

Cannabis Retail: Legalization Reverberations

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DISCLOSURES

NO CONFLICTS OF INTEREST TO DISCLOSE.



Overview

- Cannabis Epidemiology
- Legalization: Before & After
- Cannabis' Impact on Health
- Toolkits and Prevention Points of Interests



ROUTES OF ADMINISTRATION



SMOKING

Onset
5–10min

Duration
2–4hrs



VAPORIZATION

Onset
5–10min

Duration
2–4hrs



ORAL

Onset
60–180min

Duration
6–8hrs



TOPICAL

Onset
variable

Duration
variable

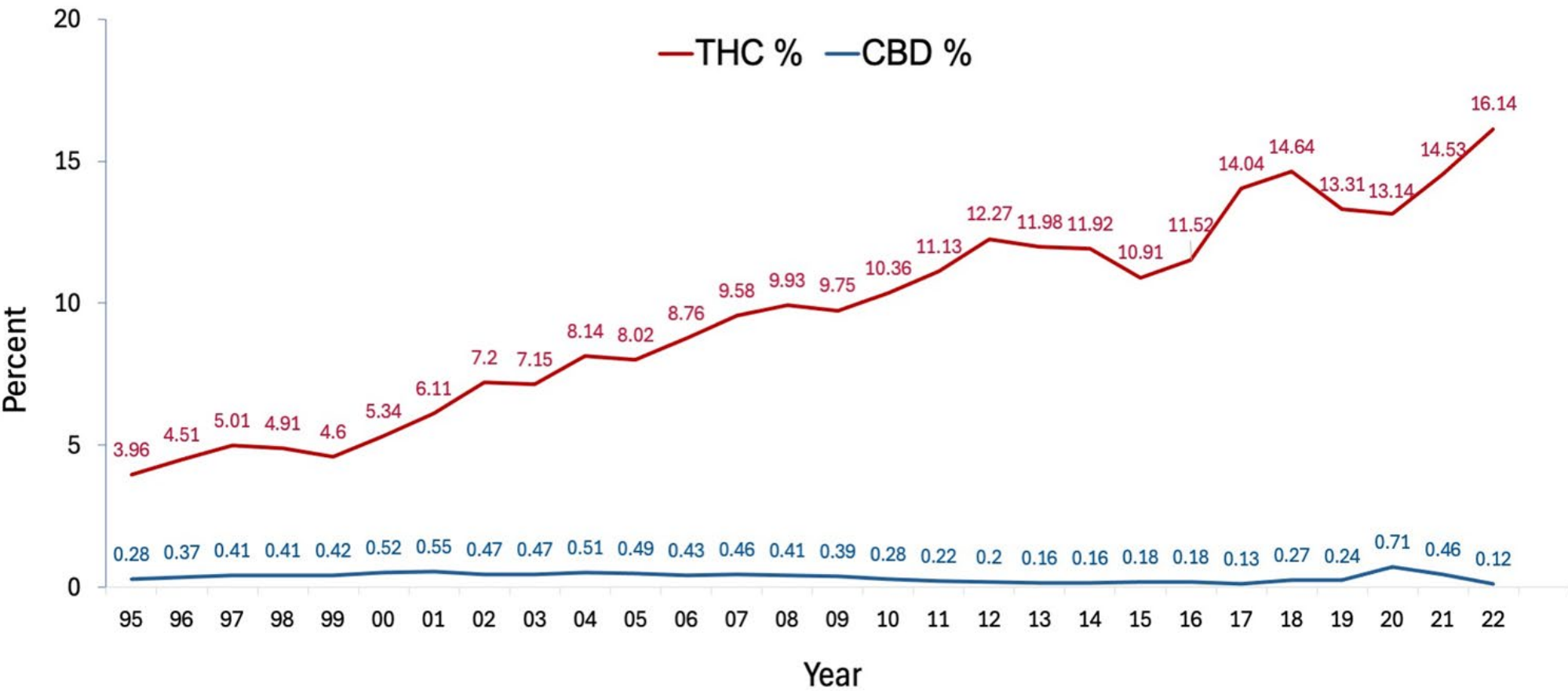


ORO-MUCOSAL

Onset
15–45min

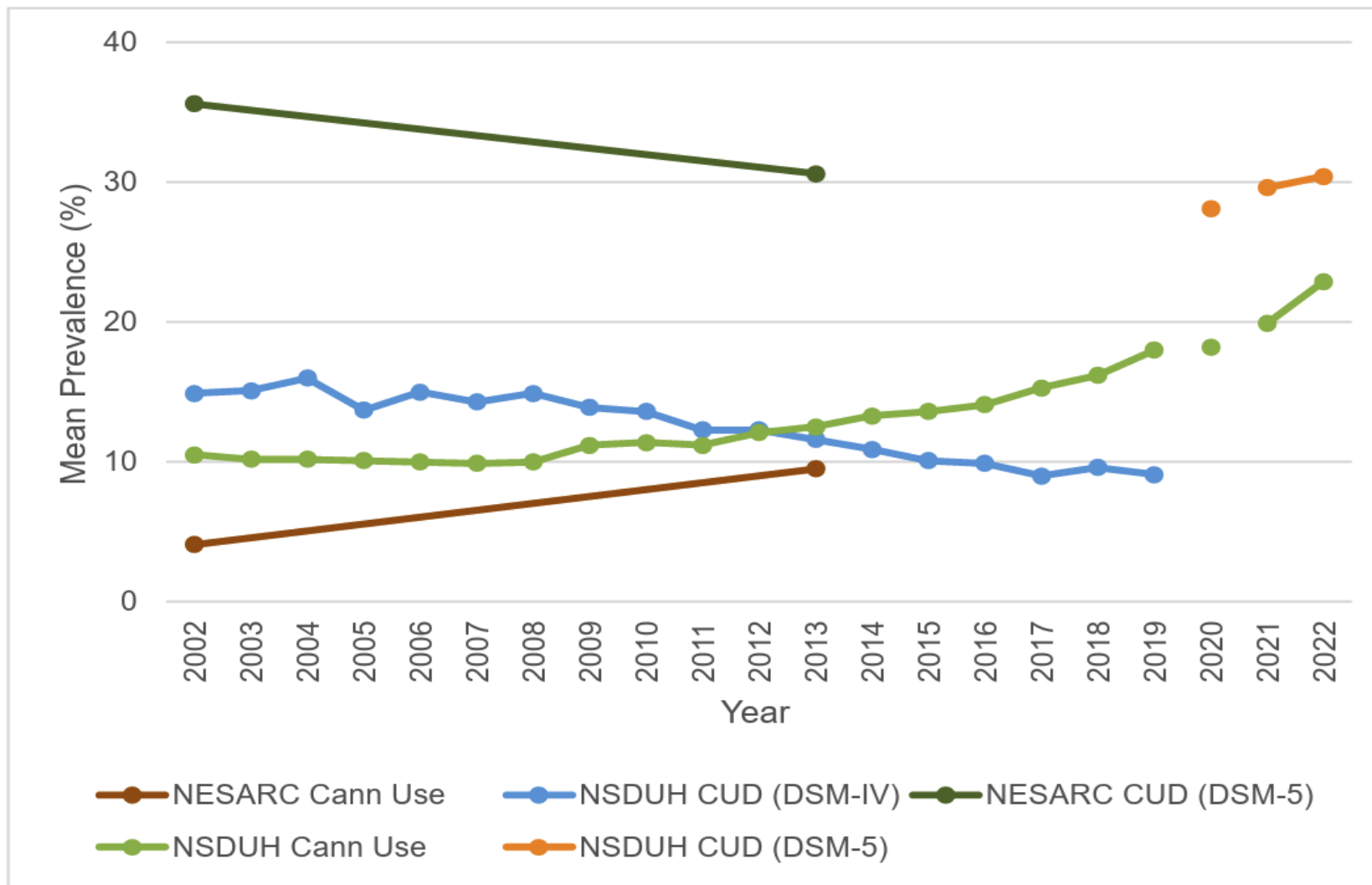
Duration
6–8hrs

Percentage of THC and CBD in Cannabis Samples Seized by the DEA, 1995-2022



SOURCE: U Miss, Potency Monitoring Project





Note: The NSDUH changed diagnostic criteria (DSM-IV to DSM-5) for CUD starting in 2020, along with making major methodological changes in data collection in 2020 and 2021. Therefore, estimates for 2020 are not comparable to other years, and post-2020 estimates should not be compared to previous years. The dramatic increase in prevalence is likely due (at least in part) to the change in diagnostic criteria.

Abbreviations. CUD: cannabis use disorder; DSM: Diagnostic and Statistical Manual of Mental Disorders; NESARC: National Epidemiologic Survey on Alcohol and Related Conditions; NSDUH: National Survey on Drug Use and Health





Cannabis-involved emergency department visits have increased for children, teens, and young adults since the start of the COVID-19 pandemic

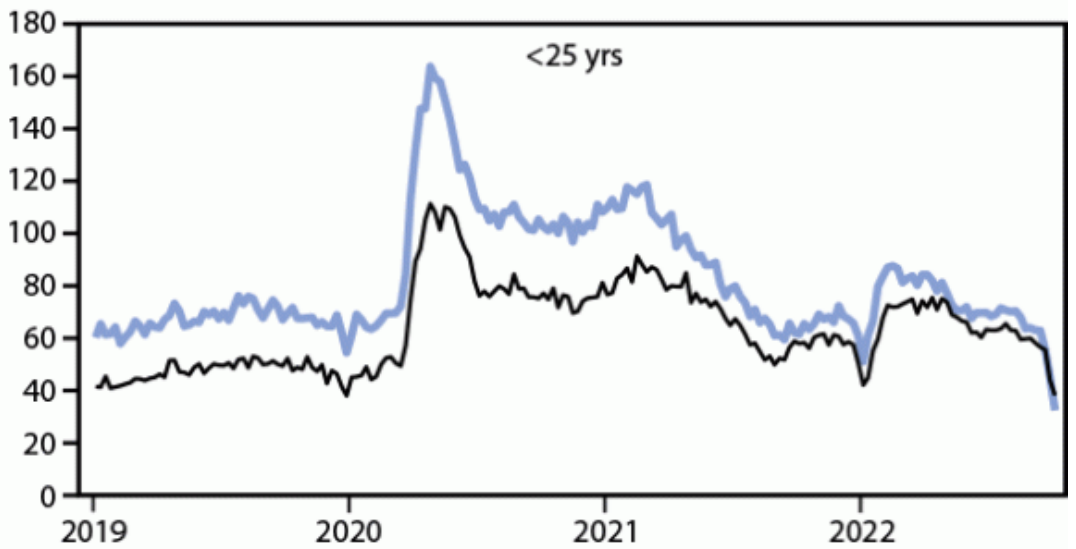
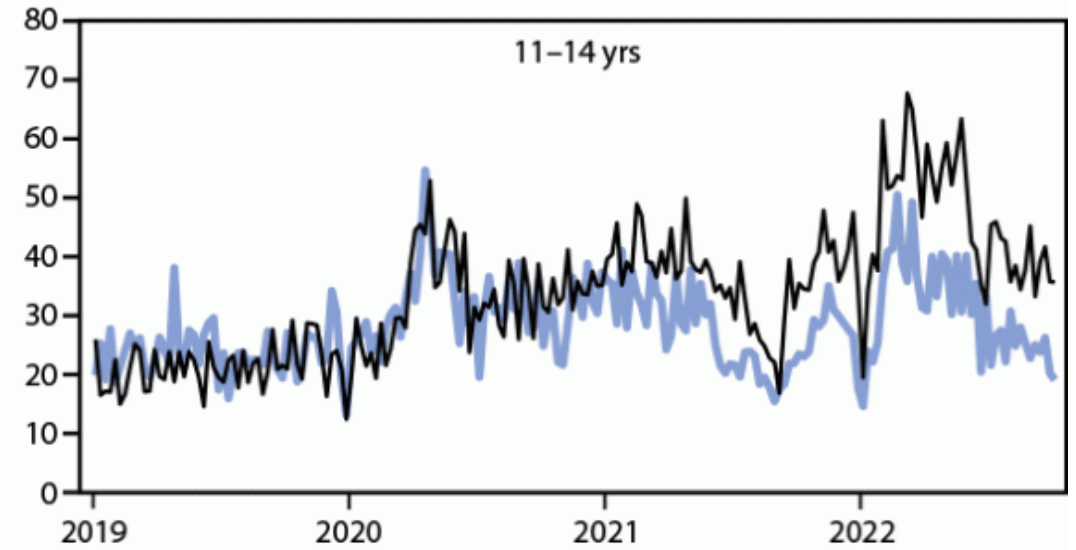
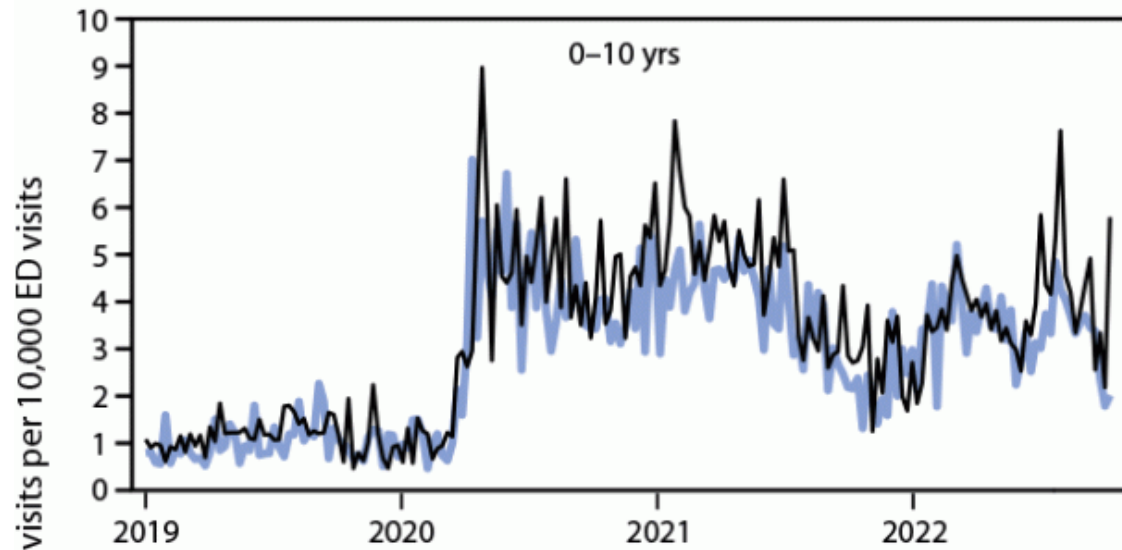
To help decrease substance use, communities can implement evidence-based programs to improve coping and problem-solving skills among young people



bit.ly/mm7228a1

JULY 14, 2023

MMWR



Year

— Male

— Female



Sex differences for cannabis

1 Perinatal Cannabis Exposure

- Cannabinoids can pass through the placenta and into breast milk
- Prenatal exposure leads to pregnancy complications
- Disruption of neurodevelopment, including excitotoxicity

2 Child and Adolescent Use

- Early use associated with cognitive alterations through modulation of excitatory/inhibitory balance
- Increased risk of developing psychiatric disorders including anxiety, depression, and schizophrenia

3 Adult Cannabis Use and Cannabis Use Disorder (CUD)



- Lower frequency of use, but expedited timeline to CUD
- Hormonal interactions
- Psychoactive metabolites



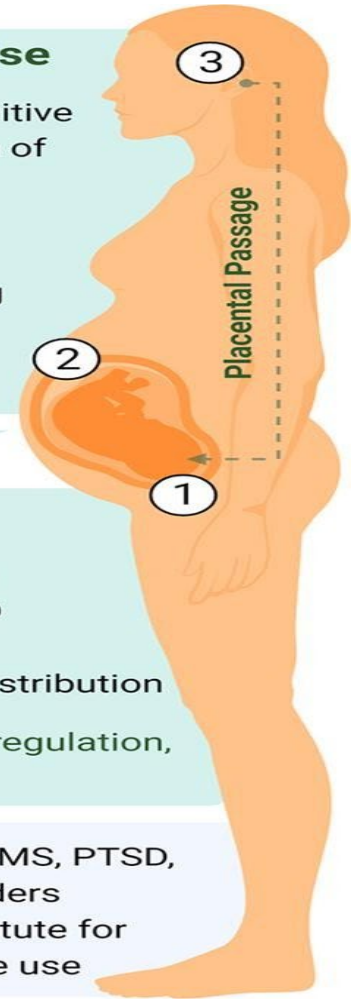
- Higher frequency of use
- Higher incidence of CUD
- Higher peak THC conc.
- Unique regional CBR1 distribution

Evidence for long-term consequences for cognitive functioning, stress response dysregulation, fertility, and mental health disorders.

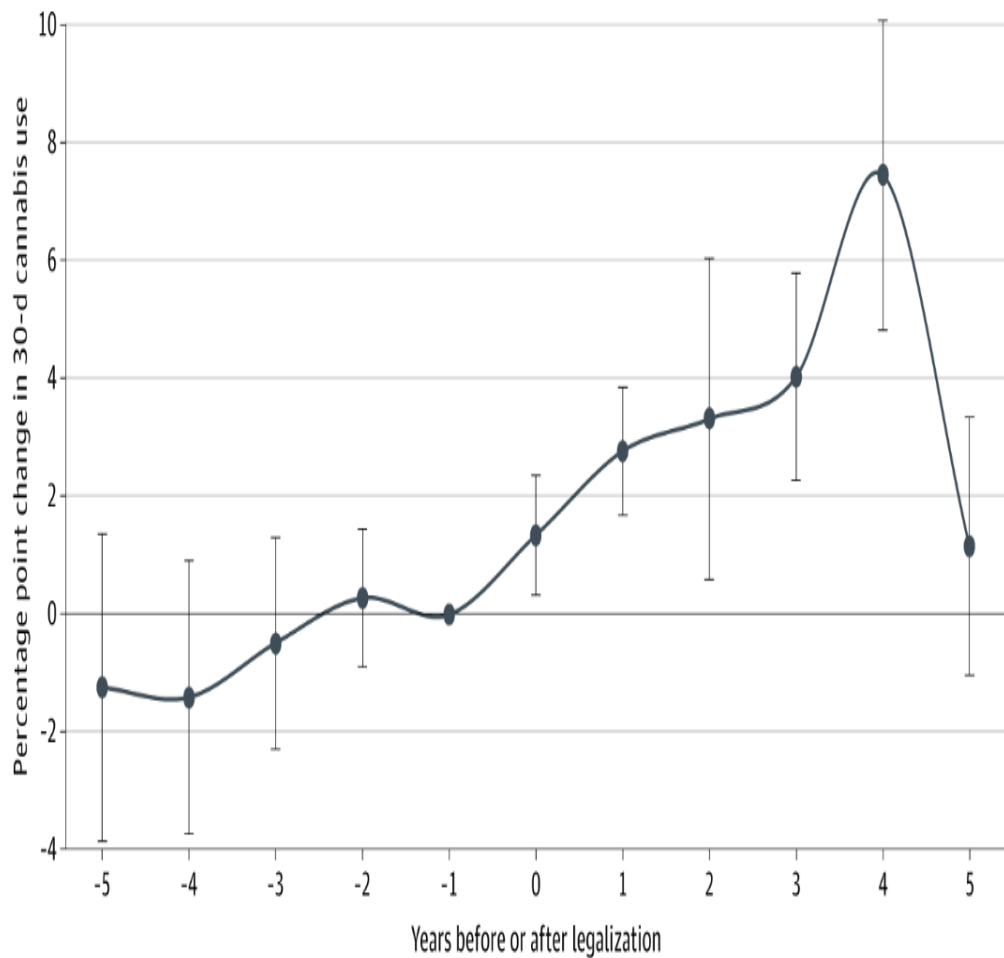
Therapeutic Applications & Harm Reduction



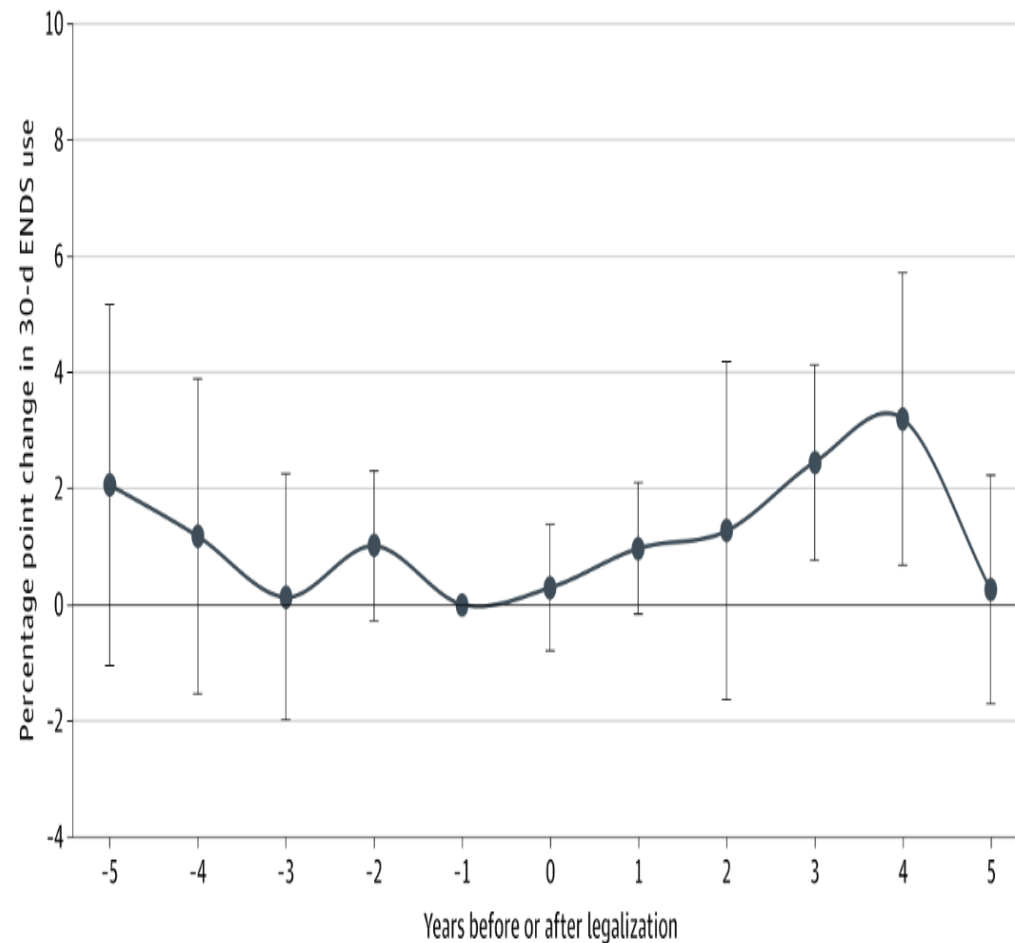
- Potential use in AD, MS, PTSD, and in uterine disorders
- Relevant as a substitute for stimulant and opiate use



A Cannabis use



C ENDS use



Population Assessment of Tobacco and Health (PATH): over 171K observation in 55,406 adults across states



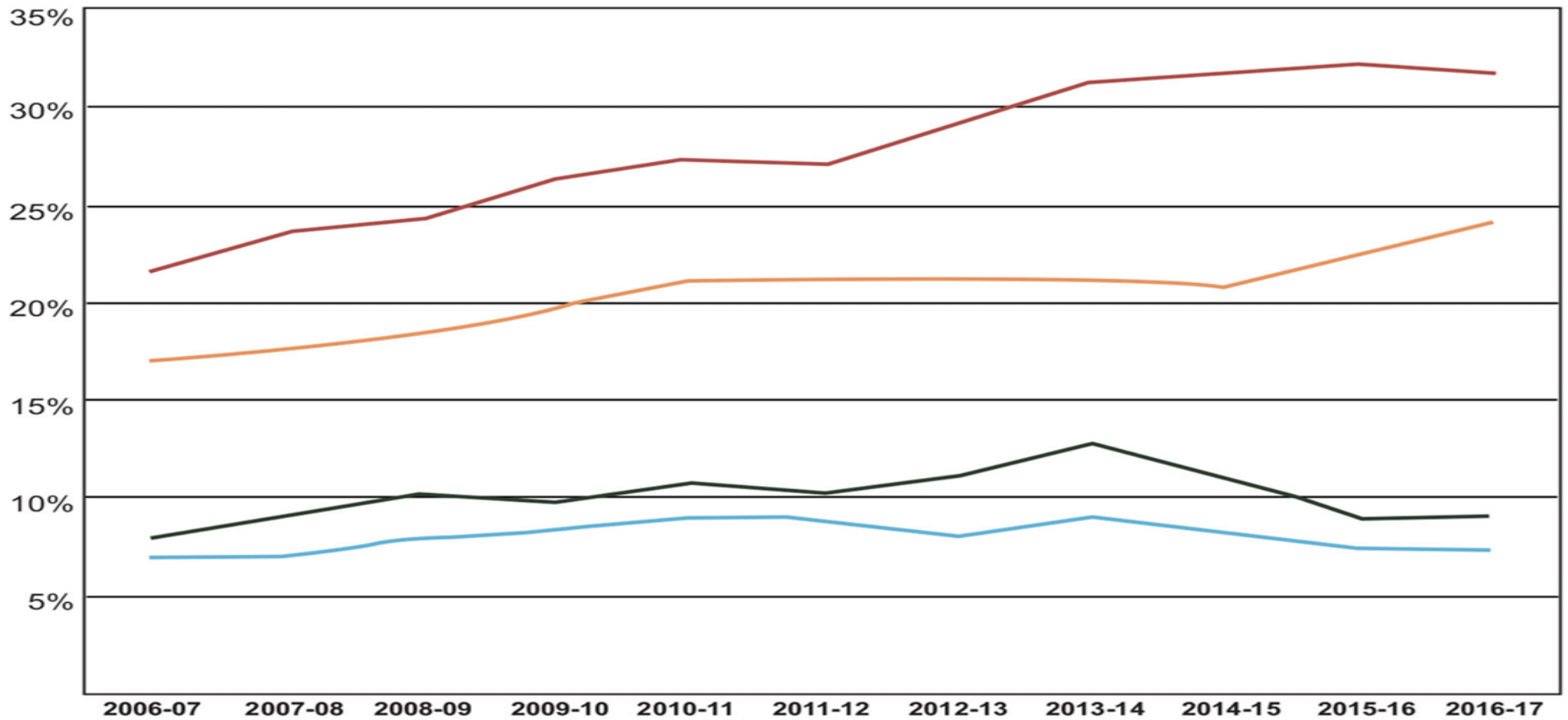


Fig. (2). Past 30-day marijuana use in Colorado compared to the West region.

Red: Colorado 18-25

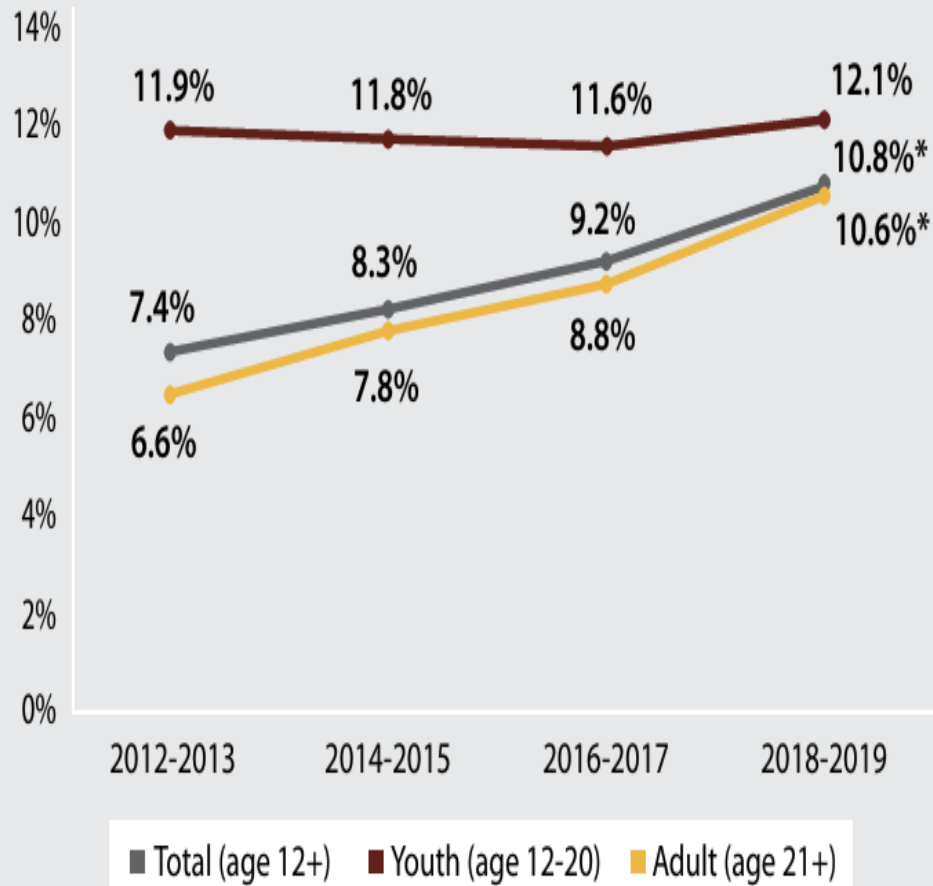
Yellow: Other Western Region States 18-25

Green: Colorado 11-17

Blue: Other West Region States 11-17



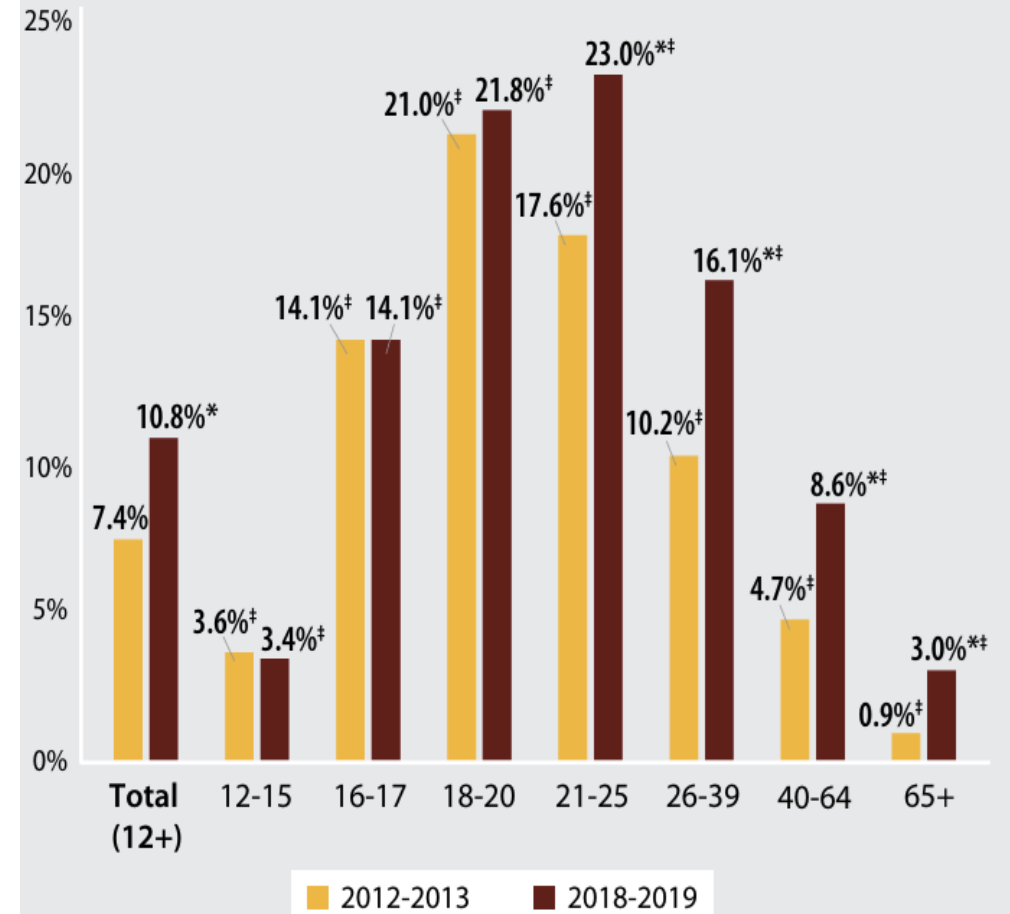
Figure 1. Self-reported Cannabis Use in the Past 30 Days, 2012-2013 to 2018-2019



CRC/SHADAC analysis of restricted NSDUH data

* Statistically significant increase from 2012-2013 to 2018-2019 at the 95% level.

Figure 2. Self-reported Cannabis Use in the Past 30 Days by Age Subgroups, 2012-2013 to 2018-2019



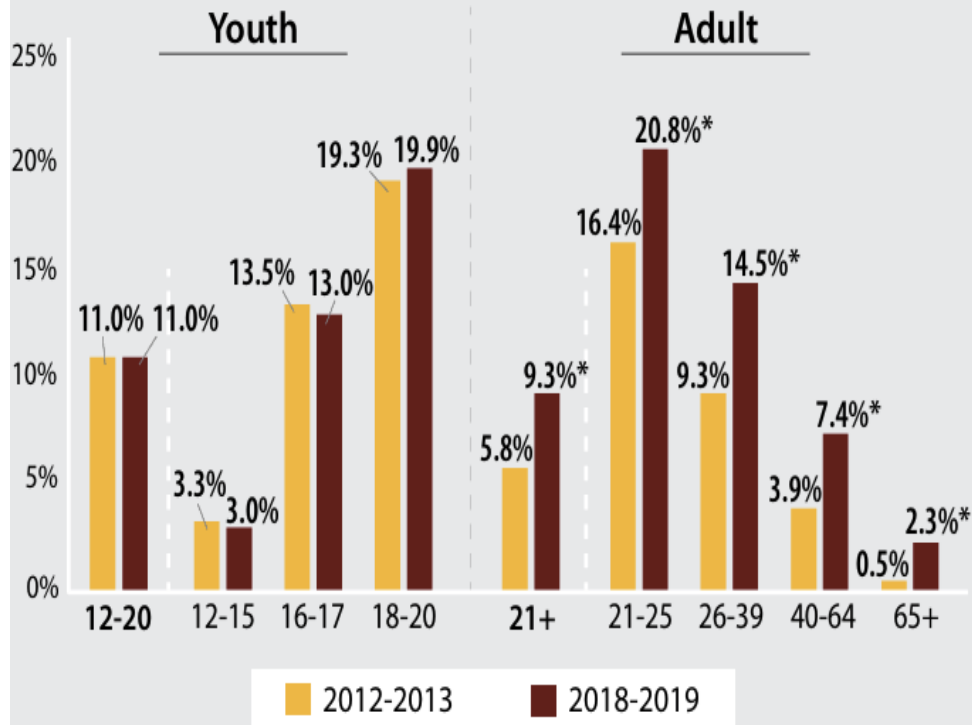
CRC/SHADAC analysis of restricted NSDUH data

* Statistically significant increase from 2012-2013 to 2018-2019 at the 95% level.

‡ Statistically significant difference between subgroup and total at 95% level.

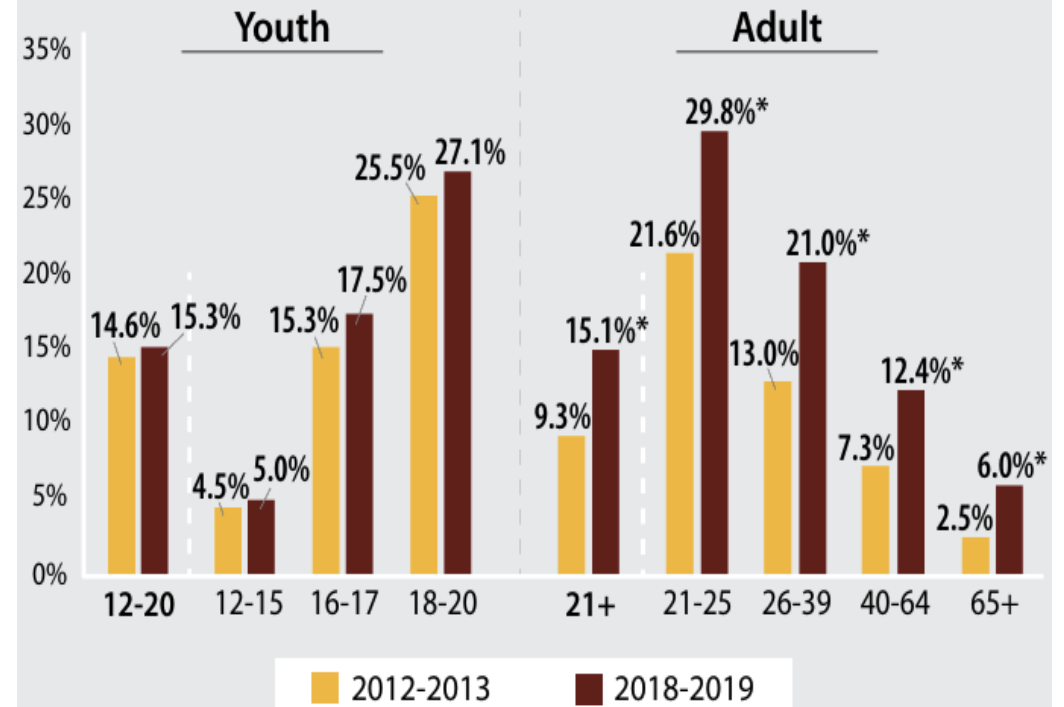


Figure 6. Self-reported Cannabis Use in the Past 30 Days by Age Subgroups in States Without Legal Sales, 2012-2013 to 2018-2019



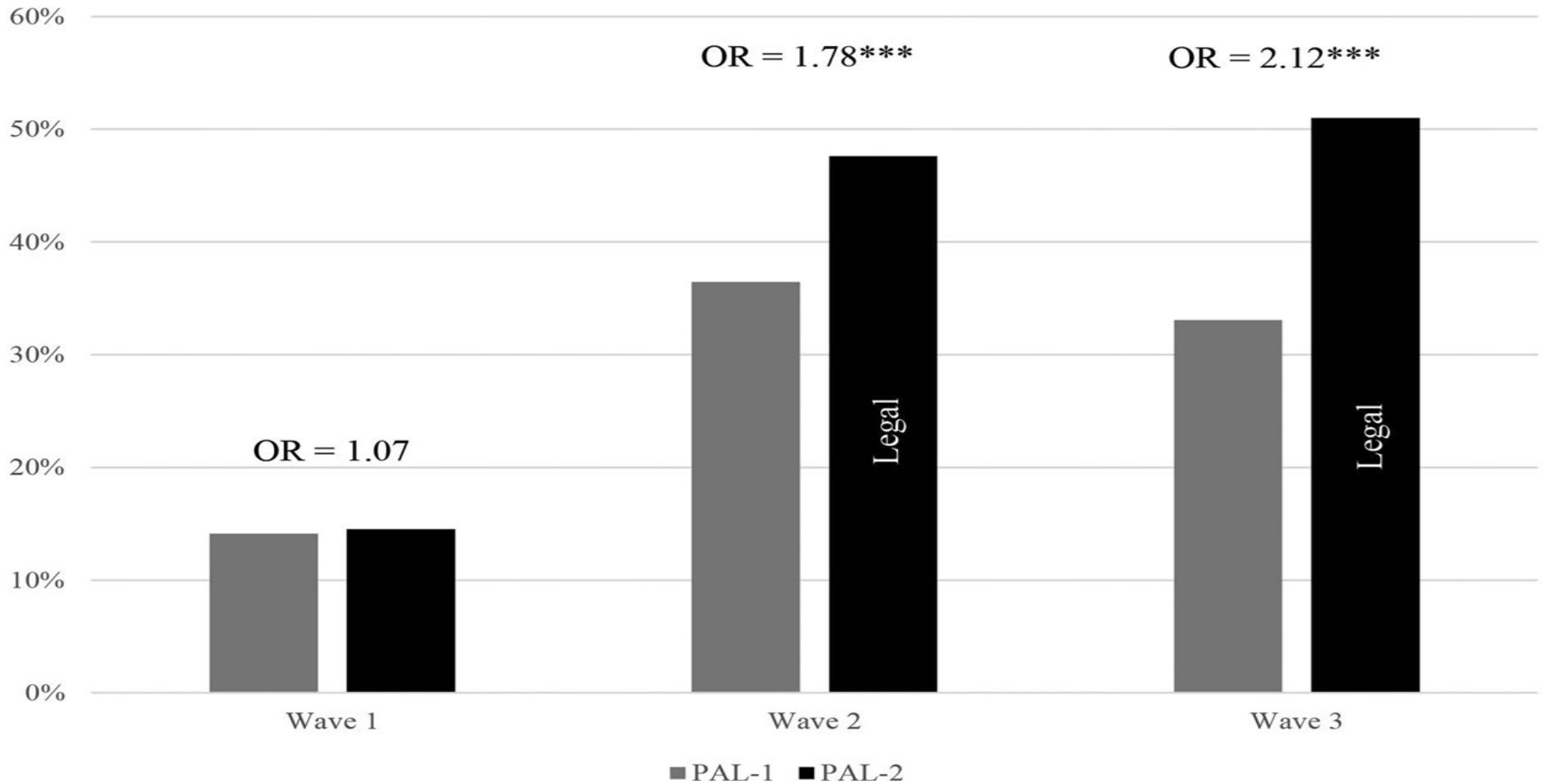
CRC/SHADAC analysis of restricted NSDUH data
 * Statistically significant increase from 2012-2013 to 2018-2019 at the 95% level.

Figure 7. Self-reported Cannabis Use in the Past 30 Days by Age Subgroups in States With Legal Sales, 2012-2013 to 2018-2019



CRC/SHADAC analysis of restricted NSDUH data
 * Statistically significant increase from 2012-2013 to 2018-2019 at the 95% level.



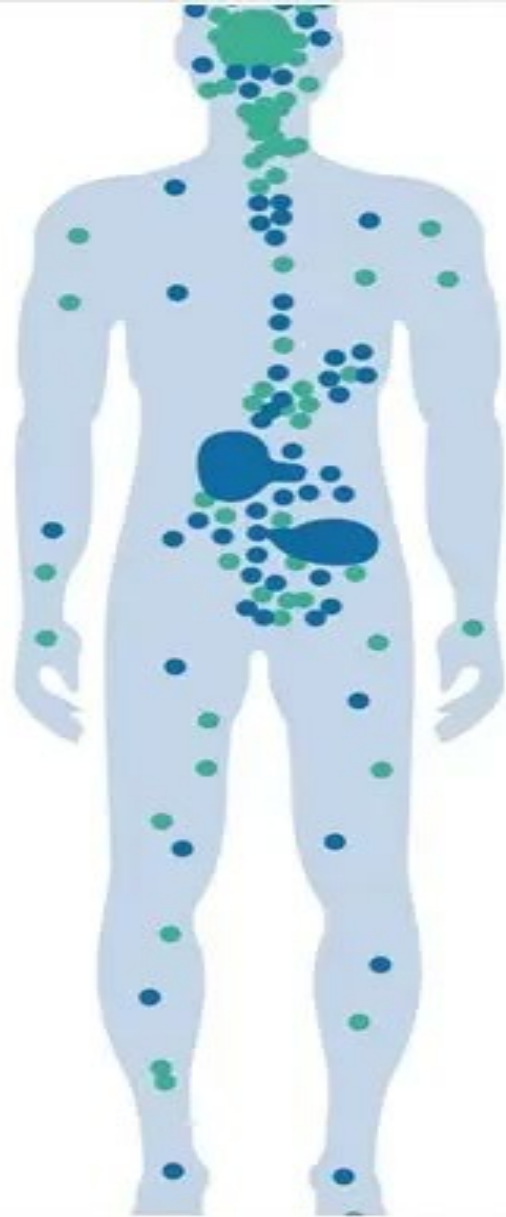


University of Oregon's Project Alliance Cohorts of High School Students



Cannabis' Health Impact





CB1

CB1 Receptors target:

- Motor activity
- Thinking
- Motor co-ordination
- Appetite
- Short term memory
- Pain perception
- Immune cells

CB2

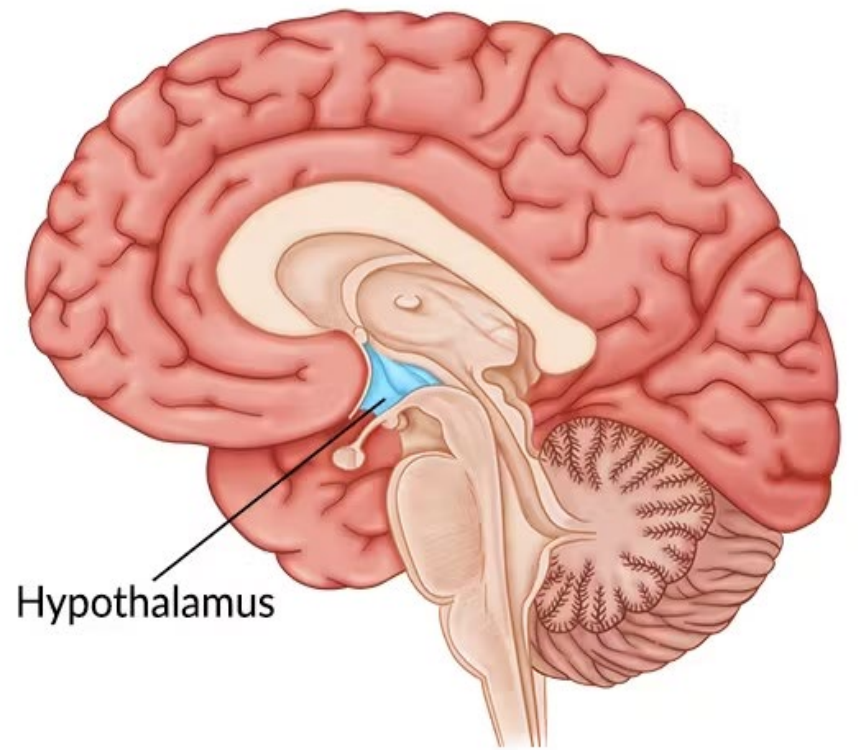
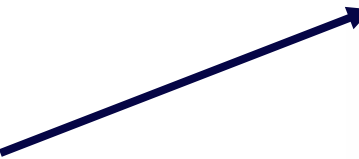
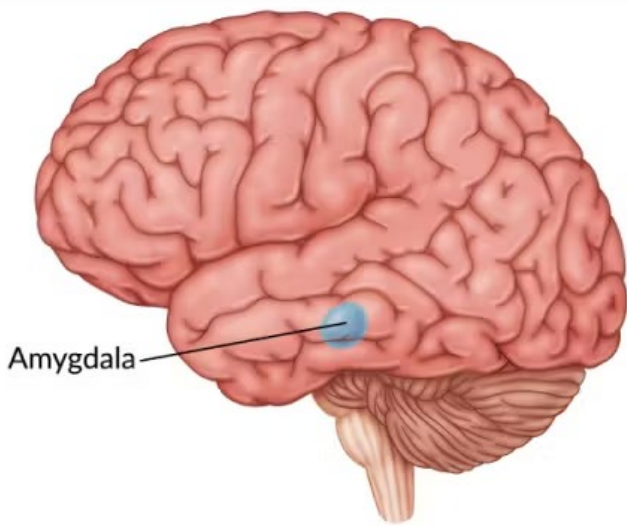
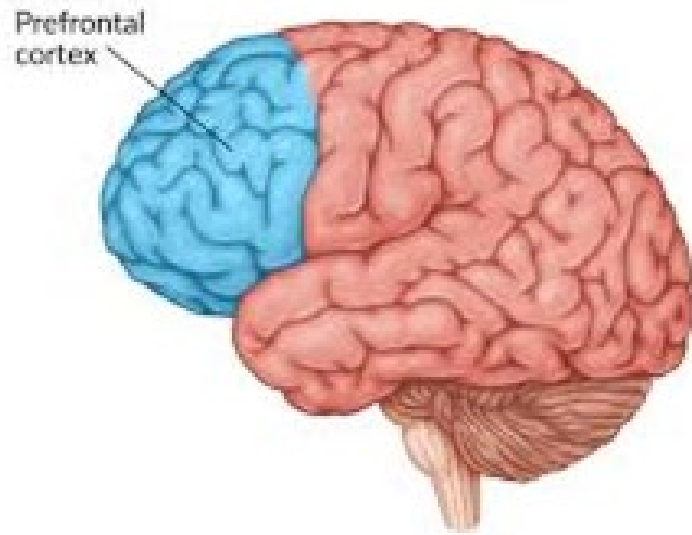
CB2 Receptors are much broader than CB1 and influence most of the body

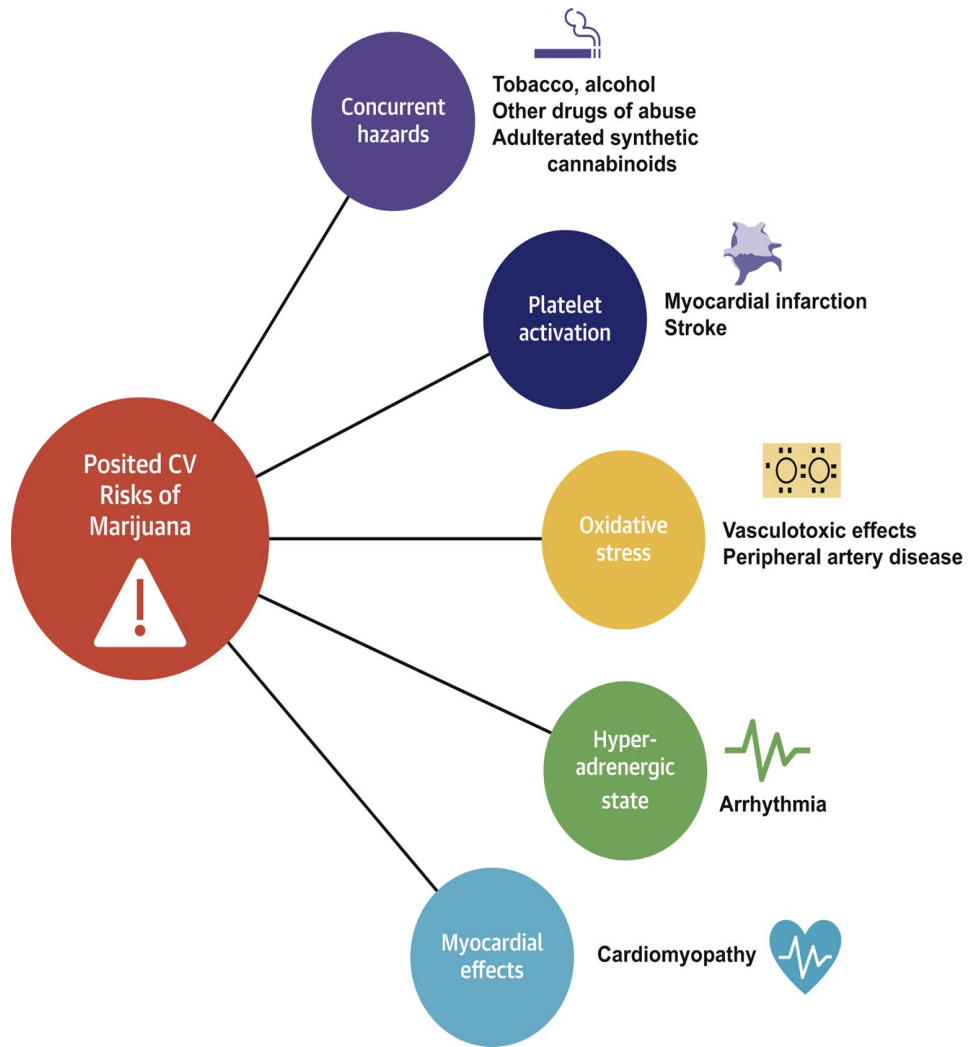
- Gut
- Kidneys
- Pancreas
- Adipose tissue
- Skeletal muscle
- Bone
- Eye
- Tumours
- Reproductive system
- Immune system
- Respiratory tract
- Skin
- CNS
- Cardiovascular system
- Liver

CANNABIDIOL vs TETRAHYDROCANNABINOL

MEDICAL APPLICATIONS

CBD Cannabidiol	ANTI-INFLAMMATORY	THC Tetrahydrocannabinol	ANTI-NAUSEANT
ANTI-SEIZURE	ANALGESIC	SLEEP AID	ANALGESIC
ANTI-TUMOR EFFECTS	ANTI-PSYCHOTIC	APPETITE STIMULANT	MUSCULAR SPASTICITY
ANTI-DEPRESSANT	ALLEVIATES IBS SYMPTOMS	ANTI-ANXIETY	ALLEVIATES GLAUCOMA SYMPTOMS

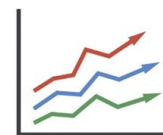




Potential Mechanisms of CV Risk With Exposure to cannabis. The quality of evidence supporting these posited mechanistic relationships is modest. CV = cardiovascular.

CENTRAL ILLUSTRATION: Practical Approach to Screening for Marijuana Use Among Patients With Cardiovascular Disease

Awareness



- >2 million Americans with CV disease are estimated to have used marijuana
- Marijuana use has been associated with a broad range of adverse CV risks
- Potency of marijuana has been ↑ over time, linked with ↑ in vaping and synthetic cannabinoids

Screening



- Screen especially in enriched populations (states with prevalent use, young patients)
- Inquire about concurrent drugs of abuse
- Ask about frequency, quantity, and methods of administration

Patient Discussion



- Review CV therapies with pharmacist to clarify pharmacological interactions
- Acknowledge limited scope of science and potential CV risks

Scientific Research



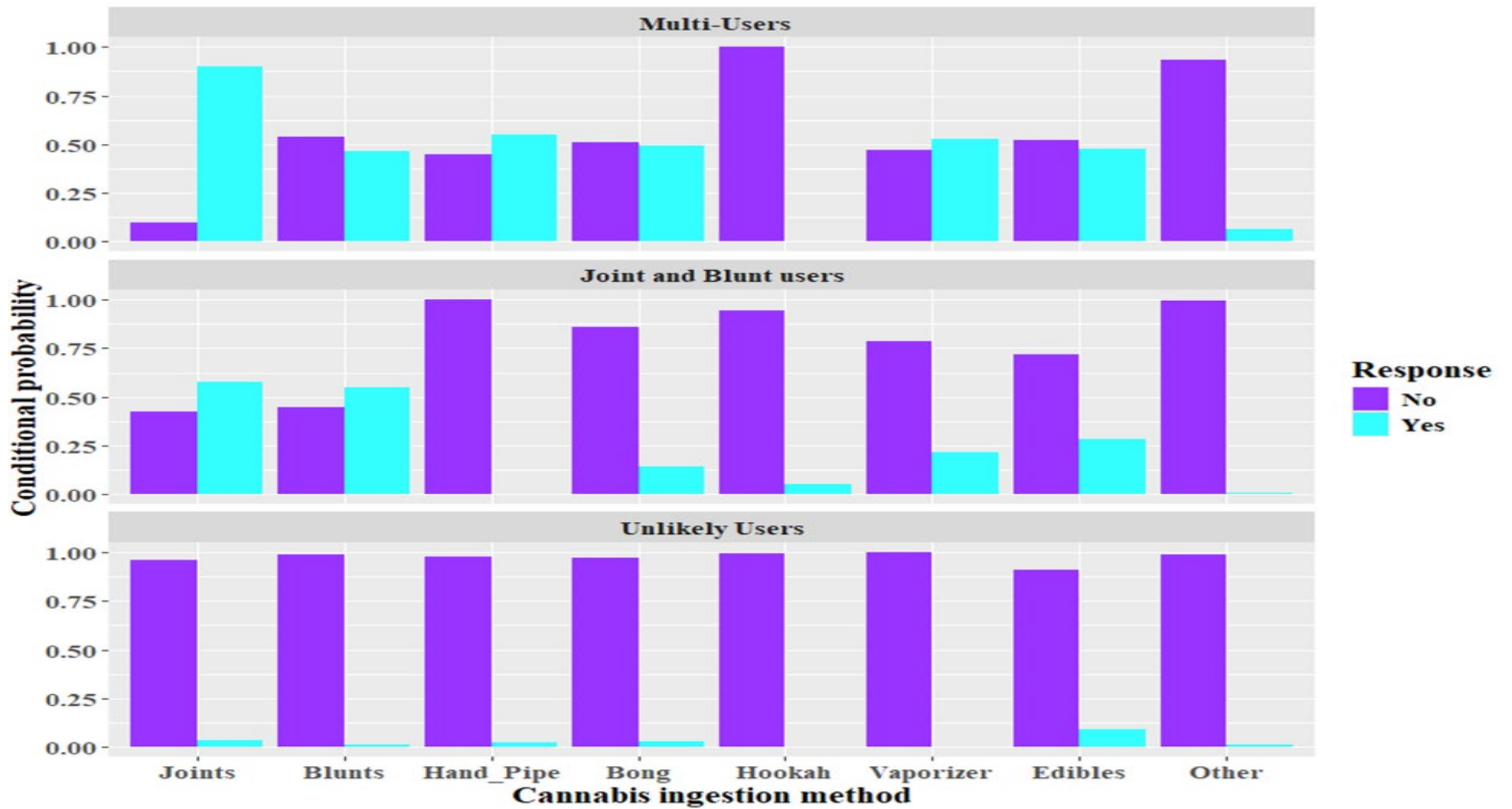
- Broad commitment of the scientific community to pursue marijuana-related research to clarify CV safety profile

DeFilippis, E.M. et al. J Am Coll Cardiol. 2020;75(3):320-32.

Practical Approach to Screening for Marijuana Use Among Patients With Cardiovascular Disease

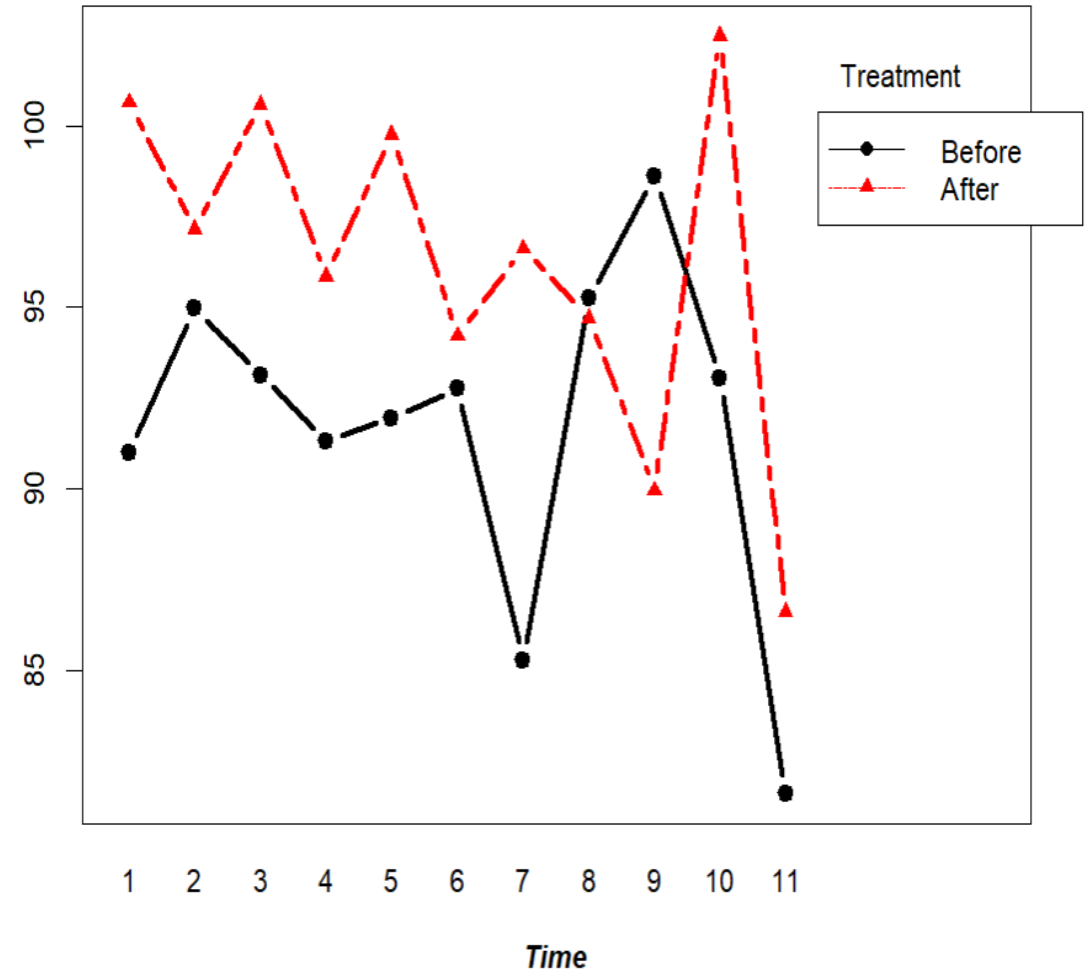
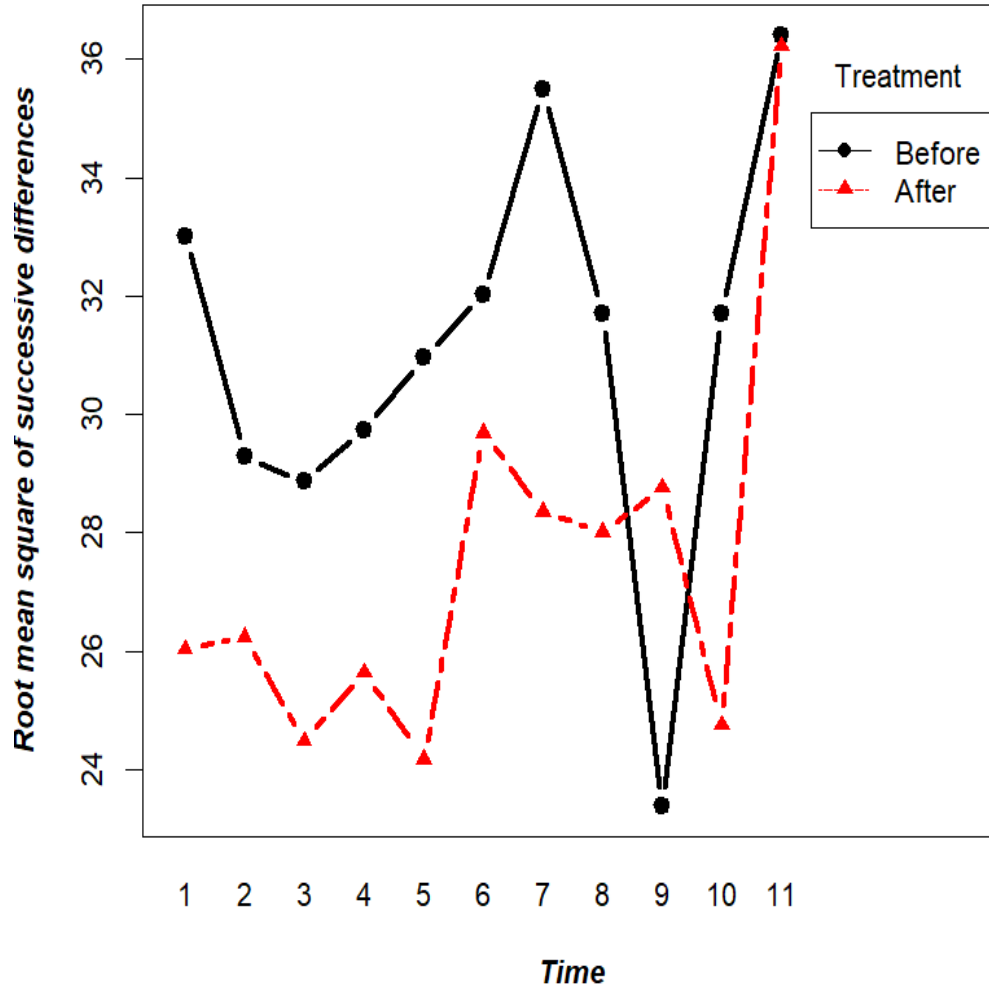
JACC Call to action for cannabis and cardiovascular risk 2022





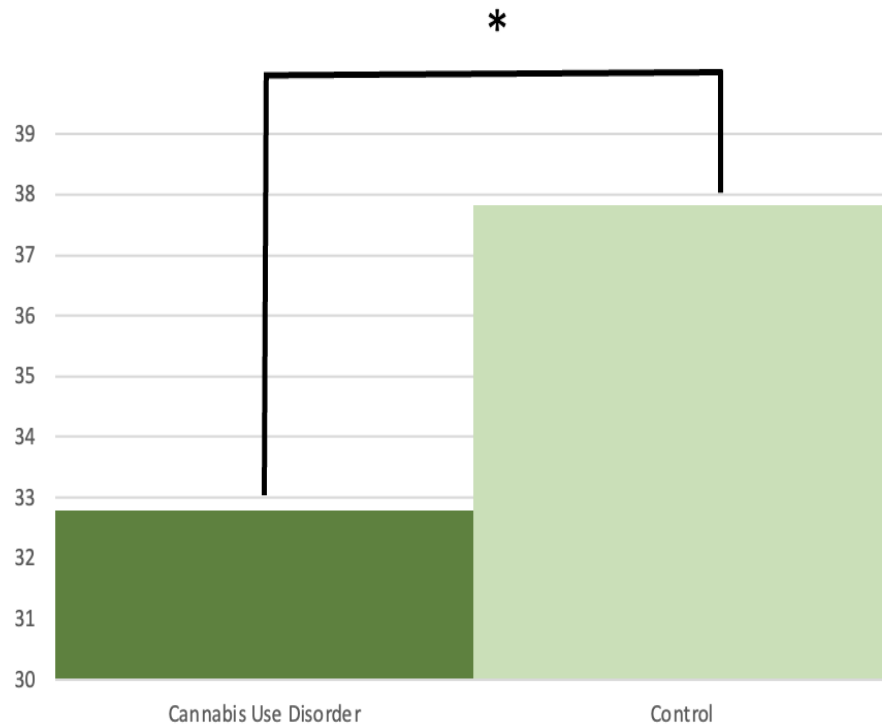
Cannabis Patterns of Use Among 431 College Students



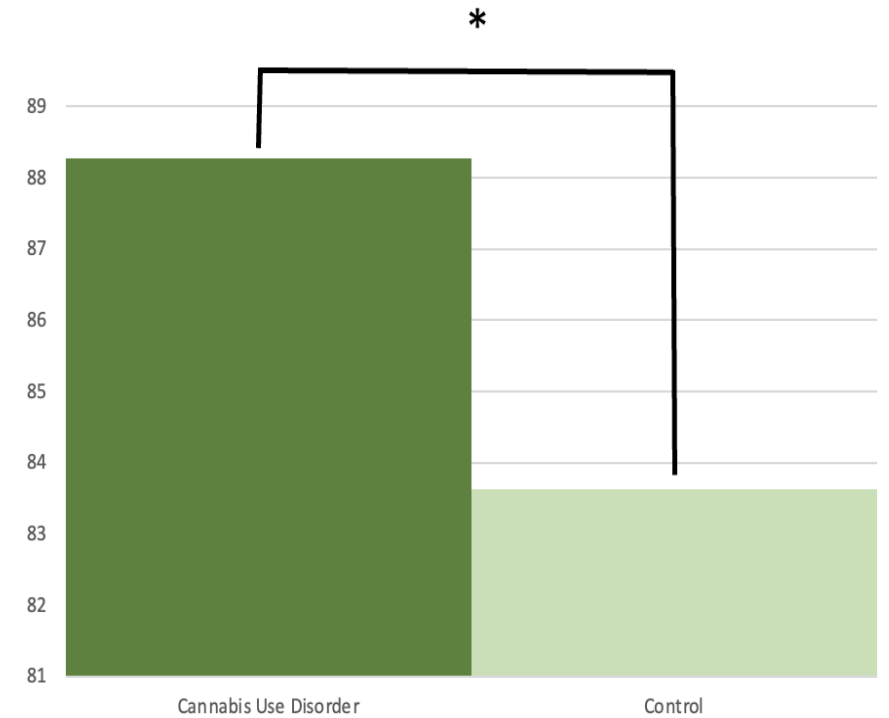


Cannabis Use 10 Minutes Before & After Differences in College Students (Keen et al., 2025)

Root Mean Square of Successive Differences Between
Individuals Living with CUD and Non-CUD Control Group



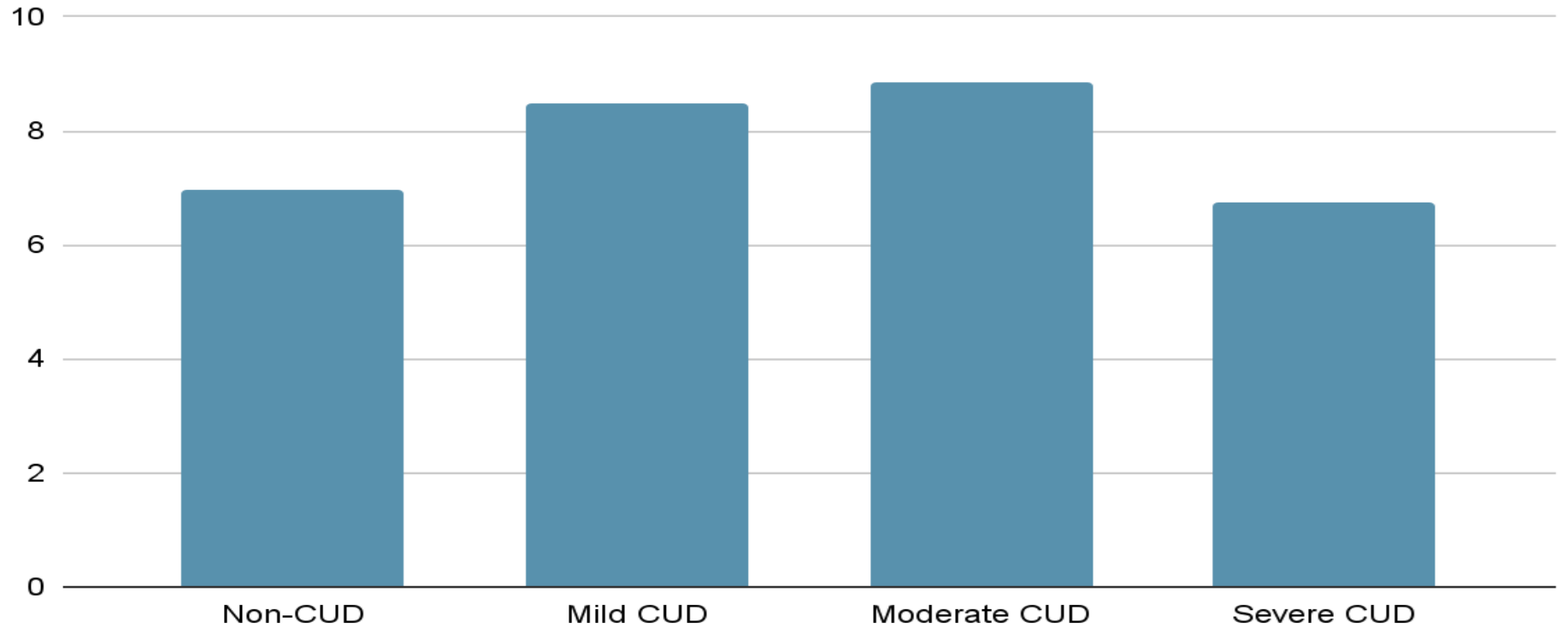
Heart Rate Differences Between Individuals Living with
Cannabis Use Disorder and Non Cannabis Use Disorder
Control Group



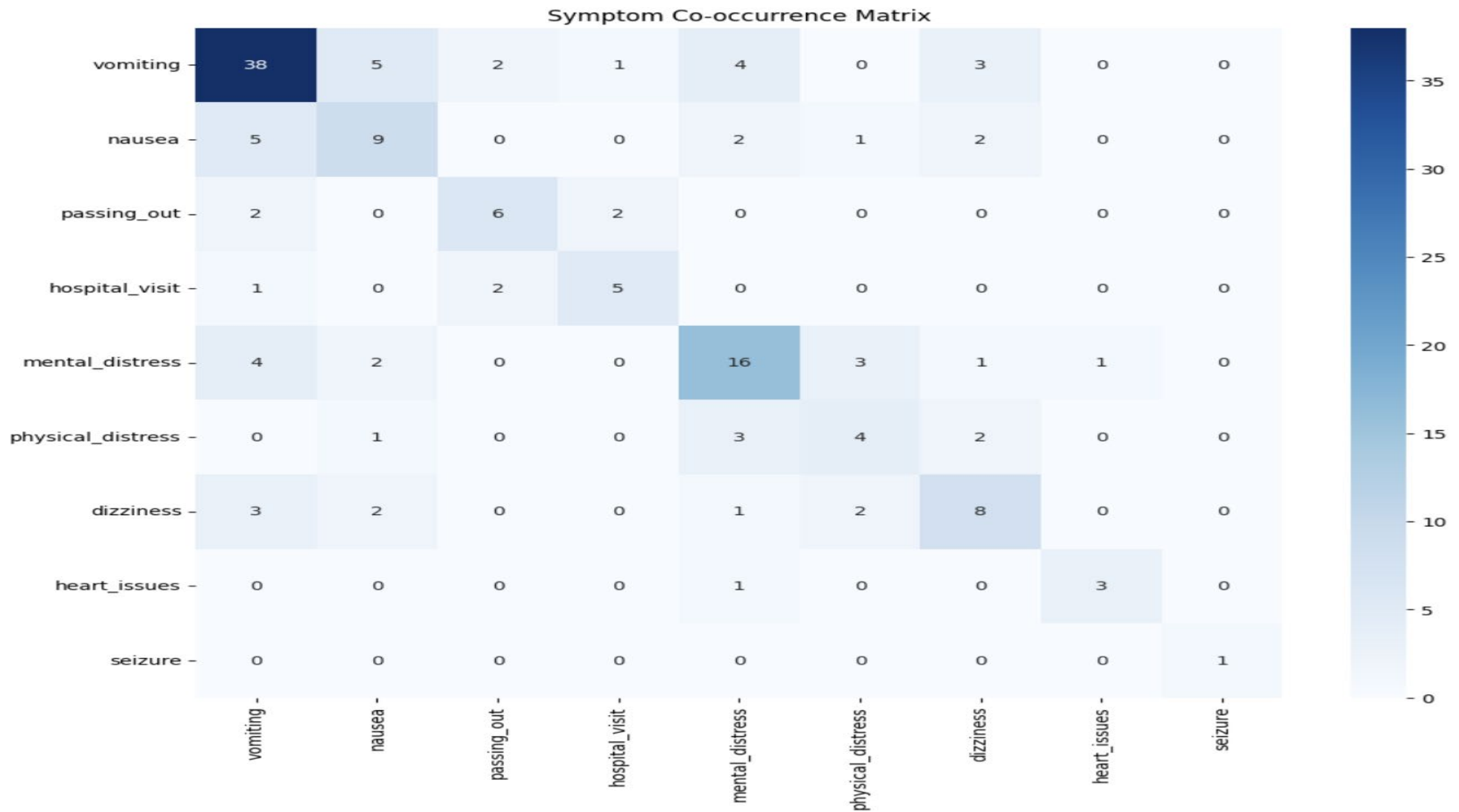
Cannabis Use Disorder Differences in 24 Heart Rate and Heart Rate Variability (Keen et al., under review)



PSQI Total Scores



Sleep Quality Differences Within Cannabis Use Disorder Severity (Keen et al., 2022)



Self-reported Symptoms from “Greening Out”



<https://www.prevention.org/cannabis-policy-resource-center/>

Youth Prevention & Responsible Cannabis Retail: Site Visit Summary

- Multiple ID checkpoints
- Secure storage and delivery procedures
- Staff training in responsible sales
- Community partnerships focused on prevention and education

Toolkits: Similar Elements Across State Lines

Similarities

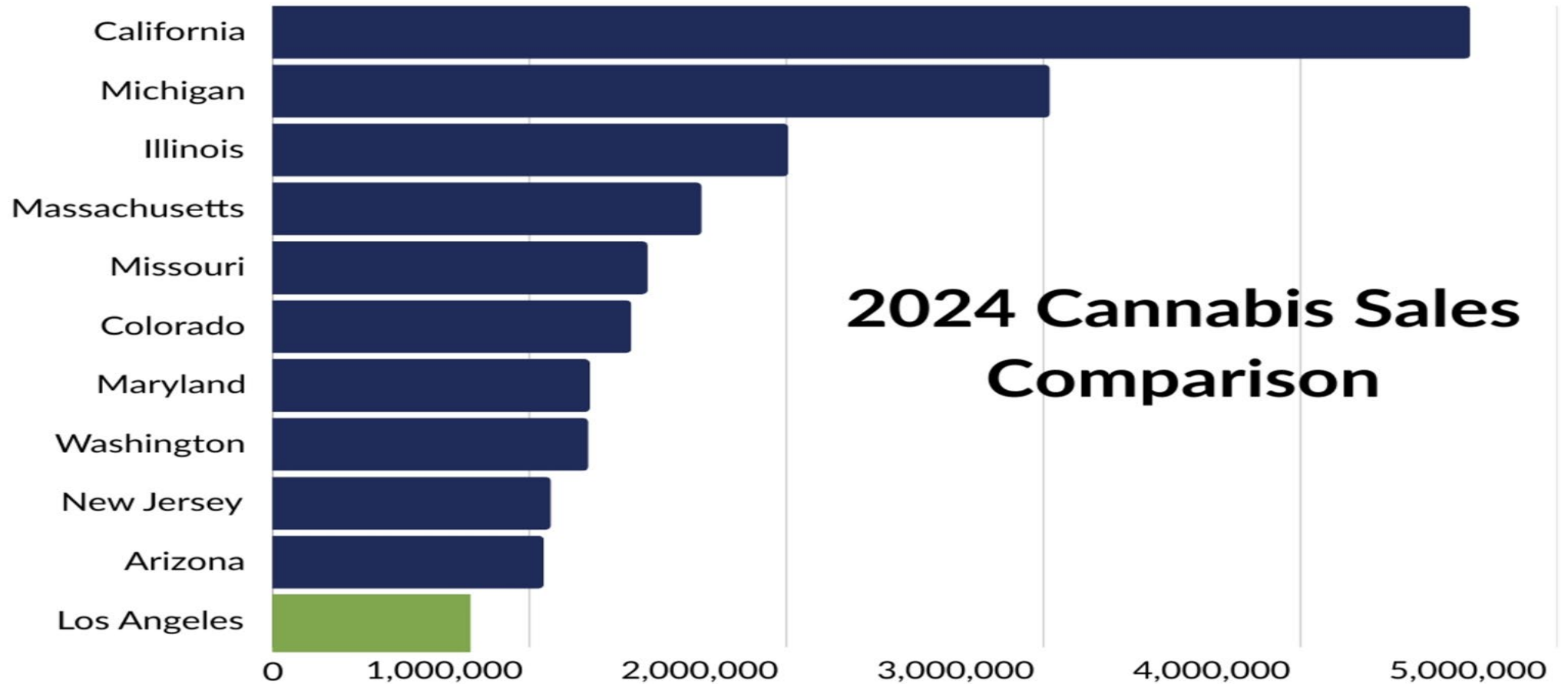
- What is cannabis and types of usage
- Laws
- Tips for speaking with youth
- Impact on mental health
- Media campaign tips/tricks

Missing Concepts

- Biological modulations
- No community level policies to prevent problematic use
- Translation of critical information into policy/ordinance
- Under representation of promotion and advertisement of modern products
- Ignorance or lack of awareness of delivery options and cross-promotion with other substances
- Implementation science
- Cultural responsiveness

Cannabis Sales Data

States with over \$1 billion in cannabis sales



2024 Cannabis Sales Comparison

Take Home Message(s)

- Inconsistent and insufficient data
- Expect an uptick, but may be accompanied by slight decline to plateau in prevalence
- CUD is a problem, even in youth
- Various offices/systems have to collaborate
- Tailoring is needed for health promotion and treatment
- Greening out symptomatology similar to binge drinking symptoms?

THANK YOU FOR YOUR TIME!!

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www.pnird.com

<https://www.vsu.edu/academics/special-programs/center-for-otter.php>

