Cannabis legalization in Canada and comparisons with US states.

DAVID HAMMOND, SAMANTHA GOODMAN, ELLE WADSWORTH on behalf of the ICPS Team

INTERNATIONAL CANNABIS POLICY STUDY

UNIVERSITY OF WATERLOO
FACULTY OF APPLIED HEALTH SCIENCES
School of Public Health and Health Systems
DISCLOSURES

NO INDUSTRY FUNDING OR INTERESTS TO DECLARE.

CONSULTANT / PAID SPEAKER / ADVISORY COMMITTEES

• Regulatory agencies e.g., Canada, Australia, UK, EC, US CDC, etc.
• Non-governmental associations e.g., Canadian Cancer Society, Heart & Stroke Foundation
• International public health authorities e.g., WHO

PAID EXPERT TESTIMONY - PUBLIC HEALTH LITIGATION

• San Francisco vs. American Beverage Association Warnings on SSB ads
• Norway Snus plain packaging
• Uganda BAT Health warnings & Point of sale
• UK Point of sale legal challenge & Plain packaging
• Commonwealth of Australia Plain packaging
• Government of Canada / Provincies Health warnings & Health care cost recovery litigation
• Uruguay Health warnings / “Single Presentation Rule”
• Irish Department of Health Plain packaging
• Class actions Craft v. Philip Morris USA / Milner v. Philip Morris USA / Donovan et al. v. Philip Morris USA /Knight v.
Cannabis legalization

Canadians celebrate legal weed

HALIFAX

CBC

https://www.youtube.com/watch?v=T9N3ku7jmic
Legalization is a process not an event.
CANNABIS POLICY

The public health impact will depend on how cannabis is regulated in legal markets.
Tobacco consumption in Canada
Per Capita 1921-1995

Great Depression
World War II
Royal College of Physicians Report
Broadcast Ad Ban
First warnings
Tobacco tax increases
Mandatory warnings
Smoking restrictions
Tobacco tax roll-back

Mass production of cigarettes
Advertising to women
Filters and “light” cigarettes

Source: Cunningham R. Smoke & Mirrors; 1996.
“SECULAR” TRENDS

The cannabis market is rapidly evolving.

Good Night Sleep

Ogk
OG Kush
3288 Reviews

Gdp
Granddaddy Purple
2812 Reviews

Chz
Blue Cheese
1646 Reviews

Pk
Purple Kush
1378 Reviews
The product market is rapidly evolving.
BEST PRACTICES & PROPORTIONALITY

Evidence to guide cannabis policy

“I’ll need to see some I.D. for the Claritine.”
Evidence needs

- Detailed population-based data
- Longitudinal data
- Comparative data or ‘controls’
To evaluate the impact of cannabis policies to maximize public health benefit.
Methods

• Prospective cohort study
• Annual survey waves 2018-2021...
• Online surveys
• Age 16-65 at recruitment
• Same methodology across 3 jurisdictions

[Images of flags indicating legal status: ILLEGAL (Canada), ILLEGAL (US), and LEGAL (US)]
Jurisdictions

**PROHIBITED**

- 10 provinces

**LEGAL**

- Alaska
- California
- Colorado
- District of Colombia
- Maine
- Massachusetts
- Nevada
- Oregon
- Vermont
- Washington
REGULATIONS

Medical cannabis laws
Sample

- Nielsen commercial panel
- Wave 1: August-Sept 2018
- Data integrity checks
- Weighted on sex, age, region, race, education

- 10,057
- 9,714
- 7,412

27,183
Study design

Prospective cohort study, with replenishment.
‘Natural experiments’ in policy

• Canada vs. US ‘legal’ states
• Between Canadian provinces
• Between US ‘legal’ states
POLICY DIFFERENCES

Packaging regulations

WARNING: Adolescents are at greater risk of harms from cannabis. 1 in 6 people who start using cannabis in adolescence will become addicted.

MISE EN GARDE : Les adolescents sont à risque élevé des effets dangereux du cannabis. Une personne sur six qui commence à consommer du cannabis à l'adolescence en deviendra dépendante.

Health Canada / Santé Canada
POLICY DIFFERENCES

‘Standardised’ packaging
CANNABIS POLICIES

Provincial differences

Summary of Provincial and Territorial Cannabis Regulations

Province and Territory details

Map Legend

- Public
- Private
- Hybrid

<table>
<thead>
<tr>
<th>P/T</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>N.L.</td>
<td>Newfoundland and Labrador Liquor Corporation can operate retail in areas of the province where private retailers have no interest in operating</td>
</tr>
<tr>
<td>P.E.I.</td>
<td>All sales public</td>
</tr>
<tr>
<td>N.S.</td>
<td>Cannabis to be co-located but in a separate area of selected NSLC stores. Access codes available from NSLC stores will be necessary for online purchases</td>
</tr>
<tr>
<td>N.B.</td>
<td>All sales public</td>
</tr>
<tr>
<td>Que.</td>
<td>All sales public</td>
</tr>
<tr>
<td>Ont.</td>
<td>Private retail sales details to be determined</td>
</tr>
<tr>
<td>Man.</td>
<td>All sales via licensees selected through request for proposal</td>
</tr>
<tr>
<td>Sack.</td>
<td>Retailers must have a physical store in order to conduct online sales</td>
</tr>
<tr>
<td>Alta.</td>
<td>Online sales government operated, physical stores private</td>
</tr>
<tr>
<td>B.C.</td>
<td>Combined public and private sales model similar to that in place for alcohol</td>
</tr>
<tr>
<td>Y.T.</td>
<td>Initial sales through Yukon Liquor Corporation via one physical site in Whitehorse and online with regulations for private sales to be determined</td>
</tr>
<tr>
<td>N.W.T.</td>
<td>Initial sales through NWT Liquor Commission. Five-year Consignment Agreements with NTLCC will be awarded by RFP, following submission of an initial expression of interest and community consultation</td>
</tr>
<tr>
<td>Nvt.</td>
<td>Nunavut Liquor and Cannabis Commission can sell online, in retail stores and through agents</td>
</tr>
</tbody>
</table>
## POLICY DIFFERENCES

### US Legal states

<table>
<thead>
<tr>
<th>State</th>
<th>Legalization</th>
<th>Retail Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>Washington State</td>
<td>2012</td>
<td>2014</td>
</tr>
<tr>
<td>Colorado</td>
<td>2012</td>
<td>2014</td>
</tr>
<tr>
<td>Alaska</td>
<td>2014</td>
<td>2016</td>
</tr>
<tr>
<td>District of Columbia</td>
<td>2014</td>
<td>--</td>
</tr>
<tr>
<td>Oregon</td>
<td>2014</td>
<td>2015</td>
</tr>
<tr>
<td>California</td>
<td>2016</td>
<td>2018</td>
</tr>
<tr>
<td>Nevada</td>
<td>2016</td>
<td>2017</td>
</tr>
<tr>
<td>Maine</td>
<td>2016</td>
<td>--</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>2016</td>
<td>2018</td>
</tr>
<tr>
<td>Vermont</td>
<td>2018</td>
<td>--</td>
</tr>
</tbody>
</table>
POLICY DIFFERENCES

US Legal states

Washington St

Colorado

Oregon

California

Massachusetts

Nevada
Policy domains

- Advertising & promotion
- Price & taxation
- Public education
- Package & labeling
- Health warnings
- Retail & commercial environment
- Product standards
Survey content areas

- Prevalence & patterns of cannabis use
- Cannabis purchasing & price
- Cannabis consumption & modes of use
- Cannabis knowledge, risk perceptions & social norms
- Exposure to public education campaigns
- Exposure to cannabis advertising & promotion
- Substance use & other risk behaviours
- Socio-demographic status & postal code

Emphasis on problematic use
Consumption & purchasing

In [time frame], how much dried herb did you use?
Market data

Environmental scans completed annually

• Number and location of legal and illegal cannabis retail outlets

• Price data
Market data
www.cannabisproject.ca
Patterns of use

SAMANTHA GOODMAN PhD

UNIVERSITY OF WATERLOO
FACULTY OF APPLIED HEALTH SCIENCES
School of Public Health and Health Systems
How often? What? Why?
Prevalence of cannabis use
UNIVERSE: ALL RESPONDENTS (n=27,183)
How often do you use marijuana?

UNIVERSE: PAST-12 MONTH CANNABIS USERS (n=6,979)
Product types
Cannabis products used in past 12 months
UNIVERSE: PAST 12-MONTH USERS (n=6,979)

- Dried herb
- Edibles
- Hash or kief
- Oil (vaped)
- Oil (oral)
- Concentrates
- Topicals
- Drinks
- Tinctures
In the past 12 months, how often did you use marijuana in the following ways?

UNIVERSE: PAST 12-MONTH USERS OF EACH PRODUCT TYPE

- DRIED HERB: n=5,314
- VAPED OIL/LIQUID: n=1,968
- CONCENTRATES: n=1,127
- EDIBLES: n=2,820
In the past 12 months, how often did you use daily?

PAST 12-MONTH USERS OF EACH PRODUCT TYPE

- **DRIED HERB**
  - n=5,314
  - 31% daily

- **VAPED OIL/LIQUID**
  - n=1,968
  - 19% daily

- **CONCENTRATES**
  - n=1,127
  - 19% daily

- **EDIBLES**
  - n=2,820
  - 6% daily
Product potency
Which of the following best describes the type of dried herb you usually use?

UNIVERSE: DRIED HERB USERS (n=7710)

- High THC, Low CBD
- High THC, High CBD
- Low THC, Low CBD
- Low THC, High CBD
- Don’t know

≤1% in each jurisdiction selected ‘Other’
Which of the following best describes the type of *dried herb* you usually use?

UNIVERSE: DRIED HERB USERS (n=7710)
What type of cannabis/marijuana **oil or liquid for vaping** do you usually use?

**UNIVERSE: VAPED LIQUID/OIL USERS (n=2,005)**

- **High THC, Low CBD**: 31%
- **High THC, High CBD**: 24%
- **Low THC, Low CBD**: 19%
- **Low THC, High CBD**: 18%
- **Don’t know**: 45%

≤2% in each jurisdiction selected ‘Other’
Legal cannabis
USA
Legal cannabis CANADA
Which of the following best describes the type of [product] you usually use? **% high THC, low CBD**

UNIVERSE: USERS OF EACH PRODUCT TYPE

<table>
<thead>
<tr>
<th>Product Type</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dried herb</td>
<td>5563</td>
</tr>
<tr>
<td>Oil (oral)</td>
<td>1511</td>
</tr>
<tr>
<td>Oil (vaped)</td>
<td>2005</td>
</tr>
<tr>
<td>Edibles</td>
<td>2877</td>
</tr>
<tr>
<td>Drinks</td>
<td>698</td>
</tr>
<tr>
<td>Concentrates</td>
<td>1165</td>
</tr>
<tr>
<td>Hash or kief</td>
<td>1418</td>
</tr>
<tr>
<td>Tinctures</td>
<td>565</td>
</tr>
<tr>
<td>Topicals</td>
<td>898</td>
</tr>
</tbody>
</table>
Medical use
Have you ever used marijuana to improve or manage symptoms for any of the following?

% ‘Yes’ UNIVERSE: ‘EVER’ CANNABIS USERS (n=14,691)

MENTAL HEALTH

PHYSICAL HEALTH
Have you ever asked a licensed health professional for a recommendation/authorization to use medical marijuana?

...Were you authorized/did you have a recommendation to use medical marijuana at any time in the past 12 months?

n=9,877  n=12,475  n=4,406
<table>
<thead>
<tr>
<th>Product</th>
<th>All users</th>
<th>Medical users</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dried herb</td>
<td>80%</td>
<td>73%</td>
</tr>
<tr>
<td>Oil (oral)</td>
<td>22%</td>
<td>57%</td>
</tr>
<tr>
<td>Edibles</td>
<td>39%</td>
<td>47%</td>
</tr>
<tr>
<td>Oil (vaped)</td>
<td>22%</td>
<td>28%</td>
</tr>
<tr>
<td>Hash or kief</td>
<td>24%</td>
<td>27%</td>
</tr>
<tr>
<td>Concentrates</td>
<td>16%</td>
<td>24%</td>
</tr>
<tr>
<td>Topical ointments</td>
<td>9%</td>
<td>19%</td>
</tr>
<tr>
<td>Tinctures</td>
<td>6%</td>
<td>17%</td>
</tr>
<tr>
<td>Drinks</td>
<td>8%</td>
<td>15%</td>
</tr>
</tbody>
</table>
Cannabis use status in Canada vs. those with a medical cannabis authorization

UNIVERSE: RESPONDENTS IN CANADA (n=10,057)

<table>
<thead>
<tr>
<th>Frequency</th>
<th>ALL USERS</th>
<th>MEDICAL USERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily</td>
<td>n=311</td>
<td>n=311</td>
</tr>
<tr>
<td>Weekly</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monthly</td>
<td>n=10,057</td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;12 months ago</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Daily cannabis use among those with a medical cannabis authorization

UNIVERSE: RESPONDENTS WITH MEDICAL CANNABIS AUTHORIZATION IN PAST 12 MONTHS (n=808)

- 43% for n=311
- 19% for n=312
- 34% for n=185
Consumption amounts
Is it easiest for you to tell us about the number of joints or the amount of dried herb (e.g., grams or ounces)?

- Number of joints
- Amount of dried herb
Please choose the joint that is closest to the size you normally smoke.

UNIVERSE: PAST 12-MONTH USERS OF DRIED HERB WHO REPORTED IN JOINTS (n=3,427)

1.2 g

1.0 g

0.8 g

0.6 g

0.4 g

0.2 g
Please choose the joint that is closest to the size you normally smoke.

MEAN JOIN SIZE (GRAMS)
UNIVERSE: PAST 12-MONTH USERS OF DRIED HERB WHO REPORTED IN JOINTS (n=3,427)

n=1,410
n=1,421
n=596
In [time frame], how much dried herb did you use?
Mean quantity of dried herb (g) used in past 12 months

UNIVERSE: PAST 12-MONTH USERS OF DRIED HERB (n=5,188)

Overall mean:
193.4 g / year

0.53 g /day
Mean quantity of dried herb (g) used in past 12 months

UNIVERSE: PAST 12-MONTH USERS OF DRIED HERB (n=5,189)
Mean quantity of dried herb (g) used in past 12 months

UNIVERSE: PAST 12-MONTH USERS OF DRIED HERB (n=5,189)

- **1.7 g per year**
- **2.1 g per month**
- **2.1 g per week**
- **1.6 g per day**

- <Once per month
- ≥Monthly
- ≥Weekly
- Daily/ almost daily
Summary

• Higher prevalence of use in US legal states, but similar frequency among current users.

• Dried herb most common, but other products gaining popularity, especially in legal market.

• Medical users use frequently, and a diverse product range.

• Similar amount of dried herb use across jurisdictions.
Purchase source & price

ELLE WADSWORTH MSc

UNIVERSITY OF WATERLOO
FACULTY OF APPLIED HEALTH SCIENCES
School of Public Health and Health Systems
Purchase source
In the past 12 months, have you got any type of cannabis from the following sources?

UNIVERSE: PAST 12 MONTH CANNABIS USERS, n=6979
In the past 12 months, have you got any type of cannabis from the following sources?

UNIVERSE: PAST 12 MONTH CANNABIS USERS, n=6979

- Family/Friend: 62% (67%)
- Dealer (in person): 34% (37%)
- Store/Co-op Dispensary: 21%
- Internet/Mail order: 20% (15%)
- Grow your own
- HC Licensed Producer
In the past 12 months, have you got any type of cannabis from the following sources?

UNIVERSE: PAST 12 MONTH CANNABIS USERS, n=6979

<table>
<thead>
<tr>
<th>Source</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family/Friend (in person)</td>
<td>67%</td>
</tr>
<tr>
<td>Dealer (in person)</td>
<td>56%</td>
</tr>
<tr>
<td>Store/Co-op Dispensary</td>
<td>37%</td>
</tr>
<tr>
<td>Dispensary</td>
<td>21%</td>
</tr>
<tr>
<td>Internet/Mail order</td>
<td>15%</td>
</tr>
<tr>
<td>Grow your own</td>
<td>11%</td>
</tr>
<tr>
<td>HC Licensed Producer</td>
<td>7%</td>
</tr>
<tr>
<td></td>
<td>8%</td>
</tr>
<tr>
<td></td>
<td>9%</td>
</tr>
<tr>
<td></td>
<td>12%</td>
</tr>
</tbody>
</table>
In the past 12 months, have you got any type of cannabis from the following sources?

**UNIVERSE: PAST 12 MONTH CANNABIS USERS, n=6979**

<table>
<thead>
<tr>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family/Friend</td>
</tr>
<tr>
<td>Dealer (in person)</td>
</tr>
<tr>
<td>Store/Co-op Dispensary</td>
</tr>
<tr>
<td>Internet/Mail order</td>
</tr>
<tr>
<td>Grow your own</td>
</tr>
<tr>
<td>HC Licensed Producer</td>
</tr>
</tbody>
</table>
In the past 12 months, have you got any type of cannabis from the following sources?

UNIVERSE: PAST 12 MONTH CANNABIS USERS, n=6979

- **Family/Friend (in person):** 62%
- **Dealer (in person):** 34%
- **Store/Co-op Dispensary:** 20%
- **Internet-Mail order:** 18%
- **Grow your own:** 11%
- **HC Licensed Producer:** 8%
In the past 12 months, have you got any type of cannabis from the following sources?

UNIVERSE: PAST 12 MONTH CANNABIS USERS, n=6979

- Family/Friend: 67%
- Dealer (in person): 37%
- Store/Co-op Dispensary: 15%
- Internet/Mail order: 7%
- Grow your own: 9%
In the past 12 months, have you got any type of cannabis from the following sources?

UNIVERSE: PAST 12 MONTH CANNABIS USERS, n=6979

- Family/Friend (56%)
- Dealer (in person) (21%)
- Store/Co-op Dispensary (55%)
- Internet/Mail order (8%)
- Grow your own (11%)
In the past 12 months, have you got any type of cannabis from the following sources?

UNIVERSE: PAST 12 MONTH CANNABIS USERS, n=6979
From what type of store or dispensary did you buy cannabis in the past 12 months?

UNIVERSE: PAST 12 MONTH CANNABIS USERS, n=1817

- Licensed medical store/dispensary
- Unlicensed/unauthorized store or dispensary
- Licensed recreational store (US only)
From what type of store or dispensary did you buy cannabis in the past 12 months?

UNIVERSE: PAST 12 MONTH CANNABIS USERS, n=1817

Licensed medical store/dispensary: 64%  
Unlicensed/unauthorized store or dispensary: 36%  
Licensed recreational store (US only): 66%

Licensed medical store/dispensary: 69%  
Unlicensed/unauthorized store or dispensary: 15%  
Licensed recreational store (US only): 42%
Of the cannabis products you purchased in the past 12 months, **did you buy them within or outside of state where you live?**

UNIVERSE: PAST 12 MONTH CANNABIS USERS, n=2,810

<table>
<thead>
<tr>
<th>All were bought in state</th>
<th>Some were bought in, some out</th>
<th>All were bought out of state</th>
<th>Don’t know</th>
</tr>
</thead>
</table>
Of the cannabis products you purchased in the past 12 months, did you buy them within or outside of state where you live?

UNIVERSE: PAST 12 MONTH CANNABIS USERS, n=2,810

- All were bought in state: 66%
- Some were bought in, some out: 13%
- All were bought out of state: 9%
- Don’t know: 12%
What are the **main reasons** you bought cannabis from unauthorized sources instead of licensed sources?

UNIVERSE: PAST 12 MONTH USERS WHO HAD USED UNAUTHORIZED SOURCES, n=484

- Easier to get / more convenient
- Lower prices
- I can get products that are not sold by licensed sources
- Stronger / more potent products
- I don’t want the government to know that I buy cannabis
- Other reasons
What are the main reasons you bought cannabis from unauthorized sources instead of licensed sources?

UNIVERSE: PAST 12 MONTH USERS WHO HAD USED UNAUTHORIZED SOURCES, n=484

- Easier to get / more convenient: 80%
- Lower prices: 72%
- I can get products that are not sold by licensed sources: 65%
- Stronger / more potent products: 49%
- Other reasons: 35%
- I don’t want the government to know that I buy cannabis: 46%
What are the **main reasons** you bought cannabis from unauthorized sources instead of licensed sources?

UNIVERSE: PAST 12 MONTH USERS WHO HAD USED UNAUTHORIZED SOURCES, n=484

- **Easier to get / more convenient**: 80%
- **Lower prices**: 72%
- **I can get products that are not sold by licensed sources**: 65%
- **Stronger / more potent products**: 49%
- **I don’t want the government to know that I buy cannabis**: 55%
- **Other reasons**: 61%

**Stronger / more potent products**

- **31%**
- **28%**

**I don’t want the government to know that I buy cannabis**

- **17%**
- **13%**

**Other reasons**

- **8%**
- **4%**
- **6%**
Cannabis prices
What do we know about prices of illicit dried herb in Canada?

$7.20/g CAD StatsCannabis
SEPTEMBER 2018, CROWDSOURCED

$7.69/g CAD Public Safety Canada

$8.62/g CAD Canadian Cannabis Survey
MAY-JULY 2018, SELF-REPORTED
OBJECTIVE ‘MARKET’ PRICES

Retail price and availability of illicit dried herb in Canada
OBJECTIVE ‘MARKET’ PRICES

Retail price and availability of illicit dried herb in Canada

• Online search engines

• Retailers in largest municipality in each of 10 provinces and 3 territories.

• Oct 2017 – May 2018

• Prices of most popular, least expensive and most expensive dried cannabis
OBJECTIVE ‘MARKET’ PRICES

Retail price and availability of illicit dried herb in Canada

- **215** cannabis retailers with physical storefronts
- Number of outlets varied across municipalities
  - **100** in Vancouver
  - **70** in Toronto
  - **8** in Montreal
  - **0** in Calgary
- Prices varied across municipalities
OBJECTIVE PRICES

Retail price and availability of illicit dried herb in Canada

Most popular strain:
- $10.02 for 1g
- $9.14 for 3.5g
- $7.33 for 28g

Least expensive strain:
- $7.80 for 1g
- $7.51 for 3.5g
- $5.92 for 28g

Most expensive strain:
- $12.30 for 1g
- $11.45 for 3.5g
- $9.74 for 28g
Are self-reported prices of dried herb similar to objective prices?
### Price paid for last purchase of dried herb

**MEAN CAD$**

**UNIVERSE:** USED AND PURCHASED CANNABIS IN PAST 12-MONTHS, CANADA ONLY, n=878

<table>
<thead>
<tr>
<th>Past 12-month user</th>
<th>At least monthly user</th>
<th>At least weekly user</th>
<th>Daily/almost daily user</th>
<th>Total</th>
</tr>
</thead>
</table>


Price paid for last purchase of dried herb

MEAN CAD$

UNIVERSE: USED AND PURCHASED CANNABIS IN PAST 12-MONTHS, CANADA ONLY, n=878

- Past 12-month user: $36
- At least monthly user: $35
- At least weekly user: $63
- Daily/almost daily user: $118
- All users: $81
# Amount bought at last purchase of dried herb

**MEAN GRAMS**

UNIVERSE: USED AND PURCHASED CANNABIS IN PAST 12-MONTHS, CANADA ONLY, n=878

<table>
<thead>
<tr>
<th></th>
<th>Past 12-month user</th>
<th>At least monthly user</th>
<th>At least weekly user</th>
<th>Daily/almost daily user</th>
<th>Total</th>
</tr>
</thead>
</table>
Amount bought at last purchase of dried herb

MEAN GRAMS

UNIVERSE: USED AND PURCHASED CANNABIS IN PAST 12-MONTHS, CANADA ONLY, n=878

- Past 12-month user: 4.3g
- At least monthly user: 3.8g
- At least weekly user: 7.9g
- Daily/almost daily user: 20.3g
- All users: 12.7g
Price-per-gram of dried herb

UNIVERSE: USED AND PURCHASED CANNABIS IN PAST 12-MONTHS, CANADA ONLY, n=878
Price-per-gram of dried herb

UNIVERSE: USED AND PURCHASED CANNABIS IN PAST 12-MONTHS, CANADA ONLY, n=878

$9.69 CAD mean of self-reported price-per-gram (SD=5.8)

- Objective price-per-gram range: $2.20-30.00 CAD
- 72% had a self-reported price-per-gram within range
Mean self-reported price-per-gram by province

n=878

British Columbia: $9.31

Prince Edward Island: $8.19

Alberta: $9.96

Saskatchewan: $10.11

Newfoundland & Labrador: $10.70

Nova Scotia: $8.62

New Brunswick: $9.18

Ontario: $9.85

Quebec: $9.68

Prince Edward Island: $8.19

Manitoba: $9.57
Mean self-reported price-per-gram by province
n=878

British Columbia: $9.31
Alberta: $9.96
Saskatchewan: $10.11
Manitoba: $9.57
Ontario: $9.85
Quebec: $9.68
Prince Edward Island: $8.19
Nova Scotia: $8.62
Newfoundland & Labrador: $10.70

Canada
Do average self-reported prices change by purchase source in Canada?
# Average price-per-gram of dried herb by source

**UNIVERSE:** PAST 12-MONTH CANNABIS USERS WITH **ONLY ONE SOURCE**, n=488

<table>
<thead>
<tr>
<th>Source</th>
<th>Purchasing 1g</th>
<th>Purchasing 3.5g</th>
<th>Purchasing 28g</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family/Friend (in person)</td>
<td>$12.55</td>
<td>$8.77</td>
<td>$9.69</td>
</tr>
<tr>
<td>Dealer</td>
<td>$14.04</td>
<td>$9.00</td>
<td>$10.61</td>
</tr>
<tr>
<td>Store/Co-op</td>
<td>$12.84</td>
<td>$5.89</td>
<td>$6.27</td>
</tr>
<tr>
<td>Dispensary</td>
<td>$17.11</td>
<td>$5.51</td>
<td>$6.65</td>
</tr>
<tr>
<td>HC Licensed Producer</td>
<td>$16.26</td>
<td>$11.74</td>
<td>$9.06</td>
</tr>
</tbody>
</table>
Average price-per-gram of dried herb by source

UNIVERSE: PAST 12-MONTH CANNABIS USERS WITH ONLY ONE SOURCE, n=488

- Family/Friend: $12.55
- Dealer (in person): $14.04
- Store/Co-op Dispensary: $12.84
- Internet/Mail order: $17.11
- HC Licensed Producer: $16.26
Average price-per-gram of dried herb by source

UNIVERSE: PAST 12-MONTH CANNABIS USERS WITH ONLY ONE SOURCE, n=488

- **Family/Friend**: $12.55 for 1g, $9.00 for 3.5g
- **Dealer (in person)**: $14.04 for 1g, $8.77 for 3.5g
- **Store/Co-op Dispensary**: $12.84 for 1g, $9.69 for 3.5g
- **Internet/Mail order**: $17.11 for 1g, $10.61 for 3.5g
- **HC Licensed Producer**: $16.26 for 1g, $11.74 for 3.5g
Average price-per-gram of dried herb by source

UNIVERSE: PAST 12-MONTH CANNABIS USERS WITH ONLY ONE SOURCE, n=488

- Purchasing 1g
- Purchasing 3.5g

<table>
<thead>
<tr>
<th>Source</th>
<th>1g Price</th>
<th>3.5g Price</th>
<th>Percentage Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family/Friend</td>
<td>$12.55</td>
<td>$9.00</td>
<td>-39%</td>
</tr>
<tr>
<td>Dealer (in person)</td>
<td>$14.04</td>
<td>$8.77</td>
<td>-60%</td>
</tr>
<tr>
<td>Store/Co-op Dispensary</td>
<td>$12.84</td>
<td>$9.69</td>
<td>-33%</td>
</tr>
<tr>
<td>Internet/Mail order</td>
<td>$17.11</td>
<td>$10.61</td>
<td>-61%</td>
</tr>
<tr>
<td>HC Licensed Producer</td>
<td>$16.26</td>
<td>$11.74</td>
<td>-39%</td>
</tr>
</tbody>
</table>
Summary

• Sources are similar among jurisdictions except the use of stores/dispensaries in legal states.
Summary

- Sources are similar among jurisdictions except the use of stores/dispensaries in legal states.

- Self-reported price similar to objective price-per-gram.
Summary

• Sources are similar among jurisdictions except the use of stores/dispensaries in legal states.

• Self-reported price similar to objective price-per-gram.

• Substantial price discount for greater quantities.
Summary

• Sources are similar among jurisdictions except the use of stores/dispensaries in legal states.

• Self-reported price similar to objective price-per-gram.

• Substantial price discount for greater quantities.

• In Canada, lower prices from dealers and family/friends.
Policy-relevant outcomes
In the past 12 months, how often have you noticed someone using marijuana near you in a public place?

% ‘EVERY DAY’ OR ‘MORE THAN ONCE A DAY’

n=8,923  n=11,299  n=4,005
How comfortable or uncomfortable would you feel openly using marijuana in public?

% 'COMFORTABLE' OR 'VERY COMFORTABLE'

- Canada: 13% (n=8,844)
- US: 14% (n=11,337)
- Other: 16% (n=4,021)
Retail access

New to cannabis? We can help.

LEARN MORE
Know Your Roll
Overall, how easy or difficult would it be for you to get marijuana?

% ‘FAIRLY’ OR ‘VERY EASY’

- **67%** (n=7,742)
- **67%** (n=9,757)
- **73%** (n=3,959)

*16-18 YEAR-OLDS (n=3,225)
How easy or difficult would it be for you to buy marijuana online?

% ‘VERY’ OR ‘FAIRLY’ EASY

- Canada: 50% (n=5,374)
- United States: 28% (n=5,959)
- Other: 47% (n=1,970)
How easy or difficult would it be for you to buy marijuana from a store or dispensary in the city/town where you live?

% ‘VERY’ OR ‘FAIRLY’ EASY

- Canada: 52% (n=6,814)
- US: 31% (n=9,271)
- Other: 73% (n=3,769)
Advertising and promotion
In the past 12 months, have you noticed marijuana being advertised or promoted in any of the following places?

% NOTICING ADS AT ‘ANY’ LOCATION
In the past 12 months, have you noticed marijuana being advertised or promoted in any of the following places?

% NOTICING ADS AT ‘ANY’ LOCATION

16-18 YEAR-OLDS

19-30 YEAR-OLDS

>30 YEAR-OLDS
In the past 12 months, have you noticed marijuana being advertised or promoted in any of the following places?

UNIVERSE: ALL (n=27,183)
In the past 12 months, have you noticed marijuana being advertised or promoted in any of the following places?

- Billboards, posters: 30%
- Outside stores that sell marijuana: 29%
- Social media (incl. news): 20%
- Websites (incl. news): 17%
- Inside stores that sell marijuana: 16%
- Print newspapers or magazines: 16%
- TV or radio (incl. news): 17%
- Flyers: 12%
- Email or text message: 8%
Can you name any brands or company names of marijuana products?

MEAN NUMBER OF BRANDS RECALLED (RANGE 1-5)

- Canada: 2.2 (n=1,087)
- USA: 2.2 (n=885)
- Other: 2.4 (n=622)
Public education

---

**GOOD TO KNOW**

Marijuana in Colorado

Whether you choose to use or not, **YOU MIGHT NOT KNOW AS MUCH AS YOU THOUGHT.**

Be educated. Be responsible.
In the past 12 months, have you noticed education campaigns or public health messages about marijuana?

% “YES”

59%
36%
44%
In the past 12 months, have you noticed education campaigns or public health messages about marijuana?

% “YES”

- **16-18 YEAR-OLDS**: 67%
  - Yes: 44%  |
  - No: 51%
- **19-30 YEAR-OLDS**: 62%
  - Yes: 42%  |
  - No: 52%
- **>30 YEAR-OLDS**: 57%
  - Yes: 33%  |
  - No: 40%
In the past 12 months, have you noticed education campaigns or public health messages about marijuana....?

UNIVERSE: n=27,183
Health warnings

WARNING: Adolescents are at greater risk of harms from cannabis. 1 in 6 people who start using cannabis in adolescence will become addicted.

MISE EN GARDE : Les adolescents sont à risque élevé des effets dangereux du cannabis. Une personne sur six qui commence à consommer du cannabis à l'adolescence en deviendra dépendante.

Health Canada / Santé Canada
In the past 12 months, have you seen health warnings on marijuana products or packages?

% ‘YES’
Based on what you know or believe...

% CORRECT

Harmful to drive or operate machinery after using marijuana?
Use marijuana when pregnant or breastfeeding?
Can marijuana be addictive?
Are teenagers at greater risk of harm from using marijuana than adults?
Can marijuana smoke be harmful?
Can regular use of marijuana increase the risk of psychosis and schizophrenia?
Can using marijuana cause diabetes?
In your opinion, what is the level of health risk from occasionally...?

% 'HIGH' OR 'VERY HIGH' RISK

- Smoking marijuana
- Consuming marijuana edibles
- Vaping marijuana
- Using high-potency marijuana concentrates
- Using synthetic marijuana
Labelling & ‘dose’

[Image of a cannabis product label showing THC and CBD contents]
What are the THC levels in the **dried herb** you usually use?

**MEAN % THC**

n=187  n=99  n=205
Which of the following best describes the type of dried herb you usually use?

UNIVERSE: DRIED HERB USERS IN US LEGAL STATES (n=3,310)

- HIGH THC, LOW CBD
- HIGH THC, HIGH CBD
- LOW THC, LOW CBD
- LOW THC, HIGH CBD
- DON'T KNOW
EMBEDDED ‘EXPERIMENTS’

HOW MUCH OF THE COOKIE SHOULD SOMEONE EAT ON ONE OCCASION IF THEY WANTED A RECOMMENDED SERVING? % CORRECT (¼ OF A COOKIE) N=870 CORRECT

NO THC LABEL
n=296

THC MG LABEL
n=284

THC DOSE LABEL
n=290

7%<sup>a</sup>  13%<sup>a</sup>  54%<sup>a</sup>

<sup>a</sup>VALUES WITH THE SAME LETTERS ARE SIGNIFICANTLY DIFFERENT AT THE P<0.05 LEVEL.
Labelling & dose

THC: 0.6% (Total THC total: 17.3%)
CBD: 0% (Total CBD total: <0.07%)
Adverse outcomes
In the past 12 months, has anyone in your household accidentally consumed marijuana?

% ‘YES’

- TOTAL: 2%
- PAST 12-MONTH USERS: 3%
- CANNABIS STORED AT HOME: 4%

n=26,302

n=6,765

n=4,461
Who was it that accidentally consumed marijuana?

UNIVERSE: REPORTED ACCIDENTAL INGESTION (n=191)
Who was it that accidentally consumed marijuana?

UNIVERSE: REPORTED ACCIDENTAL INGESTION (n=773)
In the past 12 months, did you seek medical help for any adverse or negative health effects caused by using marijuana?

If yes....did you go to an emergency department?

PAST 12-MONTH USERS

- Sought help
- Went to emergency department

n=2,568
n=2,760
n=1,488
When you experienced the negative health effects, what type or form of marijuana were you using?

UNIVERSE: EXPERIENCED NEGATIVE HEALTH EFFECTS FROM CANNABIS USE (n=605)

<table>
<thead>
<tr>
<th>Form of Marijuana</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dried herb</td>
<td>50%</td>
</tr>
<tr>
<td>Edibles</td>
<td>29%</td>
</tr>
<tr>
<td>Oils/liquids</td>
<td>27%</td>
</tr>
<tr>
<td>Concentrates</td>
<td>17%</td>
</tr>
<tr>
<td>Drinks</td>
<td>17%</td>
</tr>
<tr>
<td>Hash or kief</td>
<td>16%</td>
</tr>
<tr>
<td>Tinctures</td>
<td>8%</td>
</tr>
<tr>
<td>Topicals</td>
<td>7%</td>
</tr>
</tbody>
</table>
In the past 12 months, have you ever **tried to get help to manage problems with your marijuana use?**

% "YES"

**UNIVERSE: PAST 12-MONTH USERS**

- Canada: 4%, n=2,585
- US: 7%, n=2,770
- Other: 6%, n=1,495
Lower-risk guidelines

Lower-Risk Cannabis Use Guidelines: A Comprehensive Update of Evidence and Recommendations

Benedikt Fischer, PhD, Cayley Russell, MA, Pamela Sabioni, PhD, Wim van den Brink, MD, PhD, Bernard Le Foll, MD, PhD, Wayne Hall, PhD, Jürgen Rehm, PhD, and Robin Room, PhD

Background. Cannabis use is common in North America, especially among young people, and is associated with a risk of various acute and chronic adverse health outcomes. Cannabis control regimes are evolving, for example toward a national legalization policy in Canada, with the aim to improve public health, and thus require evidence-based interventions. As cannabis-related health outcomes may be influenced by behaviors that are modifiable by the user, evidence-based Lower-Risk Cannabis Use Guidelines (LRCUG)—akin to similar guidelines in other health fields—offer a valuable, targeted prevention tool to improve public health outcomes.

Objectives. To systematically review, update, and quality-grade evidence on behavioral factors determining adverse health outcomes from cannabis that may be Main results. For most recommendations, there was at least “substantial” (i.e., good-quality) evidence. We developed 10 major recommendations for lower-risk use: (1) the most effective way to avoid cannabis use–related health risks is abstinence, (2) avoid early age initiation of cannabis use (i.e., definitively before the age of 16 years), (3) choose low-potency tetrahydrocannabinol (THC) or balanced THC-to-cannabidiol (CBD)–ratio cannabis products, (4) abstain from using synthetic cannabinoids, (5) avoid combusted cannabis inhalation and give preference to nonsmoking use methods, (6) avoid deep or other risky inhalation practices, (7) avoid high-frequency (e.g., daily or near-daily) cannabis use, (8) abstain from cannabis-impaired driving, (9) populations at higher risk for cannabis use–related health problems should avoid use altogether, and
Key indicators

TYPE OF USER
• Early age initiation of cannabis use
• During pregnancy
• Susceptibility to psychosis

TYPE OF USE
• Daily or near-daily use
• High THC or THC:CBD ratio
• Synthetic cannabinoids
• Smoke inhalation

SETTING
• Cannabis-impaired driving
• Workplace
Cannabis use among youth

UNIVERSE: 16-18 YEAR-OLDS (n=3,807)
Of all the **dried herb** that you used in the past 12 months, what percent do you…?

**MEAN %**

<table>
<thead>
<tr>
<th></th>
<th>Canada n=1,985</th>
<th>US illegal n=2,142</th>
<th>US legal n=1,095</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SMOKE WITHOUT TOBACCO</strong></td>
<td>67%</td>
<td>77%</td>
<td>75%</td>
</tr>
<tr>
<td><strong>SMOKE WITH TOBACCO</strong></td>
<td>22%</td>
<td>10%</td>
<td>9%</td>
</tr>
<tr>
<td><strong>VAPE</strong></td>
<td>10%</td>
<td>12%</td>
<td>15%</td>
</tr>
</tbody>
</table>
Ever cannabis users
(n=14,523)

All respondents
(n=24,204)

Have you ever **driven** a vehicle within 2 hours of using marijuana?

Have you ever been a **passenger in a vehicle** driven by someone who had been using marijuana in the last 2 hours?
In the past 30 days, have you used marijuana at work (including breaks) or within 2 hours of starting work?

% ‘YES’

ALL
n=5,493

HAZARDOUS WORK
n=1,440
When was the last time you used marijuana?

% USED IN PAST 12 MONTHS

<table>
<thead>
<tr>
<th>Condition</th>
<th>TOTAL</th>
<th>FAMILY HISTORY OF...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schizophrenia</td>
<td>34%</td>
<td>n=766</td>
</tr>
<tr>
<td>Psychosis</td>
<td>26%</td>
<td>n=629</td>
</tr>
<tr>
<td>Drug/alcohol abuse</td>
<td>22%</td>
<td>n=4,362</td>
</tr>
</tbody>
</table>

All respondents
n=27,183
When was the last time you used marijuana?

% USED DAILY/ALMOST EVERY DAY

<table>
<thead>
<tr>
<th></th>
<th>TOTAL</th>
<th>FAMILY HISTORY OF...</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All respondents</td>
<td>Schizophrenia</td>
</tr>
<tr>
<td></td>
<td>n=27,183</td>
<td>n=766</td>
</tr>
<tr>
<td>Last year?</td>
<td>8%</td>
<td>14%</td>
</tr>
<tr>
<td>3-5 years ago</td>
<td>6%</td>
<td>9%</td>
</tr>
<tr>
<td>6-10 years ago</td>
<td>11%</td>
<td>20%</td>
</tr>
</tbody>
</table>
Embedded experiments

NO BRANDING

LIMITED BRANDING

FULL BRANDING

NO WARNINGS

WARNINGS

WARNING: Adolescents are at greater risk of harms from cannabis.

Early and regular use increases the risk of psychosis and schizophrenia.
Collaborations and data requests welcome.
Summary

• ‘Natural experiments’ in legalization provide opportunities for comparative studies.

• Must account for ‘secular’ trends when evaluating legalization.

• Integration of population-based and market data.

• Need to consider individual policies to understand ‘optimal’ regulatory framework.
Research team

David Hammond  University of Waterloo, Canada
Samantha Goodman  University of Waterloo, Canada
Elle Wadsworth  University of Waterloo, Canada
Cesar Leos-Toro  University of Waterloo, Canada
Christian Boudreau  University of Waterloo, Canada
Peter Driezen  University of Waterloo, Canada

Wayne Hall  University of Queensland, Australia
Dan Werb  University of Toronto, Canada
Rosalie Pacula  RAND, USA
Tony George  Centre for Addiction & Mental Health, Canada
Jurgen Rehm  Centre for Addiction & Mental Health, Canada

Knowledge partners

Health Canada
CCSA
HIV/AIDS Legal network
Thank you.

David Hammond  PhD
CIHR PHAC APPLIED PUBLIC HEALTH CHAIR
SCHOOL OF PUBLIC HEALTH & HEALTH SYSTEMS
UNIVERSITY OF WATERLOO

WEB     DHAMMOND@UWATERLOO.CA
EMAIL   WWW.DAVIDHAMMOND.CA
TWITTER @DAVIDHAMMONDPhD