Changes in cannabis use associated with legalization in Ontarians living with HIV (2008-2022)

Sergio Rueda, Marcos Sanches, Tanya Lazor, Ann N. Burchell, Jeffrey D. Wardell, Shari Margolese, Enrico Mandarino, Hayley Hamilton, Sameer Imtiaz, Tara Elton-Marshall, Yeshambel Nigatu, Mina Tadrous, Abigail E Kroch

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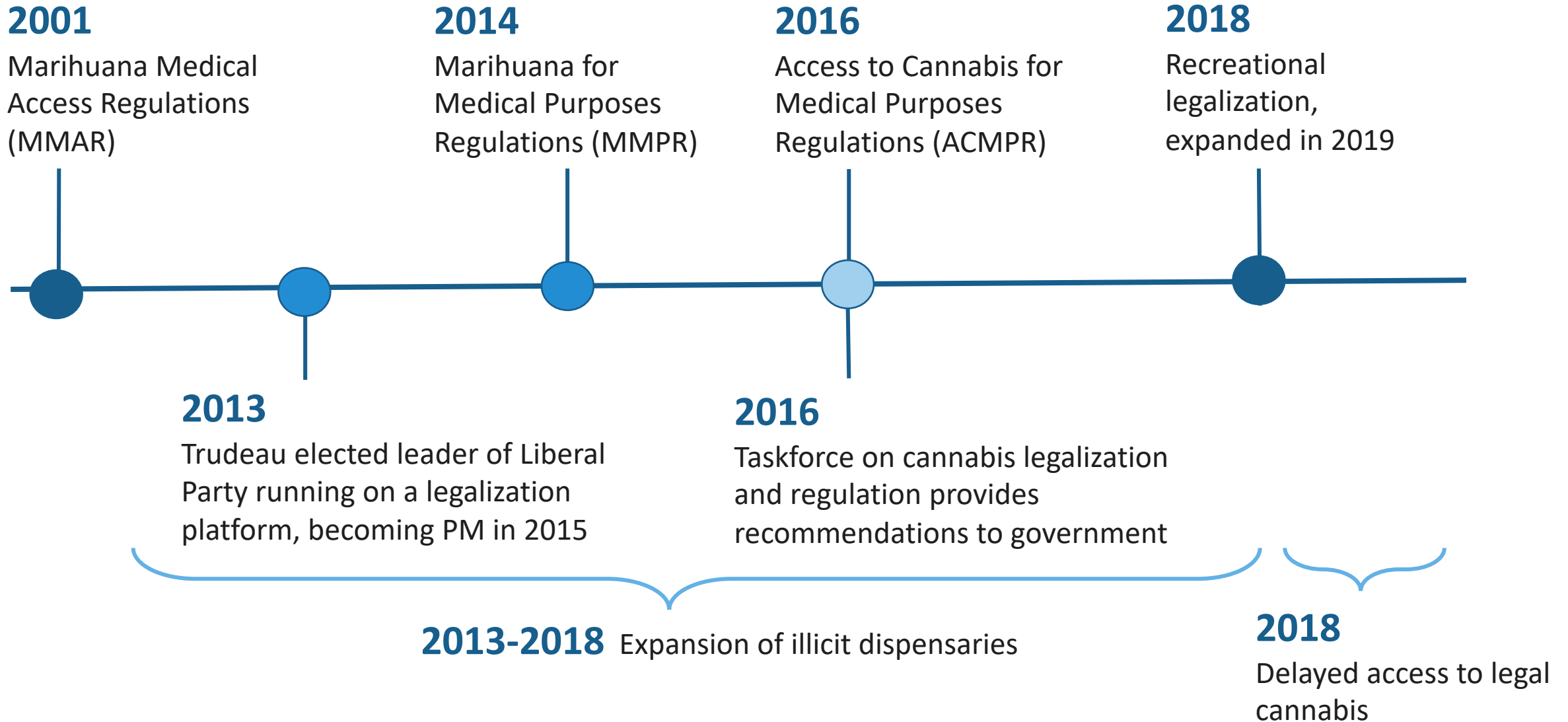33rd Canadian Conference on HIV Research (CAHR 2024)
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Conflict of Interest Disclosure

In the past 2 years I have been an employee of the **Centre for Addiction and Mental Health**

In the past 2 years I have received research support (grants) from **the Canadian Institutes of Health Research and the Ontario HIV Treatment Network**

There are relationships to disclose: **No**

Timeline of key events in the evolution of legalization in Canada

2001
Marihuana Medical Access Regulations (MMAR)

2014
Marihuana for Medical Purposes Regulations (MMPR)

2016
Access to Cannabis for Medical Purposes Regulations (ACMPR)

2018
Recreational legalization, expanded in 2019

2013
Trudeau elected leader of Liberal Party running on a legalization platform, becoming PM in 2015

2016
Taskforce on cannabis legalization and regulation provides recommendations to government

2013-2018 Expansion of illicit dispensaries

2018
Delayed access to legal cannabis

https://laws-lois.justice.gc.ca/eng/acts/C-24.5/; https://en.wikipedia.org/wiki/Cannabis_in_Canada; https://www.1922cannabisretail.com/1922-cannabis-journal/notable-canadian-cannabis-court-cases;

Impacts of legalization in Canada after 5 years

Legalization has had positive effects:

> dramatic declines in criminal charges
>
> transition to legal market / diversion of revenue to taxes
> reduction of stigma
> opportunities to shape product standards to reduce risks

Areas of ambiguity:

> maintenance of high levels of use in adolescents
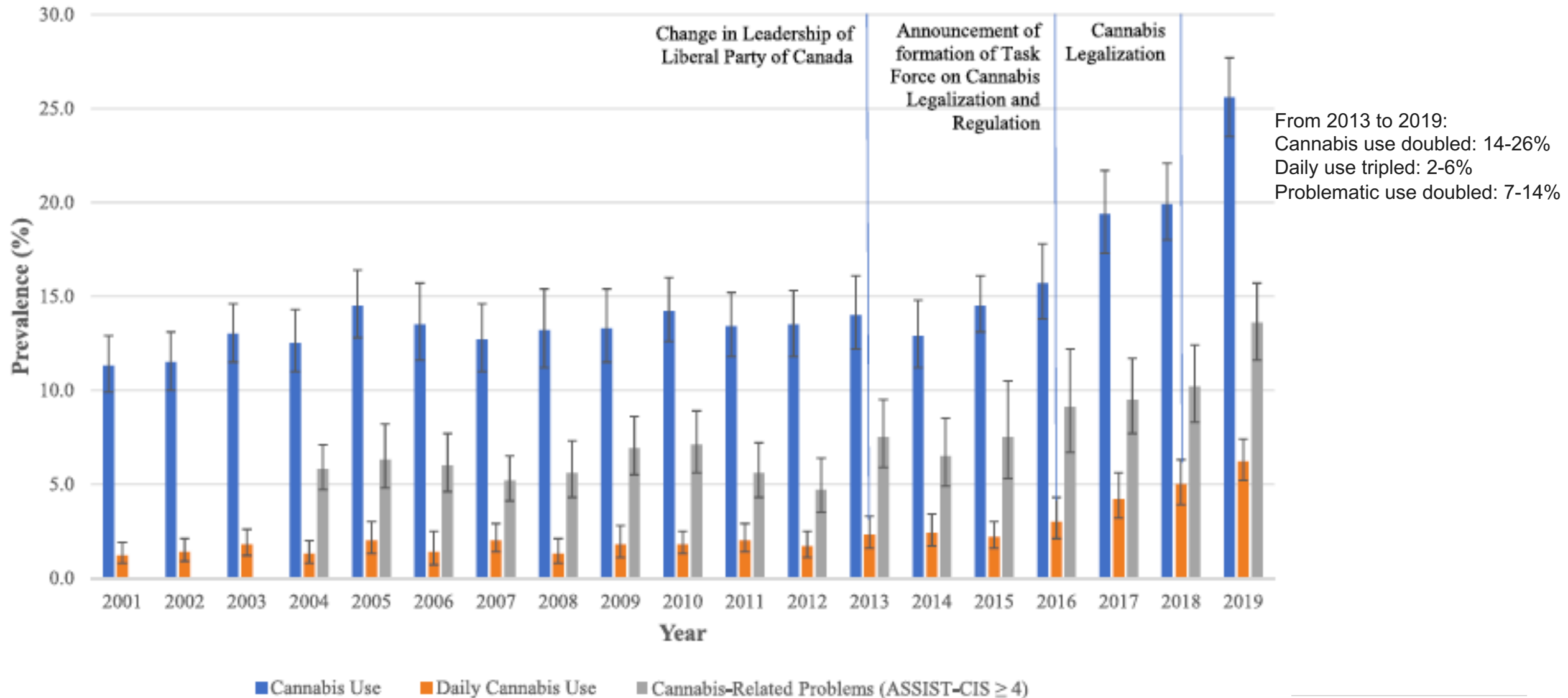> equivocal findings related to driving under the influence of cannabis

Legalization has had negative effects:

> increased prevalence of use and potentially problematic use
> increased emergency department visits in pediatric populations
> increased commercialization of cannabis

Greater access, product diversity, and lower prices

The long-term impacts remain to be seen...

Increases in cannabis use, daily use & problematic use in Ontario (2001–2019)

From 2013 to 2019:
Cannabis use doubled: 14-26%
Daily use tripled: 2-6%
Problematic use doubled: 7-14%

Chart annotations: "Change in Leadership of Liberal Party of Canada", "Announcement of formation of Task Force on Cannabis Legalization and Regulation", "Cannabis Legalization"

Legend: Cannabis Use | Daily Cannabis Use | Cannabis-Related Problems (ASSIST-CIS ≥ 4)

Y-axis: Prevalence (%), X-axis: Year (2001–2019)

Imtiaz et al. 2023

Why focus on people living with HIV?

People living with HIV consume cannabis at 3-4 times the rates of the general population

High rates of cannabis use may suggest problematic use but may also reflect widespread medical use to treat a range of symptoms and conditions

People with HIV were at the forefront of advocacy efforts that compelled the Government of Canada to create the first program to access cannabis for medical purposes and played a pivotal role in subsequent revisions to the medical cannabis program

People with HIV have also been the largest single group of patients who have received authorization to use cannabis for medical purposes, despite affordability challenges

People living with HIV are included in all our research projects

Aims

To investigate the changes in the frequency of cannabis use associated with legalization among Ontarians living with HIV

Daily or near-daily cannabis use

Past month (excluding daily use)

Past year (excluding past month)

Frequency of cannabis use (No use; <1/week; 1/week, 2-4/week; 5-7/week)

Hypotheses

Legalization will be associated with an increase in past-year or past-month cannabis use, but not daily use. Daily use will either not increase or will increase at slower rates relative to less frequent use

Cannabis use will significantly increase over the totality if the observation period but more so for recreational legalization relative to all other legalization phases

Methods

Retrospective cohort study: January 2008 – December 2022

Ontario HIV Treatment Network (OHTN) Cohort Study (OCS)

≥ 16 years old

Living with HIV and accessing HIV care

Invited to complete questionnaire annually

21,387 interviews by 5,004 participants were included

~40% completed <3 interviews

~10% completed ≥10 interviews

Analysis

We used segmented regression model in the context of Generalized Estimating Equations

Our primary model uses a quadratic function, aiming at adding some flexibility for non-linearity

For effects on the slope, we used a linear function

Predictors:

      Sequential variable to represent time in month from January 2008

      Categorical period variable (Before MMPR; between MMPR and ACMPR; between ACMPR and Legalization; and after Legalization)

      Sequential x categorical interactions

Outcomes:

      Daily or near-daily cannabis use

      Past 30 days (excluding daily use)

      Frequency of cannabis use (No use; <1/week; 1/week, 2-4/week; 5-7/week)

Results: Demographics by legalization phase

Variable	Marihuana Medical Access Regulations (2008 – 2014) (n=1753)	Marihuana for Medical Purposes Regulations (2014 – 2016) (n=622)	Access to Cannabis for Medical Purposes Regulations (2016 – 2018) (n=1301)	Recreational Legalization (2018 – 2021) (n=1328)	Overall (N=5004)
Sex					
Female	380 (22%)	101 (16%)	212 (16%)	364 (27%)	1057 (21%)
Male	1373 (78%)	521 (84%)	1085 (83%)	959 (72%)	3938 (79%)
Missing	0 (0%)	0 (0%)	4 (0.3%)	5 (0.4%)	9 (0.2%)
Age					
16-30	173 (10%)	78 (13%)	114 (9%)	139 (11%)	504 (10%)
31-50	1066 (61%)	269 (43%)	551 (42%)	646 (49%)	2532 (51%)
>50	514 (29%)	275 (44%)	636 (49%)	543 (41%)	1968 (39%)
Employed	799 (46%)	278 (45%)	599 (46%)	575 (43%)	2251 (45%)
Household Income < $20K	497 (28%)	172 (28%)	317 (24%)	358 (27%)	1344 (27%)
Personal Income < $20K	785 (45%)	275 (44%)	520 (40%)	537 (40%)	2117 (42%)

Cannabis use by legalization phase

Variable	Marihuana Medical Access Regulations (2008 – 2014) (n=1753)	Marihuana for Medical Purposes Regulations (2014 – 2016) (n=622)	Access to Cannabis for Medical Purposes Regulations (2016 – 2018) (n=1301)	Recreational Legalization (2018 – 2021) (n=1328)	Overall (N=5004)
Daily or near daily	184 (11%)	116 (19%)	231 (18%)	214 (16%)	745 (15%)
Past 30-day use	232 (13%)	92 (15%)	206 (16%)	216 (16%)	746 (15%)
Past year use	169 (10%)	43 (7%)	106 (8%)	88 (7%)	406 (8%)
Frequency of use (days per week; Mean, SD)	0.84 (1.89)	1.34 (2.33)	1.34 (2.30)	1.25 (2.23)	1.14 (2.16)

Cannabis use groups are mutually exclusive:
* Past year excludes past month and daily use
* Past month excludes daily use

Daily use increased and past-year use decreased between 2008 and 2022

Cannabis use group	OR	95% CI		p value
2022 / 2008 Daily/near-daily	1.64	1.33	2.01	<0.001**
2022 / 2008 Past month	1.03	0.84	1.26	0.806
2022 / 2008 Past year	0.72	0.56	0.92	0.01*

* p value <0.05; ** p value <0.001

Cannabis use groups are mutually exclusive:
Past year excludes past month and daily use
Past month excludes daily use

Daily use drops at recreational legalization
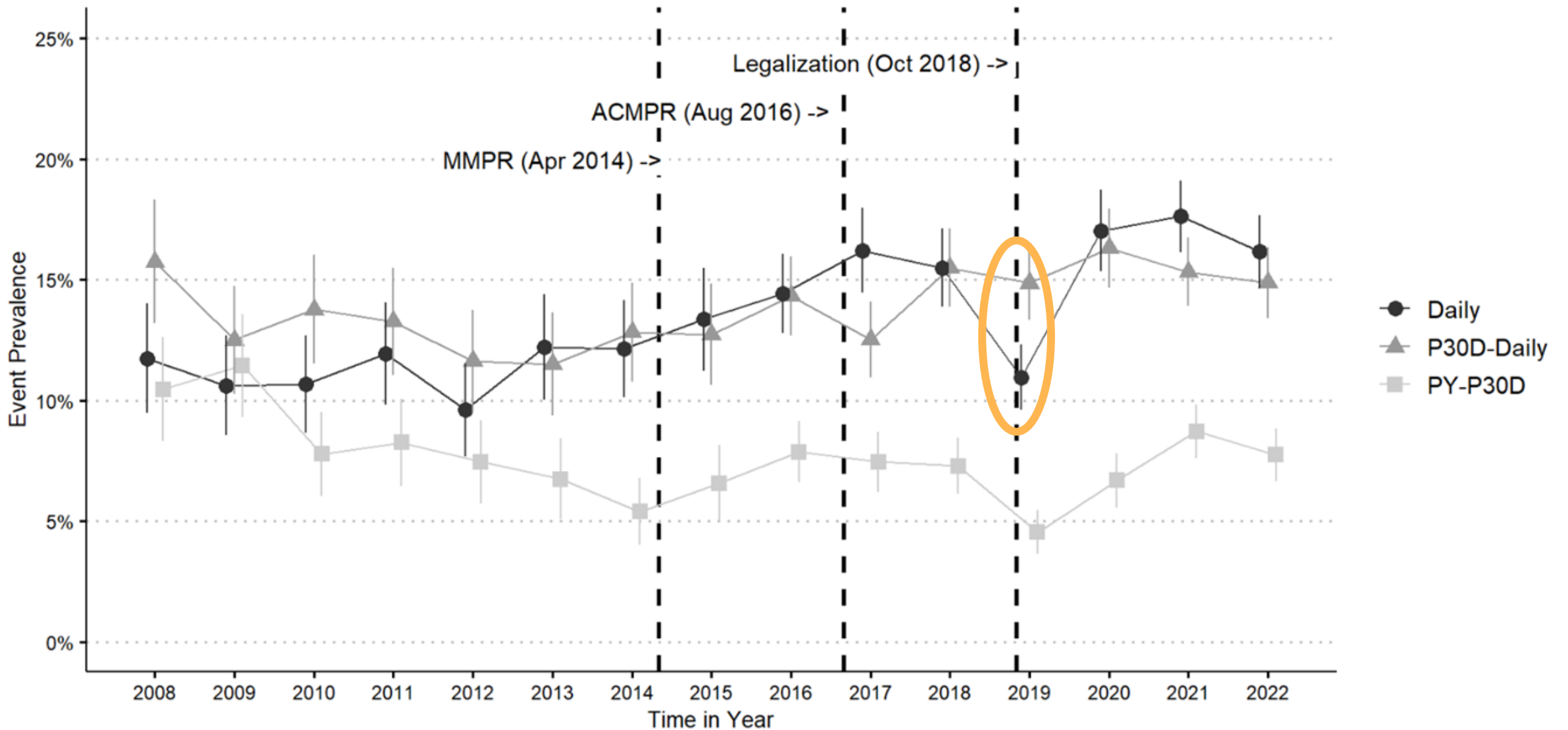
Change in prevalence of daily use at each phase

Phase	OR	95% CI	
MMPR	0.94	0.77	1.13
ACMPR	1.04	0.85	1.27
Legalization	0.50**	0.41	0.61

Estimated prevalence of daily use at each phase

Phase	Prevalence	SE
Before recreational legalization	0.17	0.011
After recreational legalization	0.09	0.007

** p value <0.001
SE = standard error

Cannabis use trends, 2008 – 2022 (N=5,004; 21,387 interviews)

Notes: P30D-Daily means past 30-day use excluding those who indicated daily use; PY-P30D means past year excluding those who indicated past 30-day use or daily

Limitations

Longitudinal design with interrupted time series is not the most robust

Ideal design would include a control group from a cohort that did not legalize cannabis

Very difficult to control for COVID-19 as strongest cannabis commercialization phase coincides with COVID

Longer observation period necessary as market also matures

Unable to distinguish between recreational and medical use

Conclusions

Daily cannabis use increased and past-year use decreased significantly among Ontarians living with HIV over the past 10 years

Fastest growth in prevalence of daily use may reflect medical use, problematic use, or both

Increases in cannabis use reflect wider trends in the general population

Ongoing investigation focused on OCS participants (n=300) who have used cannabis in the past year to develop a profile of Ontarians with HIV who use cannabis looking at:

        reasons for cannabis use,
        attitudes and behaviours,
        methods of use,
        amounts consumed,
        Standard THC Unit
        medical authorizations and insurance coverage,
        knowledge and levels of THC/CBD,
        knowledge of low-risk cannabis use guidelines,
        exposure to public health messaging and marketing

Thank You

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