Getting High in New York State: the challenges and opportunities of cannabis legalization in an era of data transparency, top-down governance and inequality

April M Roggio, Research Associate, University at Albany (Presenting author)

Suzanne Pine, Subject Matter Expert

Jonathon McKinney, Rensselaer Polytechnic Institute

Abstract: New York State recently legalized recreational cannabis for public consumption. The "roll-out" has been fraught with challenges, including an uncertain policy environment, legislative guidance that produced numerous lawsuits, and guidelines that prioritized social equity but were widely un-implementable. In an era of broad public support for access to cannabis, the challenges are instructive; more so, during a time when we will likely need to radically restructure markets to meet sustainable development needs, it is also a fascinating look at the ways in which we might get market liberalization right…or very wrong. We find that there is frequently inadequate data available to judge market conditions, for example. Moreover, as recreational cannabis has become more acceptable, evidence suggests that the illegal market for marijuana has flourished, while there has been lax enforcement of unlicensed operations. Moreover, a layered taxing scheme in states has often driven up the cost of legal cannabis, making it far more expensive than what is available from unlicensed operations. This short hybrid approach – a practitioner-academic partnership of sorts – utilizes causal loop mapping to explore the impacts of New York's policy efforts. We conclude with some policy recommendations, and propose a research agenda that merges approaches to facilitate more robust practitioner conversations.

Background and problem statement

Despite regulatory on-ramps to ensure a "smooth rollout" of recreational cannabis into an environment where it had been illegal for decades, there are some significant (but predictable) chokepoints. What is most intriguing to scholars of policy is how even when the possible chokepoints are signed, the path marked and many warnings given, we are still witnessing a policy initiative that is best described as a train wreck. This conference paper attempts to begin articulating the dynamics that prevented legal market development and identify some paths forward.

On March 31, 2021, the Marijuana Regulation and Taxation Act (MRTA) was signed into law by then Governor Andrew Cuomo, legalizing recreational cannabis for adults 21 and older. The law allowed for the possession of up to 3 ounces of cannabis flower and 24 grams of concentrated cannabis. It also permitted home cultivation of up to six mature and six immature plants per person (or 12 mature and 12 immature plants per household). Furthermore, the legislation created a tiered system, which restricted crossover between tiers. The supply tier refers to businesses involved in the production and processing of cannabis for adult-use. As shown in Figure 1, cultivators, processors, and distributors are responsible for growing the cannabis plants, for transforming the raw cannabis flower into various products like edibles, oils, and concentrates, and transporting cannabis products from processors to retailers. The retail tier refers to the establishments authorized to sell cannabis directly to consumers. As

shown in Figure 1, there are retail dispensaries and on-site consumption sites (consumption lounges) authorized under the MRTA. Dispensaries are like regular stores where customers can purchase cannabis products for consumption off-site. Both dispensaries and on-site consumption lounges, while legal under the MRTA, are subject to individual municipality opt-out clauses. New York State's diverse political geography effectively predicted patterns of municipal opt-out, with rural communities more likely to opt out than urban ones (Roggio, Pine & McKinney, 2024).

Figure 1 also identifies another complication: the MRTA was approved in an environment where medical cannabis was already authorized; and New York State also prioritized laboratory testing to ensure product safety. This tiered system was specifically designed to prevent monopolies and ensure a more competitive market.
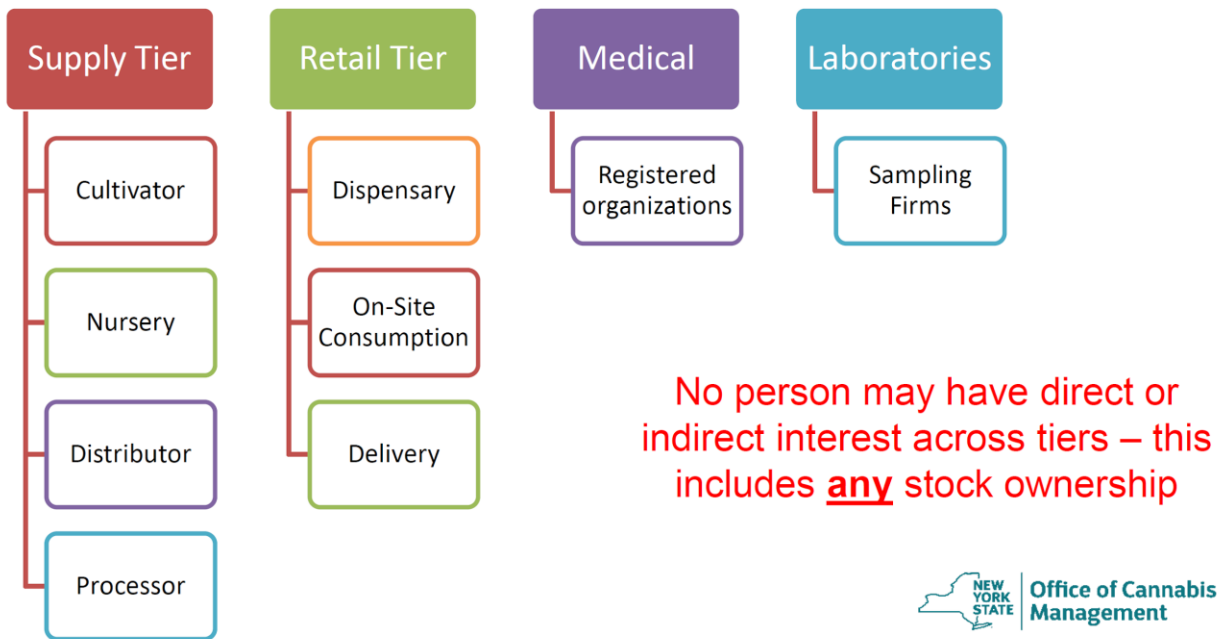

Figure 1. Tiered licensing. Office of Cannabis Management, New York State.

Additionally, a major focus was placed on social equity by prioritizing licensing for people from communities disproportionately impacted by criminalization of cannabis. An oft-cited statistic notes that while cannabis use doesn't vary much by race, arrest rates are deeply skewed; in New York State, people of color are about 2.6 times more likely to be arrested for cannabis (Gunadi & Shi, 2022). In effect, inserting social equity into the law was an attempt at what was New York's way of trying to right previous wrongs. In their New Yorker article, Toletino describes the context within which the legislation was born:

> "CAURD went a step further, mandating that the first licenses for the sale of recreational weed go to people who had, or whose family members had, a marijuana-related conviction. In the previous four decades, according to an analysis by the Legal Aid Society, police in New York had made more than a million marijuana arrests. Although weed is consumed in roughly equal proportions across the racial and economic spectrum, as recently as 2020 people of color were subjected to ninety-four per cent of marijuana arrests and summonses in New York City; arrests

in the city were also much heavier in high-poverty areas. The idea for CAURD was plain: legal weed as reparations." (Toletino, 2024)

Beginning in late 2021, despite many promises to the contrary, delays in issuing licenses and establishing regulations hindered the launch of initial retail sales. Between June and August of 2022, the OCM allowed the first conditional licenses – grower licenses to those who had been members of the state's hemp program, and conditional licenses to those who were eligible to apply to the social equity program. For the latter, this means that you had been previously convicted under a cannabis related crime (or someone in your immediate family had), and that you could show evidence of some level of business competence (such as through a share in a successful business for at least a two year duration). The state currently licenses approximately 280 cultivators, the majority of which are located in the Hudson Valley region. (Figure 3)

It wasn't until September 12, 2023 that the state approved adult-use cannabis regulations, outlining the application process for recreational dispensary licenses. In October of 2023, general cannabis licensing opened, allowing businesses to apply for recreational marijuana dispensary licenses.
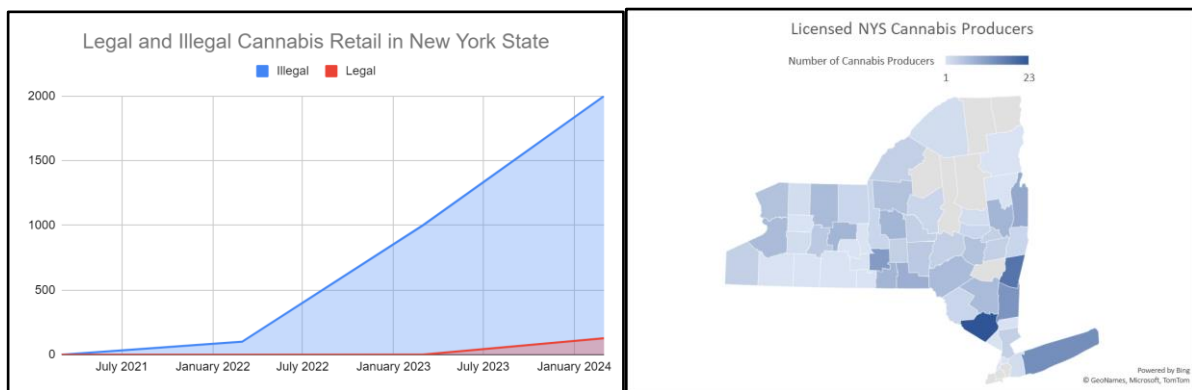

Figure 2. Cannabis retail access over time. Figure 3. Cannabis cultivators in New York.

New York City, in particular, has yet to finalize its licensing regulations for recreational dispensaries within city limits, despite the proliferation of illegal pot shops throughout the city. While measurement of the illegal market is problematic, some estimates suggest that there are more than 2000 illegal cannabis retailers operating in New York City (). Federal legalization of cannabis remains unlikely in the short term, creating uncertainty for the legal cannabis industry nationwide.

The number of legal dispensaries currently sits at only 127 facilities statewide. In January of 2024, Governor Kathy Hochul delivered a blunt assessment of the state of New York's fledging cannabis industry, referring to it as a "disaster":

> "I'm very fed up with how long it's taken to get some of these approvals. My understanding is that the board was supposed to consider 400 applicants," she said. "They only had three new retail locations approved." (Adams, 2024)

In March, she demanded a thorough review of the Office of Cannabis management in an attempt to more rapidly license legal dispensaries. That review suggested that the OCM had failed to move swiftly enough in providing licensing, claimed there were thousands of backlogged applications and suggested

that the start-up culture of the OCM needed reenvisioning. Chris Alexander, the head of the OCM, was asked for his resignation one week later.

Supply and demand transparency.

New York State is far from the first state to legalize cannabis. As shown in Figure 2, there have been numerous efforts since the late 1990's, with medical cannabis generally receiving voter approval first, followed by recreational cannabis.
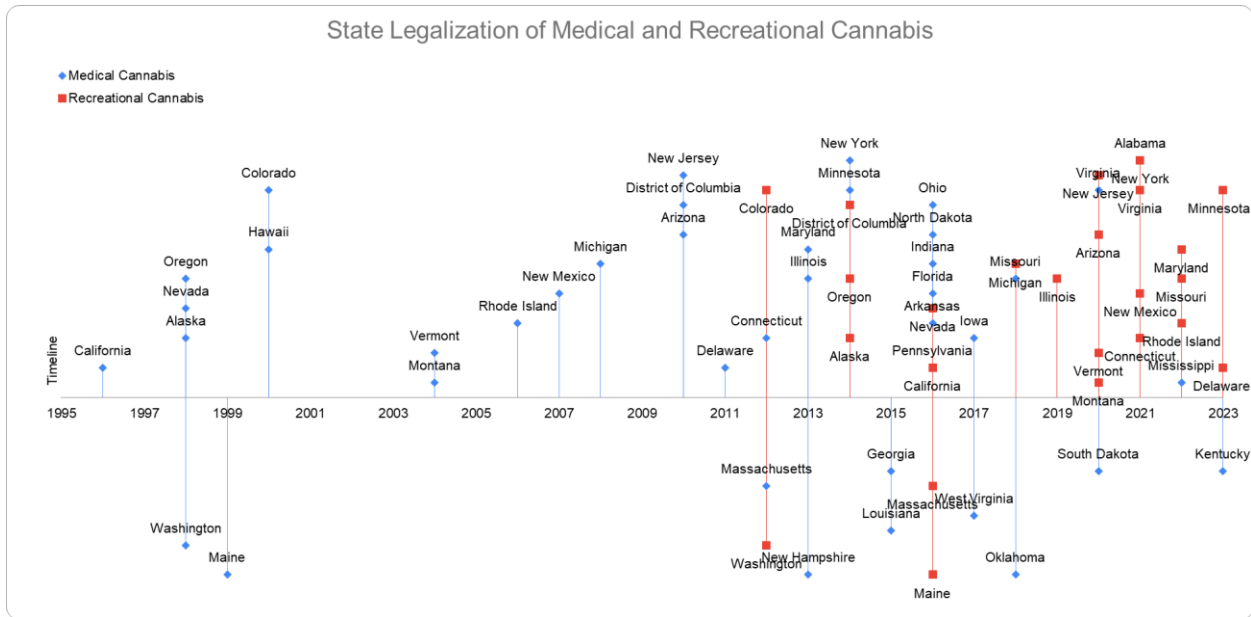

Figure 4: Legalization over time.

The goals behind each state's legislation were generally the same: to legalize cannabis and facilitate a regulated market. In theory, this is a straightforward endeavor involving the licensing of cannabis growers who would produce various cannabis products, and the licensing of retail outlets, which would sell the product. In between those two market sectors, there are smaller but not unimportant pieces of the supply chain, including regulated distribution services, processors (which contributed to value added products) and testing labs. There are a few additional pieces, too, including a component of the legislation that provided funding for micro-businesses and allowed New Yorkers to grow their own small amount of cannabis for personal consumption.

As a previously illicit product, the goal of approval was to migrate producers and consumers from an illegal market to a legal and regulated one. The objective could not have been clearer; the nuances of the implementation, however, were quite complicated and rapidly produced sub-optimal outcomes. In practice, the complexity of the roll-out produced turbulent and uncertain market conditions. Data about the size of the illegal market remains tenuous (or non-existent), for example, and compounding the problem was the changing landscape: as states legalized cannabis, cultural acceptance of the drug has increased (Chiu et al., 2022; Felson et al., 2019; Hammond et al., 2020), and enforcement of unlicensed production and distribution has declined (Stanton et al., 2022; Meinhofer & Rubli, 2021).

Some have suggested that the NYS Office of Cannabis Management took little heed of the struggles of other states to create legal cannabis markets. California, for example, has faced very public hurdles,

attempting to keep both their market intact while protecting their small producers, while facing a surge of illegal operations and little enforcement capacity to shut them down. Figure 6 illustrates the ongoing struggle to contain illegal activity. Figure 5 illustrates the impact of two events - the increase in cannabis use during COVID 19 pandemic, and the subsequent plateauing of demand. Also note that 2022, in an attempt to protect small producers, California suspended the grower tax on producers in an attempt to prevent further farm losses.
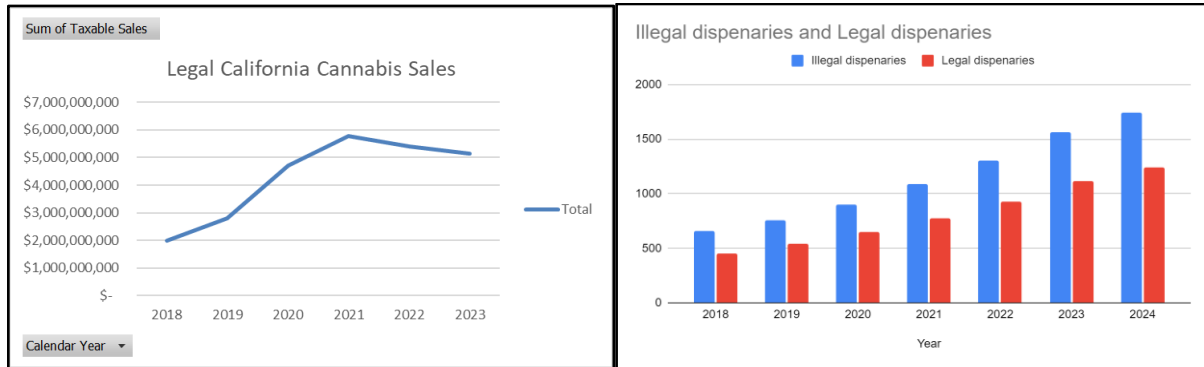
Figures 5 and 6: California cannabis sales and number of legal and illegal dispensaries

Figures 4-5: California's market dynamics

Massachusetts, shown in Figures 6 and 7, has had a slightly different trajectory. A much faster rollout of licenses for cultivators and retailers (and more transparent data availability) did not produce New York's very large backlog of license applications. And while there is little measurement of the illicit market, reports indicate that it has not grown in size. Some reports indicate that about 75% of cannabis purchased in Massachusetts has been from legal sources (Sacharczyk, 2023).
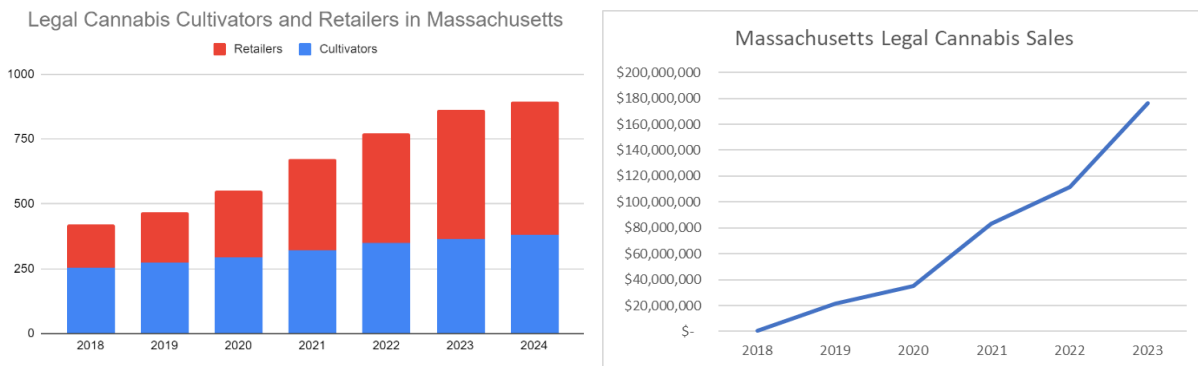
Figures 6 and 7: Massachusetts cultivators and retailers, and legal cannabis sales over time.

Therefore, while it seems logical that the process of legalization was simply a process of transforming all illegal cannabis to a formal legal market, in practice, the transition was much more complicated.

> "It's not that we know the perfect way to design or implement a cannabis market," Chris Alexander, of the O.C.M., told Jia Tolentino, of New Yorker Magazine. "Who do we turn to to know the way to do this? It's just us." The agency now has around a hundred and fifty employees. "We are not close to where we need to be to handle all that we're trying to do," Alexander said. (Tolentino, 2024)

The following sections identify the most important sectors involved in modeling cannabis policy in New York State.

Mapping supply, demand and price.

The most significant, and for scholars, the lowest hanging fruit for study, are the dilemmas resulting from supply and demand. At its simplest, the job of the state was to produce enough of a supply of legal cannabis that the price attracted consumers away from the illegal market.
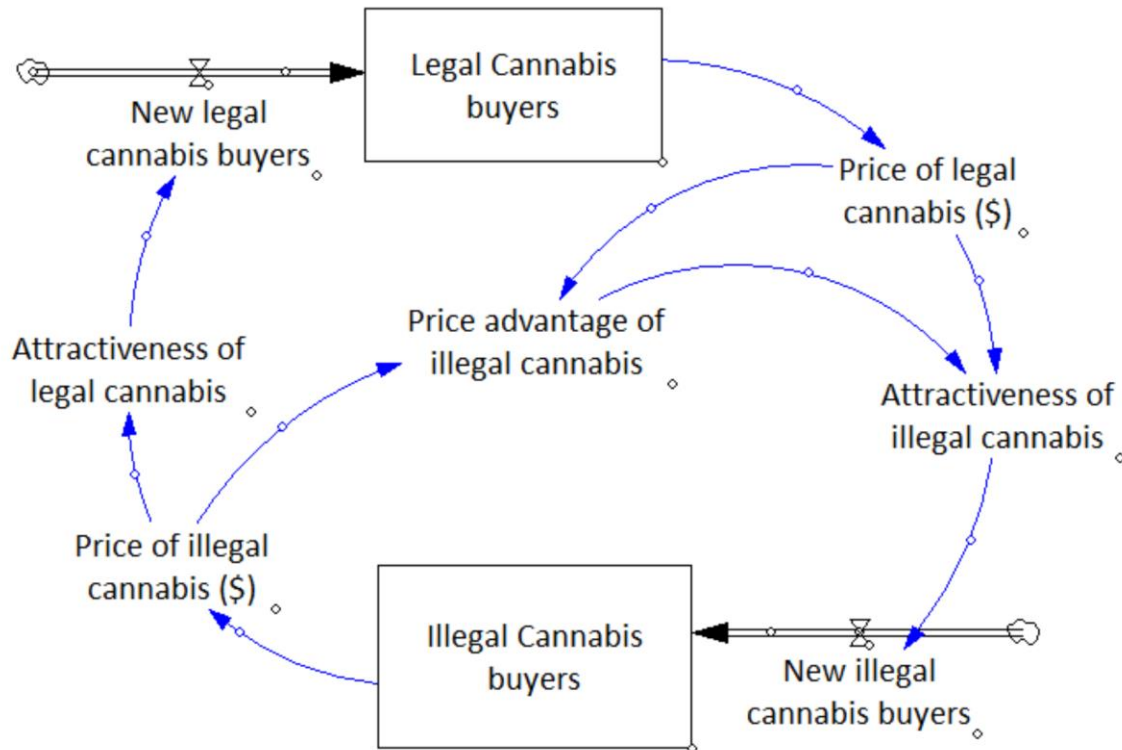

Figure 8. Supply and demand of cannabis.

As the number of legal dispensaries grew, the theory goes (and as Figure 8 indicates), the price of legal cannabis would drop and the attractiveness of illegal cannabis would decline. Instead, public perception of illegal cannabis has failed to decline, and the number of illegal dispensaries proliferated. OCM's inability to license legal dispensaries more quickly (and the steep taxes, cost of startup and licensing fees drove up the cost of legal cannabis) limited the supply of legal alternatives.

Several additional feedback loops each encourage dynamics that prevent legal dispensaries from finding a footing in the newly legalized context. First, shown in the Law Enforcement Loop in Figure 9, due in part to the legislation but also because public perception of cannabis has been changing for decades in favor of liberalization, the attractiveness (and perceived safety) of illegal cannabis has been increasing. Legalization of cannabis also effectively removed a police search strategy predicated on the scent of cannabis, and law enforcement has refused to continue to enforce illegal activities, including the rapid proliferation of illegal dispensaries predominantly but not exclusively in urban areas.

Second, this rapid growth of weed shops – and the very slow growth of legal dispensaries – gives the (very reasonable) impression that illegal cannabis is cheaper, more available and with substantially more product options. Furthermore, one important OCM strategy is public education and product safety; as shown in the Quality and Testing Infrastructure Loop in Figure 9, legal weed should be safer and more consistent in quality and potency than illegal weed. Unfortunately, New York State was not prepared to supply public investment into testing infrastructure, and a limited number of labs both restricted small growers' ability to verify potency and quality, and did little to bolster public opinion in favor of "safer" legal cannabis.
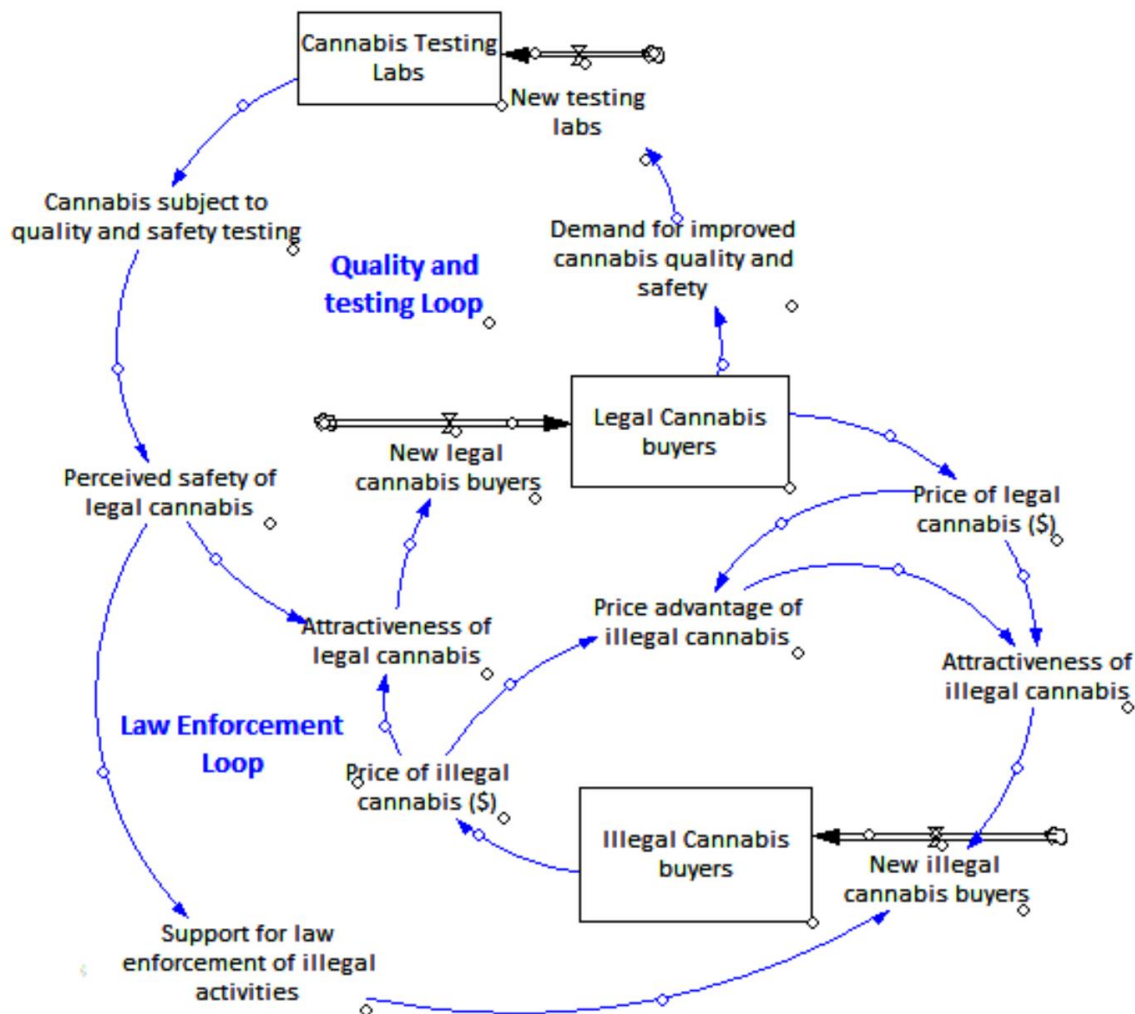

Figure 9. Without testing infrastructure, little improvement on the perceived safety front.

In New York State, early policy decisions determined that those who were already approved as part of New York State's hemp program could apply as recreational cannabis producers; this step was efficient and effectively produced a number of willing growers. However, without adequate dispensaries (a predictable chokepoint), farmers were unable to find a market for their crop. Late in 2023, the Cannabis

Farmers Alliance (Racino, 2023) surveyed their membership, to inquire about the state of cannabis production in New York State. Of the more than 30 responses, all offered a distressing outlook on the state's attempt to create a workable market:

> "First, the hemp industry disaster created $500,000 in debt because we built the infrastructure and investment but got virtually no return for three years. Then the cannabis license opened and we borrowed more money in hopes that we would make money. Because of the lack of dispensaries open and the entire structure of the program, we are barely getting by and sinking further into debt. We have great quality biomass and, in turn, distillate, but the market has been a complete bust leaving us going into our second harvest completed and less than one-third of last year's product sold."

> "With little-to-no places to sell my 2022 harvest, I'm two years behind on my property taxes and will lose my family home in a few short months."

> "I've spent all of my savings and have sold half of my stocks/investments that were meant for retirement. I'm a one-person show and I'm sitting on pounds of really good flower, but I have made zero dollars because of the lack of stores open."

While this series of causal loops does not include a sector referencing the cultivation sector, future simulation work will model the changing landscape of New York cultivators. Specifically, while the original law attempted to protect craft producers, there is little indication that New York will continue to nurture small growers. The development of a market that is dominated by only large commercial producers, though, is likely to have follow-on impacts, including a significant reduced competition, limits on strain diversity and, potentially most significantly, increases in average potency.

Potency challenges

The potency of marijuana on the illegal market has been increasing for at least the last several decades. ElSohly et al. (2016) report that analysis of seized cannabinoid products have increased in potency and that more seized samples are derived from sinsemilla, a high potency variety that has a particularly high concentration of psychoactive agents. In New York State, one of the priorities of the law is education, both broadly in terms of consumer awareness, and specifically, in the form of point-of-sale information regarding the effects of particular products.

Interestingly, one unexpected impact of legalization is a broader public acceptance of cannabis as generally "safe". Therefore even when the infrastructure for testing has not been supported, as in New York State, legal dispensaries are assumed to be selling safe products and the public has consistently demanded higher potency levels. Small craft cannabis growers, producing outside or in small less-controlled environments, tend to produce far lower potency varieties of cannabis; large commercial facilities have the capital to breed high potency varieties, effectively meeting rising consumer demand.

To counteract this tendency, in New York, a component of the law was designed to reduce the amount of high potency strains available on the market: potency was effectively taxed at an increasing rate. Still, these effects suggest that the impact of taxation will likely drive more people to the illegal market, while also driving small producers out of business. (See Figure 10 below)
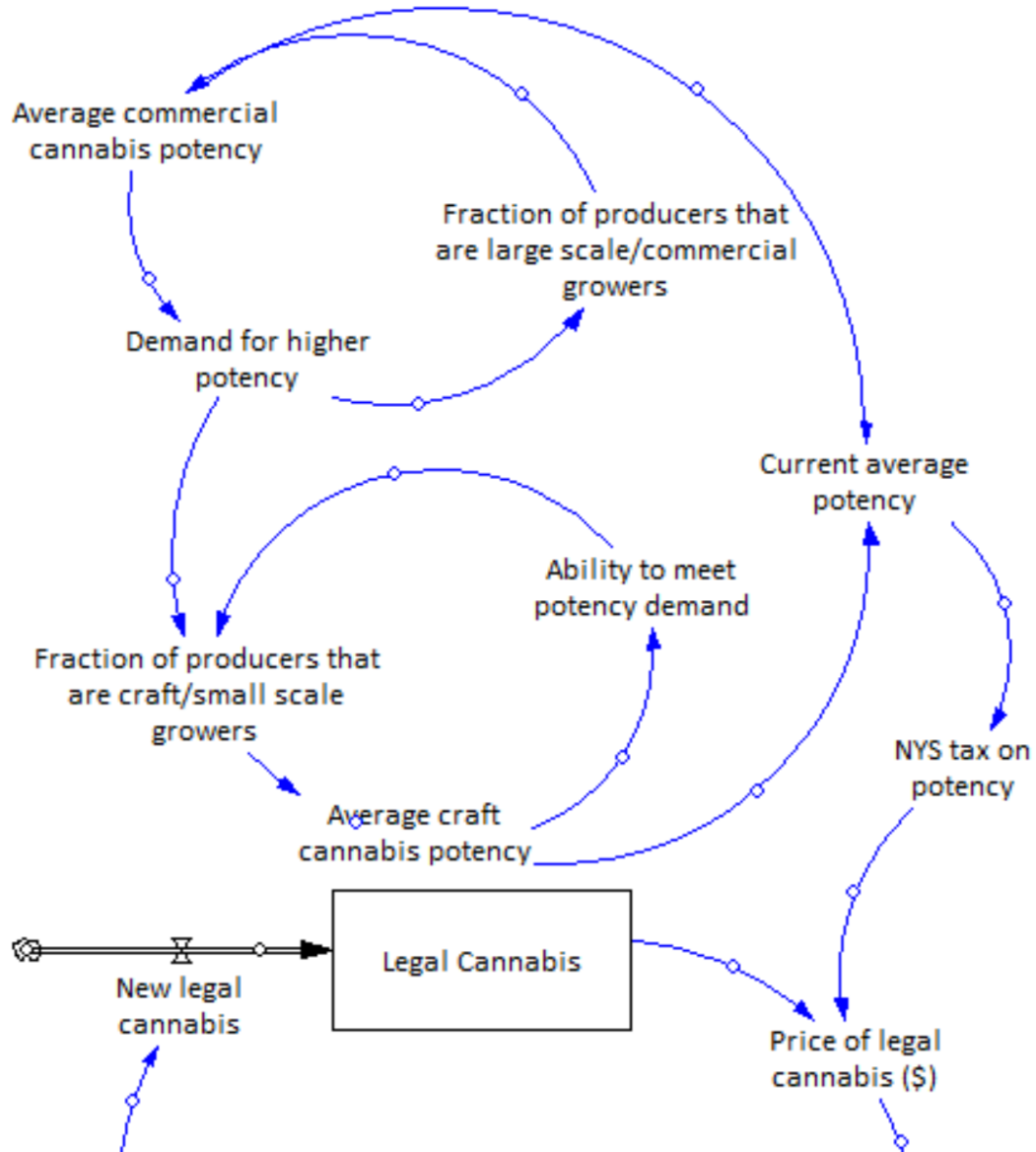
Figure 10: Craft cultivators at a disadvantage.

Moreover, without adequate testing, potency is uncertain; yet, consumers are seemingly less concerned about the potential negative impacts of high potency strains and products than the impact of taxes on the price of weed.

Discussion.

The dynamics illustrated in the causal loops above resulted in some predictable - and other more surprising - dynamics. We can conclude that the illegal market continues to exist (read: thrive), despite the fact that one of the stated reasons behind legalization of recreational cannabis was to make the illegal market irrelevant. In fact, in some ways, the policy efforts have created a situation where there is

substantially more support for cannabis consumption, making it far more culturally acceptable, while simultaneously reducing enforcement capacity.

Moreover, the policy goals do not align, and, in some cases, work against each other. Much of what is happening is predictable. The creation of an entire market is difficult and is a task that requires time, investment and thoughtful policy efforts. Still, some of the delays in the rollout could have been leveraged to provide additional support for both social equity applicants as well as for small cannabis producers. Not mentioned here, but important for more modeling work is the impact of delays due to the inability of the state to secure funding, space and support for licensees in a reasonable amount of time. Litigation has undoubtedly also impacted OCM's ability to provide licenses in a timely manner.

Additionally, these causal loops represent a small part of a larger modeling effort that considers the different ways in which cannabis is grown, harvested, manufactured into value added products, distributed and sold, depending on the firm growing it.

Future research directions.

New York's cannabis legalization rollout and the challenges it presents offers some interesting future research directions, many of which necessitate a better grasp of data management on the part of New York State. We propose modeling long-term economic impact of legalization over time.

This will include factors like tax revenue generation, job creation in different sectors (legal cannabis retail and cultivation), and the cost and impact of improved cannabis safety. Relatedly, what are the impacts of the social equity outcomes? Further simulation components will assess the effectiveness of social equity measures in promoting business ownership by people from disproportionately impacted communities.

We will also experiment with different policy scenarios, testing the potential effects of different policy changes. This will include experimenting with varying tax rates, licensing structures, enforcement priorities, or public education campaigns to see how they influence market dynamics.

A final note: our work, much of which includes long meetings, has been strengthened by the use of generative scribing (GS). GS is a visual approach to capturing and amplifying ideas during discussions (Bird, K., & Riehl, J. (2023). Based on our experimental use of it so far, we intend to integrate it into future conversations among us (an academic, a cannabis industry stakeholder and a data scientist), and with additional stakeholders.

References.

Adams, R. 2024. Gov. Hochul Speaks on 'Disaster' Cannabis Rollout and Rampant Illicit Market. https://www.protectnymedmar.com/news/2024/2/5/gov-hochul-speaks-on-disaster-cannabis-rollout-and-rampant-illicit-market

Chiu, V., Hall, W., Chan, G., Hides, L., & Leung, J. (2022). A systematic review of trends in US attitudes toward cannabis legalization. *Substance Use & Misuse*, *57*(7), 1052-1061.

Felson, J., Adamczyk, A., & Thomas, C. (2019). How and why have attitudes about cannabis legalization changed so much?. *Social science research*, *78*, 12-27.

Gunadi, C., & Shi, Y. (2022). Association of recreational cannabis legalization with cannabis possession arrest rates in the US. *JAMA network open*, *5*(12), e2244922-e2244922.

Hammond, D., Goodman, S., Wadsworth, E., Rynard, V., Boudreau, C., & Hall, W. (2020). Evaluating the impacts of cannabis legalization: the International Cannabis Policy Study. *International Journal of Drug Policy*, *77*, 102698.

Meinhofer, A., & Rubli, A. (2021). Illegal drug market responses to state recreational cannabis laws. *Addiction*, *116*(12), 3433-3443.

Racino, Brad. 2024. 'Help us, we are dying.' New York's cannabis farmers are at their breaking point. Syracuse.com

Roggio, A, Pine, S & J McKinney. Tracking Opt-out: Patterns of cannabis approval in municipalities in New York State. Working paper.

SACHARCZYK, T. (2023). "Illicit market still in business years after Massachusetts legalizes marijuana" NBC News: July 19th 2023 https://turnto10.com/i-team/massachusetts-marijuana-cannabis-weed-illicit-illegal-legacy-market-south-coast-attleboro-darmouth-fall-river-pandemic-dispensaries-recreational-sales (Last accessed 5/19/24)

Stanton, D. L., Stohr, M. K., Hemmens, C., Lovrich, N. P., Makin, D., Meize, M., & Willits, D. (2022). Rural decline and policing of cannabis legalisation in Washington. *Policing and Society*, *32*(10), 1209-1225.