

A faint, grayscale photograph of a city skyline, likely Los Angeles, featuring palm trees in the foreground and various buildings and hills in the background.

Fall 2022

# SIMULATING MARKET OUTCOMES OF CULTIVATION TAX REMOVAL IN CALIFORNIA

## CANNABIS POLICY SIMULATION LAB

*This case study is independent research from Cannabis Public Policy Consulting (CPPC) and is not sponsored by the state of California. For questions or comments related to this case study, please reach out to [msofis@cannabispublicpolicyconsulting.com](mailto:msofis@cannabispublicpolicyconsulting.com)*

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# Introduction

## Cannabis Policy Simulation Lab: Solving Cannabis Policy Questions with Data Science

The Cannabis Policy Simulation Lab integrates a joint database that includes the quarterly Regulatory Determinants of Cannabis Outcomes Survey (RDCOS) outcomes and state cannabis policies with predictive analysis that simulate likely future outcomes if certain cannabis policies are implemented. The scale of recruitment and breadth of cannabis outcomes assessed with the RDCOS drives the ability to simultaneously evaluate within-state (e.g., localities opting-in vs. opting-out of cannabis activities) and between-state comparisons of cannabis policies on over 200 cannabis outcomes. When coupled with the frequency of data collection, this facilitates an unprecedented opportunity to provide evidence-based insights rapidly and dynamically on the unique roles of cannabis policies on countless societal outcomes.

Examples of policies simulated in the Cannabis Policy Simulation Lab include, but is not limited to the following state-specific variables:

- Overall jurisdiction (illegal, medical only, or medical & adult use)
- Tax policies (e.g., cultivation excise tax, cannabis business tax, etc.)
- Type of medical qualifying conditions by state
- Cannabis dispensaries per capita and per geographic area
- Driving under the influence laws
- Presence of legal medical and adult use delivery
- Duration of time (months) since implementation of medical cannabis laws and since implementation of adult use laws.

# Simulation Highlights

01

Using regulated market sales data from California from 2018-2022, we estimate the effective tax rate from **eliminating the cultivation tax (AB-195)** resulted in a **3.1% net improvement of cost savings for licensees**. Depending on the percentage of these net revenue improvements passed on to point-of-sale pricing, we estimate between a \$0.20 and \$0.40 reduction in the price per gram of cannabis in California since late July 2022.

02

Using empirical data, we have concluded that the **majority of cannabis consumed by Californians comes from regulated sources**, in contrast to claims made by outlets using business intelligence data as opposed to empirical sources.

03

In this same vein, our findings suggest that **many Californians in opt-out localities likely travel to opt-in localities to purchase their cannabis**, indicating that opt-out localities may not be driving illicit purchasing behavior.

04

Using data collected in April and August 2022 from the Regulatory Determinants of Cannabis Outcomes Survey (RDCOS) conducted by CPPC, we ran a **between-state analysis and a within-California analysis** (compares opt-out and opt-in localities in a condensed geographic area) to model the impact of AB-195. In both models we found that the percent of **regulated cannabis consumed by Californian's shifted upwards** by a combined average of approximately 1.3%.

05

Although 1.3% may not seem overwhelming, it is important to note that all nine states with adult use cannabis represented in the Regulatory Determinants of Cannabis Outcomes Survey are within a 20% range of regulated cannabis demand, which suggests that a **1.3% improvement is notable when considered as a function of that 20% range**.

# Models and Outcomes Overview

Among the nine states with adult use cannabis markets represented in the RDCOS, California was the only state to implement a policy between the RDCOS quarterly issuance (April and August of 2022) that would presumably have any effect on the proportion of illicit/regulated cannabis accessed by consumers. Notably, California had the single largest shift in regulated adult use and delivery sales among these states (see Figure 3).

Based on the recency of the implementation of AB-195, and the consistency of the findings from the models presented herein, it seems likely that the impact on prices of adult use cannabis in California will continue to decline in time before eventually flatlining. Based on our Willingness to Pay (WTP) data, it is likely that the closer retail cannabis prices per gram get to \$10.50/gram, the more rapidly and consistently consumers will shift to the regulated market.

The odds that the 1.3% increase in regulated cannabis accessed by in-state consumers occurring between April and August was impacted by AB-195's implementation is likely given the following...

- The between-state and within-California models presented in this report each averaged a very similar modest improvement in the percent of total regulated cannabis accessed in California. Specifically, the two approaches revealed 0.7% and 1.5% improvements, respectively (i.e., average net increase of 1.3%).
- The model results generalized from comparisons to other states, to comparisons within California wherein opt-in vs. opt-out comparisons were made in a specific county (to control for between-county variations).
- We used three sub-models for the within-California overall model, which employed differential mathematical and model assumptions (such as accounting for additional variables), thus likely providing more balanced and conservative estimates.
- A 2020 report produced by another firm<sup>2</sup> reported that approximately 62% of the differences in production costs between regulated and illicit cannabis sources is at the result of cultivation tax, which AB-195 removes further supporting why an initial shift towards regulated use was found in our modeling.
- We used the same recruitment procedures and survey items for the April and August studies, which effectively rules out arguments that the current findings are due to differences in methods across the two survey administrations.

# Models and Outcomes Overview

Together, the above findings suggest that the implementation of AB-195 likely led to what is realized as a \$0.20 to \$0.40 cent per gram reduction in prices of adult use cannabis in California since late July of 2022.

Assuming based on available evidence that the average price per gram of cannabis in California is approximately \$13.00/gram, the \$0.20 to \$0.40 savings derived so far from AB-195 likely represents 9% of the way towards a goal of \$10.50/gram in California. Therefore, notable additional policy or market factors that impact prices of adult use cannabis in California will likely be needed to continue the observed increase in regulated purchases.



# Illicit Cannabis Demand California Benchmarking and Overview

The proportion of total cannabis that is accessed illicitly by Californian consumers is likely dramatically lower than are reported by business intelligence reports. Claims that an upwards of 70%-90% of cannabis accessed in California is illicit<sup>345</sup> are very unlikely to be accurate for many reasons. Concerningly, this figure has been reported in the media for approximately three years.

- As shown in Figure 1, cannabis demand for regulated cannabis has continued to increase year-over-year since implementation of adult use market access. Based on existing evidence from other states, it is extremely unlikely that total cannabis demand in California (illicit & regulated combined) has risen as much as cannabis demand for illicit cannabis. Therefore, the percent of illicit cannabis consumed in California cannot continue to be projected as much 80% when it is evident that the **demand for regulated cannabis is growing at a faster rate than illicit continuously**.
- The RDCOS data collected in April and August of 2022 assessed five different types of illicit cannabis sources. Our estimates suggest most of the cannabis consumed by Californians is regulated. As shown in Figure 1, we estimate that 73% of cannabis accessed by Californians is from regulated sources.

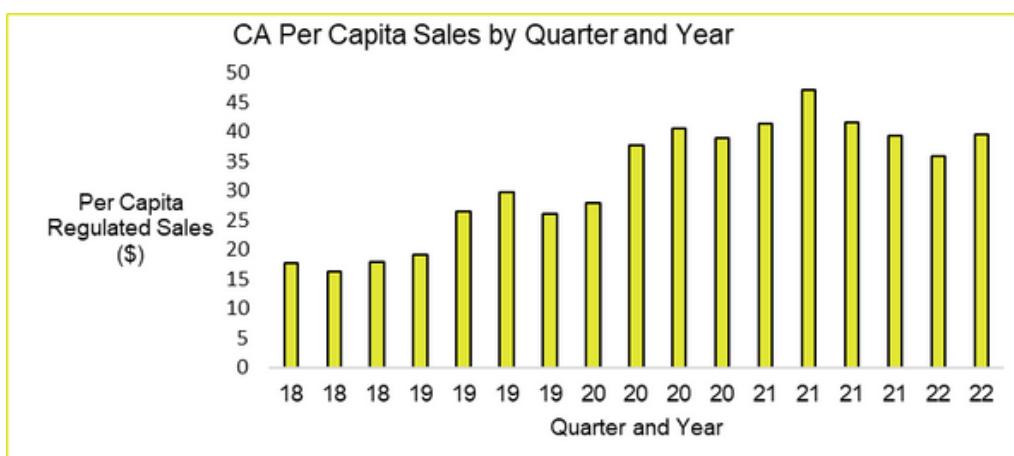


Figure 1. CA Per Capita Sales by Quarter and Year

[3] <https://www.npr.org/2021/11/07/1053387426/5-years-after-california-legalized-weed-the-illicit-market-dominates>  
[4] <https://www.politico.com/news/2021/10/23/california-legal-illicit-weed-market-516868>

[5] The RDCOS uses behavioral economics to understand consumer cannabis consumption and access in addition to interactions with cannabis markets. Cannabis illicitly accessed is different than cannabis illicitly produced. While the figures captured in this report are based on in-state demand, a vital measure of cannabis market success, it should be noted that it does not provide an estimate of illicit cannabis that is being grown in California with the intent of supplying consumers outside of California. Additionally, the RDCOS does not capture tourism consumption data, as all respondents for each state are verified residents of the state they are responding for.

- As seen in the Figure 2 below, more mature adult use markets have higher rates of regulated cannabis use, and as of August, California is on track for the percentage of cannabis that is regulated among Californians that is anticipated (see dark blue trend line indicating expected performance). This is highly likely to be a result of AB-195.

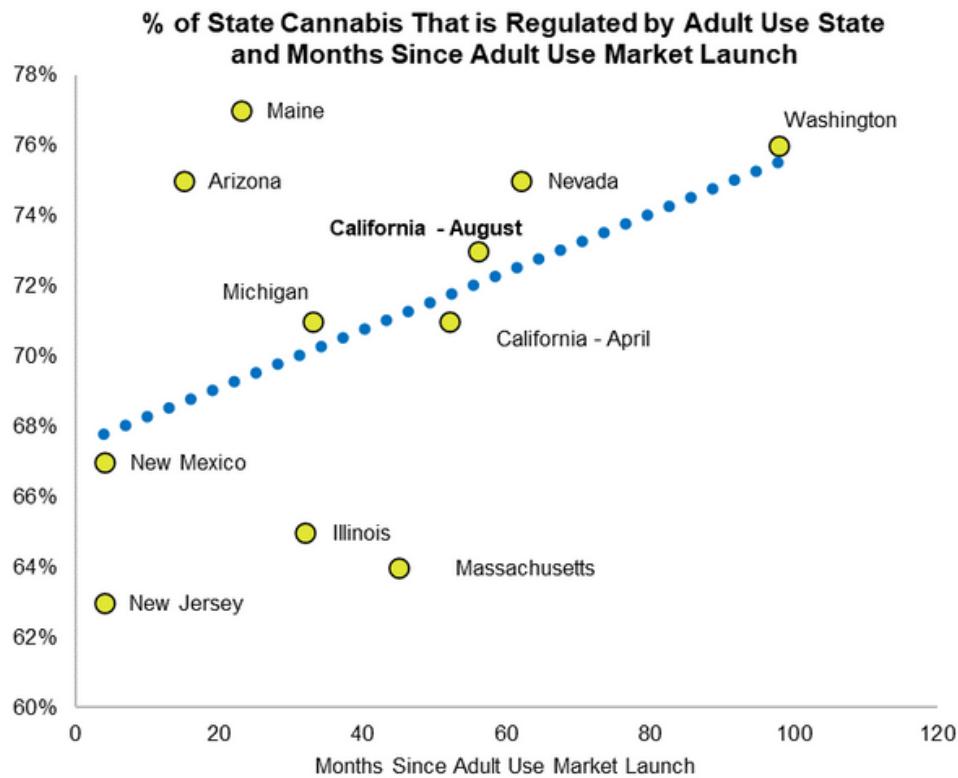


Figure 2. % of Accessed State Cannabis That is Regulated and Months Since Adult Use Market Launch

- Although there are likely illicit suppliers who intend to divert cannabis to other states, which when accounted for would provide a lower estimated percentage of cannabis that is regulated, we used several methods to help validate our illicit cannabis accessed estimates.

# Between-State Model

We compared state-level changes between April and August of 2022 using our survey across nine states with adult use cannabis programs. We examined the percent of any increase in adult use and regulated delivery in the RDCOS adult use states to derive a proportion improvement score in adult use/regulated delivery across all states. As shown in Figure 3, California showed the largest proportion (regulated/total cannabis) improvement in adult use and regulated delivery of all nine RDCOS adult use states.

Given that California was the only one of these states who implemented a policy as notable as AB-195 (as it relates to regulated cannabis), and because it was implemented precisely in between the administration of the April and August 2022 surveys, it seems more than coincidental that California showed the single largest

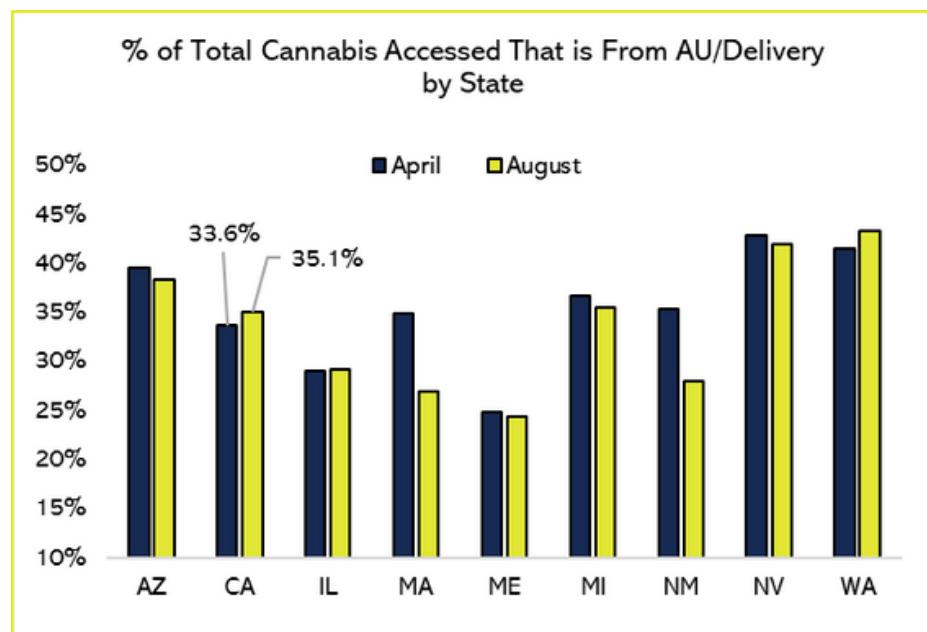


Figure 3. % of Total Cannabis Accessed from AU/Delivery

improvement of any state in adult use/regulated delivery cannabis accessed as a proportion of changes in total cannabis. Moreover, Californians reported almost identical purchasing of cannabis from dealers between April and August of 2022. This net shift would be expected given that the removal of the cultivation tax should have produced cost reductions, thus lowering point-of-sale prices in the Adult Use market modestly, and incentivizing consumers away from the illicit purchasing.

As shown in Figure 2 on the previous page, the average estimated percent of total cannabis that accessed by Californian's that was regulated was 71.5% in April, prior to the removal of the cultivation tax in early July, and then was 72.7% when assessed using our survey in late in August.

The trendline in the figure is a product of linear regression model which shows that at least when examining the percent of total cannabis consumed by residents from each state (i.e., not counting inverted and diverted cannabis), the percent of cannabis that was regulated shifted from slightly below average compared to the other states in April (i.e., below blue trend line) to slightly above average in August (i.e., above blue trend line). Put differently, based on relationship between time since adult use market launch and percent of cannabis that is regulated, California was slightly behind pace prior to implementing AB-195 but moved to slightly ahead of pace afterwards.

# Within-California Model

For the second series of analyses modeling shifts in regulated cannabis use as a function of the implementation of AB-195, we compared Los Angeles City (Opt-in) to 14 opt-out localities also located in Los Angeles County using participants from April and August RDCOS administration. The opt-out localities included Beverly Hills, Torrance, Hawthorne, Santa Clarita, Gardenia, Glendora, Claremont, West Covina, Burbank, Agora Hills, Inglewood, Monterey Park, Bell Gardens, and San Dimas.

To provide a conservative estimate of shifts in percent of total cannabis that is regulated, we used three separate models that compared relative regulated and illicit cannabis (as a function of total cannabis accessed) between April and August timepoints and between Opt-in vs. Opt-out localities. Specifically, we used three different mathematical assumptions when examining change in cannabis across time, and used different metrics of relative illicit consumption to provide a more conservative and balanced estimate of change in regulated use. The average of the three within-California models demonstrated a net increase in illicit cannabis across opt-in and opt-out localities that was driven by a net increase in regulated cannabis in opt-in localities

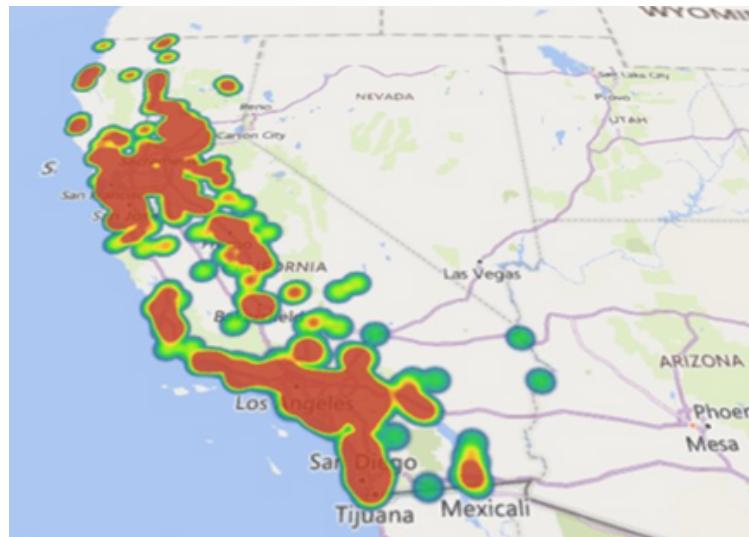


Figure 4. Heat Map Showing Zip Codes of RDCOS Respondents in California (April and August 2022)

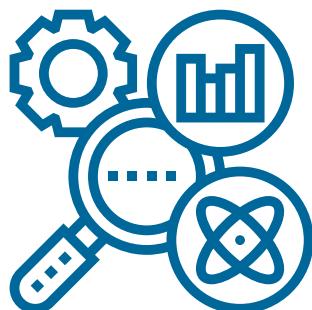
## Net Shift in Regulated Cannabis Consumption

	Opt-Out	Opt-In	Net % Change
Average of Three LA County Models	-1.1%	+1.8%	+0.7%

# Study Conclusions



Using survey data collected from thousands of Californians in April and August of 2022, we found that the elimination of the cultivation tax for licensees in California (AB-195) in July likely produced a small but notable shift towards a greater percent of total cannabis in California that cannabis accessed from regulated sources.



More research is needed to replicate these findings and to examine the extent to which these gains are maintained moving forward, but in the realistic event that these gains are maintained, then additional policy actions like AB-195 that improve the realized revenue of licensees appear prudent.

# Better Data.

# Better Policy.

# Better Outcomes.

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For more information about this simulation, please contact CPPC.

## Contact

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