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Cannabis use prior to legalisation among alcohol consumers in the Canadian Yukon and Northwest territories

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ABSTRACT

Although rates of substance use are higher in the Canadian territories than the provinces, there is little research on cannabis use. This exploratory study describes cannabis use and related risk behaviours among alcohol consumers in Whitehorse (Yukon) and Yellowknife (Northwest Territories), with comparisons to data from the provinces. Prior to non-medical cannabis legalisation, respondents (n = 387) aged ≥19 were recruited from a study on alcohol labelling to complete an online cannabis survey. Logistic regression was used to compare territorial and provincial data, and correlates of cannabis use in the territories. Forty-seven percent of respondents were past 12-month cannabis consumers, and 15.5% were daily/almost daily consumers, significantly higher than in the provinces (p < 0.001 for both). Dried herb (85.7%) and edibles (58.2%) were most commonly used among consumers. Use of dried herb, edibles, solid concentrates and tinctures was significantly higher than in the provinces (all p ≤ 0.01). Twenty-four percent of respondents had ridden with a driver who had used cannabis, while 31.9% of cannabis consumers had driven within 2h of cannabis use, significantly higher than the provinces (both p < 0.001). Further research should examine the impact of legalisation on cannabis use in the territories, including rural communities.

Introduction

The three Canadian territories, Northwest Territories, Nunavut and Yukon, are in critical need of national surveillance of substance use and other health behaviours. Compared to the 10 Canadian provinces, the territories have higher rates of alcohol, tobacco and other substance use, and hospitalisations related to alcohol and substance use disorders [1–4]. The territories also have higher rates of impaired driving compared to the Canadian provinces [5]. However, the territories are often excluded from national surveillance efforts due to the challenges of conducting population-based surveys in remote areas with smaller population sizes.

Cannabis is the most commonly used drug in Canada after alcohol [6]. Between 2017 and 2019, 15%–25% of Canadian adults aged 15 and older reported using cannabis in the past year [6–10]. However, there is a paucity of data on cannabis use in the territories, which was not included in recent years of the Canadian Tobacco, Alcohol and Drugs Survey, and only included in one National Cannabis Survey quarterly report [6,11]. The Canadian Cannabis Survey,

which began in 2017, aggregated territorial residents with Western provinces in its 2017 report, and sampled approximately 200 territorial respondents in 2018 and 2019 [12–14]. To our knowledge, these limited data from the Canadian Cannabis Survey and National Cannabis Survey provide the only recent comparisons of cannabis use in the territories and provinces. However, both surveys suggest considerably higher rates of cannabis use in the territories compared to the provinces. In the Canadian Cannabis Survey, past-year cannabis use was reported by approximately 39% and 33% of residents in the territories in 2018 and 2019, respectively, compared to 16%-31% of respondents in the provinces [8,9]. National Cannabis Survey data suggest that rates of past 3-month cannabis use in the territorial capital cities – Whitehorse (23%), Yellowknife (27%), and Iqaluit (33%) – were up to double the Canadian average prior to legalisation (16%) [11]. Territory-specific surveys also suggest higher rates of past-year cannabis use in these populations compared to the Canadian provinces, including the 2005 Yukon Addictions Survey (21% vs. 14% in the 2004 Canadian Addictions Survey), and the 2018 Northwest Territories

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Addictions Survey (26% vs. 22% in the 2018 Canadian Cannabis Survey) [8,15,16]. These higher rates of cannabis use in the territories are consistent with higher rates of use of other substances, including alcohol and tobacco [1,3,4].

Little data is available on sources of cannabis in the territories; to our knowledge, neither the Canadian Cannabis Survey nor National Cannabis Survey have presented data on cannabis sources separately by province or territory. However, it is plausible that the geographic remoteness of the territories may have implications for the cannabis market, including how consumers access their products. For example, one might expect lower levels of access to both legal and illegal retail sources in remote or rural regions. However, the modern illicit cannabis market no longer relies on in-person sales transactions due to the widespread availability of online and/or mail-order services [17].

Given the lack of and gaps in data on cannabis use in the Canadian territories, this exploratory study aimed to describe rates and correlates of cannabis use and related risk behaviours in this population in 2018, immediately prior to non-medical cannabis legalisation in Canada. A secondary objective was to compare findings to existing survey data using identical measures from the Canadian provinces.

Methods

Data were collected from September 5 to 2 October 2018 via self-completed online surveys. Participants were recruited from an existing study examining alcohol labelling in Whitehorse and Yellowknife, the capital cities of Yukon and Northwest Territories. For the alcohol labelling study, a cohort of participants were systematically recruited in-person by trained research assistants as they exited the single government-owned and operated liquor store in Whitehorse and the only two government-owned liquor stores in Yellowknife. Inclusion criteria were age ≥19 years; having consumed ≥1 alcoholic drink in the past 30 days; having purchased alcohol at the liquor store on the day of recruitment; residing in either Whitehorse or Yellowknife; having an email address; and self-reporting not being pregnant or currently breastfeeding. Research assistants used a standard intercept technique of approaching every

person that passed a pre-established landmark in the liquor store. Participants completed a screener and the online survey on a tablet in the liquor store. Participants who provided their contact information at an earlier wave were emailed survey instructions, a unique survey link, and an e-transfer as remuneration. At the end of the alcohol survey, participants were asked if they are interested in learning more about a cannabis study. If respondents indicated interest, they were emailed a unique URL to access an online cannabis survey. Respondents provided consent prior to completing the cannabis survey. Median survey time was 27.5 min. Respondents were sent 15 CAD by e-transfer as remuneration. The study was reviewed by and received ethics clearance through a University of Waterloo Research Ethics Committee (ORE#31330) and by Public Health Ontario (file#2018-030.01). A full description of the study methods can be found in the study's Technical Report [18].

Findings were compared to data collected concurrently in the 10 Canadian provinces as part of the 2018 International Cannabis Policy Study (ICPS), recruited using a Nielsen consumer panel and described in a previous publication [19]. In order to facilitate comparisons with the territorial sample, the current analysis reports data from 4,928 ICPS respondents aged 19–65 in the Canadian provinces who reported consuming alcohol at least monthly.[1] For the provincial ICPS sample, post-stratification sample weights were constructed based on Canadian Census estimates. Respondents were classified into age-by-sex-by-province and education groups. Correspondingly grouped population count and proportion estimates were obtained from Statistics Canada. A raking algorithm was applied to the full analytic sample (n = 27,169) to compute weights that were calibrated to these groupings, and weights were rescaled to the sample size. Estimates for provincial data are weighted unless otherwise specified; for more details, see the ICPS 2018 (Wave 1) Technical Report: www.cannabisproject.ca/methods. Sample characteristics for the provincial sample are shown in Supplementary Table 1.

Measures

Respondents completed the ICPS 2018 survey in English. See the survey document for full item wording: http://cannabisproject.ca/methods/. Demographic information collected included sex at birth, age,

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[1]Alcohol consumption was assessed by asking, "During the past 12 months, how often did you usually have any kind of beverage containing alcohol?", with the following responses categorised as "at least monthly drinking": *Every day or nearly every day; Three or four times a week; Once or twice a week*; and *One to three times a month*.

ethnicity, highest education level, personal gross income and alcohol use (see Table 1 for coding of response options).

Cannabis use questions included current frequency of cannabis use (Less than once per month, One or more times per month, One or more times per week, Every day or almost every day). "Regular" cannabis use was coded as 1 = Weekly or daily use; 0 = No or less frequent use. Respondents were asked about the following nine cannabis products used in the past 12 months (coded as 1 = Used in past 12 months, 0 = No use in past 12 months): dried herb/flower; oils for oral ingestion (e.g. drops, capsules); vape oils; edibles/foods; drinks (e.g. cannabis cola, coffee, tea); hash or kief; solid concentrates (e.g. wax, shatter); tinctures; and topical ointments. Respondents were also asked, "In the past 12 months, how did you get the cannabis you used? Select all that apply" (I grew my own; From a family member or friend; From a dealer (in person); Health Canada medical marijuana licensed producer; By mail order or other internet delivery service; From a store, co-operative or dispensary (in person); Other).

Cannabis-related risk behaviours included driving after cannabis use ("Have you ever driven a vehicle (e.g. car, snowmobile, motor boat, or an off-road vehicle (ATV)) within 2 hours of using marijuana?") and riding with a driver who had used cannabis ("Have you ever been a passenger in a vehicle (e.g. car, snowmobile, motor boat, or an off-road vehicle (ATV) driven by someone who had been using marijuana in the last 2 hours?"). These were coded as binary variables: 1 = Engaged in behaviour in past 12 months; 0 = Did not do so. Respondents were asked about substances used on the same occasion as cannabis (tobacco cigarettes; e-cigarettes/vaped nicotine; synthetic cannabis; amphetamines; MDMA; hallucinogens; prescription pain relievers to get high; heroin, fentanyl or other illegal/street opioids; cocaine). "Simultaneous use" of cannabis and other substance(s) was coded as 1 = Used ≥1 substance on the same occasion as cannabis in the past 12 months; 0 = Did not do so.

Data analysis

Of 1,185 participants in the alcohol labelling study, 664 expressed interest in the cannabis study and were sent email invitations (56%). Of those, 518 (78%) individuals accessed the survey, and 398 (60%) completed the survey. The final analytic sample comprised 387 participants after removing 9 individuals with poor data quality (incorrect response to current month), 1 who reported responding dishonestly, and 1 with unstated education level. Sample characteristics did not differ by sex, age, ever or current cannabis use, Indigenous status or education level when these respondents were excluded (p > 0.05).

Separate binary logistic regression models were conducted to test correlates of the following four outcomes among the territories sample: daily/almost daily cannabis use; driving within 2 h of cannabis use; being a passenger in a vehicle with someone who had used cannabis in the past 2 h; and simultaneous use of cannabis and ≥1 other substance. Bivariate correlations were tested between the four outcomes and possible covariates (identified *a priori*). Location of recruitment (Whitehorse vs. Yellowknife) was excluded from the model due to lack of association with outcome measures. Correlations with the remaining tested covariates were statistically significant and were included in all models (p < 0.05): sex, age group, education, income, and alcohol use (see Table 1 for response options). In addition, odds of past 12-month cannabis use, daily/almost daily use, simultaneous product use, passenger and driving behaviours, cannabis sources and products used in the territories were compared using binary logistic regression models to the sample of "at least monthly" alcohol consumers in the Canadian provinces. Models were adjusted for the same covariates described above. In addition, cannabis use (Regular vs. Less frequent/No cannabis use) was included in all models conducted among the subsample of past 12-month cannabis consumers: driving and passenger behaviours, simultaneous substance use, cannabis sources and products used. Adjusted odds ratios (AORs) are reported throughout. Analyses were conducted using SPSS version 25.

Results

Mean participant age was 47.6 (SD = 14.1; range: 19–81) years. Approximately half (54.8%) of respondents were female, and the majority (93.8%) had at least some college or university education. Table 1 shows the remaining characteristics of the territories sample.
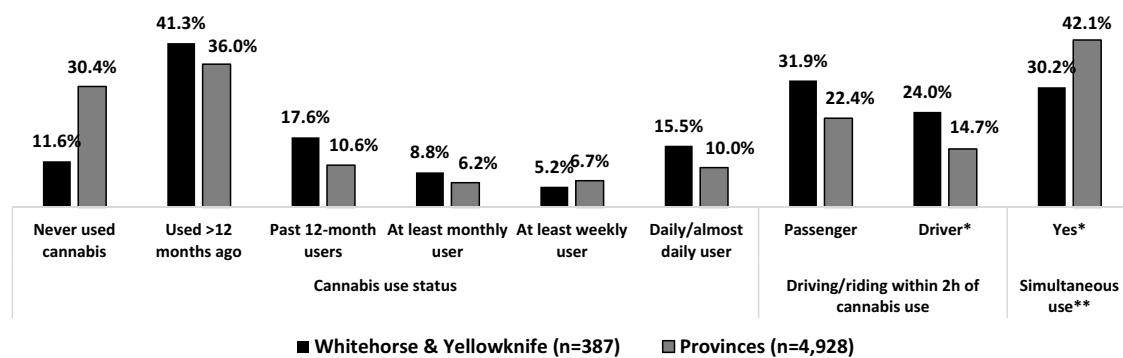
Cannabis use

Figure 1 shows the frequency of cannabis use among respondents in the territories compared to the Canadian provinces. A significantly greater proportion of respondents in the territories compared to the provinces reported having used cannabis in the past 12 months (47.1% vs. 33.5%; AOR = 2.72 (95% CI = 2.13–3.46), p < 0.001). In addition, daily/almost

Table 1. Sample characteristics among alcohol consumers in Whitehorse and Yellowknife, 2018 (n = 387).

Variable	% (n)
Sex	
Female	54.8% (212)
Male	45.2% (175)
Age group (years)	
19–25	5.4% (21)
26–35	18.3% (71)
36–45	20.4% (79)
46–55	21.2% (82)
56–65	23.0% (89)
≥66	11.6% (45)
Location of recruitment	
Whitehorse, Yukon	70.5% (273)
Yellowknife, Northwest Territories	29.5% (114)
Ethnicity	
White	83.7% (324)
Indigenous	10.9% (42)
Other/Mixed/Unstated	5.4% (21)
Highest education level	
High school or less	6.2% (24)
Some college/university or technical/vocational training	36.7% (142)
Bachelor's degree or higher	57.1% (221)
Personal gross income	
<$50,000	20.7% (80)
$50,000 to <$70,000	20.9% (81)
$70,000 to <$100,000	27.1% (105)
≥$100,000	25.3% (98)
Unstated	5.9% (23)
Alcohol use*	
Low volume	77.8% (301)
Risky volume	10.6% (41)
High volume	7.2% (28)
Unstated	4.4% (17)

*Categories of alcohol use defined according to Canada's Low-Risk Alcohol Drinking Guidelines [31]: low volume: ≤10/≤15 drinks/week for females and males, respectively; risky volume: 11–19/16-29 drinks/week for females and males, respectively; high volume: ≥20/≥30 drinks/week for females and males, respectively.

Figure 1. Cannabis use and cannabis-impaired driving behaviours among alcohol consumers in Whitehorse and Yellowknife versus the Canadian provinces, 2018.

*Note that questions on driving within 2 h of cannabis use and simultaneous use of cannabis and another substance are shown among past 12-month cannabis consumers (territories: n = 182; provinces: n = 1,655); cannabis use status and passenger behaviours are shown among all respondents. **Use of at least 1 other substance on the same occasion as cannabis in the past 12 months.

daily use was significantly higher in the territories versus the provinces (15.5% vs. 10.0%; AOR = 3.20 (95% CI = 2.28–4.47), p < 0.001).

Table 2 presents the results of the logistic regressions modelling covariates associated with cannabis use in the territories. Males (21.1%) were significantly more likely to use cannabis daily than females (10.8%; p < 0.001). Those with the lowest income level (<$50,000) were significantly more likely to use cannabis daily/almost daily (35.0%) compared to

Table 2. Correlates of cannabis use and related risk behaviours among alcohol consumers in Whitehorse and Yellowknife, 2018.

Variable	Daily/almost daily cannabis use (n = 387)	Rode with someone who had used cannabis in past 2 h (n = 387)	Drove within 2 h of cannabis use (n = 182)*	Simultaneous use of cannabis and ≥1 other substance (n = 182)*
			AOR (95%CI), p-value	
Sex	$\chi^2(1)$ = 13.44, <0.001	$\chi^2(1)$ = 0.03, 0.87	$\chi^2(1)$ = 8.39, <0.01	$\chi^2(1)$ = 0.65, 0.42
Female *(ref)*	–	–	–	–
Male	**3.41 (1.77–6.56), <0.001**	0.96 (0.55, 1.67), 0.87	**3.59 (1.51, 8.51), <0.01**	1.35 (0.65, 2.78)
Age group (years)	$\chi^2(5)$ = 10.34, 0.07	$\chi^2(5)$ = 8.27, 0.14	$\chi^2(5)$ = 6.94, 0.23	**$\chi^2(5)$ = 13.83, 0.02**
19–25 *(ref)*	–	–	–	–
26–35	2.31 (0.58, 9.18), 0.23	1.32 (0.38, 4.56), 0.66	0.68 (0.12, 3.83), 0.66	0.88 (0.23, 3.43), 0.85
36–45	2.27 (0.56, 9.29), 0.25	1.33 (0.38, 4.60), 0.65	0.63 (0.10, 3.83), 0.62	0.40 (0.10, 1.67), 0.21
46–55	0.85 (0.19, 3.72), 0.83	0.59 (0.16, 2.12), 0.42	**0.12 (0.02, 0.92), 0.04**	0.23 (0.05, 1.03), 0.05
56–65	1.29 (0.32, 5.25), 0.72	0.54 (0.13, 2.18), 0.39	0.51 (0.09, 3.00), 0.46	**0.20 (0.05, 0.88), 0.03**
≥66	0.40 (0.07, 2.22), 0.29		0.30 (0.04, 2.59), 0.28	**0.07 (0.01, 0.82), 0.03**
Education level	$\chi^2(2)$ = 1.48, 0.48	$\chi^2(2)$ = 0.85, 0.65	$\chi^2(2)$ = 0.36, 0.84	$\chi^2(2)$ = 2.49, 0.29
High school or less *(ref)*	–	–	–	–
Some college/university or technical/vocational training	1.06 (0.32, 3.48), 0.94	1.26 (0.41, 3.86), 0.69	0.88 (0.22, 3.52), 0.86	0.84 (0.25, 2.84), 0.78
Bachelor's degree or higher	0.70 (0.21, 2.38), 0.57	0.97 (0.31, 3.03), 0.96	1.18 (0.28, 4.93), 0.82	0.48 (0.14, 1.68), 0.25
Personal income (CAD)	**$\chi^2(4)$ = 19.51, 0.001**	$\chi^2(4)$ = 1.72, 0.79	$\chi^2(4)$ = 1.97, 0.74	$\chi^2(4)$ = 3.18, 0.53
<$50,000 *(ref)*	–	–	–	–
$50,000 to <$70,000	**0.29 (0.12, 0.72), 0.01**	0.83 (0.36, 1.89), 0.66	2.03 (0.59, 7.00), 0.27	0.83 (0.28, 2.48), 0.74
$70,000 to <$100,000	**0.21 (0.09, 0.54), 0.001**	0.77 (0.35, 1.71), 0.52	1.86 (0.54, 6.34), 0.32	0.48 (0.17, 1.36), 0.17
≥$100,000	**0.13 (0.05, 0.37), <0.001**	0.57 (0.23, 1.40), 0.22	2.29 (0.57, 9.17), 0.24	1.28 (0.40, 4.11), 0.68
Unstated	0.19 (0.04, 0.97), 0.05	1.02 (0.29, 3.56), 0.97	2.08 (0.22, 19.83), 0.53	0.69 (0.09, 5.43), 0.73
Alcohol use	$\chi^2(3)$ = 6.99, 0.07	$\chi^2(3)$ = 5.90, 0.12	$\chi^2(3)$ = 3.51, 0.32	$\chi^2(3)$ = 5.15, 0.16
Low volume *(ref)*	–	–	–	–
Risky volume	1.48 (0.55, 3.99), 0.44	1.42 (0.61, 3.31), 0.42	3.65 (0.93, 14.35), 0.06	0.68 (0.20, 2.26), 0.52
High volume	2.51 (0.88, 7.14), 0.09	**3.04 (1.21, 7.63), 0.02**	0.93 (0.21, 4.10), 0.93	**0.10 (0.01, 0.86), 0.04**
Unstated	**3.66 (1.16, 11.57), 0.03**	1.36 (0.42, 4.37), 0.61	1.12 (0.24, 5.28), 0.89	0.50 (0.12, 2.01), 0.33
Frequency of cannabis use	n/a	**$\chi^2(1)$ = 35.19, <0.001**	**$\chi^2(1)$ = 37.78, <0.001**	$\chi^2(1)$ = 2.04, 0.15
Less frequent use *(ref)*	n/a	–	–	–
Regular (daily/weekly) use	n/a	**6.30 (3.43, 11.57), <0.001**	**19.95 (7.68, 51.81), <0.001**	1.71 (0.82, 3.56), 0.15
Overall frequency % (n)	**15.5% (60)**	**24.0% (n = 93)**	**31.9% (n = 58)**	**30.2% (n = 55)**

χ^2 = Wald Chi-square. *Respondents reporting no past 12-month cannabis use were excluded from this model.

those who made 50,000 CAD to <$70,000 (13.6%), 70,000 CAD to <$100,000 (11.4%) or ≥$100,000 CAD (7.1%; p < 0.01 for all). Similarly, males (33.7%) were significantly more likely than females (26.9%) to report having used cannabis and another substance on the same occasion (p = 0.03), whereas older adults aged 55–65 (7.9%) and ≥66 years (2.2%) were less likely than young adults aged 19–25 (38.1%; p < 0.05 for both).

Use of cannabis by product type

Figure 2 shows the frequency of past 12-month use of each form of cannabis, among past 12-month cannabis consumers. In both the territories and provinces, dried herb was the most common product used, followed by edibles/foods. Significantly more consumers in the territories compared to the provinces had used edibles

(+16.7%; AOR = 1.90 (95%CI = 1.35–2.66), p < 0.001), solid concentrates (+4.7%; AOR = 1.91 (95%CI = 1.23–2.96), p = 0.004), dried herb (+4.1%; AOR = 2.02 (95% CI = 1.22–3.36), p = 0.007) and tinctures (+4.0%; AOR = 2.14 (95%CI = 1.20–3.81), p = 0.010) in the past year. There was some evidence of higher rates of use of orally ingested oils (+6.4%; AOR = 1.41 (95% CI = 0.96–2.06), p = 0.081) and vape oils (+5.9%; AOR = 1.43 (95%CI = 0.98–2.10), p = 0.067) in the territories versus the provinces. There was no significant difference between the territories and provinces in use of topicals (−1.4%; p = 0.563), hash/kief (−0.4%; p = 0.116) or drinks (+0.3%; p = 0.576).

Source of cannabis

In 2018, prior to non-medical cannabis legalisation in Canada, almost three-quarters of past 12-month
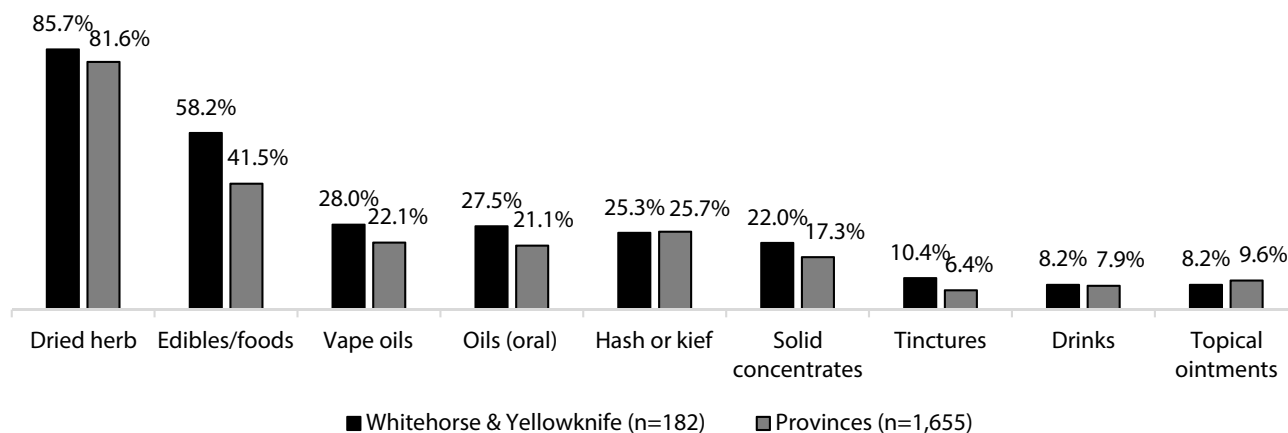
Figure 2. Prevalence of past 12-month use of different forms of cannabis among past 12-month cannabis consumers in Whitehorse and Yellowknife versus the Canadian provinces, 2018.
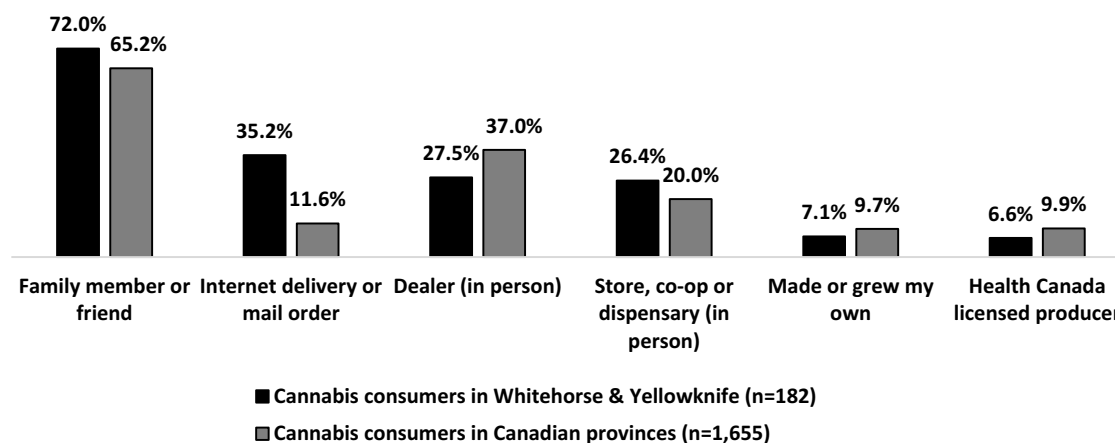
Figure 3. Sources of cannabis in the past 12 months among past 12-month consumers in Whitehorse and Yellowknife versus the Canadian provinces, 2018.

Note that respondents could select all that applied. "Health Canada licensed producer" refers to licenced producer of medical cannabis.

cannabis consumers in the territories sourced their cannabis from a family member or friend, and over a third used an internet delivery or mail order service (Figure 3). Cannabis was purchased in person from a dealer (27.5%) or a store/dispensary (26.3%) by over a quarter of consumers. Very few respondents (7.1%) made or grew their own cannabis or ordered it from a Health Canada medical marijuana licenced producer. As shown in Figure 3, compared to consumers in the provinces, consumers in the territories were significantly more likely to get their cannabis from internet or mail order services (+23.6%; AOR = 5.00 (95% CI = 3.38–7.39), p < 0.001) or a store/dispensary (+6.4%; AOR = 1.48 (95%CI = 1.01–2.17), p = 0.042). More consumers in the territories also sourced their cannabis from a family member/friend (+6.8%; p = 0.133), whereas fewer purchased it from a dealer (−9.5%; p = 0.782) or Health Canada medical marijuana licenced producer (−3.3%; p = 0.142), or made/grew their own (−2.6%; p = 0.788); however, the current study was unable to detect a statistical difference in these proportions.

Simultaneous use of cannabis and other substances

As shown in Figure 1, 30.2% of cannabis consumers in the territories reported simultaneous use of cannabis plus at least one other substance in the past 12 months; this did not significantly differ from the provinces (42.1%; p = 0.416). Over a third of cannabis consumers in the territories (35.4%) reported simultaneous use of tobacco cigarettes and cannabis in the past year, compared to 55.1% in the provinces. Other substances used simultaneously were e-cigarettes/vaped nicotine (territories: 20.9%; provinces: 20.9%), cocaine (territories: 10.3%; provinces: 21.2%), and hallucinogens (territories: 9.8%; provinces: 11.2%); alcohol use was not included in the measure of simultaneous use.

Driving and passenger behaviours

As shown in Figure 1, 31.9% of past 12-month cannabis consumers from the territories reported driving a vehicle within 2 h of cannabis use in the past 12 months, significantly higher than in the provinces (22.4%; AOR = 2.12 (95%CI = 1.44–3.11), p < 0.001). Almost a quarter (24.0%) of the territorial sample reported riding with a driver who had used cannabis within 2 h of cannabis use in the past 12 months; significantly higher than in the provinces (14.7%; AOR = 2.21 (95%CI = 1.64–2.99), p < 0.001).

As Table 2 indicates, demographic differences were observed in the territories: males (44.9%) were significantly more likely to report driving a vehicle after cannabis use than females (19.4%; p < 0.01), as were regular (60.0%) compared to less frequent cannabis consumers (9.8%; p < 0.001). Little difference in riding with a driver who had used cannabis was observed between females and males (23.1% vs. 25.1%, respectively, p > 0.05). "Regular" cannabis consumers (57.5%) were significantly more likely to have ridden in a vehicle with a driver who had used cannabis compared to less frequent or non-consumers (15.3%; p < 0.001).

Discussion

Prior to non-medical cannabis legalisation in Canada, estimates of cannabis use among respondents in two Canadian territorial capital cities were higher than estimates for the 10 Canadian provinces. Approximately 16% of respondents (or 33% of past 12-month cannabis consumers) used cannabis daily/almost daily. This is 8 percentage points higher than the Canadian average in the 2018 Canadian Cannabis Survey [8] and 6 percentage points higher than among the Canadian provinces in the 2018 ICPS. Respondents in the current study were recruited for a cohort in a previous study in which being a current drinker and purchasing alcohol were inclusion criteria. Although almost 80% of Canadian adults use alcohol [6], data suggest the prevalence of cannabis use is substantially higher among adults who consume alcohol compared to those who do not [20]. This sampling frame may have contributed to the higher rates of cannabis use observed among respondents in the current study, although differences between respondents in the territories and provinces persisted after restricting the ICPS sample to alcohol consumers only. Moreover, findings from this study align with national data, suggesting higher overall cannabis use in the territories compared to the provinces [8,9]. Given that respondents in the current study were recruited from two territorial capital cities – which might more closely approximate small to mid-sized provincial cities – even more pronounced differences between the territories and provinces are possible in rural communities outside of the territorial capital cities.

Prevalence of cannabis-related risk behaviours in Whitehorse and Yellowknife also differed from the provinces. Rates of driving after cannabis use or riding with a driver who had used cannabis were significantly higher among respondents in Yellowknife and Whitehorse relative to ICPS provincial data, consistent with 2016 data on rates of impaired driving from Statistics Canada [5]. In the 2018 Canadian Cannabis

Survey, respondents from the three territories reported even higher rates of driving after cannabis use than reported in the current study (41.4% vs. 31.5% herein) and riding with a driver who had used cannabis (47.3% vs. 24.0% herein) [8], suggesting that rates may be higher than observed herein. It is unclear whether these behaviours are higher in communities in the territories and/or Nunavut, which were not sampled in the current study and where access to public transport or taxis may be even more limited. In contrast to driving behaviours, simultaneous use of cannabis and at least one other substance was considerably lower, but not significantly different than in the provinces. Nevertheless, the fact that a third of consumers reported simultaneous use of cannabis and tobacco cigarettes is concerning: combining these substances is associated with additional health risks, including cannabis use disorders, psychosocial problems, and poorer cessation outcomes [21,22].

Socio-demographic correlates of cannabis use risk behaviours aligned with previous studies, as did those on product use. As in previous research, males were more likely to use cannabis daily and to drive after cannabis use than females [8,23–26]. Also in line with previous research, regular cannabis use was associated with both cannabis-impaired driving and passenger behaviour [27]. Similar to national data, dried herb and edible cannabis products were the two most common cannabis products consumed in the territories [8,9]. However, use of specific cannabis product types – including dried herb, edibles and solid concentrates – was significantly higher than in the provinces; use of vape oils was also considerably higher. Although the Canadian Cannabis Survey suppressed its territorial data on product use in 2018, 2019 estimates show higher use of edibles in the territories compared to the provinces [9]. Edibles have a longer duration of onset compared to smoked forms of cannabis, and solid concentrates and vape oils are typically highly potent and may be associated with increased health risks [28,29]. Taken together, the above findings suggest that education campaigns targeting the territories should focus on risky cannabis use behaviours such as regular use; cannabis-impaired driving; and use of product types such as edibles, solid concentrates and vape oils; and that efforts to target male consumers may be warranted.

Finally, results suggest that consumers in Whitehorse and Yellowknife had widespread access to cannabis, despite the fact that non-medical cannabis was still an illicit drug at the time of the study. Compared with consumers in the provinces, consumers in the territories were significantly more likely to obtain their cannabis from internet or mail order services, with a difference of almost 24 percentage points. This higher reliance on delivery services is likely due in large part to the northern, remote location of the territories; as mentioned earlier, internet/mail order services were the primary conduit for cannabis sales in the illicit cannabis market, both before and immediately after legalisation of non-medical cannabis in Canada [17,30]. Legalisation has enabled purchasing of legal cannabis from physical and/or online stores; however, many consumers cannot yet access legal stores. Although Northwest Territories and Yukon have among the highest retail densities of legal cannabis stores in Canada [30], in the early stages following legalisation, the only legal retail store in Yukon was located in Whitehorse, and as of fall 2020, three of the five legal stores were located in Whitehorse. Rural consumers therefore may have difficulty accessing legal cannabis from physical vendors. Due to considerable distances to legal stores, online and/or mail-order services – which have been permitted in all three territories since legalisation – will continue to play an important role in providing access to legal cannabis retailers in the territories.

Limitations

Firstly, respondents were initially recruited for a study on alcohol labelling in two territorial capital cities; therefore, rates of cannabis may be inflated and cannot be considered representative estimates of cannabis use in the Canadian territories. Secondly, rates of per capita alcohol sales and heavy drinking are higher in Yukon and Northwest Territories relative to the provinces [1], although provincial data were restricted to drinkers to facilitate sample comparison. Thirdly, because alcohol was erroneously omitted from the list of response options when assessing substances used on the same occasion as cannabis, simultaneous use of alcohol and cannabis in the territories should be assessed in future research. Fourthly, the territories sample included respondents aged ≥19 years recruited in Whitehorse and Yellowknife (capital cities), whereas the provincial sample comprised respondents aged 19–65 from both rural and urban locations in the Canadian provinces. Furthermore, ICPS respondents were recruited using a Nielsen consumer panel, whereas territory respondents were recruited in person. Given these differences in sampling frame and relatively small sample size of the current study, comparisons between the two samples and estimates of cannabis use should be interpreted with caution. Finally, this study is subject to limitations common to survey research, including social desirability bias. However, as indicated in the Technical

Report, respondents who indicated that they did not respond honestly to survey questions about cannabis were excluded from the sample [18].

Conclusions

Higher rates of regular cannabis use and driving after cannabis use were observed among alcohol consumers in Whitehorse and Yellowknife compared to the Canadian provinces. Respondents in the territories were also more likely than the provinces to use internet/mail order services. Use of specific cannabis product types, including dried herb, edibles, and solid concentrates, were higher than in the provinces. While the current study does not constitute a representative sample of the Canadian territories, these findings are consistent with national data suggesting higher use of cannabis and other substances in the territories relative to the Canadian provinces. Results highlight the need for continued surveillance of cannabis use in these regions, including patterns of product use and risk behaviours, and whether they have changed since legalisation. Finally, findings suggest that legal online cannabis retailers will be important in displacing the illegal market, especially in the remote northern territories.

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Data availability

The datasets used and/or analysed for the current study are available from the corresponding author on reasonable request.

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