



# Cannabis Research in WA State: An Update from the University of Washington

**September 15<sup>th</sup>, 2020**

Presented to the House Commerce & Gaming Committee

**Susan Ferguson**

Associate Professor – School of Medicine  
Director – ADAI

**Beatriz Carlini**

Senior Research Scientist – ADAI  
Affiliate Associate Professor – School of Public Health

# I-502 Funding at ADAI

22

I-502/ADAI funded projects since 2015

23

Current federally-funded projects from 18 investigators  
(half received I-502 funds)

Goal

Create and disseminate knowledge to scientists, the health services workforce, legislators and the community.

Community

Clinical

Basic

ADAI Small Grants (I-502 Funds): <http://bit.ly/ADAI502>

# Community Research

## COVID impacts on mental health and substance use in young adults

- **PI:** Dr. Christine Lee (Dept. of Psychiatry, SOM)
- **Aim:** Longitudinal study examining cannabis and alcohol use prior to and during pandemic.
- **Goal:** Identify risk and protective factors for use during high-stress times

## Parenting interventions for preventing underage cannabis use

- **PI:** Dr. Marina Epstein (SDRG, School of Social Work)
- **Aim:** Identify the tools needed for parents who use cannabis to effectively discuss issues around cannabis use with their children
- **Goal:** Develop effective family-based prevention programs for preventing cannabis use in youth

## Prazosin as a treatment for Cannabis Use Disorder

- **PI:** Dr. Garth Terry (Dept. of Psychiatry, SOM)
- **Aim:** Determine if prazosin reduces cannabis use in people with and without PTSD
- **Goal:** Identify viable treatments for Cannabis Use Disorder

## Detection and prediction of trauma-driven substance use

- **PIs:** Dr. Jennifer Mankoff (Paul Allen School of Computer Science & Engineering) and Dr. Michele Bedard-Gilligan (Dept. of Psychiatry, SOM)
- **Aim:** Use machine learning approaches to establish relationships between affect, context and cannabis use
- **Goal:** Develop predictive algorithms to determine risk and allow early intervention among those at highest risk for cannabis misuse and addiction

# Basic Research

## Role of thalamus cannabinoid system in reward and aversion

- **PI:** Dr. Michael Brucas (Dept. of Anesthesiology, SOM)
- **Aim:** Determine the role of endocannabinoids in the thalamus in reward and aversion behaviors
- **Goal:** Map endocannabinoid systems; Identify novel medications for anxiety disorders

## Role of cannabinoids in enhancing opioid pain relief

- **PI:** Dr. Benjamin Land (Dept. of Pharmacology, SOM)
- **Aim:** Determine mechanisms by which cannabinoids alter opioid analgesia in chronic pain models
- **Goal:** Identify novel pain medications without abuse liability that can lower need for opioids to treat pain


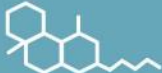





# Information and Dissemination

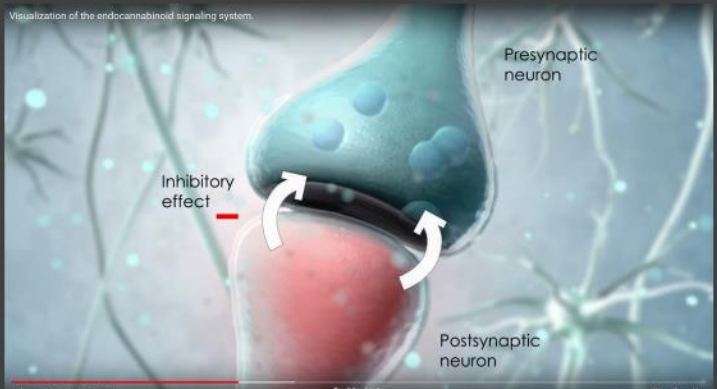
Selected resources

# Training for Clinicians in WA State: Knowledge

## Main Menu

- Section 1**  
Endocannabinoid System  

- Section 2**  
Cannabinoids  

- Section 3**  
The Whole Plant  

- Section 4**  
Research  

- Section 5**  
Legal Aspects  


## Video: Endocannabinoid Signaling



Visualization of the endocannabinoid signaling system.

Presynaptic neuron

Inhibitory effect


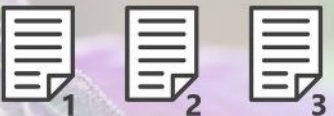
Postsynaptic neuron

Leanne Chan, University of Toronto

External link

## Advantages of the Whole Plant

- Side effects mitigated** by other compounds
- “Entourage” effect** – exertion of additional therapeutic properties



## Authorizing Treatment with Cannabis

Healthcare professionals still **cannot prescribe or provide cannabis**

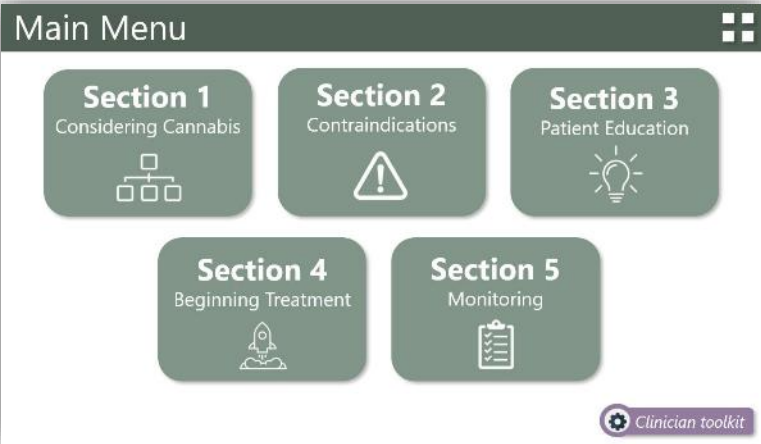
**Cannabis Patient Protection Act**

**Discuss medical cannabis** as a treatment option:

- MD
- DO
- ND
- PA
- OPA
- ARNP



# Training for Clinicians in WA State: Skills



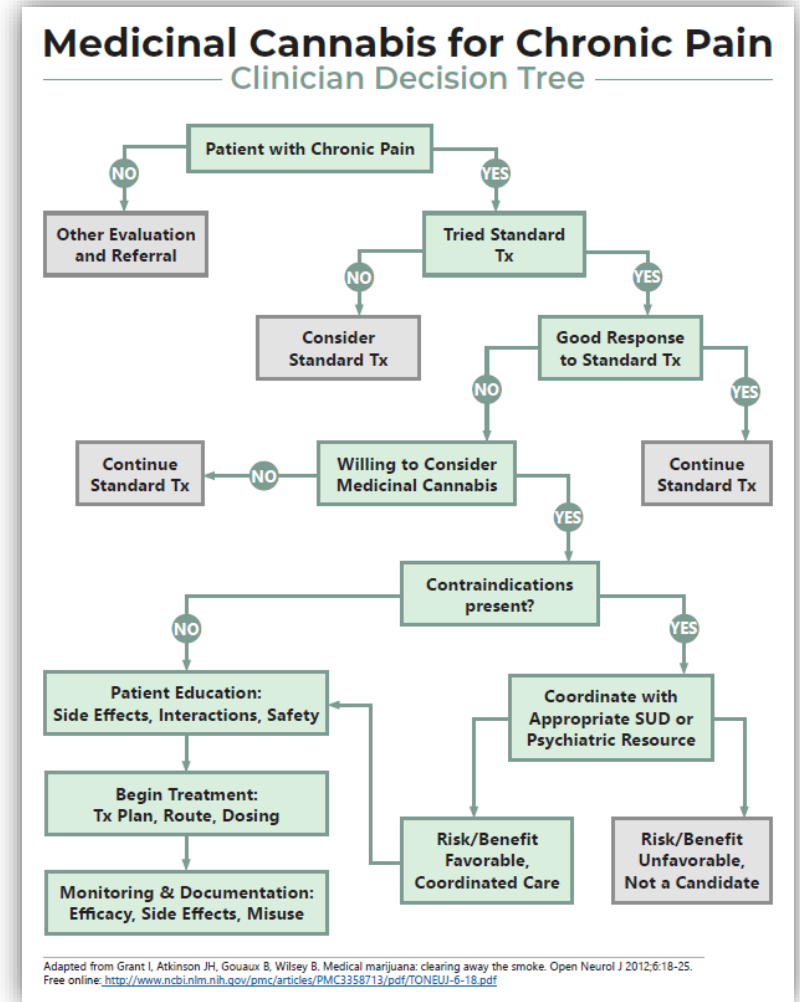
## Side Effects: Research Outcomes

**Institute of Medicine (1999)**  
*"Except for the harms associated with smoking, the adverse effects of marijuana are within the range of effects tolerated for other medications"*

**Wang et al. (2008)**

- No difference in serious adverse events
- Non-serious adverse events slightly higher in cannabis group
- Most common: dizziness

View report



## Side Effects: In the Body

- Unwanted psychoactive effects
- Short-term memory loss
- Impaired psychomotor function
- Tachycardia
- Bronchitis and lung irritation
- Increased appetite
- Cannabinoid Hyperemesis Syndrome
- Decreased sperm count

## Standard Treatments

- Provide patients risks and benefits of each treatment
- Introduce cannabis as one option among many



# Information for the Public

LEARN ABOUT MARIJUANA  
Science-based information for the general public.

TOPICS PARENTS TEENS POLICY & LAW CONSUMERS GET HELP

## LEARN ABOUT MARIJUANA

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## TOPICS

This page presents research-based factsheets, reports, and videos providing information on specific areas of interest. Looking for a topic you don't see here? Email us at [adai@uw.edu](mailto:adai@uw.edu).

-   
Products & Modes of Use
-   
Data & Surveys
-   
Health Effects
-   
Cannabis Use Disorder
-   
Populations & Settings
-   
Other Drugs & Cannabis

# Barriers for Research

## State level

- 12-month funding cycle
- Uncertainty

## Federal level – Schedule 1

- Limits research in humans
- Prohibits research with cannabis used in the “real world”
- Emphasize risks, discount medical potential



# High Potency Cannabis

From flower to manufactured products



# Topics

1. What is high potency cannabis?
2. Who are the consumers?
3. Health risks and consequences
4. Science and legalization policies

# High Potency Cannabis

In a not very distant past....

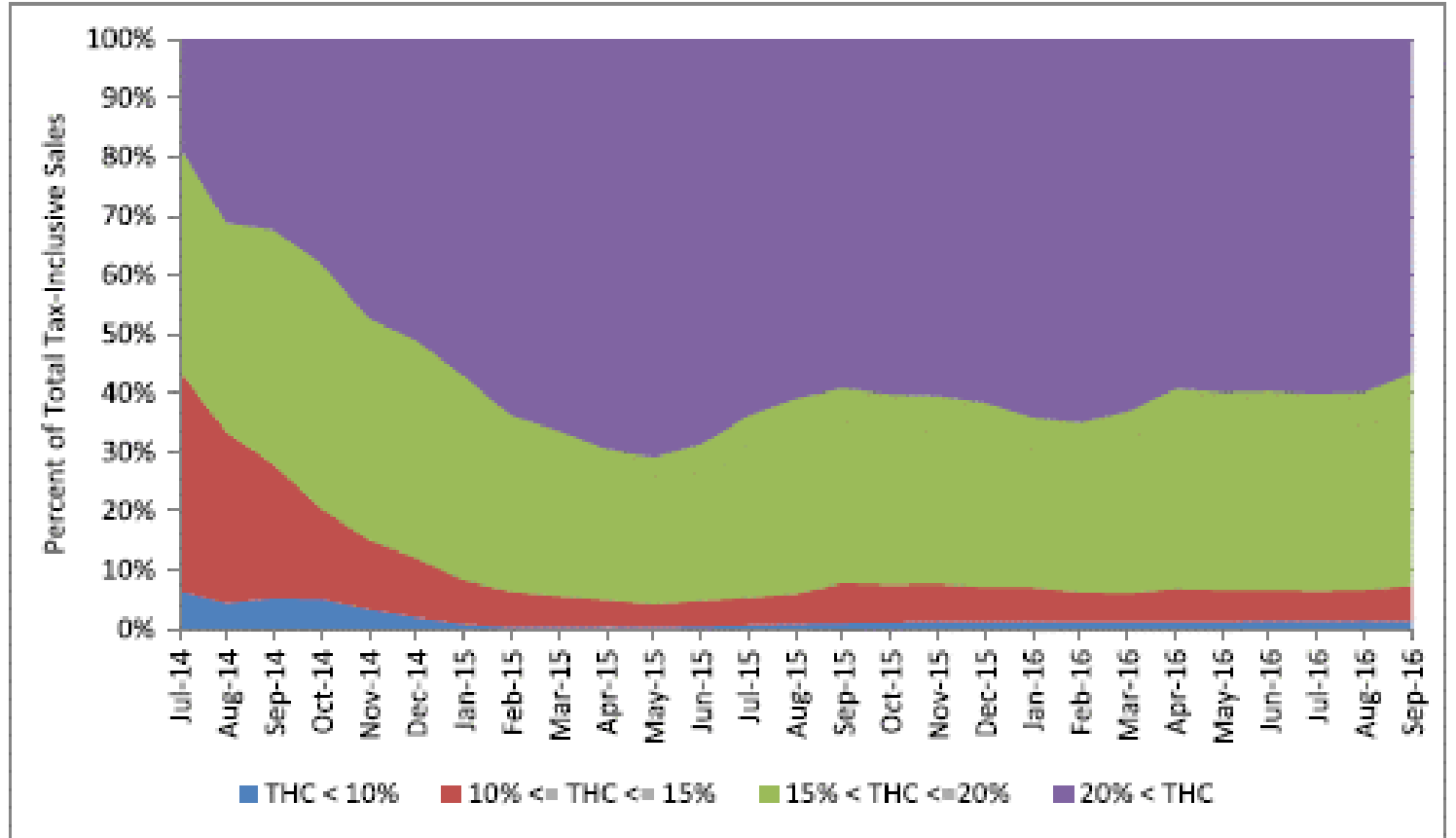
In a not very distant land....

**High potency = THC concentration > 10%**

And then market forces redefined cannabis

# High Potency Cannabis

Flower with less than 10% of THC has vanished from the WA market



Smart R, Caulkins JP, Kilmer B, Davenport S, Midgette G. Variation in cannabis potency and prices in a newly legal market: evidence from 30 million cannabis sales in Washington state.

*Addiction*. 2017;112(12):2167-2177.

# High Potency Cannabis

Manufactured products – THC concentration 60-90%



Concentrates or extracts

*Hash oil*

*Shatter*

*Wax*

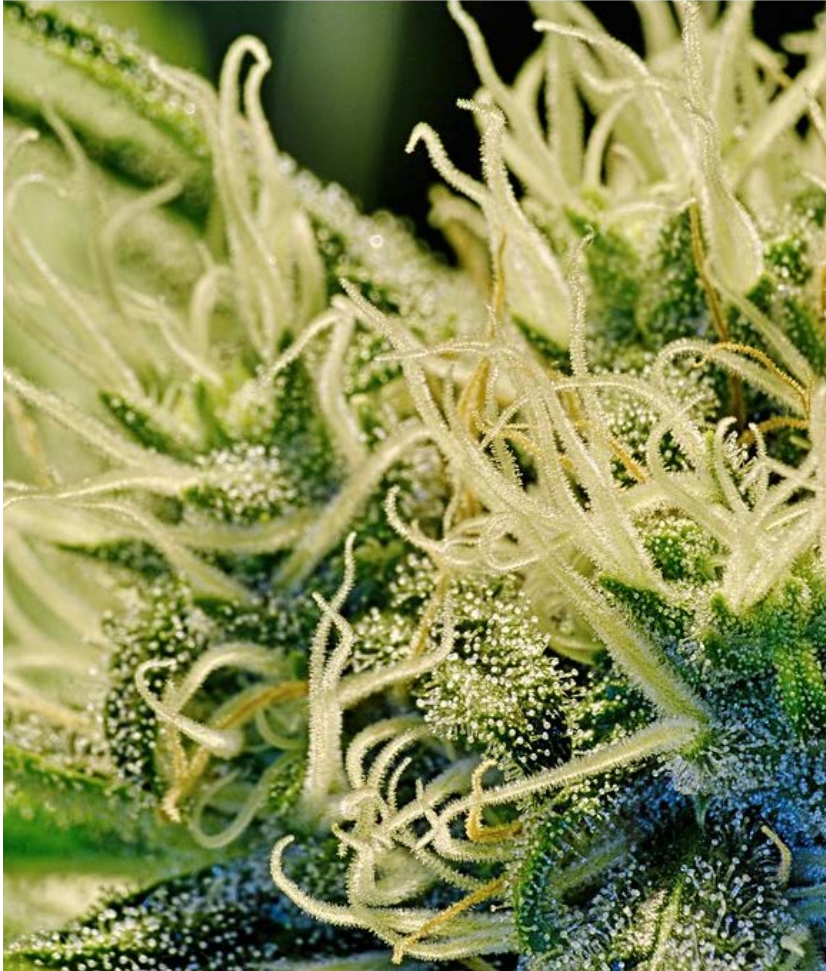


*Honeycomb*

*Budder*

*CO2 oil*

# High Potency Cannabis



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Add  
Extract  
Concentrate  
Purify  
Process



["GoD"](#) by [Symic](#) is licensed under [CC BY 2.0](#)



# High Potency Cannabis



"fruit" by [sibhusky2](#) is licensed under [CC BY-NC 2.0](#)

Add  
Extract  
Concentrate  
Purify  
Process



"~ sweet ~" by [~lzee~](#) is licensed under [CC BY-SA 2.0](#)

# Cannabis Devices



# Market Share and Sales in WA State

Extracts' market share went from **9%** in 2014 to **24%** by 2017.

Nearly **ten-fold increase** in sales from extract products  
(from \$3.95 million in 2014 to \$311 million in 2017).

Kilmer, Beau, Steven Davenport, Rosanna Smart, Jonathan P. Caulkins, and Gregory Midgette, After the Grand Opening: Assessing Cannabis Supply and Demand in Washington State. Santa Monica, CA: RAND Corporation, 2019. [https://www.rand.org/pubs/research\\_reports/RR3138.html](https://www.rand.org/pubs/research_reports/RR3138.html).

Firth CL, Davenport S, Smart R, Dilley JA. How high: Differences in the developments of cannabis markets in two legalized states. *Int J Drug Policy*. doi:10.1016/j.drugpo.2019.102611

# Cannabis Concentration Workgroup

Prevention Research Sub Committee (PRSC)

**Main goal:** Consensus statement on health risks of high concentration cannabis (THC)

Available by mid-October 2020

- Members and Contributors from UW and WSU
- Participation of state and community-based organization
- General agreement from prevention community that:
  - High potency cannabis is more detrimental to health than lower potency cannabis
  - High potency cannabis disproportionately affects marginalized and/or vulnerable populations

# Who are the Consumers?

## Adult cannabis users who vape or dab in WA

### More likely to vape:

- Males
- College educated
- Higher income

### More likely to dab:

- Males
- Latinx
- Young adults
- Adults with:
  - Poor mental health
  - No health insurance
  - Low income

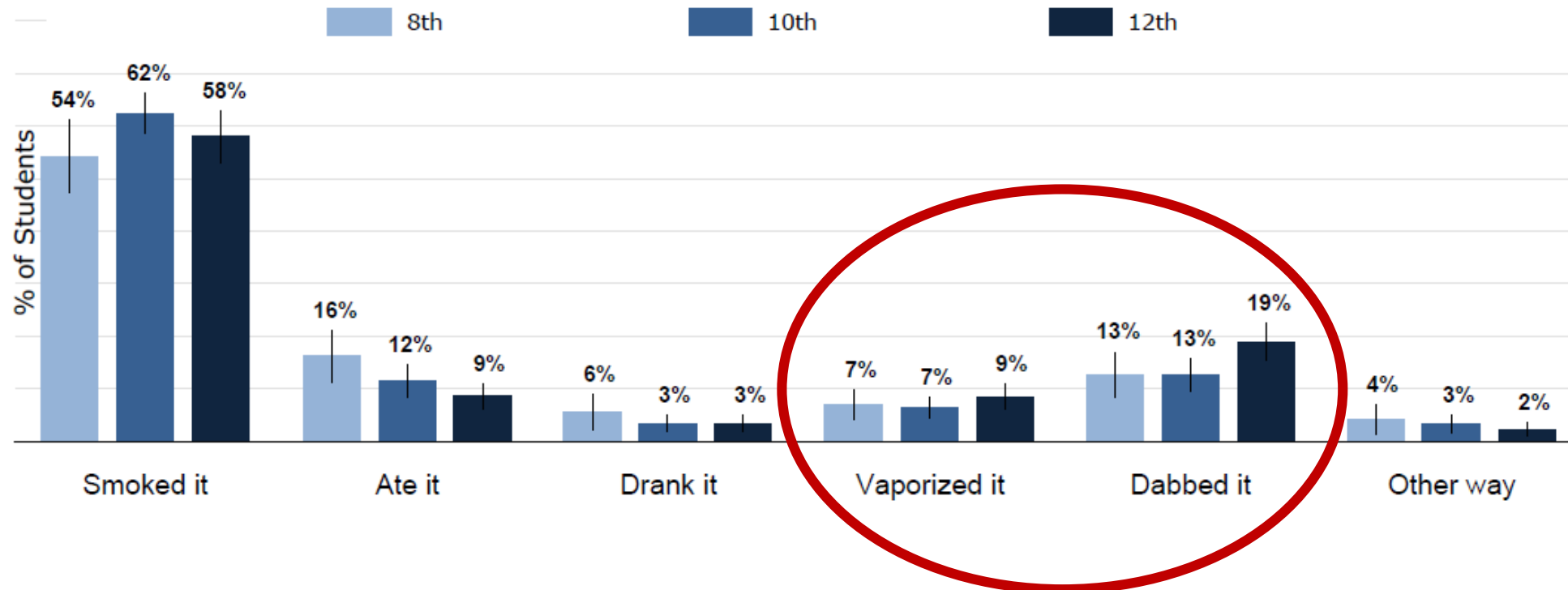
Caislin Firth, PhD, University of Washington

Data Source: 2015-2017 WA Department of Health, Behavioral Risk Factor Surveillance System (BRFSS)

# Who are the Consumers?

## WA State Healthy Youth Survey, 2018

*Type of Marijuana Use, among Current Marijuana Users*



# Health risks and Consequences



# Consequences

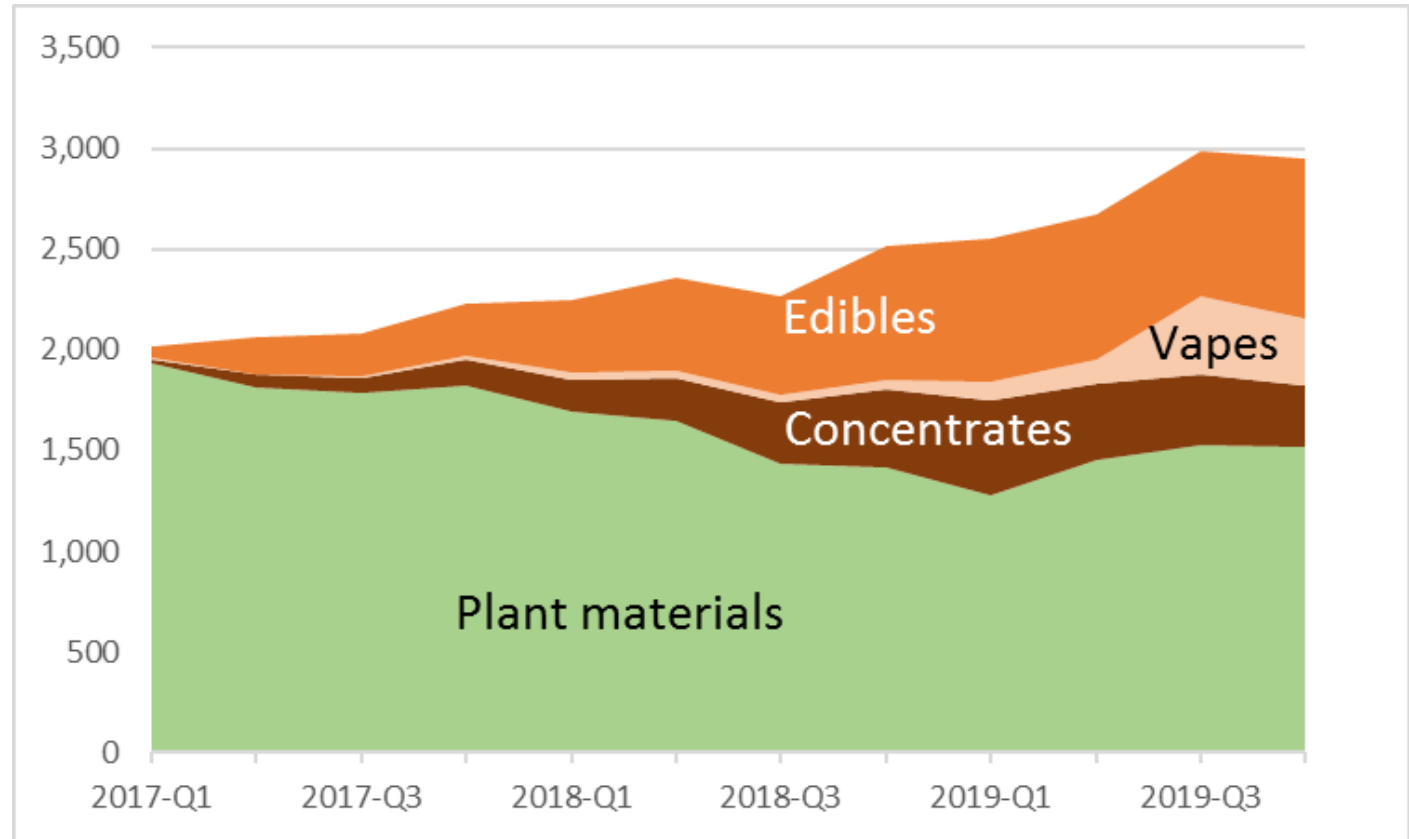
## Cases reported to Poison Centers: increase in manufactured high-potency cannabis products relative to plant materials (US, 2017-19)

### Plant materials:

Majority co-use (61%)  
9.8 % children 11 or younger

### Concentrates, edibles and vapes:

Majority cannabis-only (82%)  
29.7 % children 11 or younger



Dilley JA, Brooks-Russell A, Whitehill JM, Graves JM – Manuscript in preparation



# Consequences

## High potency= higher chances of addiction

### Takeaway:

- ✓ Use of cannabis with high THC concentration (or high potency) increases the chances of developing Cannabis Use Disorder (CUD) or addiction to cannabis, particularly among young people.

### Context:

- ✓ These studies have been conducted by observing people over time (prospectively or retrospectively.)
- ✓ It is not ethical to conduct studies that randomize people to different concentrations of cannabis to ascertain risk of addiction overtime.
- ✓ The scientific knowledge related to the higher potential of addiction of crack (vs. cocaine) or fentanyl (vs. heroin) are also observational in nature.

Review by Denise Walker, PhD & Jason Kilmer, PhD, University of Washington

#### References

1. Barrington, Trimis, J.L., Cho, J., Ewusi-Boisvert, E., Hasin, D., Unger, J.B., Miech, R.A., & Leventhal, A.M. (2020). Risk of persistence and progression of use of 5 cannabis products after experimentation among adolescents. *JAMA Network Open*, 3(1):e1919792. Doi:10.1001/jamanetworkopen.2019.19792
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3. Bidwell, L.C., YorkWilliams, S.L., Mueller, R.L., Bryan, A.D., Hutchison, K.E. (2018). Exploring cannabis concentrates on the legal market: User profiles, product strength, and health-related outcomes. *Addictive Behaviors Reports*, 8, 102-106.
4. Curran, H.V., Hindocha, C., Morgan, C.J.A., Shaban, N., Das, R.K., & Freeman, T.P. (2019). Which biological and self-report measure of cannabis use predict cannabis dependency and acute psychotic-like effects? *Psychological Medicine*, 49, 1574-1580.
5. Freeman, T.P., & Winstock, A.R. (2015). Examining the profile of high-potency cannabis and its association with severity of cannabis dependence. *Psychological Medicine*, 45, 3181-3189.
6. Gunn, R.L., Aston, E.R., Sokolovsky, A.W., White, H.R., & Jackson, K.M. (2020). Complex cannabis use patterns: Associations with cannabis consequences and cannabis use disorder symptomatology. *Addictive Behaviors*, 105, epub ahead of print.
7. Hines, L.A., Freeman, T.P., Gage, S.H., Zammit, S., Hickman, M., Cannon, M., Munafo, M., MacLeod, J., & Heron, J. (2020). Association of high-potency cannabis use with mental health and substance use in adolescence. *JAMA Psychiatry*, epub ahead of print E1-#8.

# Consequences

## Frequent use of high potency = higher chances of developing a psychotic disorder

### Takeaway:

- ✓ Daily cannabis use, particularly of high potency products increases the risk of developing a psychotic disorder, like schizophrenia, compared to cannabis abstinence. Daily use of cannabis, particularly high potency cannabis, is associated with increased symptoms of psychosis in people who have a psychotic disorder.

### Context:

- ✓ These studies are observational in nature.
- ✓ Studies on this topic define high potency cannabis as products with 10% or more THC. There are no published studies investigating with products available in US legal market (60%-90% THC.)

Review by Michael McDonell, PhD, Washington State University

#### References

1. van der Steur SJ, Batalla A, Bossong MG. Factors Moderating the Association Between Cannabis Use and Psychosis Risk: A Systematic Review. *Brain Sci.* 2020;10(2):97. Published 2020 Feb 12. Sideli L, Quigley H, La Cascia C, Murray RM. Cannabis use and the risk for psychosis and affective disorders. *J Dual Diagn*, **16**, 22-42 (2020).
2. Myles, H., Myles, N., Large, M., Cannabis use in first episode psychosis: meta analysis of prevalence, and the time course of initiation and continued use. *Australian & New Zealand Journal of Psychiatry* 50, 208–219 (2016).
3. Murray, R. M. *et al.* Cannabis-associated psychosis: Neural substrate and clinical impact. *Neuropharmacology* **124**, 89–104 (2017).
4. Di Forti, M. *et al.* The contribution of cannabis use to variation in the incidence of psychotic disorder across Europe (EU-GEI): a multicentre case-control study. *The Lancet Psychiatry* **6**, 427–436 (2019).
5. Brañas, A. *et al.* U-shaped curve of psychosis according to cannabis use: New evidence from a snowball sample. *J. Psychopharmacol.* **30**, 1331–1338 (2016).
6. Andréasson S., Engstrom A., Allebeck P., Rydberg U. Cannabis and schizophrenia: a longitudinal study of Swedish conscripts. *Lancet*, **2**: 1483–86 (1987).
7. Di Forti, M. *et al.* Daily use, especially of high-potency cannabis, drives the earlier onset of psychosis in cannabis users. *Schizophr. Bull.* **40**, 1509–1517 (2014).

# Regulations, Science & Legalization Policies

Market-oriented legalization

Product diversification and innovation

Regulation

Science

Who owns the burden to prove safety and quality of the products being sold?



**Thanks!**