Pennsylvania	1.9% (774)	3.9% (1,563)
New Mexico	1.9% (769)	0.6% (251)
Ohio	1.7% (697)	3.9% (1,563)
Georgia	1.5% (594)	3.5% (1,400)
Maine	1.8% (730)	0.4% (165)
Montana	1.4% (553)	0.3% (131)
North Carolina	1.3% (530)	2.9% (1,170)
Alaska	0.8% (322)	0.2% (91)
Tennessee	0.9% (377)	1.9% (785)
Missouri	0.8% (320)	2.1% (846)
Indiana	0.9% (361)	1.9% (771)
South Carolina	0.7% (296)	1.6% (658)
Kentucky	0.8% (311)	1.5% (602)
Alabama	0.7% (281)	1.4% (561)
Oklahoma	0.5% (210)	1.0% (410)
Wisconsin	0.7% (292)	1.5% (612)
Vermont	0.8% (330)	0.2% (79)
Maryland	0.6% (261)	1.5% (603)
District of Columbia	0.2% (77)	0.6% (233)
Louisiana	0.6% (254)	1.4% (558)
Arkansas	0.5% (201)	1.1% (424)
Mississippi	0.5% (196)	1.0% (403)
Iowa	0.4% (142)	0.8% (335)
West Virginia	0.3% (128)	0.6% (240)
Kansas	0.3% (131)	0.8% (343)
Utah	0.3% (123)	1.1% (448)
Nebraska	0.2% (89)	0.5% (214)
Delaware	0.1% (54)	0.3% (118)
Idaho	0.2% (64)	0.5% (192)
New Hampshire	0.3% (123)	0.5% (201)
Rhode Island	0.2% (77)	0.3% (108)
Hawaii	2.2% (884)	0.4% (170)
Wyoming	0.0% (19)	0.1% (56)
South Dakota	0.1% (34)	0.2% (94)
North Dakota	0.1% (25)	0.2% (66)

Australian**state or territory** (n=2,866)

New South Wales (NSW)	27.7% (795)	31.2% (894)
Victoria (VIC)	24.5% (702)	25.8% (739)
Queensland (QLD)	19.5% (558)	20.4% (584)
Western Australia (WA)	10.1% (291)	10.7% (308)
South Australia (SA)	6.6% (189)	6.8% (196)
Australian Capital Territory (ACT)	8.6% (248)	1.8% (53)
Tasmania (TAS)	2.1% (60)	2.3% (68)
Northern Territory (NT)	0.8% (23)	0.8% (23)

New Zealand region (n=2,898)

Auckland	40.1% (1163)	35.3% (1024)
Canterbury	11.6% (336)	12.8% (370)
Wellington	10.7% (310)	11.0% (320)
Waikato	8.1% (235)	10.4% (300)
Bay of Plenty	5.0% (144)	5.4% (156)
Manawatu-Wanganui	5.7% (165)	5.0% (145)
Otago	3.9% (113)	4.8% (139)
Northland	3.0% (87)	3.2% (156)
Hawke's Bay	3.5% (102)	3.1% (91)
Taranaki	2.6% (77)	2.4% (69)
Southland	1.7% (49)	1.9% (55)
Nelson	1.5% (44)	1.9% (56)
Gisborne	0.5% (15)	0.8% (22)
Marlborough	0.8% (24)	0.9% (25)
West Coast	0.6% (19)	0.5% (15)
Tasman	0.5% (15)	0.6% (17)

^aData are weighted to the national population using the variable WEIGHT_RESC in Canada, US, Australia, and New Zealand, which are the inflation weights scaled back to the sample size of Canada, US, Australia, and New Zealand.

Table 4: Comparison between 2022 ICPS sample and sociodemographic profile in Canada

Census 2021^a, age 15+		ICPS 2022, Canada, age 16–65	
	%	Unweighted % (n)	Weighted^d % (n)
		(n=15,765)	(n=15,737)
Education			
Less than high school	13.9%	9.0% (1,415)	13.8% (2,169)
High school diploma or equivalent	26.3%	14.5% (2,283)	26.3% (4,138)
Some college or technical training or diploma	31.0%	39.2% (6,183)	31.0% (4,885)
Bachelor's degree or higher	28.8%	37.3% (5,884)	28.9% (4,545)
Census 2021^a, all ages		ICPS 2022, Canada, age 16–65 (n=15,942)	
	%	Unweighted % (n)	Weighted^d % (n)
Ethnicity			
White	69.8%	69.0% (11,003)	66.8% (10,656)
Chinese (ICPS: East and Southeast Asian)	4.7%	8.7% (1,382)	8.8% (1,405)
Indigenous	5.0%	2.4% (388)	2.4% (388)
South Asian	7.1%	4.3% (692)	4.6% (738)
Black	4.3%	4.7% (749)	5.3% (850)
Other/Mixed/Unstated (ICPS: also includes Latinx and Middle Eastern)	9.1%	10.9% (1,728)	11.9% (1,903)

^a Data obtained from the Canada Census 2021; values from ICPS 2022 exclude Don't know/Refuse to answer (n=177, 1.1%); ^b Data obtained from the Canadian Community Health Survey 2015. ^d Data weighted using the variable WEIGHT_RESC, which are the inflation weights scaled back to the sample size of Canada.

Table 5: Comparison between 2022 ICPS sample and census sociodemographic profile in the United States (US)

ACS 2021 ^a , age 18–64		ICPS 2022, US, age 18–65	
		Unweighted % (n)	Weighted ^d % (n)
%		(n=37,500) ^e	(n=35,577)
Education			
Less than high school	10.8%	3.1% (1,173)	3.8% (1,368)
High school or more (but not Bachelor's)	56.8%	55.3% (20,736)	61.0% (21,707)
Bachelor's degree or higher	32.4%	41.6% (15,591)	35.1% (12,501)
US Census 2020 ^b age 16–65 %		ICPS, 2022, US, age 18–65	
		Unweighted % (n)	Weighted % (n)
		(n=37,760)	(n=35,823)
Ethnicity (exclusive categories)			
White	75.8%	78.7% (29,745)	75.4% (26,991)
Black or African American	13.6%	8.5% (3,205)	14.2% (5,073)
Asian	6.1%	4.2% (1,577)	3.7% (1,329)
American Indian or Alaskan Native	1.3%	1.2% (467)	1.2% (427)
Native Hawaiian or Pacific Islander	0.3%	0.9% (324)	0.4% (146)
Other/≥2 races/ unstated	2.9%	6.5% (2,442)	5.2% (1,856)
Hispanic origin	18.9%	10.7% (4,039)	12.9% (4,624)
NHIS 2021 ^c age ≥18 %		ICPS, 2022, US, age 18–65	
		Unweighted % (n)	Weighted % (n)
		(n=37,459) ^f	(n=35,565)
Self-rated health			
Excellent	22.6%	12.0% (4,497)	14.3% (5,082)
Very good	34.3%	30.2% (11,329)	27.9% (9,931)
Good	28.3%	36.3% (13,614)	35.8% (12,738)
Fair	11.4%	17.2% (6,447)	17.9% (6,359)
Poor	3.4%	4.2% (1,572)	4.1% (1,455)

^a Data obtained from the American Community Survey (ACS) 2021. ^b Data obtained from the US Census 2020. ^c Data obtained from the National Health Interview Survey (NHIS) 2021. ^d National data weighted using WEIGHT_RESC, which are the inflation weights scaled back to the US sample size as a whole. ^e ICPS 2022 data exclude 'Don't know' and 'Refuse to answer' (n=260, 0.7%). ^f ICPS 2022 data exclude 'Don't know' and 'Refuse to answer' (n=301, 0.8%).

Table 6: Comparison between 2022 ICPS sample and sociodemographic profile in Australia

Australian Bureau of Statistics 2021 ^a age 15–74		ICPS 2022, Australia, age 16–65 (n=2,847) ^b	
%		Unweighted % (n)	Weighted % (n)
Education			
Less than high school	21.4%	15.5 (441)	17.2 (493)
High school diploma or equivalent	17.5%	19.7 (560)	22.3 (635)
Some college or technical training or diploma	27.1%	28.7 (816)	27.6 (786)
Bachelor's degree or higher	32.1%	36.2 (1,030)	32.8 (935)
Australian Bureau of Statistics 2021 ^b all people		ICPS 2022, Australia, age 16–65 (n=2,866)	
%		Unweighted % (n)	Weighted % (n)
Ethnicity			
English only	72.0%	75.0 (2,150)	74.3 (2,130)
Other	24.8%	25.0 (716)	25.7 (736)

^aData obtained from the Australian Bureau of Statistics 2021 (<https://www.abs.gov.au/statistics/people/education/education-and-work-australia/latest-release#data-download>). ^b2021 Australia, Census All persons QuickStats | Australian Bureau of Statistics ([abs.gov.au](https://www.abs.gov.au)) ^cICPS 2022 data exclude 'Don't know' and 'Refuse to answer' (n=19, 0.7%).

Table 7: Comparison between 2022 ICPS sample and sociodemographic profile in New Zealand

Census 2018 ^a age ≥15		ICPS 2022, New Zealand, age 16–65 (n=2,867)	
%		Unweighted % (n)	Weighted % (n)
Education			
Less than high school	18.2%	2.7 (76)	6.0 (172)
High school diploma or equivalent	38.3%	24.4 (699)	48.1 (1,378)
Some college or technical training or diploma	18.7%	25.7 (738)	18.8 (538)
Bachelor's degree or higher	24.8%	47.2 (1,354)	27.1 (777)
Census 2018 ^a age ≥15		ICPS 2022, New Zealand, age 16–65 (n=2,898)	
%		Unweighted % (n)	Weighted % (n)
Ethnicity			
New Zealand European	64.1%	62.8 (1,820)	58.4 (1,692)
Maori	16.5%	16.4 (476)	21.0 (608)

^aData obtained from the NZ Census 2018: <https://www.stats.govt.nz/information-releases/2018-census-totals-by-topic-national-highlights-updated>. ^bICPS 2022 data exclude 'Don't know' and 'Refuse to answer' (n=31, 1.1%).

CANNABIS USE – COMPARISONS WITH NATIONAL BENCHMARK SURVEYS

COMPARISONS WITH NATIONAL BENCHMARKS

Tables 9–14 show estimates of cannabis use among ICPS respondents compared with population estimates from national benchmark surveys.

In the Canadian ICPS sample, cannabis prevalence was generally lower than national estimates for youth/young adults. Mean age of initiation of cannabis use was similar to national estimates. Prevalence of use of dried flower and other product types among past 12-month consumers was similar to national estimates, with the exception of oils for ingestion, solid concentrates and topical ointments which were higher among ICPS respondents.

In the US ICPS sample, lifetime cannabis estimates were similar to national estimates for youth/young adults and higher than national estimates among adults. ICPS estimates of past 12-month and 30-day use were similar to national estimates for 16–25-year-olds and 18–25-year-olds, and higher among older age groups.

In the Australian ICPS sample, past 12-month cannabis prevalence was generally lower than national estimates for youth/young adults and higher than national estimates among adults. Of note, national 2021 data for Australia were unavailable at the time of writing; comparisons to 2019 data may not reflect secular changes in cannabis use that occurred from 2019–2021.

In the New Zealand ICPS sample, past 12-month cannabis prevalence was generally lower than national estimates for youth/young adults and higher than national estimates among adults 25 and over.

Table 8: Indicators of cannabis use among 2022 ICPS cross-sectional respondents aged 16–65, weighted

Indicator	All ICPS respondents n=62,126				Past 12-month cannabis users n=21,377			
	Canada n=15,942	US n=40,420	Australia n=2,866	New Zealand n= 2,898	Canada n=5,477	US n=14,615	Australia n=579	New Zealand n=706
Ever tried cannabis								
Yes	61.8% (9,846)	63.7% (25,748)	57.7% (1654)	63.3% (1835)	100%	100%	100%	100%
Cannabis use status^a								
Never user	38.2% (6,096)	36.3% (14,672)	42.3% (1,212)	36.7% (1,063)	--	--	--	--
Used >12 months ago	26.3% (4,198)	29.6% (11,977)	37.0% (1,060)	35.6% (1,031)	--	--	--	--
Used in past 12 months	10.3% (1,638)	9.0% (3,654)	6.0% (173)	7.6% (221)	29.0% (1,638)	26.5% (3,654)	29.1% (173)	27.5% (221)
Monthly use	6.9% (1,095)	6.5% (2,618)	5.4% (155)	8.0% (232)	19.4% (1,095)	19.0% (2,618)	26.2% (155)	28.9% (232)
Weekly use	6.3% (999)	5.3% (2,155)	2.5% (70)	4.5% (131)	17.7% (999)	15.6% (2,155)	11.9% (70)	16.3% (131)
Daily/almost daily use	12.0% (1,916)	13.2% (5,343)	6.8% (195)	7.6% (219)	33.9% (1,916)	38.8% (5,343)	32.9% (195)	27.3% (219)

^a Exclusive categories ('Used in past 12 months' does not include monthly, weekly, or daily/almost daily users)

Table 9: Cannabis use in Canada among ICPS 2022 cross-sectional respondents aged 16–65 and national surveys

	CCS 2022 ^a age ≥16 n=10,045 %	ICPS 2022, Canada, age 16–65 n=15,942	
		Unweighted %	Weighted %
Lifetime (ever) use	58.8%	63.3%	61.8%
16–19	46.4%	34.0%	33.0%
16–24	--	47.0%	43.9%
20–24	67.1%	57.2%	55.9%
25–44	--	68.7%	69.7%
45–64	--	62.6%	60.9%
Past 12-month use	27.2%	34.4%	35.4%
Age 16–19	36.8%	27.9%	26.5%
Age 20–24	50.2%	39.9%	41.0%
Past 30-day use	18.7%	22.5%	23.7%
Age 16–19	24.8%	16.1%	15.4%
Age 20–24	36.5%	23.4%	24.3%
Frequency of cannabis use (past 12-month users)			
Monthly	17.2%	19.5%	19.4%
Weekly	23.3%	16.5%	17.7%
Daily/almost daily	25.2%	32.5%	33.9%
Initiation to cannabis use			
Mean age (years)	20.5	21.4	20.1
16–19	15.9	15.4	15.4
20–24	17.4	17.5	17.3
Products used (current users)			
Dried flower*	65.3%	65.7%	68.0%
Edibles (foods)	52.7%	55.5%	51.7%
Vaped*	33.3%	30.7%	31.3%
Hash/kief	17.7%	18.9%	21.2%
Oils for oral ingestion	22.3%	31.1%	29.4%
Solid concentrates	12.2%	16.2%	18.0%
Topical ointments	8.3%	18.0%	16.6%
Beverages	18.8%	21.0%	20.9%

^aData obtained from the 2021 Canadian Cannabis Survey (CCS) (CCS2022_DetailedTables-EN.pdf (lac-bac.gc.ca) in which cannabis users may have been more likely to complete the study compared to other surveys such as CSTADS *Note that ICPS asks about dried herb (smoked or vaped) separate from oils/liquids for vaping, whereas CCS asks about use of dried flower versus use of a vape pen or cartridge. Thus, CCS estimates for vaping include vaporizing dried flower, which is captured in the 'dried flower' estimate for ICPS.

Table 10: International Cannabis Policy Study annual changes in cannabis estimates, Canada, weighted^a

Indicator of cannabis use	ICPS Canada 2018 n=10,057	ICPS Canada 2019 n=15,256	ICPS Canada 2020 n=15,780	ICPS Canada 2021 n=16,952	ICPS Canada 2022 n=15,942
Ever tried cannabis					
All respondents	56.5%	62.0%	60.7%	61.9%	61.8%
Age 16-19	32.0%	36.1%	33.8%	32.6%	33.0%
Age 20-24	57.2%	61.6%	59.3%	51.9%	55.9%
Age 25-44	61.8%	69.4%	67.4%	69.4%	69.7%
Age 45-64	59.8%	61.7%	63.0%	62.3%	60.9%
Past 12-month use					
All respondents	27.5%	35.3%	34.1%	36.3%	35.3%
Age 16-19	25.9%	29.3%	27.7%	26.6%	26.5%
Age 20-24	40.5%	46.1%	44.5%	37.6%	41.0%
Age 25-44	34.8%	43.6%	42.0%	45.9%	43.4%
Age 45-64	20.5%	27.6%	28.0%	28.9%	28.2%
Past 30-day use					
All respondents	18.7%	23.6%	23.5%	25.6%	23.7%
Age 16-19	15.1%	15.5%	16.1%	14.2%	15.4%
Age 20-24	25.5%	28.5%	30.2%	24.3%	24.3%
Age 25-44	24.1%	30.0%	30.0%	33.3%	29.5%
Age 45-64	14.5%	18.8%	19.3%	20.7%	19.5%
Daily/almost daily use					
All respondents	8.9%	11.3%	11.8%	13.6%	12.0%
Age 16-19	5.4%	5.5%	6.3%	5.3%	6.1%
Age 20-24	11.6%	14.3%	17.5%	14.2%	13.3%
Age 25-44	11.5%	15.1%	15.4%	19.0%	15.0%
Age 45-64	7.5%	8.8%	9.6%	10.0%	10.1%

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

Table 11: Cannabis use in the USA among ICPS 2022 cross-sectional respondents and national surveys

NSDUH 2021 ^a age ≥12 n=69,850		ICPS 2022 US age 16–65 n=40,420	
Cannabis use	%	Unweighted %	Weighted ^b %
Ever (lifetime) use			
Age 16–25	44.9%	51.5%	46.7%
Age 18–25	49.9%	60.2%	57.4%
Age 26–49	54.7%	72.2%	67.9%
Age 50–54	50.1%	70.0%	66.1%
Age 55–59	50.2%	70.9%	67.4%
Age 60–64	54.0%	72.8%	69.8%
Past 12-month use			
Age 16–25	32.4%	37.4%	34.1%
Age 18–25	35.4%	41.5%	38.5%
Age 26–49	24.6%	41.8%	39.4%
Age 50–54	15.2%	32.6%	30.1%
Age 55–59	14.2%	28.0%	25.0%
Age 60–64	13.0%	26.4%	24.4%
Past 30-day use			
Age 16–25	21.7%	23.5%	20.9%
Age 18–25	24.1%	27.7%	26.2%
Age 26–49	17.5%	28.6%	26.6%
Age 50–54	10.6%	22.5%	21.1%
Age 55–59	9.8%	19.4%	17.5%
Age 60–64	9.8%	17.9%	15.9%

^aData obtained from the 2020 National Survey on Drug Use and Health (NSDUH); ^bNational data weighted using WEIGHT_RESC, which are the inflation weights scaled back to the US sample size as a whole. Source: Substance abuse and Mental Health Services Administration (SAMHSA). Key Substance Use and Mental Health Indicators in the United States: Results from the 2020 National Survey on Drug Use and Health. 2021:

<https://www.samhsa.gov/data/sites/default/files/reports/rpt39441/NSDUHDetailedTabs2021/NSDUHDetailedTabs2021/NSDUHDetTabsSection2021.htm>

Table 12: International Cannabis Policy Study cross-sectional sample comparison, United States, weighted^a

Indicator of cannabis use	ICPS US 2018 n=17,112	ICPS US 2019 n=30,479	ICPS US 2020 n=29,900	ICPS US 2021 n=30,081	ICPS US 2022 n=40,420
Ever tried cannabis					
All respondents	56.1%	64.0%	58.8%	64.1%	63.7%
Age 16-19	31.9%	41.3%	32.5%	40.2%	39.6%
Age 20-25	52.7%	60.6%	52.4%	51.8%	58.8%
Age 26-49	57.4%	68.2%	62.7%	69.0%	67.9%
Age 50-64	66.1%	67.1%	64.5%	68.3%	67.8%
Past 12-month use					
All respondents	26.0%	32.7%	29.3%	34.2%	34.1%
Age 16-19	26.0%	31.6%	23.9%	29.3%	31.3%
Age 20-25	38.5%	40.0%	36.7%	34.2%	39.1%
Age 26-49	28.6%	37.1%	34.3%	40.2%	39.4%
Age 50-64	21.1%	24.6%	22.6%	26.9%	26.5%
Past 30-day use					
All respondents	16.2%	21.8%	19.5%	23.2%	22.7%
Age 16-19	12.7%	16.4%	13.9%	17.2%	17.5%
Age 20-25	22.4%	25.3%	24.2%	23.0%	26.7%
Age 26-49	18.0%	25.7%	22.9%	27.5%	26.6%
Age 50-64	14.7%	17.3%	15.6%	18.9%	18.2%
Daily/almost daily use					
All respondents	8.3%	12.8%	11.8%	13.7%	13.2%
Age 16-19	4.0%	7.4%	7.8%	8.3%	8.0%
Age 20-25	10.0%	16.7%	15.3%	15.2%	17.2%
Age 26-49	9.7%	16.1%	14.5%	16.9%	16.3%
Age 50-64	8.10%	8.8%	8.5%	10.2%	9.8%

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

Table 13: Cannabis use in Australia among ICPS 2022 cross-sectional respondents and national surveys

NDSHS 2019 ^a age ≥14 n=22,274		ICPS 2022 Australia age 16–65 n=2,866	
Cannabis use	%	Unweighted %	Weighted %
Ever (lifetime) use			
Age 18+	38.1%	–	–
Age 14–19	18.2%	–	–
Age 15–24	32.6%	24.6%	22.9%
Age 18–24	39.6%	46.3%	40.2%
Age 20–29	43.8%	61.7%	59.1%
Age 30–39	47.2%	69.5%	67.4%
Age 40–49	49.4%	57.6%	54.1%
Age 50–59	43.1%	59.2%	58.5%
Age 60+	18.9%	–	–
Age 65+	13.3%	–	–
Past 12-month use			
Age 18+	11.8%	–	–
Age 14–19	13.3%	–	–
Age 15–24	21.6%	15.9%	16.1%
Age 18–24	25.4%	24.4%	21.8%
Age 20–29	23.8%	26.9%	27.2%
Age 30–39	13.7%	26.8%	29.1%
Age 40–49	11.4%	18.2%	18.0%
Age 50–59	9.2%	16.3%	15.2%
Age 60+	2.9%	–	–
Age 65+	1.8%	–	–

^aData obtained from the 2019 National Drug Strategy Household Survey (NDSHS) (<https://www.aihw.gov.au/reports/alcohol/alcohol-tobacco-other-drugs-australia/contents/drug-types/cannabis>).

Table 14: International Cannabis Policy Study cross-sectional sample comparison, Australia, weighted^a

Indicator of cannabis use	ICPS AUS 2021 n=2,925	ICPS AUS 2022 n=2,866
Ever tried cannabis		
All respondents	52.9%	57.7%
Age 16-19	36.1%	29.1%
Age 20-25	43.0%	56.5%
Age 26-49	56.1%	60.8%
Age 50-64	44.6%	57.2%
Past 12-month use		
All respondents	19.0%	20.7%
Age 16-19	22.4%	18.2%
Age 20-25	20.0%	27.3%
Age 26-49	22.0%	23.8%
Age 50-64	13.5%	12.4%
Past 30-day use		
All respondents	9.7%	11.1%
Age 16-19	10.4%	8.5%
Age 20-25	8.0%	9.1%
Age 26-49	11.1%	13.6%
Age 50-64	8.7%	8.2%
Daily/almost daily use		
All respondents	6.0%	6.8%
Age 16-19	6.8%	4.0%
Age 20-25	5.9%	6.7%
Age 26-49	7.0%	8.1%
Age 50-64	4.3%	5.0%

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

Table 15: Cannabis use in New Zealand among ICPS 2022 cross-sectional respondents and national surveys

New Zealand Health Survey 2021/22 ≥15 n=4,434		ICPS 2022 New Zealand age 16-65 n=2,898	
Cannabis use	%	Unweighted %	Weighted %
Past 12-month use			
Age 15+	14.7%	–	–
Age 15-24	28.4%	30.9%	29.6%
Age 25-34	23.4%	29.7%	34.8%
Age 35-44	15.2%	25.3%	29.1%
Age 45-54	10.0%	23.4%	28.8%
Age 55-64	10.2%	16.5	17.7%
Age 65-74	4.6%	–	–
Age 75+	0.6%	–	–
Weekly use or more (in the last 3 months)			
Age 15+	4.3%	–	–
Age 15-24	8.0%	8.4%	9.7%
Age 25-34	6.9%	9.7%	15.5%
Age 35-44	4.2%	8.1%	10.6%
Age 45-54	2.7%	8.3%	11.2%
Age 55-64	4.4%	7.2%	7.2%
Age 65-74	0.7%	–	–
Age 75+	0%	–	–

^aData obtained from the 2021/22 New Zealand Health Survey (https://minhealthnz.shinyapps.io/nz-health-survey-2021-22-annual-data-explorer/_w_1d128d8c/#!/explore-topics)

Table 16: International Cannabis Policy Study cross-sectional sample comparison, New Zealand, weighted^a

Indicator of cannabis use	ICPS NZ 2021 n=2,980	ICPS NZ 2022 n=2,898
Ever tried cannabis		
All respondents	59.6%	63.3%
Age 16-19	31.2%	36.4%
Age 20-25	44.0%	54.2%
Age 26-49	65.0%	68.4%
Age 50-64	65.9%	65.4%
Past 12-month use		
All respondents	23.8%	27.7%
Age 16-19	23.6%	18.8%
Age 20-25	23.0%	34.9%
Age 26-49	28.7%	32.9%
Age 50-64	17.0%	18.8%
Past 30-day use		
All respondents	14.7%	14.4%
Age 16-19	14.0%	13.5%
Age 20-25	14.0%	13.2%
Age 26-49	18.2%	17.4%
Age 50-64	10.2%	10.7%
Daily/almost daily use		
All respondents	7.4%	7.6%
Age 16-19	4.9%	3.4%
Age 20-25	8.3%	5.6%
Age 26-49	10.3%	9.8%
Age 50-64	3.4%	6.1%

^a Data are weighted to the national population using the variable WEIGHT_RESC, which are the national inflation weights scaled back to the sample size of New Zealand.

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