
Recommendations for Regulating High Potency Cannabis in Recreational Markets and Why

Rosalie Liccardo Pacula, Ph.D.

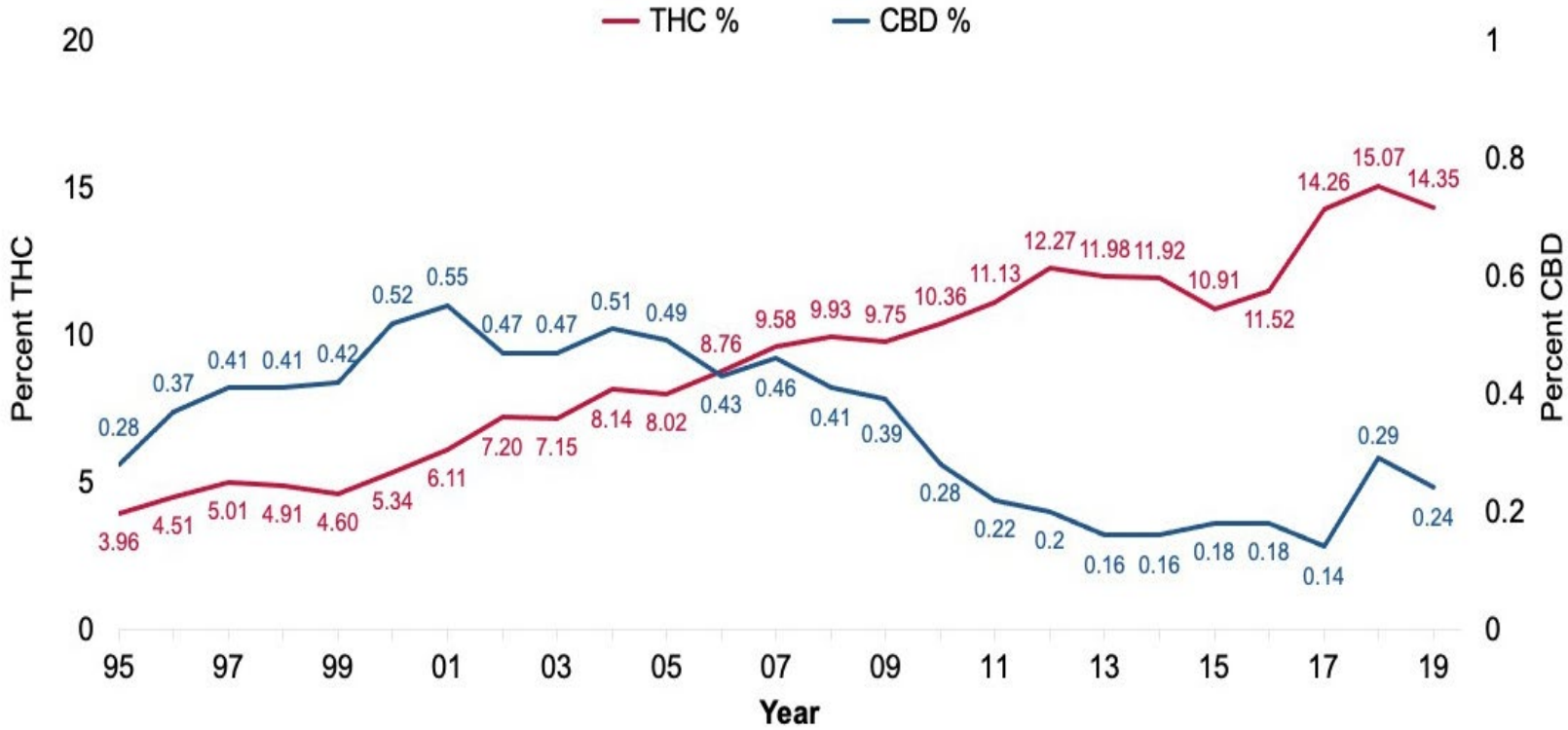
Summarizes information from:

- *Pacula RL, Pessar SC, Zhu J, Kritikos A, and R Smart. (2022). “Federal Regulation of Cannabis for Public Health in the United States” USC Leonard D. Schaeffer Center White Paper Series FBEW-6Z03, July 2022, available at <https://healthpolicy.usc.edu/research/federal-regulations-of-cannabis-for-public-health-in-the-u-s/>*

The current regulatory environment in U.S. states leading to

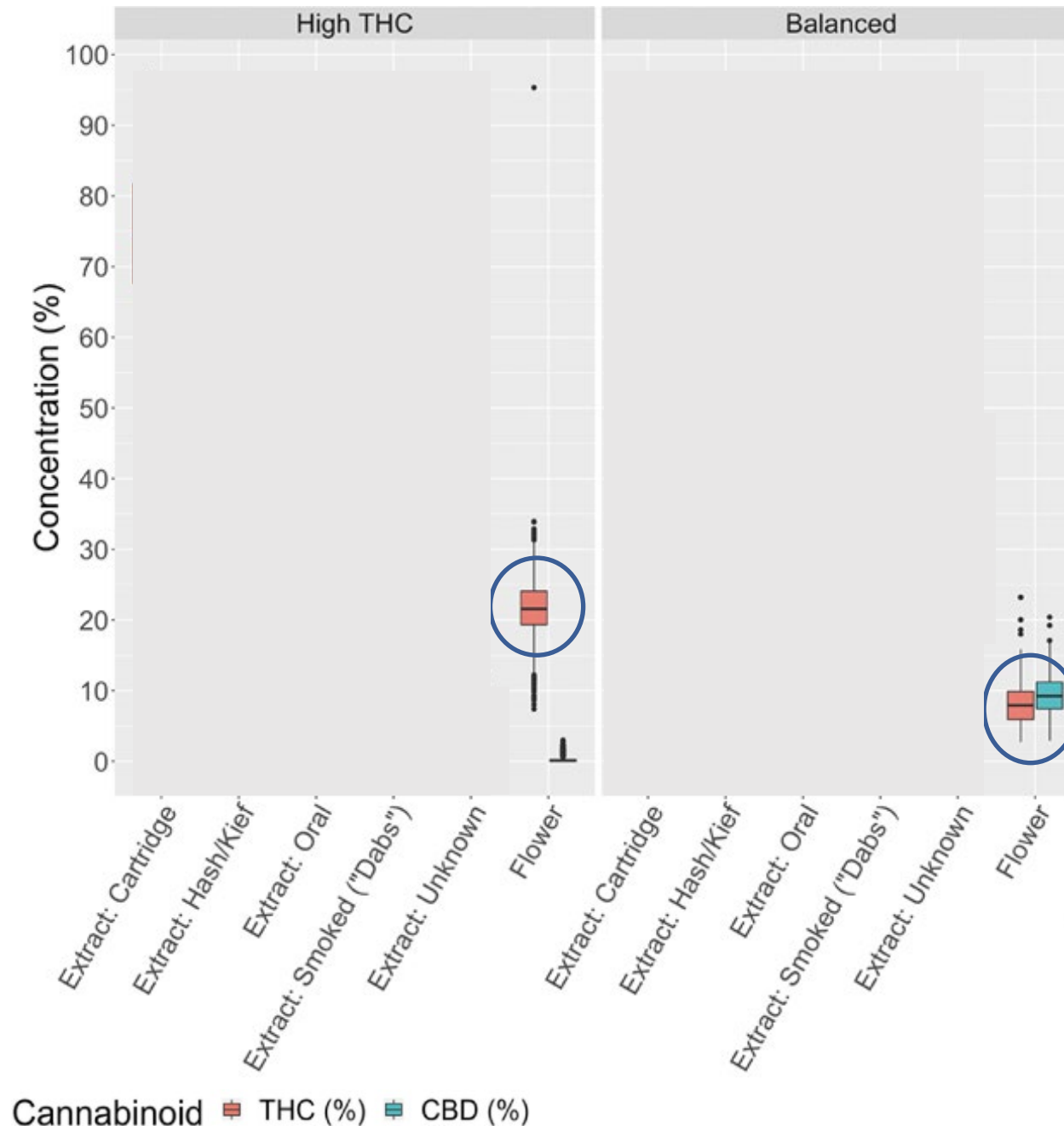
- Large increases in average potency of the cannabis plant
- Large declines in purity adjusted price
- Rapid proliferation of new products
 - new higher potency derivatives from the plant
 - growing number of products that are attractive to youth

Our focus on for-profit commercial markets has led to significantly higher potencies, even in the illicit market



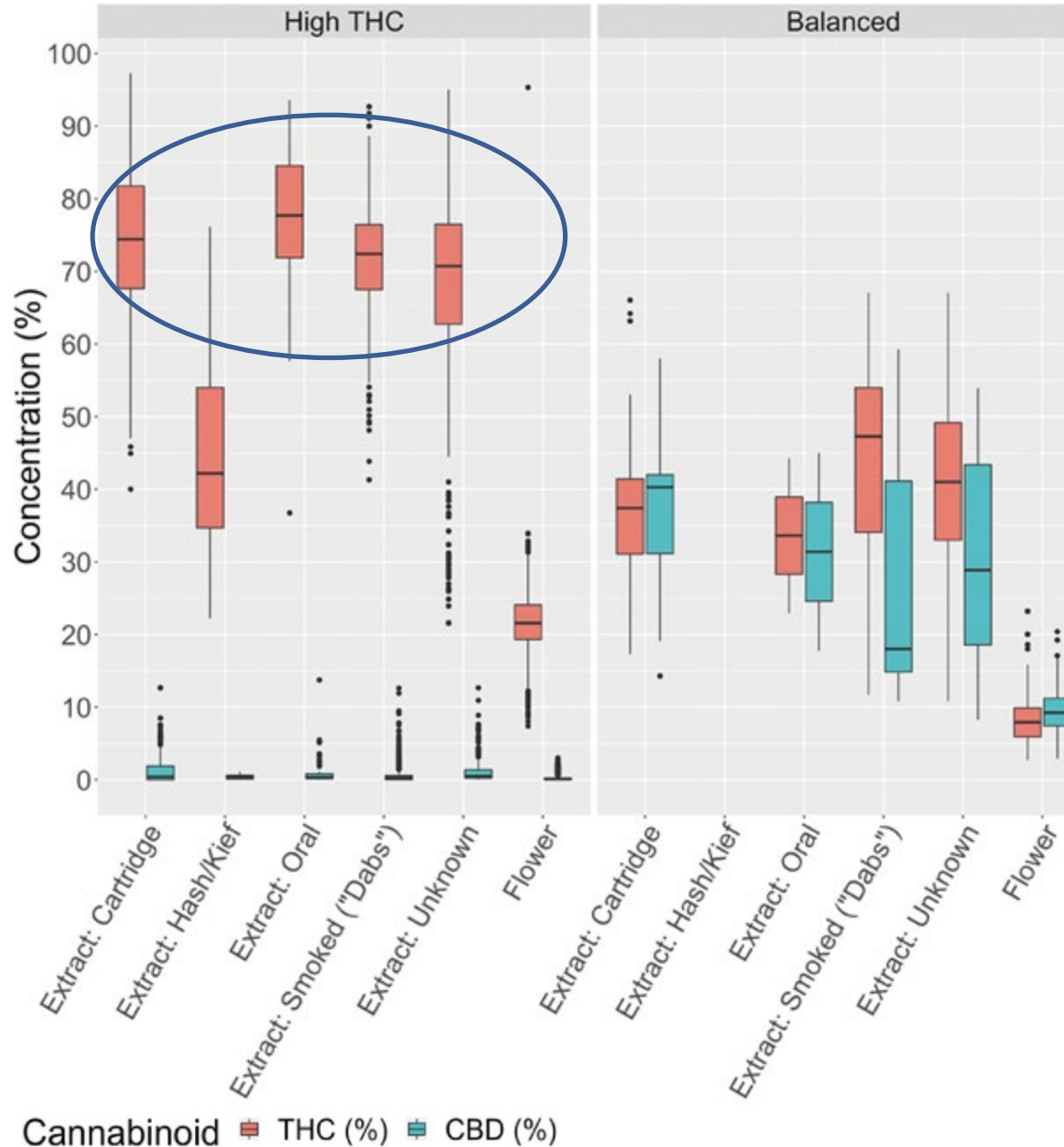
Sources: ElSohly, M. A., Chandra, S., Radwan, M., Majumdar, C. G., & Church, J. C. (2021). A Comprehensive Review of Cannabis Potency in the United States in the Last Decade. *Biological psychiatry. Cognitive neuroscience and neuroimaging*, 6(6), 603–606. <https://doi.org/10.1016/j.bpsc.2020.12.016>; Mehmedic, Z., Chandra, S., Slade, D., Denham, H., Foster, S., Patel, A., Ross, S. A., Khan, I. A., & ElSohly, M. A. (2010). Potency Trends of Δ⁹-THC and Other Cannabinoids in Confiscated Cannabis Preparations from 1993 to 2008. *J. Forensic Sci*, 55(5), 1209-1217.

Average THC of **flower** sold in legal stores in WA state between 2014-2018 is higher, **above 20%**



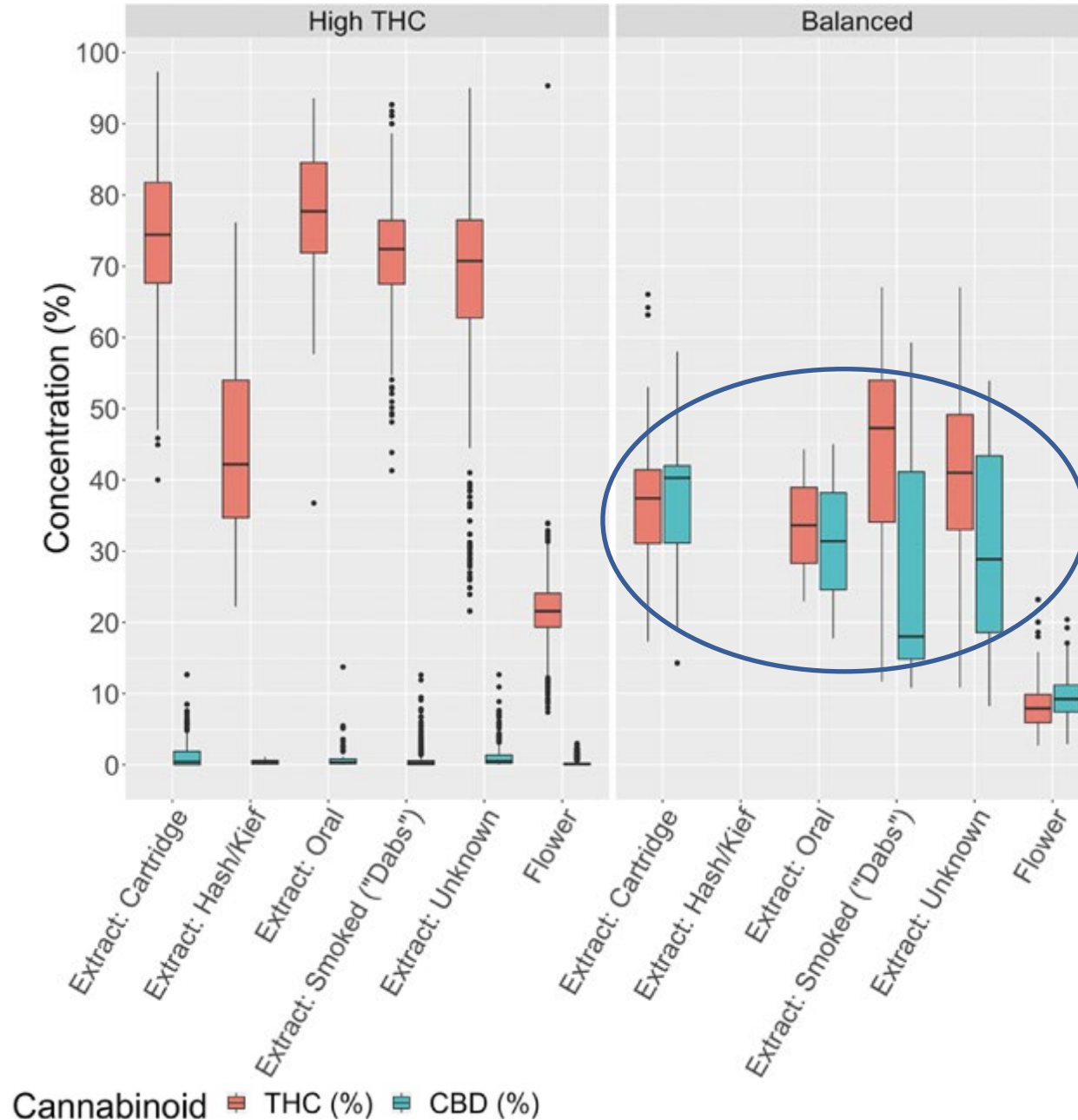
Source: Davenport, S. (2019). Price and product variation in Washington's recreational cannabis market. *International Journal of Drug Policy*, 102547.

Average THC of oils and concentrates sold in legal stores in WA is even higher, above 70%



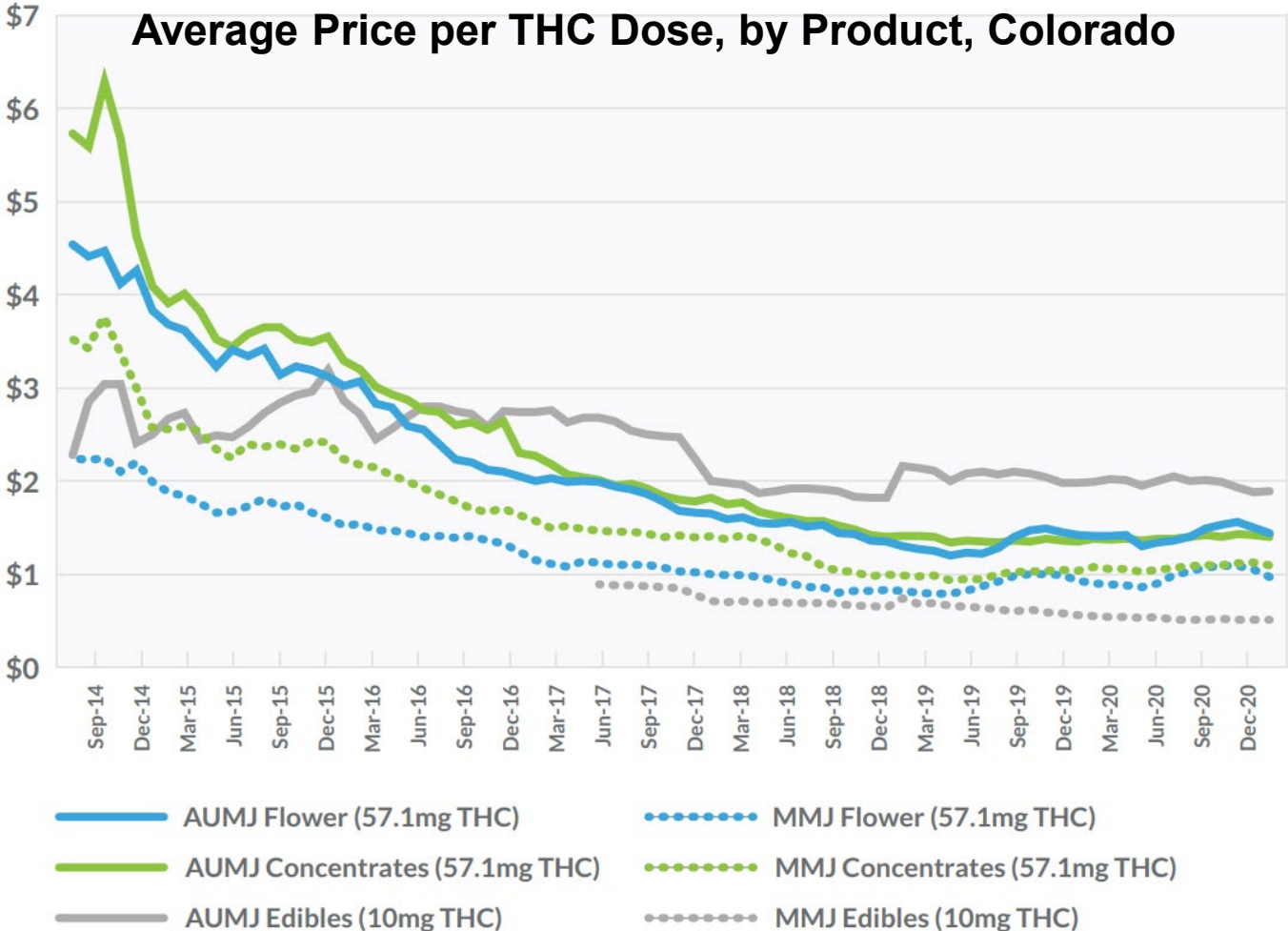
Source: Davenport, S. (2019). Price and product variation in Washington's recreational cannabis market. *International Journal of Drug Policy*, 102547.

Even products with “balanced” amounts of THC and CBD have THC above 40%



Source: Davenport, S. (2019). Price and product variation in Washington’s recreational cannabis market. *International Journal of Drug Policy*, 102547.

Potency adjusted average prices of all products are falling, now below \$2.00 per dose of THC



Source: MPG Consulting & Leeds School of Business. 2020 Regulated Marijuana Market Update.

Potency adjusted average prices per 10 mg of THC in Washington is even lower than Colorado

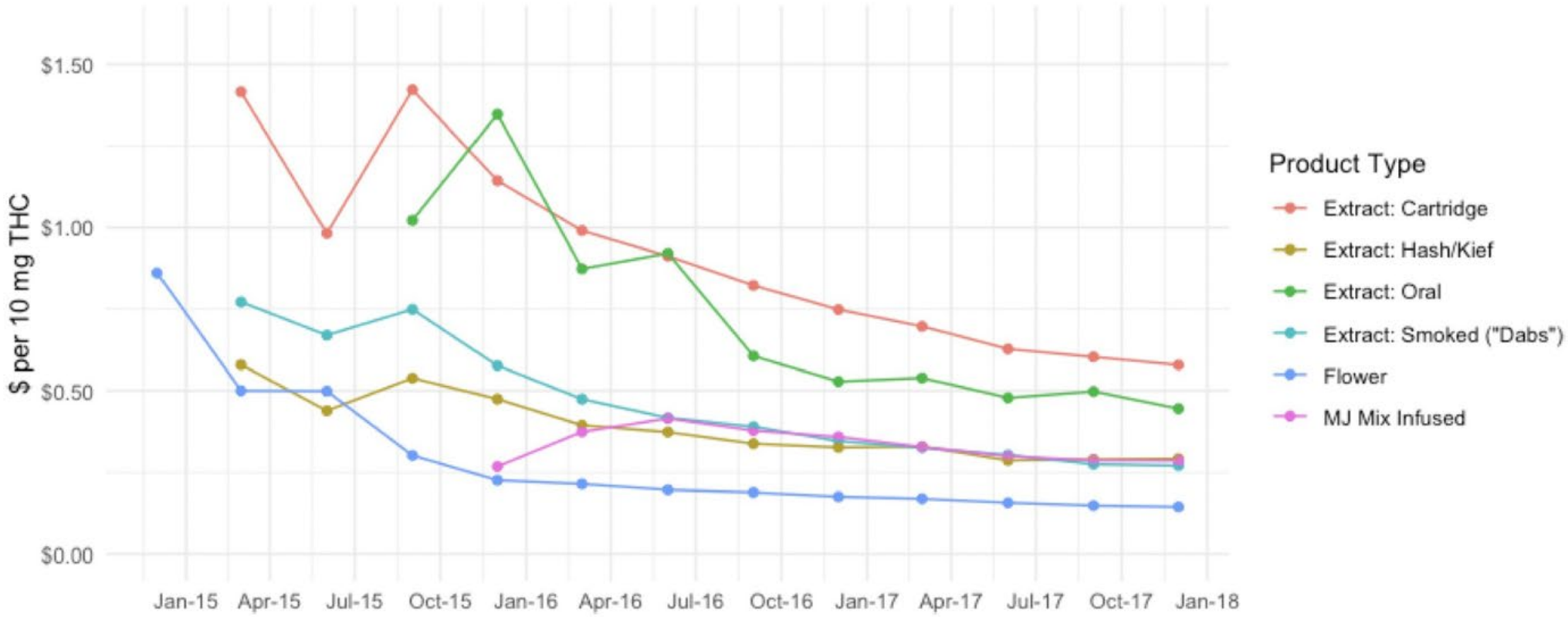


Fig. 4. Regression-based estimates for price per THC by product/subtype over time.

Source: Davenport S. (2019) Price and product variation in Washington's recreational cannabis market. *International Journal of Drug Policy*, 102547.

Industry is developing a variety of new products



Two California Entrepreneurs Launch CBD And THC Ice Cream



Iris Dorian Contributor @ Vices
I cover the business of cannabis.

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MOTA CBD Fruit Jellies - 200mg CBD
\$18.00



Herbivores Gummies - 150mg THC
\$17.00



Herbivores Pastries - 150mg THC
\$17.00



Herbivores Chocolate Bar - 100mg THC
\$15.00

Is our current regulatory scheme working?

- Enormous reduction in criminal justice costs
- New jobs, great source of tax revenue
- In WA, legalization appears to impose relatively low risk of use/ harm among many youth

BUT:

Our current regulation schemes have not stopped illicit markets

Industry claims the only way to stop illicit markets is to take away restrictions and/or taxes (race to the bottom)

There is growing evidence of health risks associated with high-potency products the industry keeps developing

Why not focus on delivering a safe, known product that can be enjoyed by consumers without potential risk of harm?

My Recommendations:

Legalization can be designed to generate overall net benefits in the long run if policymakers carefully consider potential public health effects of allowing a market for an intoxicating substance:

1. **Cap the amount of THC** and its psychoactive analogs that can be contained in legal products.

Washington states is far less restrictive than other countries also concerned about illicit market

| | Uruguay (2013) | Canada (2020) | Washington State (2020) |
|----------------------------|--|--|---|
| Maximum THC Content | Flower: THC ≤ 9% Edibles, concentrates, oils are prohibited | Edibles: 10 mg of THC/package Extract: 1000 mg of THC/unit Oil: 1000 mg of THC/mL | Edibles: 100 mg THC/package No other caps |

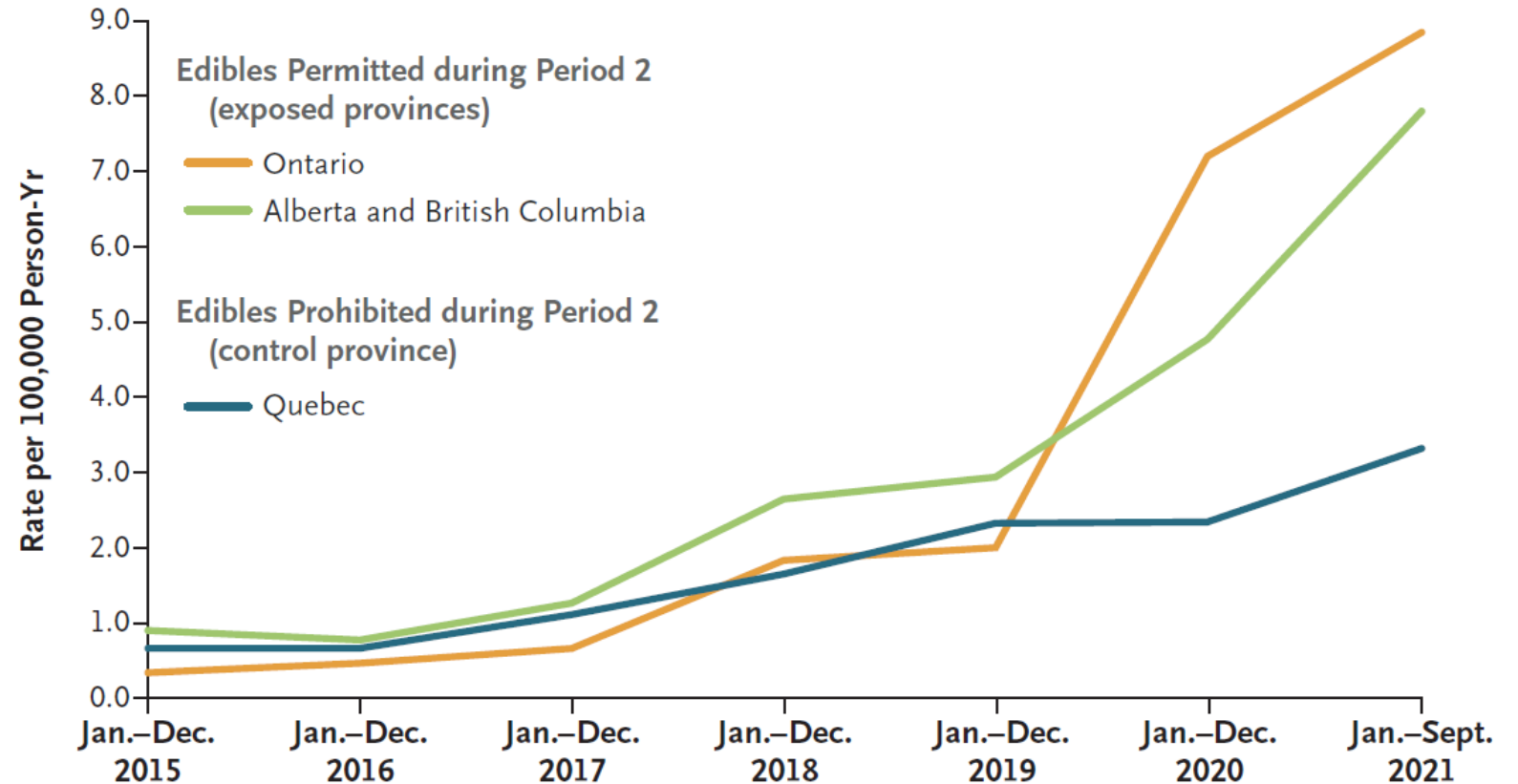
Source: UNODC (2021). World Drug Report 2021 & Pacula et al (2022).

VT and CT are the only states with a potency cap on both flower (30% THC) and solid concentrates (60% THC).

Imposing a cap on THC substantially reduces the public health risk from naïve or unintended exposures

Figure 1. Changes in Rates of Hospitalization for Unintentional Cannabis Poisoning in Children 0 to 9 Years of Age in Four Canadian Provinces, 2015–2021.

The legalization of cannabis with restricted products began in October 2018. The legalization of edible cannabis products began in January 2020. CI denotes confidence interval.



Source: Myran et al, “Edible Cannabis Legalization and Unintentional Poisonings in Children” *NEJM* 387(8), Aug 25, 2022

THC Caps would not harm patients or limit their access

Columbia Care Products Purchased in NY State (Jan 1 2016 – Aug 15, 2019)

| Product | Formulation Ratio of THC: CBD | Freq N (%) ^c | THC per dose (mg) ^{d,f} | THC/ product (mg) ^{d,f} | CBD per dose (mg) ^{e,f} | CBD/ product (mg) ^{e,f} |
|------------------|----------------------------------|-------------------------|---|--|---|--|
| Tablets | Equal THC:CBD | 9,006 (5.92) | 5 | 75 | 5 | 75 |
| | Low THC: High CBD | 12,458 (8.19) | 0.5 | 7.5 | 10 | 150 |
| | High THC: Low CBD | 15,130 (10.12) | 10 | 150 | 0.5 | 7.5 |
| Tinctures | Equal THC:CBD | 16,938 (11.13) | 5 | 35 | 5 | 35 |
| | Low THC: High CBD | 16,148 (10.62) | 0.6 | 4.2 | 12.6 | 88.2 |
| | High THC: Low CBD | 24,546 (16.13) | 10 | 70 | 0.5 | 3.5 |
| Vaporizer | Equal THC:CBD | 12,054 (7.92) | 1 | 90 | 1 | 90 |
| | Low THC: High CBD | 5,394 (3.55) | 0.1 | 9 | 2 | 180 |
| | High THC: Low CBD | 39,539 (25.99) | 2 | 180 | 0.1 | 9 |

Source: Kritikos and Pacula (2022) “Medical Haze: Describing Medical Cannabis Dosing from Purchase Behavior in New York State.” Draft paper

My Policy Recommendations:

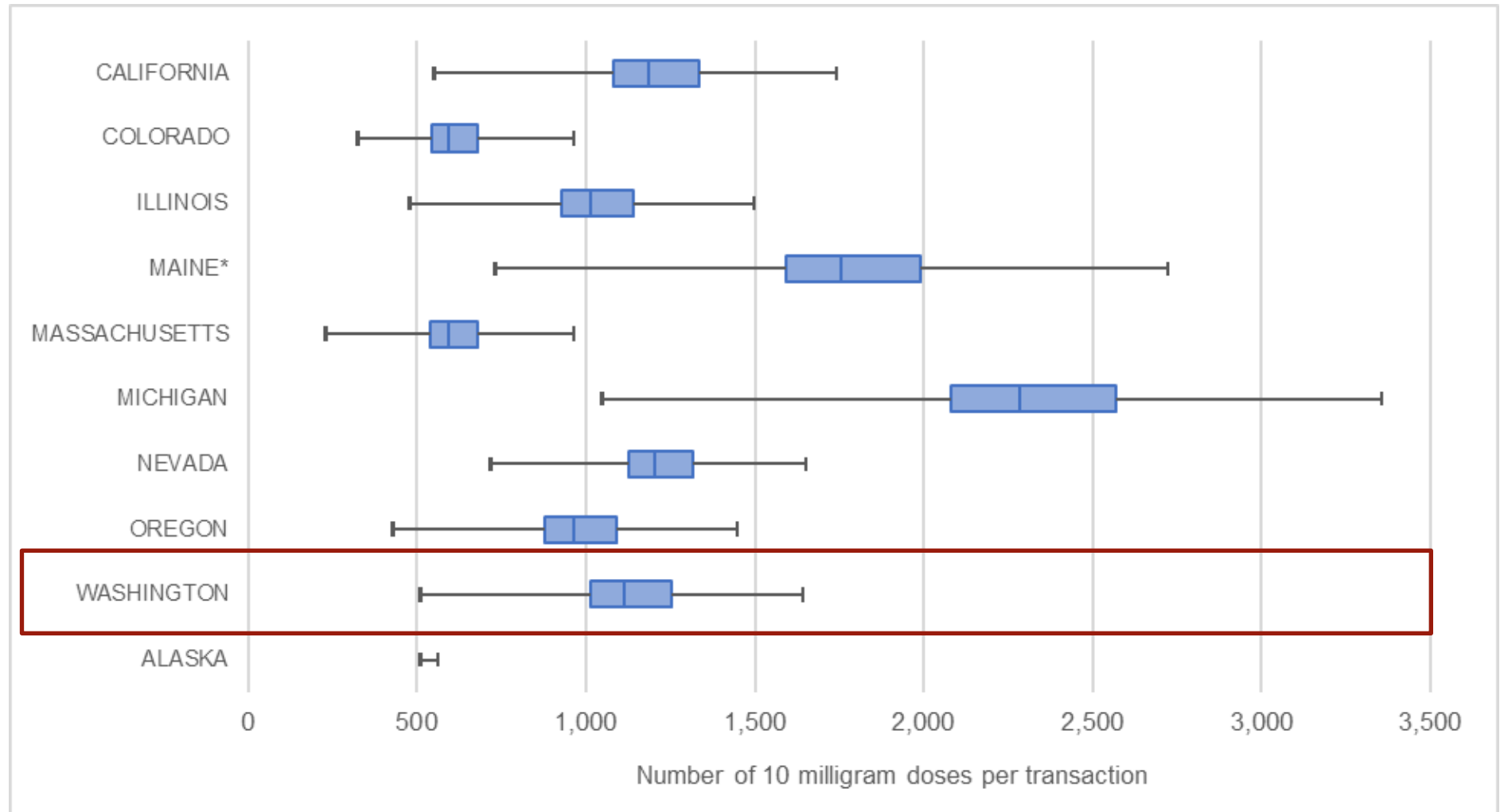
Legalization can be designed to generate overall net benefits in the long run if policymakers carefully consider potential public health effects of allowing a market for an intoxicating substance:

1. **Cap the amount of THC** and its psychoactive analogs that can be contained in legal products.
2. **Limit the types of products** that can have cannabis/ THC infused in them.
3. Consider instituting a **potency-based sales limits**

Implied ranges of 10 milligram THC doses associated with state sales limits in Jan 2020

Point of comparison:

A keg of beer holds 165 12-oz servings of alcohol



Source: Pacula et al (2021). Current U.S. State Cannabis Sales Limits Allow Large Doses for Use or Diversion. *American Journal of Preventive Medicine*, 60(5), 701-705.

Relative to other legalizing countries, U.S. states including WA are far less restrictive

| | Uruguay (2013) | Canada (2018) | Washington State (2020) |
|-------------------------|---|---|--|
| Commercial Distribution | Only licensed pharmacies regulated federally by IRCCA. 40 gram cap per month / 10 gram per week. | Varies by province but mostly private or government retail stores and online sales regulated provincially. 30 gram cap of dried cannabis or equivalent per sale | Allows sale from private licensed establishments, maximum amounts per transactions: 1 oz flower + 7 grams concentrate + 16 oz edibles + 72 fl oz (liquids) |

Source: UNODC (2021). *World Drug Report 2021* and Pacula et al (2021) “Current U.S. State Cannabis Sales Limits Allow Large Doses for Use or Diversion.” *American Journal of Preventive Medicine*, 60(5), 701-705.

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3. Consider instituting a **potency-based sales limits**
4. **Dedicate serious resources toward regulation** of the industry and the illicit market. Impose large penalties / fines on those who violate licensing, sales, and/or marketing rules

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Thank you!