One Year Impact of Cannabis Legalization in Canada

Dr. Daniel McGrath
Department of Psychology, University of Calgary
Alberta Gambling Research Institute Conference 2021

April 27, 2021

UNIVERSITY OF
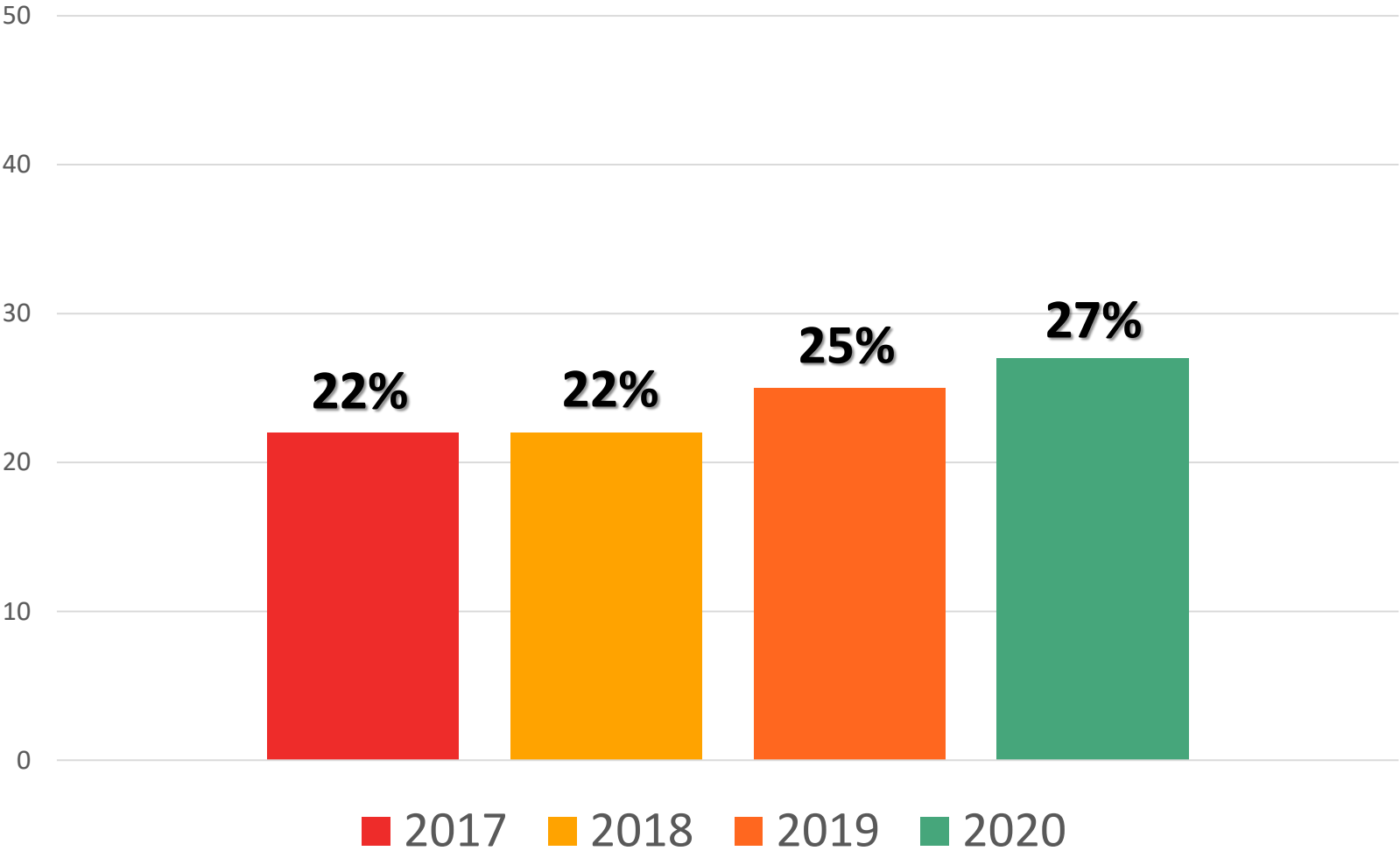CALGARY

Disclosure of Potential Conflict of Interest

- I have received research support from the Alberta Gambling Research Institute

- I have received a speaker's honorarium from Spectrum Therapeutics

UNIVERSITY OF CALGARY

Cannabis Legalization & Use in Canada

- October 17, 2018 recreational cannabis use

- October 17, 2019 cannabis edibles legal for sale

Canadian Cannabis Survey

https://www.canada.ca/en/health-canada/services/publications/drugs-health-products/canadian-cannabis-survey-2019-summary.html
https://www.canada.ca/en/health-canada/services/drugs-medication/cannabis/research-data/canadian-cannabis-survey-2020-summary.html

What is Cannabis?

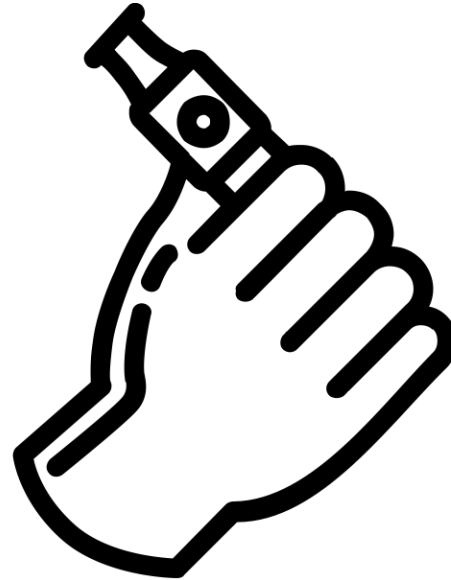- ## Cannabis or Marijuana
  - *Cannabis sativa*

- ## Cannabinoids (Canada.ca; NIH.gov)
  - Chemical compounds
  - Over 100 identified
  - Δ9-tetrahydrocannabinol (THC)
  - Cannabidiol (CBD)
  - CB_1 and CB_2 receptors
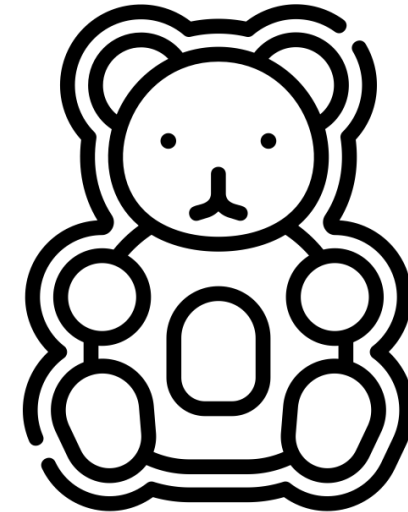
UNIVERSITY OF CALGARY

Routes of Administration
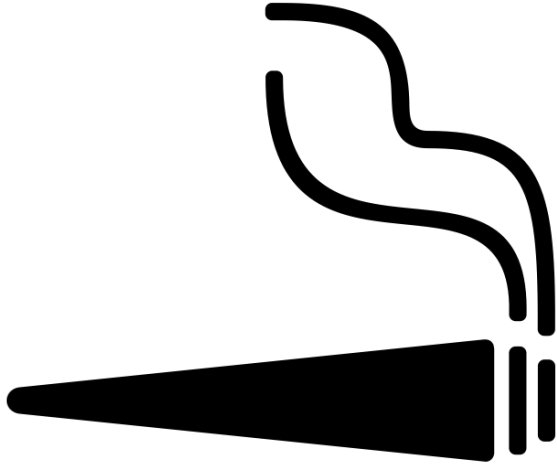
Created by Milton Raposo C. Rêgo Jr.
from Noun Project

Created by avent alitia
from Noun Project

Created by ciciliakwo
from Noun Project

https://www.canada.ca/en/health-canada/services/drugs-medication/cannabis/information-medical-practitioners/information-health-care-professionals-cannabis-cannabinoids.html#rn400

Cannabis and Gambling

- Punia et al. (2020)

- Relationships between Cannabis and Gambling
  - Cannabis use is relatively common among gamblers
  - Cannabis use is more strongly associated with problematic gambling
  - Co-occurrence of both cannabis and gambling are associated with other substance use issues

UNIVERSITY OF CALGARY

Cannabis and Gambling

- Punia et al. (2020)

- Cannabis Use while Gambling
    - No studies of acute cannabis use while gambling
    - However, cannabis impairs performance of decision-making and risk-taking tasks in the laboratory
    - Impaired financial decision making

UNIVERSITY OF CALGARY

AGRI ANP Project

- AGRI National Study on Gambling (ANP): Online Panel Project
  - Leger Opinion's registered pool of online panelists
  - People who gambled at least once per month
  - Two waves of data
    - August to October 2018
    - August to November 2019
  - Pre- and Post- Legalization
  - Numerous cannabis questions

UNIVERSITY OF CALGARY

AGRI ANP Project

Demographic Variable		2018 – Baseline N = 10,199	2019 – Follow-up N = 4,707
Sex	Male	46.7%	48.6%
	Female	53.2%	51.3%
Age	18 to 24	4.7%	1.9%
	25 to 34	13.1%	10.0%
	35 to 44	15.1%	13.6%
	45 to 54	19.5%	19.9%
	55 to 64	24.1%	27.7%
	65 to 74	18.3%	21.0%
	75 or older	5.2%	5.7%
PPGM	Problem Gambler	3.9%	4.0%
	Pathological Gamblers	9.3%	8.5%

UNIVERSITY OF
CALGARY

Results: Baseline Cannabis Use

- Non Users
- Daily
- Weekly
- Monthly
- < Monthly

7%
4%
5%
5%
79%

UNIVERSITY OF CALGARY
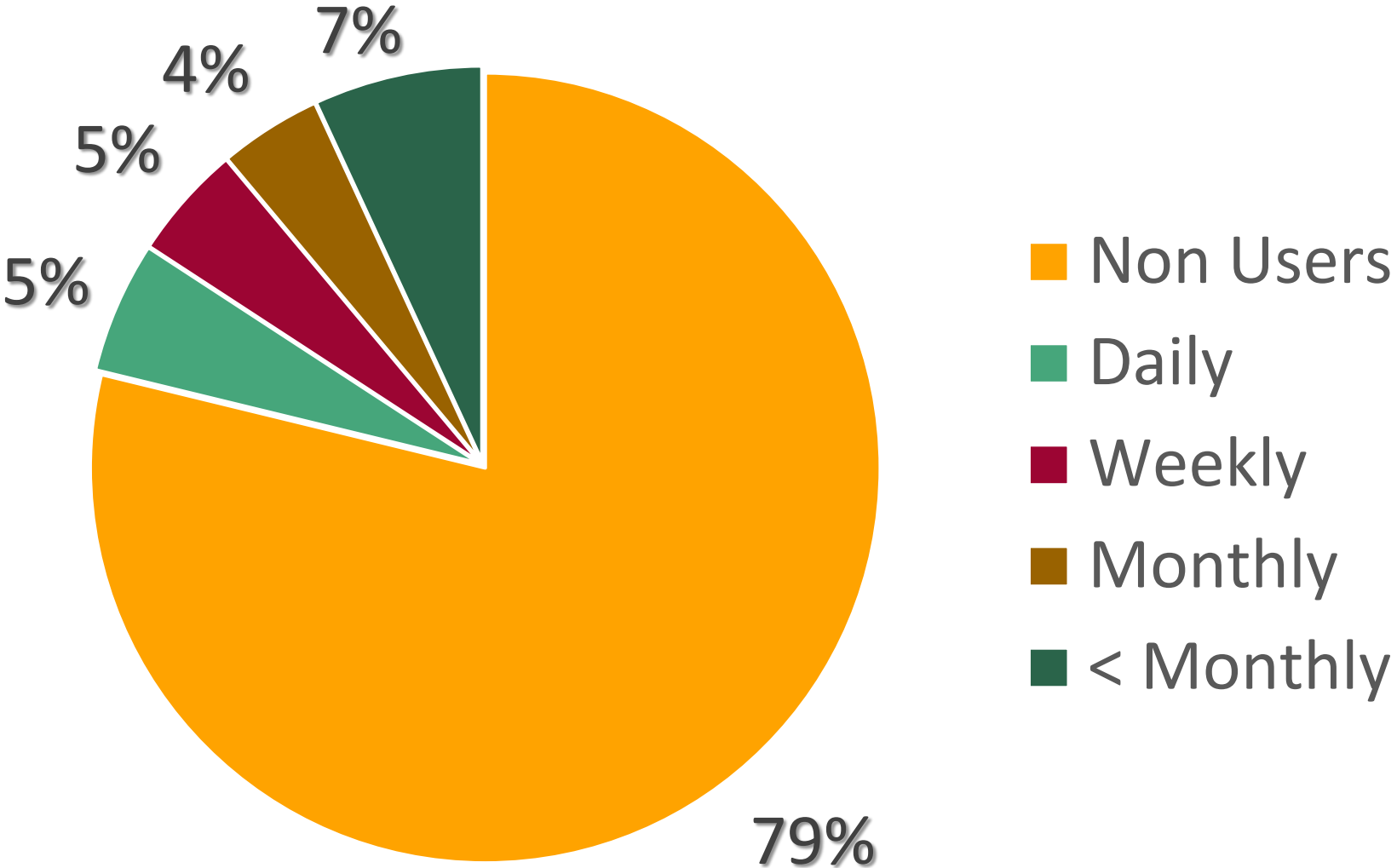
Results: Follow-up Cannabis Use

Pie chart showing follow-up cannabis use:
- Non Users: 74%
- Daily: 6%
- Weekly: 7%
- Monthly: 6%
- < Monthly: 7%
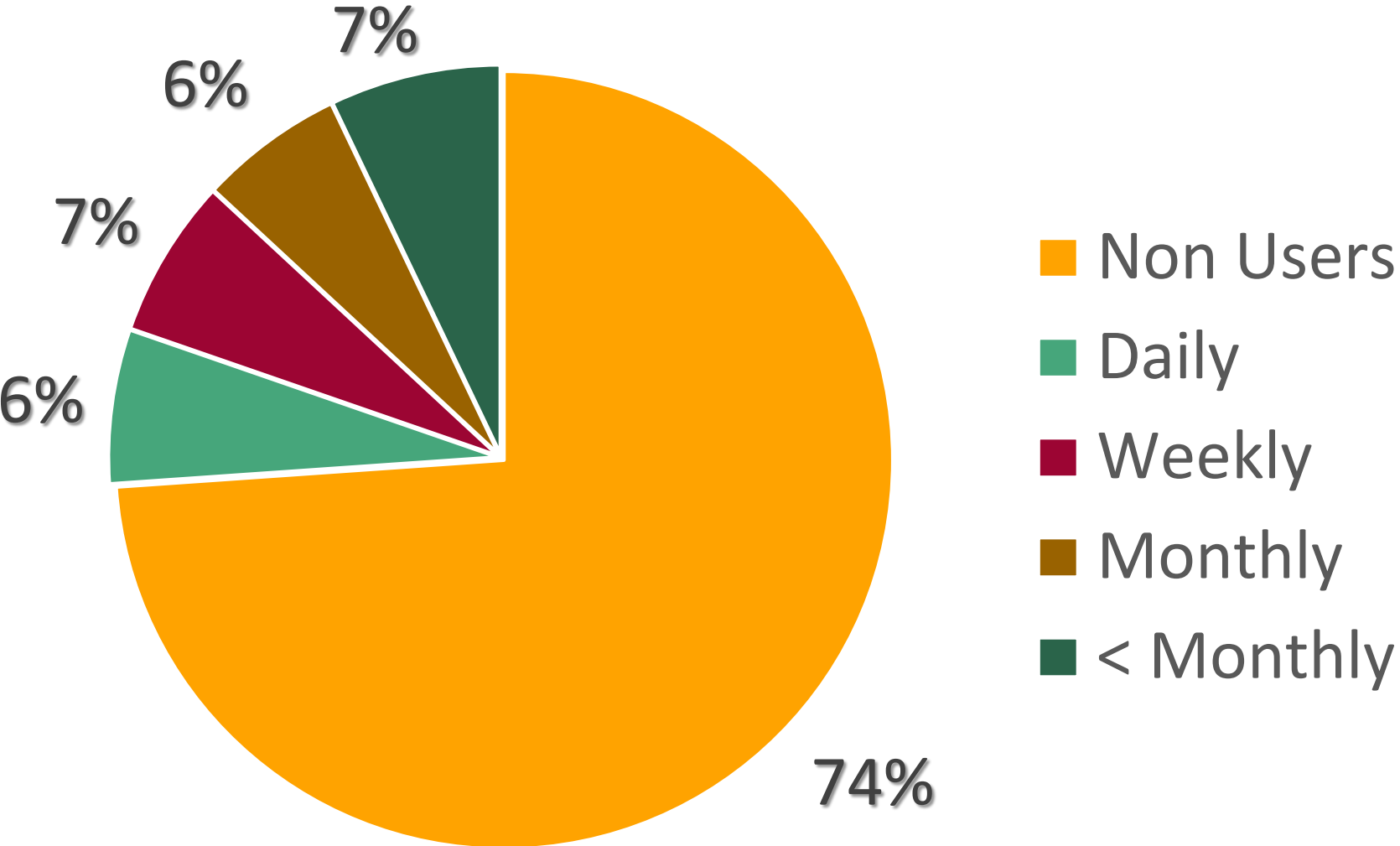
Results: Baseline Demographics

Variable	Cannabis Users (n = 2,553)		Non-users (n = 7,501)		Significance Test	
	N	% M (SD)	N	% M (SD)	χ2 / t	p
Male	1,271	27.3%	3,391	72.7%	16.38	<0.01*
Female	1,281	23.8%	4,104	76.2%		
Age (years)	2,433	43.3 (14.1)	7,193	55.5 (14.5)	36.10	<0.01*
Single	773	30.3%	1,283	17.1%	248.93	<0.01*
Married	1,400	54.8%	4,871	64.9%		
White European	1,429	23.0%	4,780	77.0%	48.46	<0.01*
Other Ethnic Origins	1,124	29.2%	2,721	70.8%		

UNIVERSITY OF CALGARY

Results: Baseline Gambling Variables

Variable	Cannabis Users (n = 2,553)		Non-users (n = 7,501)		Significance Test	
	N	% M (SD)	N	% M (SD)	χ2 / t	p
PGSI Score	2,553	4.3 (6.2)	7,501	1.3 (3.3)	30.66	<0.01*
PG Category	635	24.9%	431	5.7%	928.55	<0.01*
Hours Gambled (per month)	2,553	48.2 (91.7)	7,501	22.6 (55.6)	16.81	<0.01*
# Gambling Types	2,553	3.8 (2.2)	7,501	2.5 (1.3)	35.38	<0.01*
EGM Gambling	1,347	52.8%	2,449	32.6%	327.85	<0.01*
Table Games	904	35.4%	886	11.8%	724.77	<0.01*
Online Gambling	913	35.8%	1,412	18.8%	307.38	<0.01*
GFM Total Score	2,553	5.7 (2.2)	7,501	6.6 (1.7)	22.27	<0.01*

UNIVERSITY OF CALGARY

Results: Baseline Gambling Motives

Variable	Cannabis Users (n = 2,553)		Non-users (n = 7,501)		Significance Test	
	N	%	N	%	χ2	p
Excitement/fun	637	25.0%	1,824	24.3%	252.17	<0.01*
To win money	1,312	51.4%	4,022	53.6%		
To develop skills	70	2.7%	21	0.3%		
To compete or challenge	95	3.7%	69	0.7%		
To socialize	94	3.7%	284	3.8%		
To support worthy causes	43	1.7%	241	3.2%		
To escape	144	5.6%	415	5.5%		
Makes me feel good	13	0.5%	31	0.4%		
Other	57	2.2%	272	3.6%		
None	88	3.4%	322	4.3%		

UNIVERSITY OF CALGARY

Results: Baseline Regression of Non-Use/Use

Variable	B	SE	Wald	P	Exp(B)	95% CI	
						Lower	Upper
Smoking/Vaping	1.44	.057	631.01	<0.01*	0.24	0.21	0.27
Age	-.032	.002	247.11	<0.01*	0.97	0.96	0.97
Illicit Drugs	1.63	.127	163.60	<0.01*	0.20	0.15	0.25
Alcohol	.737	.107	47.00	<0.01*	0.48	0.39	0.59
PGSI Scores	.040	.006	39.78	<0.01*	1.04	1.03	1.05
NEO Impulsivity	.038	.006	33.96	<0.01*	1.04	1.03	1.05
Anxiety	.419	.088	22.65	<0.01*	0.66	0.55	0.78
Sex	-.264	.057	21.25	<0.01*	1.30	1.16	1.46
Behavioural Addictions	-.170	0.78	4.68	0.03*	1.19	1.02	1.38
Depression	.061	.083	0.54	0.46	0.94	0.80	1.11

UNIVERSITY OF CALGARY

Results: Upcoming Legalization - Users
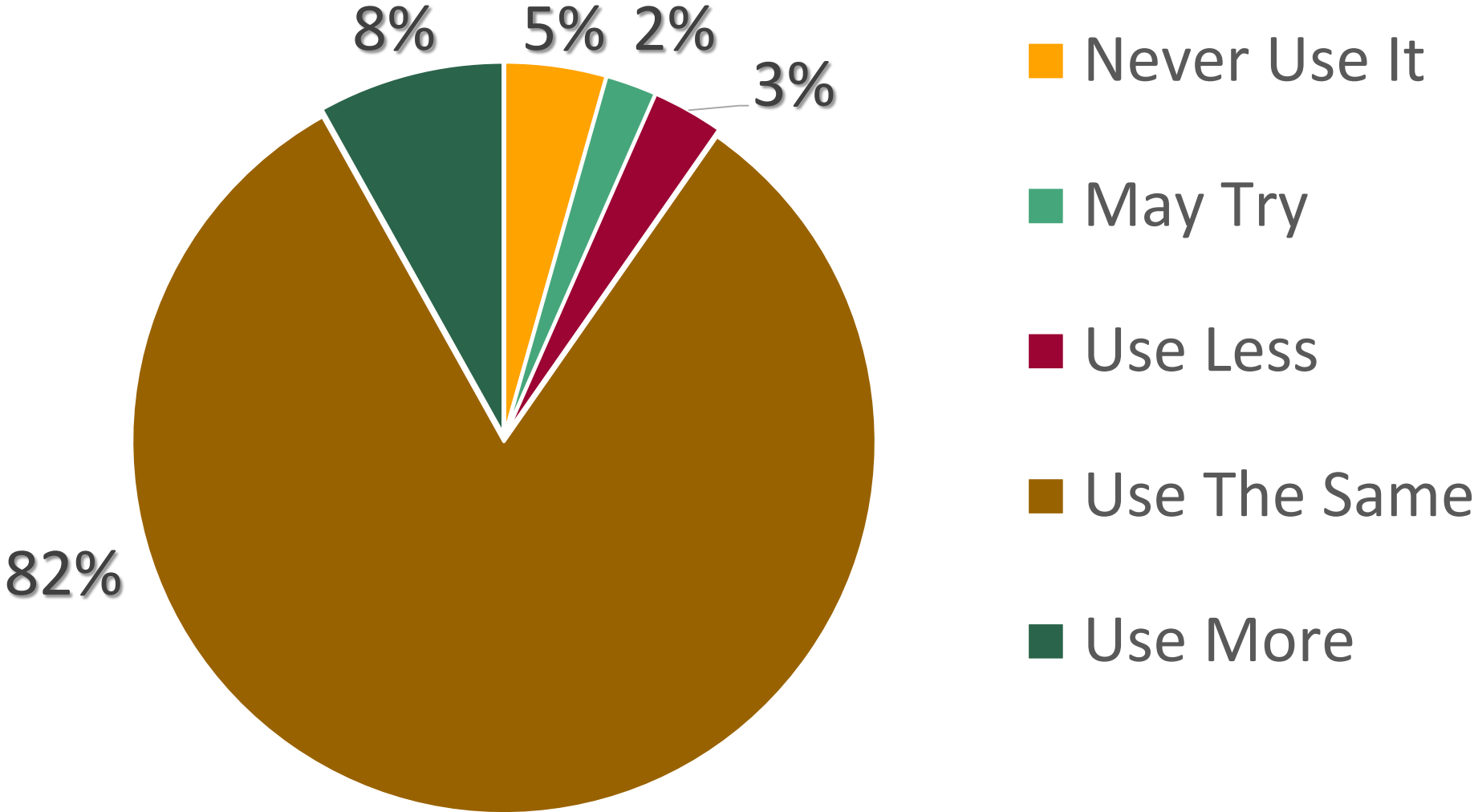
Results: Upcoming Legalization – Non-Users

- Never Use It
- May Try
- Use Less
- Use The Same
- Use More

83%   10%   0%   5%   2%
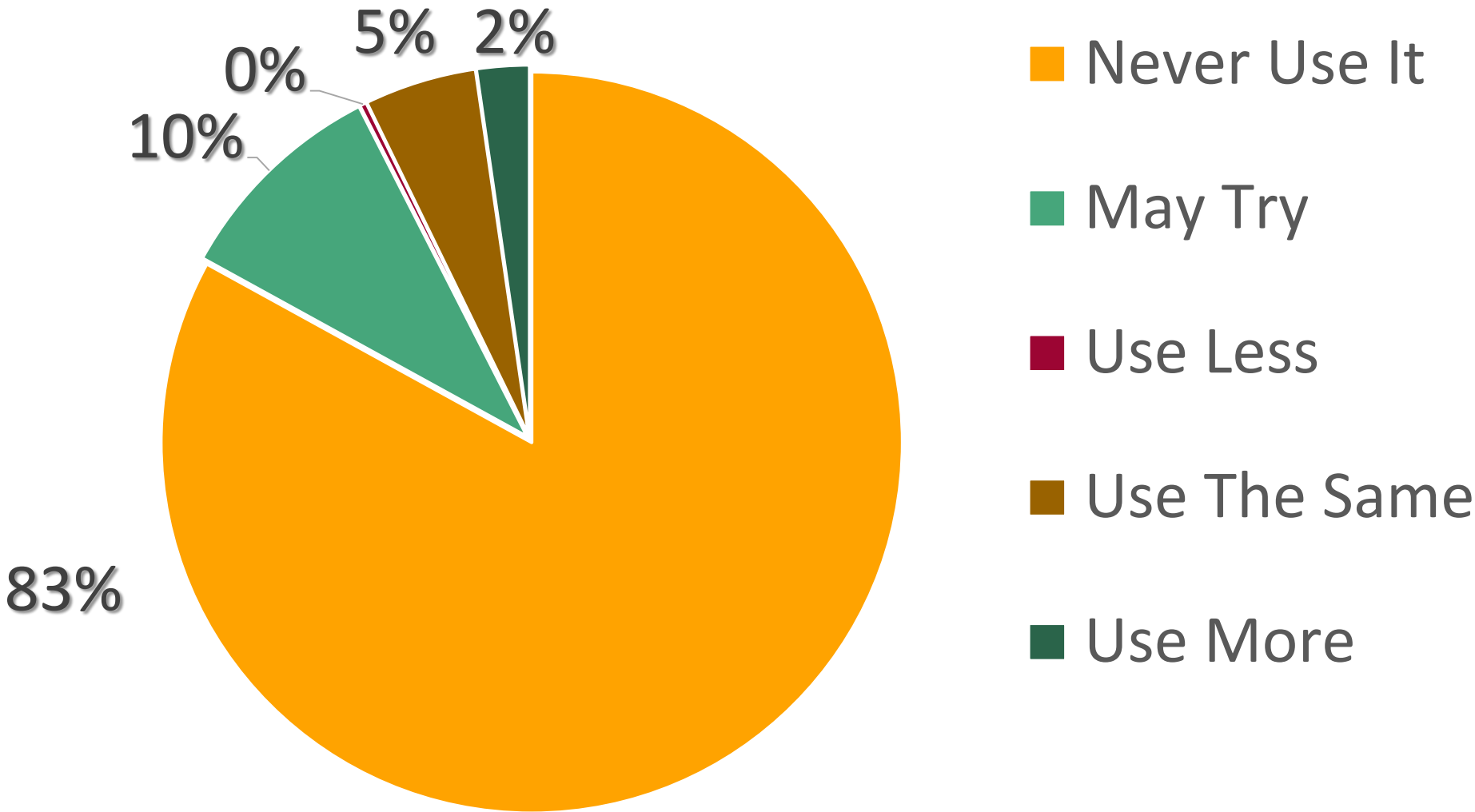
Results: Baseline to Follow-up Cannabis Use

Baseline

Follow-up

89%

11%

UNIVERSITY OF CALGARY
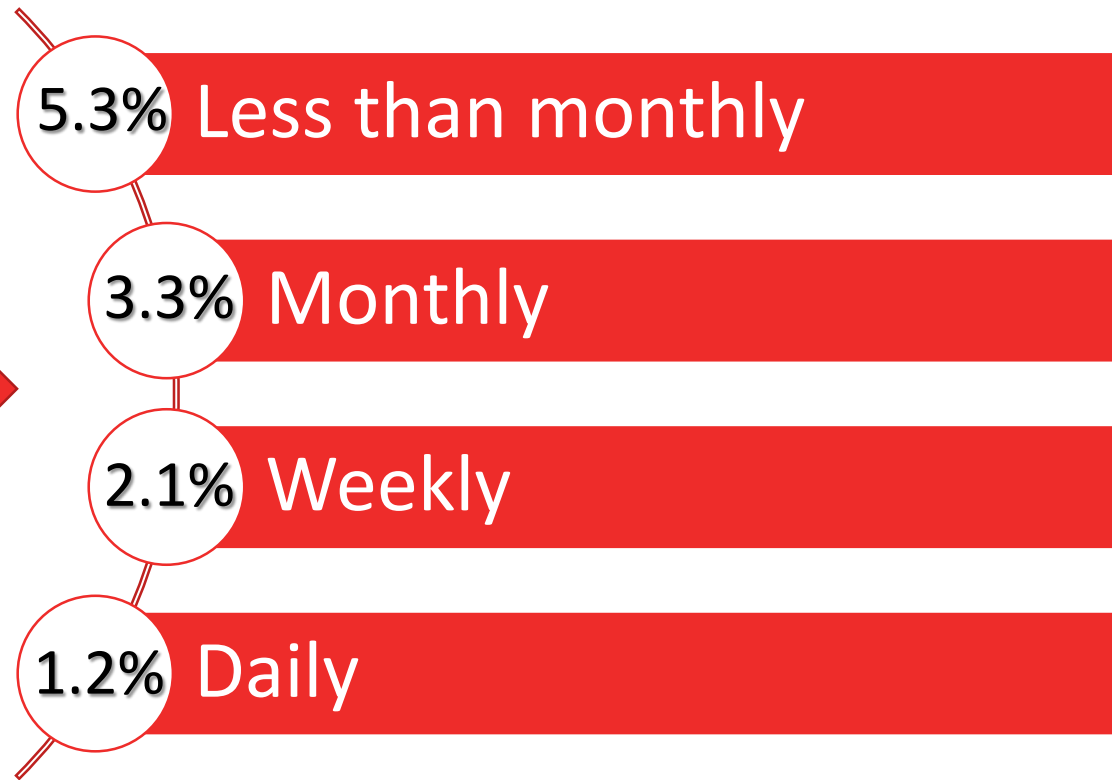
Results: Regression of Switching to Use

Variable	B	SE	Wald	P	Exp(B)	95% CI Lower	Upper
Age	-.053	.005	111.42	<0.01*	0.95	0.94	0.96
Smoking/Vaping	-1.01	.13	61.40	<0.01*	0.36	0.28	0.47
Anxiety	.57	.21	7.41	0.01*	1.77	1.17	2.67
Alcohol (everyday)	.60	.22	7.05	0.01*	1.81	1.17	2.82
Divorced	.59	.23	6.78	0.01*	1.81	1.16	2.82
Sex	-.34	.13	6.70	0.01*	0.71	0.55	0.92
Alcohol (4 to 6 times per week)	.34	.17	3.95	0.04*	1.40	1.01	1.96

UNIVERSITY OF CALGARY

Discussion

- Cannabis use appears to be increasing following legalization

- Link between cannabis use and gambling

- Research on the topic is limited
  - Especially acute effects

- The ANP dataset provides for a more detailed look at the relationship

UNIVERSITY OF CALGARY

Discussion: Gambling Outcomes

- Cannabis use increased in our sample from 21% at baseline to 26% at follow-up

- Cannabis users had higher PGSI scores and gambled more
  - More strategic gambling, EGMs, and online

- Cannabis use was most associated with smoking vaping, younger age, and substance use

UNIVERSITY OF CALGARY

Discussion: Cannabis Use at Follow-up

- 12% of baseline non-users later used cannabis
  - Most used monthly or less

- There were a number of potential predictors of switching
  - Age, smoking/vaping, anxiety, male, heavier alcohol use

- More longitudinal research needed to identify continued predictors of use

UNIVERSITY OF
CALGARY

Acknowledgements

References

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

- https://www.canada.ca/en/health-canada/services/drugs-medication/cannabis/research-data/canadian-cannabis-survey-2020-summary.html

- https://www.canada.ca/en/health-canada/services/drugs-medication/cannabis/information-medical-practitioners/information-health-care-professionals-cannabis-cannabinoids.html#rn400

- Punia, K., DeVillaer, M., MacKillop, J., & Balodis, I. M. (2020). Understanding the overlap between cannabis use and gambling behaviour: A systematic review of empirical findings and consideration of policy implications. *Current Addiction Reports, 8(1),* 35-56. doi:10.1007/s40429-020-00323-x