



CANNABIS  
PUBLIC POLICY  

---

CONSULTING

# AN EXAMINATION OF THE VIRGINIA MEDICAL CANNABIS MARKET

ASSESSING PATIENT EXPERIENCES & POTENTIAL  
PATHWAYS FOR IMPROVEMENT

---

NOVEMBER 2023

Cannabis Public Policy Consulting (CPPC) is a collective of researchers, data scientists, public health professionals, and policy experts working together toward a unified goal: to bring much-needed data, innovation, and nuance to cannabis policymaking.

With a guiding philosophy that data should drive policy, CPPC is the only firm providing original cannabis research coupled with full-service consulting. Our proprietary data is the foundation of our work, ensuring our services are evidenced-based while promoting public health and harm reduction principles.

*Citation:* Cannabis Public Policy Consulting, (2023, November 17). An Examination of the Virginia Medical Cannabis Market: Assessing Patient Experiences & Potential Pathways for Improvement. <https://www.cannabispublicpolicyconsulting.com/>

# ABOUT CANNABIS PUBLIC POLICY CONSULTING LLC

## **Principal**

### **Investigators:**

Sara Zimmer, MS

Michael Sofis, PhD

### **Analysis and Authorship:**

Mackenzie Slade, MPH

Summer Fox, MPP

Gideon Cunningham, MS





# TABLE OF CONTENTS

**04**

Executive  
Summary

**07**

Study & Report  
Overview

**09**

Virginia Policy  
Overview

**15**

Study  
Limitations

---

**18**

Key Findings

**29**

Policy Pathways  
for Consideration

**39**

Survey  
Overview &  
Research Design

**44**

Medical  
Cannabis Patient  
Overview

---

**57**

Medical Cannabis  
Patient  
Purchasing  
Behavior &  
Demand

**68**

Appendix A.  
Policy  
Benchmarking

**70**

Appendix B.  
General  
Population  
Findings on  
Cannabis  
Consumption

**74**

Appendix C.  
Virginia  
Cannabis-  
Related Public  
Health  
Outcomes

---

**77**

Appendix D. Letter from Virginia House Health, Welfare and Institutions  
Committee Requesting this Study

# EXECUTIVE SUMMARY



**Background:** In 2023, the Virginia House Health, Welfare and Institutions Committee requested that the Virginia Cannabis Control Authority (Authority) conduct a study on Virginia’s medical cannabis program, focusing on patient access and determining the necessity and feasibility of adding new licenses to the existing program. To complete this study, the Authority contracted with Cannabis Public Policy Consulting (CPPC) to complete a population survey of past-year cannabis consumers and patients, an assessment of supply based on patient experiences (as quantitative supply data was unavailable), and a thorough policy analysis.

**Results:** The study found that the Virginia medical cannabis program is struggling to capture patients amid evolving local policies as well as adult-use policies in bordering states, resulting in prices remaining high.

- The price of medical cannabis in Virginia is categorically higher compared to other medical cannabis states, resulting in 90% of patients purchasing cannabis from sources other than the Virginia medical market, with the largest proportion of grams being obtained from an unregulated, but not necessarily illicit, market.
- Approximately 57% of medical patients obtained cannabis by growing at home and 65.2% of patients received cannabis from a friend or family suggesting that recent home-grow and adult-use sharing

# EXECUTIVE SUMMARY CONT.

legislation has negatively impacted the ability of Pharmaceutical Processors to obtain and retain demand.

- Moreover, 12% of patients report traveling to obtain cannabis from other states or jurisdictions, most notably Washington, DC, and Maryland, where prices are much lower.
- Virginia's estimated patient enrollment reflects 0.5% of the total state population despite low barriers to patient participation, further supporting the finding that individuals can meet their demand for medical cannabis elsewhere.
- Of past-year consumers that are not patients, 22% reported they did not need to become medical patients because they already had access to cannabis, suggesting that interest in program participation is low among potential patients despite the recent reduction in barriers to patient participation.

**Findings:** Virginia's restrictive policy framework, including limited licensing and the Health Service Area (HSA) segmentation, coupled with the widespread availability of cannabis from out-of-state markets, home cultivation, and illicit channels, has created an environment in which Pharmaceutical Processors are operating at their profit-maximizing supply quantity. In other words, licensees may have no expectation of increased profits if they expand their supply and lower prices because substitute markets have recently taken root.

**Importantly, the high prices of medical cannabis found in Virginia are likely necessary for Pharmaceutical Processors to remain solvent given the current market and policy conditions and are unlikely to indicate an effort to intentionally overcharge medical patients.** Given the current absence of incentives for Pharmaceutical Processors to lower prices, medical patients will likely continue to seek cannabis from alternative sources, and Pharmaceutical Processors will struggle to capture the full potential of patient demand.

**Policy Pathways for Consideration:** For the Virginia General Assembly to meet the goal of improving patient access to medical cannabis, the following five policy pathways may be considered. The shared objective of these pathways is to increase supply as a mechanism to lower prices and shift patient demand to regulated Pharmaceutical Processors. These pathways are considerations and are not to be interpreted as formal recommendations.

# EXECUTIVE SUMMARY CONT.

- **Pathway 1:** Make no policy changes to the medical cannabis program and issue the remaining Pharmaceutical Processor license in HSA I.
- **Pathway 2:** Add limited standalone medical cultivation, manufacturing, and dispensary licenses that can operate within any HSA, and allow Pharmaceutical Processors to expand beyond their six-store maximum within their HSA.
- **Pathway 3:** Issue additional Pharmaceutical Processor licenses in each HSA and maintain the HSA framework.
- **Pathway 4:** Issue additional Pharmaceutical Processor licenses, eliminate the HSA framework, and allow Pharmaceutical Processors to expand beyond their six-store maximum across the state.
- **Pathway 5:** Add limited standalone medical cultivation, manufacturing, and dispensary licenses, adopt permissive vertical integration for new and existing operators, allow Pharmaceutical Processors to expand in specialized supply chain functions, and remove the HSA framework.

# STUDY AND REPORT OVERVIEW

In 2023, the Virginia House Health, Welfare and Institutions Committee requested that the Virginia Cannabis Control Authority conduct a study on the Virginia medical cannabis market “regarding the content of SB 1090 and the necessity and feasibility of adding licenses to the existing medical cannabis program established in VA Code § 54.1-3442.” The Committee suggested that the Authority consider various issues in the study, including patient access to the program and the price and variety of medical cannabis products.\* In response to the Committee’s request, the Authority commissioned Cannabis Public Policy Consulting to prepare a study that would:

- Assess the current and projected supply and demand of medical cannabis in Virginia, including whether supply is, or will be, adequate to meet existing and future demand and whether expansion of cultivation sites, dispensaries, and/or processing facilities is necessary to meet demand;
- Evaluate product types currently available in dispensaries and patient usage or consumption patterns to determine whether there are any gaps in supply of what patients need to address their medical conditions, including factors such as cost and variety of product offerings;
- Determine how accessible medical cannabis is to patients in Virginia and identify any barriers that exist in accessing medical cannabis, including whether patients must travel excessive distances and/or spend excessive time to access dispensaries;
- Benchmark, or study, medical cannabis market structures and practices in other states and determine whether adoption of any of those structures or practices would enhance the patient-centered nature and medical orientation of Virginia’s medical cannabis program; and
- Assess whether any identified gaps in supply, product types, and/or patient accessibility can be addressed by modifying Virginia’s vertical integration requirement for participation in the program to allow the licensing of participants that are not vertically integrated (e.g., retailers, cultivators, or processors).

To address these priority areas of interest, Cannabis Public Policy Consulting (CPPC) completed the following: (1) a representative population survey of past-year cannabis consumers, including a sample of medical patients, (2) an assessment of demand for cannabis across all sources, (3) an analysis of proxy variables to better understand

\*JUNE 20 EMAIL REQUEST FROM DEL. BOBBY ORROCK TO ACTING HEAD OF THE VIRGINIA CANNABIS CONTROL AUTHORITY, JEREMY PREISS. REFER TO APPENDIX D.

supply dynamics within the limited medical cannabis program, (4) policy benchmarking of similarly situated medical cannabis states, (5) a comprehensive policy analysis of relevant statutes and regulations, and (6) policy simulations to evaluate the impact of vertical integration and increasing dispensary density in the state.

There are two main sections of the report: Policy Research and Analysis (Part 1) and Virginia Patient Population Survey and Demand Study (Part 2). Part 1 includes a review of current policies in Virginia, key findings from our analysis of supply dynamics in the medical market, and policy considerations for Virginia's General Assembly. Part 2 provides an overview of the population survey findings, including information on patient purchasing behaviors, barriers patients face accessing medical cannabis, and patient consumption patterns. Part 2 also includes an analysis of patient demand across all sources of cannabis, including both legal and unregulated sources. It is important to note that data collected from the population survey (covered extensively in Part 2) is referenced throughout Part 1. Additional information, including policy benchmarking tables and findings from the general population survey, can be found in the Appendix.

The focus of this study was to examine Virginia's medical cannabis program and its interplay with competing markets (illicit, home cultivation, gray market, and out-of-state regulated markets), and to assess whether the current program is meeting the demand and needs of medical cannabis patients. This report assumes that, for the foreseeable future, medical cannabis and limited home cultivation are the only means to access cannabis lawfully. It makes no assumptions or forward-looking statements regarding the legalization of adult-use cannabis sales in Virginia.





---

PART 1:  
**POLICY, RESEARCH,  
AND ANALYSIS**

# 1.0 VIRGINIA POLICY OVERVIEW

The following section includes a brief history of cannabis legalization in Virginia and an overview of elements of the state's medical cannabis program pertinent to CPPC's study, including the Health Service Area (HSA) framework, the limited licensing scheme, and the vertically integrated Pharmaceutical Processors.

## 1.1 Cannabis Legalization in Virginia

### Medical Legalization

Virginia's current medical cannabis program is a compilation of several incremental bills spanning multiple years and legislative sessions. The medical program began officially in 2015 when the state legalized cannabidiol (CBD) and THC-A oil for patients with intractable epilepsy.<sup>1</sup> A few years later, the Pharmaceutical Processor license type was created via legislation to produce and sell CBD and THC-A oil.<sup>2</sup> The Virginia Board of Pharmacy awarded five Pharmaceutical Processor licenses in September 2018. Not long after, HB 1251 was passed, known as the "Let Doctors Decide" bill, that expanded eligibility for CBD and THC-A oil to all patients with a recommendation from their physician.<sup>3,4</sup> In other words, CBD and THC-A oil were available as a treatment for any diagnosed condition or disease as long as an individual had a written certification from their doctor and registered as a medical cannabis patient with the Board of Pharmacy.

A few years later, Virginia's program expanded again with the passage of HB 2218, which legalized the production, manufacturing, sale, and possession of "botanical cannabis," commonly known as cannabis flower.<sup>5</sup> This legislation significantly broadened the availability and diversity of regulated medical cannabis (THC-9) products for registered patients. Today, Pharmaceutical Processors cultivate, manufacture, and sell a variety of medical cannabis products to patients across the state.

[1] CANNABIDIOL OIL AND THC-A OIL; POSSESSION OF MARIJUANA, HB 1445 (2015). [HTTPS://LIS.VIRGINIA.GOV/CGI-BIN/LEGP604.EXE?151+SUM+HB1445](https://lis.virginia.gov/cgi-bin/legp604.exe?151+SUM+HB1445)

[2] CANNABIDIOL OIL AND THC-A OIL; PERMITTING OF PHARMACEUTICAL PROCESSORS TO MANUFACTURE AND PROVIDE, SB 1027 (2017). [HTTPS://LIS.VIRGINIA.GOV/CGI-BIN/LEGP604.EXE?SES=171&TYP=BIL&VAL=SB1027&SES=171&TYP=BIL&VAL=SB1027](https://lis.virginia.gov/cgi-bin/legp604.exe?ses=171&tYP=BIL&VAL=SB1027&SES=171&tYP=BIL&VAL=SB1027)

[3] CBD OIL AND THC-A OIL; CERTIFICATION FOR USE, DISPENSING, HB 1251 (2018). [HTTPS://LIS.VIRGINIA.GOV/CGI-BIN/LEGP604.EXE?SES=181&TYP=BIL&VAL=HB1251](https://lis.virginia.gov/cgi-bin/legp604.exe?ses=181&tYP=BIL&VAL=HB1251)

[4] WHSV. (2018, JANUARY 29). GOV. NORTHAM AUTHORIZES USE OF MEDICAL CANNABIS OIL THROUGHOUT VIRGINIA. [HTTPS://WWW.WHSV.COM/CONTENT/NEWS/VALLEY-DELEGATE-INTRODUCES-BILL-FOR-MEDICAL-CANNABIS-OIL-471685974.HTML](https://www.wHSV.com/content/news/valley-delegate-introduces-bill-for-medical-cannabis-oil-471685974.html)

[5] PHARMACEUTICAL PROCESSORS; PERMITS PROCESSORS TO PRODUCE & DISTRIBUTE CANNABIS PRODUCTS, HB 2218 (2021). [HTTPS://LIS.VIRGINIA.GOV/CGI-BIN/LEGP604.EXE?212+SUM+HB2218](https://lis.virginia.gov/cgi-bin/legp604.exe?212+SUM+HB2218)

## Adult-Use Legalization

A few months following the legalization of botanical cannabis for medical purposes, Virginia made history as the first Southern state to legalize adult-use cannabis. Then-Governor Northam signed SB 1406 in April 2021, legalizing limited cannabis possession, sharing, and home cultivation for adults 21 and older.<sup>6</sup> Currently, commercial adult-use sales are not lawful in Virginia; such a market cannot exist unless authorized by the legislature. As of November 2023, Virginia adults can legally possess cannabis privately and grow up to four plants per household. Public possession and private sharing of cannabis are capped at 1 ounce.<sup>7</sup>

## 1.2 Medical Cannabis Program Overview

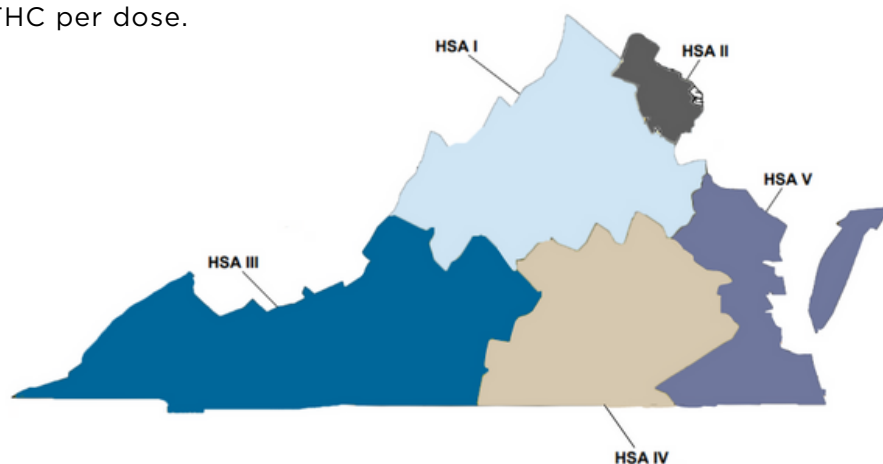
### Patient Registration, Possession Limits, and Product Availability

Virginia residents can use medical cannabis to treat or alleviate the symptoms of any diagnosed condition or disease with the permission of their medical practitioner. Minors and “vulnerable adults” can designate a parent or legal guardian to obtain and administer medical cannabis on their behalf. As of July 2022, patients are no longer required to register with the Board of Pharmacy, the regulator of the medical cannabis program at the time of publication of this paper, though patients can pay \$50 for an optional medical cannabis registration card if they prefer. To legally purchase medical cannabis, patients must obtain a written certification from their practitioner and present it along with their government-issued ID at a dispensary.

Patients can purchase up to a 90-day supply of medical cannabis, or no more than four ounces per 30 days, at licensed dispensaries. Pharmaceutical Processors can sell botanical cannabis products, CBD oil, and THC-A oil to patients. Cannabis and cannabis oil products cannot exceed 10mg of THC per dose.

### Health Service Areas

When Virginia legalized the production of CBD and THC-A oil for patients with intractable epilepsy, the Board of Health was tasked with



**Figure 1. Health Service Area Map.**

[6] MARIJUANA; LEGALIZATION OF SIMPLE POSSESSION, ETC., SB 1406 (2021). [HTTPS://LIS.VIRGINIA.GOV/CGI-BIN/LEGP604.EXE?212+SUM+SB1406](https://lis.virginia.gov/cgi-bin/LEGP604.EXE?212+SUM+SB1406)

[7] VIRGINIA CANNABIS CONTROL AUTHORITY. (N.D.) FREQUENTLY ASKED QUESTIONS. RETRIEVED NOVEMBER 16, 2023, FROM [HTTPS://WWW.CCA.VIRGINIA.GOV/FAQS/GENERAL\\_INFORMATION?LANGUAGE\\_CONTENT\\_ENTITY=EN#PANEL-1](https://www.cca.virginia.gov/faqs/general_information?language_content_entity=en#panel-1)

dividing the state into designated HSAs, as observed in Figure 1. Only one Pharmaceutical Processor license is allowed per HSA, and Pharmaceutical Processors may operate up to five additional dispensing locations within their assigned HSA (for a total of six retail locations per Pharmaceutical Processor license).

The HSA framework is unique to Virginia, as Pharmaceutical Processors can only sell directly to patients via dispensing locations in their designated region, with the exception of delivery. However, Pharmaceutical Processors may wholesale cannabis and cannabis products across HSAs to each other. Another geographic constraint is that only a limited number of counties in Virginia have licensed dispensaries. Table 1 represents the patient sample for the survey per each county where there is a dispensary, indicating that half of the survey respondents live in counties where there are currently no dispensing locations.

This likely reflects the experience of the medical cannabis patient population in the state at large.

**Table 1. Number of Patients Residing in a County with a Cannabis Dispensary.**

Dispensing Locations	# of patients (n)	Dispensing Locations Cont.	# of patients (n)
Manassas	1	Richmond	10
Alexandria	4	Henrico County (Glen Allen)	22
Fairfax	39	Colonial Heights	0
Loudon County (Sterling)	50	Portsmouth	6
Arlington	6	Virginia Beach	28
Washington County (Abingdon)	0	Williamsburg	0
Montgomery County (Christiansburg)	6	Hampton	9
Lynchburg	8	Norfolk	27
Salem	0	Suffolk	7
Bristol	2	<b>Total Patients Living in a County with a Dispensary</b>	238
Danville	13	<b>Total Patients Surveyed</b>	476



## Pharmaceutical Processors

As of November 2023, there are four operational Pharmaceutical Processors and 21 active dispensing locations in Virginia as seen in Table 2. The four Pharmaceutical Processors are owned by three companies, with one company owning licenses in two HSAs. A maximum of five Pharmaceutical Processors are permitted in the state, one per designated HSA. The Board of Pharmacy announced the winners of each Pharmaceutical Processor license in September 2018, and the first regulated medical sales began in October 2020.<sup>8,9</sup>

There currently is no active Pharmaceutical Processor in HSA I, as the Board of Pharmacy rescinded the conditional license issued for that area in 2020, because the license awardee had failed to start construction on a Pharmaceutical Processor facility. The Board of Pharmacy issued a new request for applications, but could not act on it during the licensee's appeal of the Board of Pharmacy's decision. Following lengthy litigation challenging the license revocation, the Board of Pharmacy voted officially to rescind the request for applications in September 2023. The Virginia Cannabis Control Authority will issue a new request for applications (RFA) for HSA I after it assumes authority over the medical cannabis program in January 2024.<sup>10</sup>

**Table 2. Number of Dispensing Locations per Health Service Area.**

Health Service Area	Number of Current Dispensing Locations
I	NA
II	5
II	6
IV	4
V	6

Source: Virginia Board of Pharmacy

[8] WHSV. (2018, SEPTEMBER 5). VIRGINIA PICKS FIRST 5 MEDICAL CANNABIS DISPENSARIES. [HTTPS://WWW.WHSV.COM/CONTENT/NEWS/VIRGINIA-TO-KEEP-MEDICAL-CANNABIS-LICENSING-PROCESS-SECRET-492516451.HTML](https://www.wHSV.com/content/news/virginia-to-keep-medical-cannabis-licensing-process-secret-492516451.html)

[9] WWBT. (2020, OCTOBER 16). FIRST MEDICAL CANNABIS DISPENSARY TO OPEN IN VIRGINIA. WDBJ7. [HTTPS://WWW.WDBJ7.COM/2020/10/16/FIRST-MEDICAL-CANNABIS-DISPENSARY-TO-OPEN-IN-VIRGINIA/](https://www.wdbj7.com/2020/10/16/first-medical-cannabis-dispensary-to-open-in-virginia/)

[10] DEPARTMENT OF HEALTH PROFESSIONS, BOARD OF PHARMACY. (2023, OCTOBER 2). RESCISSION OF REQUEST FOR APPLICATIONS FOR PHARMACEUTICAL PROCESSORS - HEALTH SERVICE AREA I [GENERAL NOTICE]. VIRGINIA REGULATORY TOWN HALL. [HTTPS://TOWNHALL.VIRGINIA.GOV/L/VIEWNOTICE.CFM?GNID=2688](https://townhall.virginia.gov/L/VIEWNOTICE.CFM?GNID=2688)

## Mandatory Vertical Integration and Limited Licenses

Virginia law requires Pharmaceutical Processors to be vertically integrated, meaning they must cultivate, manufacture, distribute, and sell cannabis under one entity and license. Licensees can sell wholesale cannabis products to each other (across HSA boundaries), allowing dispensaries to sell a variety of brands and product types to consumers. Vertical integration enables businesses to take advantage of economies of scale and improve their efficiency and profit margins. However, vertical integration within any industry requires significant capital up front. When factoring in limited lending and funding options for the cannabis industry, well-funded, large-scale operators are typically best prepared to enter and stay financially viable in the market.

Virginia's vertical integration requirements vary slightly from other states with similar mandates in one important way: Pharmaceutical Processors and their associated dispensing locations must stay within their assigned HSA, with the exception of wholesale distribution and delivery. Although license caps are commonplace in other states, such as Florida, they typically include less stringent restrictions dictating where dispensaries can be located. Virginia's HSA borders allow Pharmaceutical Processors to dominate their region without meaningful local competition from the other regulated medical operators.

In addition to the HSA framework, Virginia is set apart by its limited number of retail access points compared to other medical states. The state allows a maximum of 30 dispensing locations or six locations per Pharmaceutical Processor license. If all Pharmaceutical Processors operated their maximum allocated dispensing locations, Virginia would have one retailer for every 289,454 residents.<sup>11</sup>

However, with only 21 operational dispensing locations in the state, there is one retailer for every 413,505 residents. This ratio is considerably lower than that of Florida or South Dakota, which have dispensary densities of one retailer per 36,890 residents and one retailer per 11,664 residents, respectively.<sup>12, 13</sup>

[11] U.S. CENSUS BUREAU. (N.D.) QUICKFACTS: VIRGINIA. U.S. DEPARTMENT OF COMMERCE. RETRIEVED NOVEMBER 16, 2023, FROM [8] [WHSV. \(2018, SEPTEMBER 5\). VIRGINIA PICKS FIRST 5 MEDICAL CANNABIS DISPENSARIES. HTTPS://WWW.WHSV.COM/CONTENT/NEWS/VIRGINIA-TO-KEEP-MEDICAL-CANNABIS-LICENSING-PROCESS-SECRET-492516451.HTML](https://www.wHSV.com/content/news/virginia-to-keep-medical-cannabis-licensing-process-secret-492516451.html) [12] U.S. CENSUS BUREAU. (N.D.) QUICKFACTS: FLORIDA. U.S. DEPARTMENT OF COMMERCE. RETRIEVED NOVEMBER 16, 2023, FROM

[13] OFFICE OF MEDICAL MARIJUANA USE. (N.D.). MEDICAL MARIJUANA TREATMENT CENTERS. FLORIDA DEPARTMENT OF HEALTH. RETRIEVED NOVEMBER 16, 2023, FROM

## 2.0 STUDY LIMITATIONS

The commissioned study sought to better understand medical cannabis supply, market conditions, and patient accessibility in the state of Virginia through measurement and analysis of patient perceptions and demand. Due to several limitations in this study, as outlined below, our analyses do not indicate causation and should not be regarded as definitive or final conclusions.

### 2.1 Lack of Track-and-Trace System and Supply Data

Most studies that seek to quantify supply and draw conclusions on market conditions utilize supply-side data, including goods produced, goods sold, where goods were sold geographically, and the cost of goods sold. When looking at the supply chain for agricultural products, supply data is vital, as crops have variations in yield due to environmental factors and regulatory costs, for example.

Cannabis supply data is typically aggregated in a track-and-trace system, which is a database that collects information on the movement of cannabis and cannabis products through the supply chain.<sup>14</sup> These databases are commonly referred to as “seed-to-sale” systems, as they track cannabis from the moment of planting a cannabis seed to the point of retail sale. Seed-to-sale systems are considered a best practice in states with legal cannabis sales and are required in most states with medical cannabis programs.

Virginia’s medical cannabis laws do not require a centralized track-and-trace systems. Rather, Pharmaceutical Processors must maintain “perpetual inventory” records, which are to be made available by request of the Board of Pharmacy. The CPPC research team pursued pathways in formally requesting inventory data through the Board of Pharmacy; however, these efforts were unsuccessful. As a third-party vendor, CPPC did not have the authority to pursue independently owned inventory data from Pharmaceutical Processors. Moreover, such data may reasonably be considered trade secrets or not to be used for analysis. If inventory data were to be obtained, it would be necessary to have voluntary participation from all four Pharmaceutical Processors to represent the entire state supply. However, in the absence of a centralized system, there would be no way for the research team to validate the accuracy of these data sets.

*Note: The Virginia Cannabis Control Authority intends to implement a track-and-trace system in the medical cannabis program in 2024.*

[14] METRC. (N.D.). TRACK AND TRACE TECHNOLOGY. RETRIEVED NOVEMBER 16, 2023, FROM [HTTPS://WWW.METRC.COM/TRACK-AND-TRACE-TECHNOLOGY/](https://www.metrc.com/track-and-trace-technology/)

In addition to inventory records, the Board of Pharmacy has employed its Prescription Drug Monitoring Program (PDMP) to “verify... that the registrations are current, the written certification has not expired, and the date and quantity of the last dispensing of cannabis products to the registered patient.”<sup>15</sup> However, this data is considered protected patient information, making it less available for study. Additionally, regulatory requirements for the use of the PDMP were repealed and the requirement for patients to be certified was eliminated. These changes have decreased the likelihood that the PDMP data set captures the entire patient population; therefore, relying on PDMP data for study could have introduced the types of errors the study seeks to avoid.

To understand supply and market dynamics without data from a track-and-trace system, CPPC used alternative data points, including patient demand, purchasing behaviors, sourcing, and perception, as proxies for supply. Because of this limitation, our analysis does not seek to quantify supply in Virginia or estimate potential adequate supply. Our findings indicate direction (under- vs. oversupply) but not magnitude (exact degree of under- or oversupply).

### **Proxy Variables as a Solution**

Proxy variables are commonly used in the natural and social sciences to systematically approximate a variable that cannot be measured directly, either because a data source does not exist or because researchers cannot obtain the necessary information. A proxy variable is typically chosen because it is directly observable and can suggest information about the unknown variable. This is possible because the relationship between the unknown variable and the proxy variable is demonstrated in scientific evidence. Each additional proxy variable studied provides more information about the unknown variable, which increases the likelihood of accurate conclusions to be drawn about the unknown variable. In this study, our researchers used several measures of cannabis consumer behavior (proxy variables) to estimate cannabis supply (unknown variable). It is important to note that although this study relied on observable data and scientifically informed theory, our analysis should not be used to infer any causal claims.

Because of these limitations, CPPC’s research and policy teams use national data sets, policy analysis, and benchmarking data to further contextualize, corroborate, and validate all findings. When assessed together, direct measures of demand, proxy variable studies, and policy analyses provide a holistic view of the current conditions of the Virginia market, allowing us to make inferences about supply with confidence.

[15] BOARD OF PHARMACY. (N.D.). CURRENT LAWS PERTAINING TO PHARMACEUTICAL PROCESSORS. VIRGINIA DEPARTMENT OF HEALTH PROFESSIONS. RETRIEVED NOVEMBER 16, 2023, FROM [HTTPS://WWW.DHP.VIRGINIA.GOV/PHARMACY/PHARMACEUTICALPROCESSING/LAWS.HTM](https://www.dhp.virginia.gov/pharmacy/pharmaceuticalprocessing/laws.htm)



Given the number of proxy variables employed in this report, it is very likely that the current findings are sufficiently reliable to identify overarching trends in Virginia's medical cannabis market. Moreover, conservative interpretations were provided in multiple cases throughout this report to improve the likelihood of gleaning accurate conclusions from the data.

## **2.2 Lack of Baseline Data**

The current report is the first of its kind for Virginia. The limited baseline data on medical cannabis demand and consumer behavior inhibits further conclusions beyond those made in this report. First, without previous data on cannabis supply and consumer behavior, it is not possible to draw conclusions about trends over time.

Second, there is no comprehensive data available, to our knowledge, on the exact numbers or locations of existing medical cannabis patients. This limits our ability to understand dynamics between patients and nonpatients across market sources and inhibits our capacity to provide accurate estimates of necessary supply.

## 3.0 KEY FINDINGS

The following study was intended to be a scientific investigation in supply and demand dynamics to assess whether the current regulated supply is meeting patient demand, including providing sufficient accessibility, and to evaluate the patient-centered nature and medical orientation of Virginia's medical cannabis program. The research team's analysis determined that the outcomes observed and discussed are a direct result of Virginia's formal policy structures. Subsection 3.1 provides an overview of the proxy variables analyzed in this study, and subsections 3.2 through 3.5 highlight key findings of the Virginia cannabis market based on the proxy and policy analyses conducted.

### 3.1 Analysis of Proxy Variables Produces a Generalized Effect

As described in the discussion of study limitations in section 2.1, proxy variables are observed findings that suggest the direction of an unknown variable of research interest. Our proxy supply variables are assumed, based on research in other jurisdictions, to be correlated with the unknown amount of supply. For this study, proxy supply variables were used to investigate whether supply is adequate in meeting demand. Throughout the sections that follow, research and data are thoroughly discussed to demonstrate how we arrived at these proxy variables by studying consumer demand and perception.

The proxy variables studied in this report appear to influence each other; because of that, no variable should be viewed in isolation. In our analysis, all proxy supply variables supported the same main finding, producing what is scientifically referred to as a generalized effect—when one finding is replicated across qualitatively different outcomes nested under the same conceptual umbrella. The generalized finding of this analysis is that the price of medical cannabis is the controlling variable in the observed market outcomes. Simply put, the price of medical cannabis is too high and is a direct result of the unique policy framework in Virginia. **These findings suggest that an increase in supply may be advantageous in increasing regulated medical market demand capture, but only if the supply increase produces lower prices.**

Table 3 below summarizes the proxy variables identified in the research section that, when analyzed together, tell a story regarding supply and demand dynamics in the state of Virginia. In the sections below, these variables are used with a parenthetical indicator next to them.

**Table 3. Proxy Variables.**

Proxy Variable #1	Twenty-two percent of the total population sample indicated that they already had access to cannabis, and therefore did not need to obtain a medical certification.
Proxy Variable #2	Over half of participants in the medical cannabis program in each HSA reported that the cost of cannabis products has been a barrier for them when accessing medical cannabis (66%).
Proxy Variable #3	Despite price being listed as the highest barrier for accessing cannabis products from regulated dispensaries, patients are satisfied with the quality of the products.
Proxy Variable #4	Patients who reported lower satisfaction with the accessibility of medical cannabis were more likely to report obtaining cannabis from sources other than a dispensary.
Proxy Variable #5	Patients in HSAs with more dispensaries generally reported fewer barriers to accessing medical cannabis overall.
Proxy Variable #6	Medical cannabis patients spend more on cannabis than non-medical cannabis patients in Virginia and medical cannabis patients across the country.
Proxy Variable #7	Medical cannabis patients in Virginia report spending an estimate of \$19 per gram on average for medical cannabis flower, which is higher than the national average for medical cannabis flower.
Proxy Variable #8	The presence and volume of regulated dispensaries did not influence travel time to access cannabis when looking across all sources of cannabis.
Proxy Variable #9	Medical patients were significantly more likely to report that they have traveled to a different state to purchase cannabis within the past month compared to non-medical patients despite the medical patients' unique regulated access.
Proxy Variable #10	Medical patients are diversifying the source of their cannabis, with only 23.6% of their past-month grams sourced from regulated medical cannabis dispensaries.
Proxy Variable #11	More than half of medical cannabis patients report growing cannabis at home (57.5%), which is 26.8% greater than past-year adult-use cannabis consumers (30.7%), for whom the law was intended.

### 3.2 High Prices but High-Quality Product Has Created a High-End but Limited Medical Cannabis Market

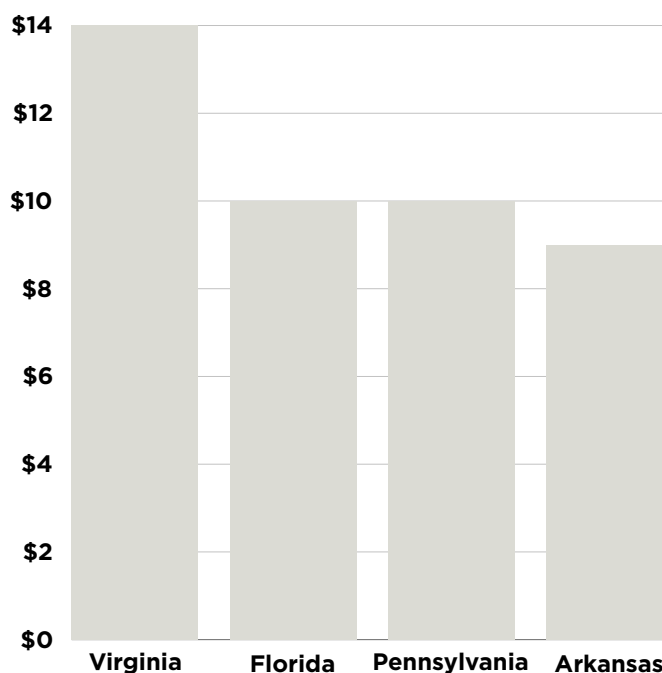
The Virginia medical cannabis market has categorically higher retail prices when compared to other similarly situated states with medical cannabis programs.

Consumers report spending an average of approximately \$19 per gram for flower products in this survey (7). To get a more precise and substantiated figure for the price of flower in Virginia and other states, we examined publicly available price data from medical dispensaries in Virginia and other states through a randomized data collection procedure. The average price per gram for flower in Virginia is closer to \$14, compared to \$10 in Pennsylvania, \$9 in Arkansas, and \$10 in Florida, as seen in Figure 2.<sup>16</sup> As a result, medical cannabis patients in Virginia spend more on cannabis than medical cannabis patients in other states (6).

As mentioned later in this report, the most common barrier to accessing medical cannabis among survey participants was the price of cannabis products (2). However, patients are largely satisfied with the quality of products that are obtained through the regulated market (3).

From these proxy variables, we can infer that because prices are so high compared to other (unregulated) sources, patients are obtaining 76.4% of their cannabis grams from sources outside of the regulated market (10). However, medical cannabis patients are likely prioritizing regulated dispensaries for access to specific high-quality products.

**Figure 2. Average Price Per Gram of Medical Cannabis Flower.**



[16] AVERAGE PRICE PER GRAM OF FLOWER WAS COLLECTED FROM PUBLICLY AVAILABLE PRICE INFORMATION ON DISPENSARY WEBSITES. TEN MEDICAL CANNABIS DISPENSARIES WERE SELECTED IN EACH STATE (VIRGINIA, ARKANSAS, PENNSYLVANIA, AND FLORIDA) AND AVAILABLE PRODUCTS ON EACH DISPENSARY'S MENU WERE FILTERED TO ONLY SHOW FLOWER PRODUCTS. PRICING, AMOUNT (GRAMS), AND POTENCY INFORMATION WERE COLLECTED FROM THE 1ST, 3RD, 5TH, 7TH, AND SO ON, FLOWER PRODUCTS AVAILABLE ON THE DISPENSARY'S MENU, UP TO 10 PRODUCTS. ONLY PRODUCTS WITH LISTED PRICE, AMOUNT, AND POTENCY INFORMATION WERE INCLUDED IN THE ANALYSES. PRICE PER PRODUCT WAS RECALCULATED TO REFLECT THE PRODUCT'S PRICE PER GRAM. AN AVERAGE PRICE PER GRAM OF FLOWER PER DISPENSARY WAS CALCULATED BY AVERAGING THE PRICE PER GRAM OF THE PRODUCTS (UP TO 10) SELECTED FROM EACH DISPENSARY. THE AVERAGE PRICE PER GRAM OF FLOWER PER DISPENSARY WAS AVERAGED ACROSS THE 10 DISPENSARIES, TO ARRIVE AT AN AVERAGE PRICE PER GRAM OF FLOWER PER STATE.

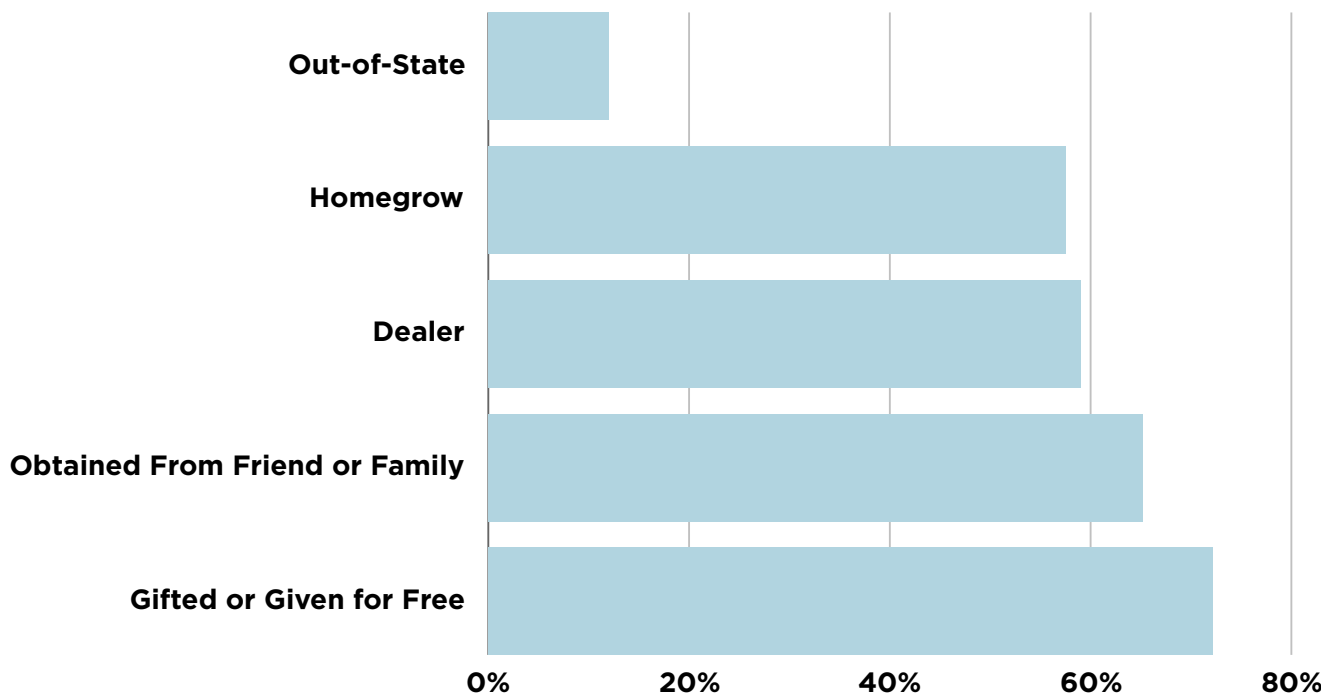


This may have created a high-end, but ultimately scarce market that is failing to meet the needs of the average past-month patient consumer, contributing to consumers' choice to purchase cannabis from alternative (e.g., regulated products from other states) or unregulated sources (e.g., illicit markets).

### 3.3 Patients Diversifying Their Sources of Cannabis Occurs More Because of High Prices than Because of Inadequate Access

Medical cannabis patients in Virginia do not exclusively purchase their cannabis from a single source. Among all participants surveyed, 90% of patients reported obtaining cannabis from more than one source within the past month. Only 23.6% of patients past-month grams were sourced from regulated medical cannabis dispensaries (10). Further supporting this finding is that the presence of regulated dispensaries did not impact the time patients reported traveling to access cannabis (8), suggesting that patients can meet their demand locally, be it from a regulated source or not. Figure 3 shows the percentage of patients who report obtaining cannabis from non-dispensary sources, with over two-thirds of patients obtaining cannabis from a friend or being gifted cannabis.

**Figure 3. Percent of Participants Obtaining Medical Cannabis from Non-Dispensary Sources in Past Month**



Importantly, lower satisfaction ratings with medical cannabis accessibility were significantly linked to those purchasing cannabis from outside the regulated market (4). This, paired with the point that patients in HSAs with more dispensaries generally reported fewer barriers to accessing medical cannabis overall (5), suggests that expanding dispensaries should reduce barriers and potentially drive-up regulated market capture, the amount of cannabis purchased in the regulated market. This is logically sound, as increased access typically aids in capturing demand, and this has been statistically demonstrated across the country for cannabis markets.<sup>17, 18</sup>

### **Testing the Impact of Increasing Dispensary Density on Market Capture**

The Cannabis Policy Simulation Lab is a statistical modeling tool that examines and predicts changes in outcomes by simulating policy changes. Using this tool, the research team statistically tested the magnitude of the relationship between dispensary density and patient demand across the state, and predicted how patient sourcing would change if retail access increased. Unlike other states where this same simulation was prepared, the finding was null regardless of which supply proxy measure was tested. Put simply, the simulation could not predict the change in the amount of cannabis purchased in the regulated market if additional dispensaries were added. However, this null finding is vital to understanding the current market dynamics in Virginia.

As described in this section, only 23.6% of the cannabis obtained by medical cannabis patients came from Virginia's regulated medical dispensaries. This low percentage of demand is one reason that the simulation model could not statistically show a relationship between dispensary density and regulated demand. The second reason is that there are so few dispensaries for the population. The data is severely limited in both the observable variable (dispensary density) and the outcome measure (regulated market capture) that there is a lack of statistical significance.

However, this finding does not negate the primary point of this section: increasing the number of dispensaries may stimulate regulated market capture. This remains true, but not at a surface level. **Rather, in the unique case of Virginia, adding medical dispensaries could increase regulated market capture only if additions were used as a mechanism to reduce the price of medical cannabis.**

[17] SOFIS, M., & SLADE, M. (2023, JANUARY 5). FUTURE ADULT USE CANNABIS DEMAND & PREDICTIVE MODELING: A BEHAVIORAL ECONOMIC STUDY. MARYLAND DEPARTMENT OF LEGISLATIVE SERVICES. [HTTPS://MGA.LEG.MARYLAND.GOV/MEETING\\_MATERIAL/2023/SCR%20-%20133174234517847255%20-%20MARKET%20STUDY%20REPORT\\_01052023.PDF](https://mga.leg.maryland.gov/meeting_material/2023/SCR%20-%20133174234517847255%20-%20MARKET%20STUDY%20REPORT_01052023.PDF)

[18] CANNABIS PUBLIC POLICY CONSULTING. (2022, SEPTEMBER 27). SIMULATING ADULT USE RETAIL LICENSE CAPS & MARKET OUTCOMES IN RHODE ISLAND. [HTTPS://WWW.CANNABISPOLICYCONSULTING.COM/SIMULATING-ADULT-USE-RETAIL-LICENSE-CAPS-MARKET-OUTCOMES-IN-RHODE-ISLAND/](https://www.cannabispolicyconsulting.com/simulating-adult-use-retail-license-caps-market-outcomes-in-rhode-island/)

In the current policy landscape, it is unlikely that additional stores for only existing firms under the HSA limited license structure could successfully serve as this mechanism because Pharmaceutical Processors would still maintain regional control over supply and price. The findings of this study suggest that existing Pharmaceutical Processors are likely already operating at their profit-maximizing supply quantity—the microeconomic theoretical expectation that firms are operating at price point where marginal revenue is equal to marginal cost. In other words, licensees may have no expectation of substantial increased profits by expanding their operations at this time. This is important, as the unique regional confinement of Pharmaceutical Processor’s dispensing locations has directly created this scenario.

The regional restriction of the Pharmaceutical Processor direct-to-patient sales has created zones where competition from other regulated businesses is extremely limited. As with any sound for-profit business, cannabis companies engage in a cost-benefit analysis to arrive at a price point and quantity that maximizes profit under the current policy environment. Lowering price and/or substantially increasing supply is likely to reduce profit margins for the Pharmaceutical Processors, at least in the short term. Given the current economic landscape of the cannabis industry, this may be harmful to their financial positions and, as a result, could potentially threaten their operations. However, the current price point supported by the policy environment ultimately appears to be driving patients to source their cannabis outside of the regulated market.

### **3.4 High Prices Are Likely a Result of Regional Processors Not Competing with Other Sources**

#### **Proximity to Out-of-State Markets**

Approximately 35% of Virginia residents live within the Washington DC, metropolitan area, where cannabis in Washington DC and Maryland can be legally purchased with relative ease by out-of-state consumers.<sup>19</sup> In Maryland, medical cannabis is only available to registered Maryland patients; however, adults 21 and older can purchase regulated adult-use cannabis at licensed dispensaries regardless of where they live. Accessing medical cannabis in DC as a nonresident also presents few obstacles.

In DC, nonresidents can apply for a temporary self-certified registration or present their medical card from Virginia or another state to access cannabis from licensed medical dispensaries. To obtain a temporary self-certification medical card, an individual merely must attest to a qualifying medical condition. This type of card does not require a physician recommendation.

[19] U.S. CENSUS BUREAU. (N.D.). DP05: ACS DEMOGRAPHIC AND HOUSING ESTIMATES. U.S. DEPARTMENT OF COMMERCE. RETRIEVED NOVEMBER 16, 2023.

Nearly 12% of patients in this survey indicated they have traveled to a different jurisdiction to purchase cannabis, with the most common markets being DC and Maryland. In the month of September, 1,118 unique Virginia medical patients accessed the DC medical cannabis market.<sup>20</sup> In the same month, another 402 unique Virginia residents obtained cannabis in DC using a self-certified medical cannabis card. Notably, our study indicates that medical patients in Virginia were significantly more likely than nonpatients to travel out of state to purchase cannabis despite local access to a regulated market (9). As price is the top reported barrier for patients accessing regulated cannabis (2), it is likely that patients are seeking cheaper cannabis from out-of-state markets.

On average, DC medical cannabis is significantly cheaper than Virginia cannabis with an average price per gram of \$8.73 in September 2023. In Maryland, adult-use cannabis is \$9.27 per gram on average.<sup>21</sup> Further, patients living in HSAs that border Washington, DC, and Maryland had higher proportions of individuals traveling out of state to purchase cannabis compared to those living in HSAs that do not border a jurisdiction with legal and accessible cannabis. The HSAs that do not border DC or Maryland had higher number of patients reporting barriers to accessing cannabis,

Given that cannabis is readily accessible from bordering markets, it would stand to reason that significantly lower prices for cannabis products would be observed in these HSAs abutting Washington DC and Maryland than the Virginia average of approximately \$14 per gram. Based on the price collection data procedures mentioned in the last section, the price of cannabis is still costly when compared to the nearby markets and is consistent within a range of the state average. Notably, both HSAs bordering DC and Maryland have higher population densities than other areas in the state.<sup>22</sup> Higher population densities may correspond to higher patient counts regionally, which should result in larger local demand. Larger local demand, in turn, has the potential to stimulate lower prices, but this does not appear to be evidenced in these regions.

As higher prices of cannabis motivate purchasing substitution generally,<sup>23</sup> and specifically in the case of Virginia medical cannabis patients (10), one would expect to see the average price of flower per gram to be closer to parity, or near equivalence, with bordering markets. This would indicate that the Pharmaceutical Processors in these regions were successfully competing with the DC and Maryland markets. With a lack of baseline data, it would be impossible to infer whether competition is truly being produced. However, the lack of price parity between these regions and bordering markets

[20] ALCOHOLIC BEVERAGE AND CANNABIS ADMINISTRATION. (2023, SEPTEMBER). MEDICAL CANNABIS PROGRAM REPORT.

[HTTPS://ABCA.DC.GOV/SITES/DEFAULT/FILES/DC/SITES/ABRA/PAGE\\_CONTENT/ATTACHMENTS/MCP%20METRICS%20-%20SEPTEMBER%202023.PDF](https://abca.dc.gov/sites/default/files/dc/sites/abca/page_content/attachments/mcp%20metrics%20-%20september%202023.pdf)

[21] HOOKE, M. (2023, AUGUST 1). MARYLAND CANNABIS SALES ECLIPSE \$87M IN FIRST MONTH OF RECREATIONAL MARKET. BALTIMORE BUSINESS JOURNAL.

[HTTPS://WWW.BIZJOURNALS.COM/BALTIMORE/NEWS/2023/08/01/MARYLAND-CANNABIS-SALES-JULY-RECREATIONAL-MARKET.HTML](https://www.bizjournals.com/baltimore/news/2023/08/01/maryland-cannabis-sales-july-recreational-market.html)

[22] [HTTPS://WWW.OPENDATANETWORK.COM/ENTITY/0400000US51/VIRGINIA/GEOGRAPHIC.POPULATION.DENSITY?YEAR=2018](https://www.opendatanetwork.com/entity/0400000US51/VIRGINIA/GEOGRAPHIC.POPULATION.DENSITY?YEAR=2018)

[23] AMLUNG, M., REED, D. D., MORRIS, V., ASTON, E. R., METRIK, J., & MACKILLOP, J. (2019). PRICE ELASTICITY OF ILLEGAL VERSUS LEGAL CANNABIS: A BEHAVIORAL ECONOMIC SUBSTITUTABILITY ANALYSIS. ADDICTION (ABINGDON, ENGLAND), 114(1), 112-118. [HTTPS://DOI.ORG/10.1111/ADD.14437](https://doi.org/10.1111/add.14437)

suggests that competition is limited. Effectively, competing with bordering markets on lower prices would not maximize revenues, even with the addition of patient demand. There is likely a revenue trade-off in increasing market capture where the additional transactions minimize revenues. This further supports the overall finding that the current price point and quantity of supply maintained by the Pharmaceutical Processors, at this point in time, is a result of the current policy environment.

The question of competition and price parity is further complicated when introducing unregulated but assumed legal markets, such as home cultivation and adult sharing. Due to our limited data, we cannot make a sound quantitative assessment of how these other markets are observably challenging the medical cannabis market. On the other hand, our survey findings make a compelling qualitative claim of the influence of unregulated markets on the development and maturation of the medicinal cannabis market.

### **High Uptake of New Home Cultivation and Adult Sharing Laws**

When Virginia legalized adult-use cannabis in 2021, possession and home cultivation became legal for adults. Previously, medical cannabis patients were not permitted to grow cannabis for personal use and could only lawfully obtain cannabis in Virginia from licensed dispensing locations. After July 1, 2021, adults, including medical patients 21 and older, could grow up to four plants per household, with certain restrictions. Home cultivation, coupled with Virginia's "adult-sharing" laws that allow for the gifting or transferring of up to one ounce of cannabis, created a new source of legal cannabis for both patients and nonpatient adults. Nearly one-third of non-medical patients (30.7%) and over half of medical patients (57.5%) reported obtaining cannabis they grew from home, suggesting that Virginia's new home cultivation law has received notable uptake among medical cannabis patients (11). Similarly, 62.5% of all survey participants and 65.2% of patients reported obtaining cannabis from a friend.

These new sources of legal but unregulated cannabis in Virginia, in addition to the newly legal and expanding regulated markets in DC and Maryland, have created a confluence of complicating factors, which certainly has shifted business away from the Pharmaceutical Processors. The introduction of these new policies and markets, all within about 18 months, has likely created a dilemma for Pharmaceutical Processors. They may aim to compete by lowering prices, but risk revenue loss to the point of financial harm. Alternatively, they may maintain prices and supply levels and, consequently, witness consumers continue to diversify their sources. Eventually, this diversification may increase further to the point of financial harm for the Pharmaceutical Processors as the price point of surrounding markets is likely to continue to decrease. Because of this, a change in the policy environment that induces lower prices should be thoughtfully considered.



One type of policy change that can lower prices is introducing regulations that aim to expand the consumer population. If patient enrollment increases, the higher demand may shift the dynamics of the financial trade-offs for Pharmaceutical Processors. Policies aiming to have this effect were enacted in 2022.

### **Section 3.5 Low Patient Enrollment Is Both a Cause and Result of High Prices**

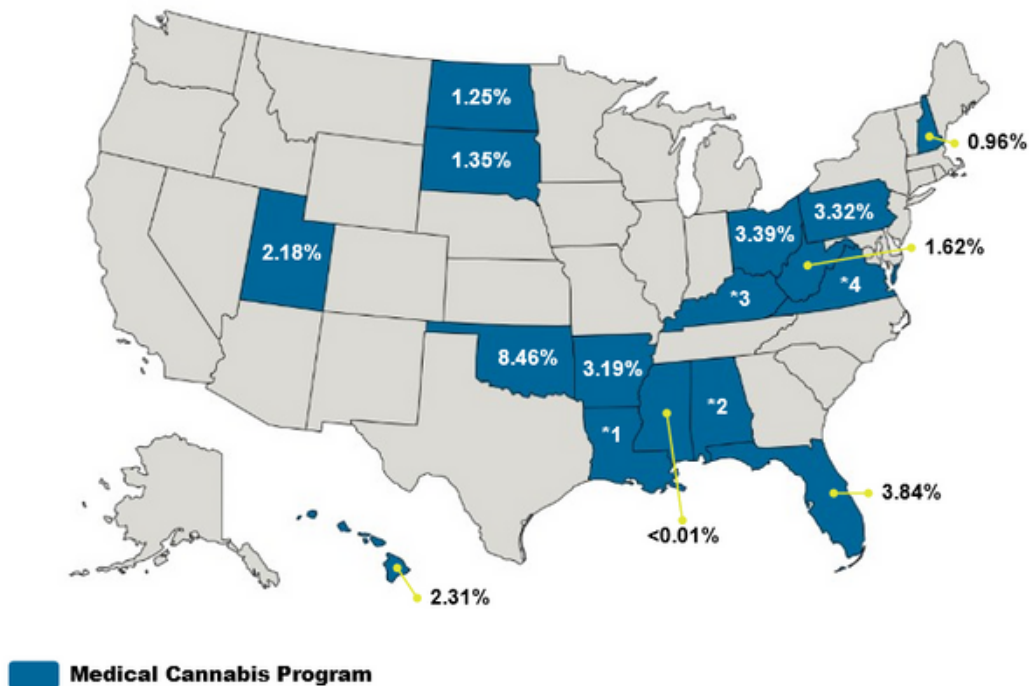
Population data for Figure 4 was gathered from 2020 U.S. Census Bureau population estimates, and enrolled medical patient data was sourced from each state's respective regulatory agency website.<sup>24</sup>

Although it is currently impossible to know the true number of participants in the Virginia medical cannabis program since patients no longer need to register with the Board of Pharmacy, available data from a 2022 Fiscal Impact Statement estimates the number to be around 40,000 active patients, with 8,000 pending applications. According to these estimates, 48,000 patients equates to 0.5% of the total population in Virginia.

This is lower than other medical states, such as Ohio, Florida, and Utah, which have patient populations of 3.39%, 3.84%, and 2.18%, respectively. However, it is important to note that the actual number of medical cannabis patients is likely higher in Virginia than this estimate, as many patients likely choose to not register with the Board of Pharmacy but still receive a certification from their certifying practitioner.

[24] UTAH DEPARTMENT OF HEALTH CENTER FOR MEDICAL CANNABIS. (2023, NOVEMBER 1). OCTOBER 2023 REPORT. UTAH DEPARTMENT OF HEALTH & HUMAN SERVICES. [HTTPS://MEDICALCANNABIS.UTAH.GOV/WP-CONTENT/UPLOADS/OCTOBER-2023-MONTHLY-REPORT.PDF](https://medicalcannabis.utah.gov/wp-content/uploads/October-2023-Monthly-Report.pdf)  
NORTH DAKOTA DEPARTMENT OF HEALTH AND HUMAN SERVICES. (N.D.) MEDICAL MARIJUANA. RETRIEVED NOVEMBER 16, 2023, FROM [HTTPS://WWW.HHS.ND.GOV/MM](https://www.hhs.nd.gov/mm)  
SOUTH DAKOTA DEPARTMENT OF HEALTH. (N.D.). MEDICAL CANNABIS IN SOUTH DAKOTA. RETRIEVED NOVEMBER 16, 2023, FROM [HTTPS://MEDCANNABIS.SD.GOV/](https://medcannabis.sd.gov/)  
OKLAHOMA MEDICAL MARIJUANA AUTHORITY. (2023, NOVEMBER 15). LICENSING AND TAX DATA. [HTTPS://OKLAHOMA.GOV/OMMA/ABOUT/LICENSING-AND-TAX-DATA.HTML](https://oklahoma.gov/omma/about/licensing-and-tax-data.html)  
ARKANSAS DEPARTMENT OF HEALTH. (N.D.) MEDICAL MARIJUANA. RETRIEVED NOVEMBER 16, 2023, FROM [HTTPS://WWW.HEALTHY.ARKANSAS.GOV/PROGRAMS-SERVICES/TOPICS/MEDICAL-MARIJUANA](https://www.healthy.arkansas.gov/programs-services/topics/medical-marijuana)  
MISSISSIPPI MEDICAL CANNABIS PROGRAM. (2022). [ANNUAL REPORT]. [HTTPS://WWW.MMCP.MS.GOV/SITES/DEFAULT/FILES/DOCUMENTS/19562.PDF](https://www.mmcp.ms.gov/sites/default/files/documents/19562.pdf)  
OFFICE OF MEDICAL MARIJUANA USE. (2023, NOVEMBER 3). [WEEKLY UPDATE]. FLORIDA DEPARTMENT OF HEALTH. [HTTPS://KNOWTHEFACTSMMJ.COM/WP-CONTENT/UPLOADS/OMMU\\_UPDATES/2023/110323-OMMU-UPDATE.PDF](https://knowthefactsmmj.com/wp-content/uploads/OMMU_updates/2023/110323-OMMU-UPDATE.PDF)

**Figure 4. Percent of State Population Enrolled in Medical Cannabis Program.**



\*1. LOUISIANA DOES NOT HAVE A STATE REGISTRY FOR MEDICAL CANNABIS.

\*2. ALABAMA HAS NOT YET OFFICIALLY ISSUED MEDICAL CANNABIS REGISTRATIONS.

\*3. KENTUCKY HAS NOT YET OFFICIALLY ISSUED MEDICAL CANNABIS REGISTRATIONS.

\*4. VIRGINIA NO LONGER REQUIRES STATE REGISTRATION FOR MEDICAL CANNABIS.

As noted in the previous section, several key changes to Virginia's medical cannabis program have aimed to expand the medical market by lowering barriers for patient participation. These changes include allowing practitioners to recommend medical cannabis for any condition or symptom they deem appropriate, legalizing the production and sale of a variety of cannabis product types, allowing physician assistants and nurse practitioners to write medical cannabis certifications, and removing the requirement for patients to register with the Board of Pharmacy prior to obtaining medical cannabis.

When compared to other states with regulated medical cannabis, Virginia has lower barriers for patients to participate in the program. Many states, such as New Mexico and Florida, have a predetermined list of conditions that qualify an individual to obtain cannabis for medical purposes. In comparison, Virginia does not have a list of qualifying conditions and instead allows practitioners to recommend cannabis to their patients for any condition or symptom as needed. This approach allows for a broader subset of the population to legally participate in the medical cannabis program compared to other states.

Without baseline or current enrollment data, it is unknown to what degree these policies have aided in increased patient enrollment and, consequently, Pharmaceutical Processor business. However, provided that 22% of the past-year consumer population reported that they did not need to become a patient as they already had access to cannabis, (1), it could be inferred that interest to join the medical cannabis program is low. Importantly, the removal of patient registration requirements, which theoretically should have increased patient participation in the medical program, happened shortly after the legalization of possession and home cultivation for adult-use purposes. The lack of interest is likely related to the availability of other regulated markets or unregulated sources for adult and medical use, all of which are known to have lower prices.

The interaction observed here is cyclic in nature. Historically, price has been influenced by low patient enrollment; because of the current high price point and substitute sources, patient enrollment likely remains stagnant.

### 3.6 The Perfect Policy Storm

The cannabis policies enacted in Virginia and the surrounding states, as well as the timing of their enactment, have created a perfect storm for market conditions. The inability of Pharmaceutical Processors to sell directly to patients outside their HSA supports regional market domination.<sup>25</sup> While Pharmaceutical Processors can and do sell products to one another, there is little reason beyond external brand-name value to procure products outside the single supply chain they control. The *ability* to achieve and maintain profit-maximizing supply quantities is a result of this. With the nearly concurrent additions of Maryland's medical and new adult-use markets and Washington DC's expanded medical market, as well as Virginia's home-grow and gifting policies, the ability to achieve is likely now a necessity for Pharmaceutical Processors.

However, it cannot be assumed that all Pharmaceutical Processors are in the same financial position. Licensees that have strategically scaled supply both in quantity and number of dispensing outlets in Virginia over the past 2 years, as well as nationally, may be better positioned than others. It follows that these licensees may have lower priced products when compared to their Virginia counterparts; however, additional research is required to validate this.

This "perfect policy storm" is a case study in path dependence; the economic concept where decisions made historically limit the decisions available to be made today. Because of the implementation of past policies, individually and together, the ability to correct the market through new policies is limited. Pathways for potential pursuit follow.

[25] DELIVERY IS AN EXCEPTION TO THIS, HOWEVER OUR RESEARCH FOUND IT WAS NOT UTILIZED SUBSTANTIALLY.

# 4.0 POLICY PATHWAYS FOR CONSIDERATION TO STRENGTHEN THE VIRGINIA MEDICAL CANNABIS PROGRAM AND IMPROVE ACCESS

## 4.1 Five Policy Pathways Aimed to Lower Prices and Shift Patient Consumption to Regulated Medical Dispensaries

The following section outlines five separate policy pathways to improve patient access to medical cannabis in Virginia. The shared objective across all policy pathways is to increase supply to reduce prices and shift patient consumption to the regulated medical market. These policy pathways are for the consideration of the Virginia General Assembly and should not be interpreted as formal recommendations. As this report makes no assumptions or forward-looking statements regarding the legalization of adult-use cannabis sales in Virginia, the scope of all policy pathways is limited to the existing medical program.

### Externalities Associated with Policy Pathways

With each policy pathway comes externalities related to increased supply that must be taken into consideration. The addition of supply and new market entrants can unintentionally disrupt the stability and integrity of the medical market. For one, failure to introduce additional supply in a controlled and scalable fashion runs the risk of producing a supply surplus. Supply surpluses have set cannabis markets across the nation into instability, leading to plummeting prices and businesses exiting the market. There is typically a cascading effect of oversupply where products with restricted shelf-life are not immediately met by demand, causing production to halt to prevent an overflow of unsold inventory. Prices then increase when inventory sells and becomes scarce. If a product in the regulated market is scarce or unavailable, consumers will seek out similar products from alternative sources, such as the illicit market. This can become a cyclic period known as a Boom-and-Bust Cycle that is extremely challenging to interrupt, as seen in other states.<sup>26, 27</sup> A direct result of this, and oversupply in general, is divergence to the illicit or gray markets.

[26] SHEPHERD, K. (2019, JANUARY 2). IT WOULD TAKE OREGONIANS SEVEN YEARS TO SMOKE ALL THE WEED THEY HARVESTED THIS YEAR. WILLAMETTE WEEK. [1] DELIVERY IS AN EXCEPTION TO THIS, HOWEVER OUR RESEARCH FOUND IT WAS NOT UTILIZED SUBSTANTIALLY.

[27] DEMKO, P. (2022, DECEMBER 23). A NATIONAL WEED GLUT IS CAUSING PRICES TO PLUMMET AND IMPERILING BUSINESSES. POLITICO PRO. [1] DELIVERY IS AN EXCEPTION TO THIS, HOWEVER OUR RESEARCH FOUND IT WAS NOT UTILIZED SUBSTANTIALLY.

**Finally, the price of medical cannabis is likely necessary for Pharmaceutical Processors to remain solvent given the current market and policy conditions in Virginia and is unlikely to indicate an effort to intentionally overcharge medical patients.** All policy pathways contemplated below must consider the operations and viability of the existing licensees. Any structural changes to the medical cannabis program could result in at least one of the Pharmaceutical Processors exiting the market based on their financial positions and national strategy. Market exits pose a dangerous threat to the future of the medical cannabis program—especially where price is concerned—and could further impede patient access to regulated cannabis.

Any pathways considered by the Virginia General Assembly should include extensive stakeholder engagement with patients and existing licensees and thoughtful implementation planning. Additionally, all pathways must be implemented with supply-side data collection, as contemplated in Section 4.2

*Note: The research team submitted a survey to the Pharmaceutical Processors seeking qualitative input on some of the topical areas of this report to include their unique perspective. No Pharmaceutical Processor provided a response by the close of the data collection period.*

## **01** Pathway 1: Make no policy changes to the medical cannabis program and issue the remaining Pharmaceutical Processor license in HSA I.

**Description:** Virginia makes no policy changes to the medical cannabis program and the the Authority issues an RFA for the remaining Pharmaceutical Processor license in HSA I as planned.

**Pros:** This pathway would require no legislative changes, making it the easiest pathway concerning administration and oversight. Further, it is reasonable to assume that the addition of another Pharmaceutical Processor will increase the total supply of medical cannabis. This will also introduce new cannabis products and brands to the medical market, as well as enhance access to medical cannabis regionally. When compared to patients in all other HSAs, a higher number of patients (57%) in HSA I reported a lack of nearby dispensaries as a barrier to accessing medical cannabis. Adding a Pharmaceutical Processor to this region will likely improve patient access, particularly for those in HSA I; however, the total impact cannot be quantified at this time.

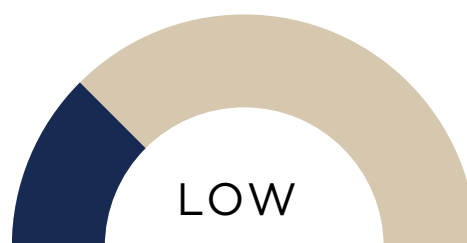


**Potential Challenges:** Without any policy changes affecting market structure and conditions, It is unlikely that the addition of one more Pharmaceutical Processor will improve the price of medical cannabis for patients across the state. Virginia's restrictive license cap and atypical HSA framework support a marketplace owned by a limited number of large operators who have regulated market domination over their designated portion of the state. Facing little regulated competition, Pharmaceutical Processors likely have minimal incentive to increase supply and decrease prices accordingly. The addition of one more vertically integrated Pharmaceutical Processor is unlikely to result in enough competition to lower cannabis prices and meaningfully shift consumption to the regulated medical market. Moreover, as our research indicates, patients in HSA I are accessing cannabis from other sources, making transitions to a new Pharmaceutical Processor contingent on low entry prices.

Unless the new Pharmaceutical Processor is also a large, well-funded, and experienced operator that can jump-start the localized market with low prices, patients may not transition. While the most equitable option would appear to be awarding the license to a newly established company or small business, the absence of lean operations and cost-saving efficiencies would likely put the business at a great disadvantage. Vertical integration requirements can be exceedingly cost-prohibitive for many potential new market entrants. Operating a vertically integrated cannabis business from seed to sale requires significant capital to start up and operate. These barriers to entry are compounded by the lack of funding options available for cannabis businesses as all cannabis commerce is illegal at the federal level. Only those with access to a large amount of private funding can successfully launch a vertically integrated business. If no policy changes are made, there are very few potential operators who can afford to enter the Virginia cannabis market as a vertically integrated business with any expectation of having low enough prices to be successful in competing with the unregulated market currently fulfilling patient demand in HSA I.

**Likely Impact:** Maintaining the status quo in other HSAs while introducing a licensee in HSA I will likely have a *low* impact on lowering prices and shifting demand to the regulated market. It will also not address the current and anticipated issues experienced by the existing Pharmaceutical Processors.

Potential Policy  
Pathway #1 Likely  
Impact



## 02 **Pathway 2: Add limited standalone medical cultivation, manufacturing, and dispensary licenses that can operate within any HSA, and allow Pharmaceutical Processors to expand beyond their six-store maximum within their HSA.**

**Description:** Through a legislative change, Virginia could create three new standalone license types: a cultivation license, a manufacturing license, and a dispensary license. These new licensees would be permitted to operate within any HSA. Retail licensees would be authorized to purchase wholesale cannabis products from all Pharmaceutical Processors, standalone cultivators, and standalone manufacturers, and sell cannabis to medical patients. Cultivation licensees would be authorized to grow medical cannabis and sell directly to manufacturers, Pharmaceutical Processors, and standalone dispensary businesses. Cannabis manufacturer licensees would be allowed to purchase cannabis directly from cultivators and process the plants into various cannabis products. Manufacturers would be permitted to sell wholesale to Pharmaceutical Processors and standalone dispensaries. Existing Pharmaceutical Processors should not be excluded from the opportunity to expand access points with new entrants as they are producing high-quality desirable products for patients. Maintaining the existing HSA framework, the state may allow existing operators to reasonably expand beyond their maximum of six dispensing locations within their region.

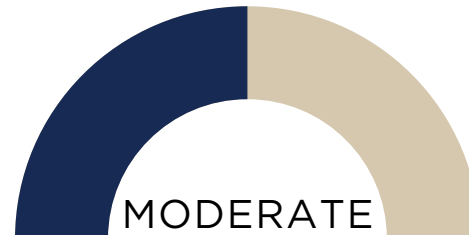
**Pros:** Adding more cultivators to the Virginia medical cannabis marketplace could increase supply-side competition and drive down prices for patients, and adding additional access points could improve patient access to regulated cannabis. Specialized license types that focus on only one function of the cannabis supply chain require less capital than a vertically integrated cannabis business, increasing market opportunities for prospective small and medium-sized operators. Additionally, adding these three license types could create new businesses and jobs for Virginia residents.

**Potential Challenges:** New market entrants will be required to participate in the market with Pharmaceutical Processors. For example, new dispensaries may still become dependent on purchasing from the existing licensees who have an economic incentive to maintain price parity with their own retail stores. In other words, existing operators may not offer wholesale prices lower than the price point that could be expected to lead to a decrease in prices, unless they planned to decrease retail prices at their own store. Cultivators or manufacturers may still become dependent on Pharmaceutical Processors to purchase their products, who may not have any or little need for them.

Should these new entrants only interact with one another and not the existing operators, the Pharmaceutical Processors could, in theory, maintain solvency at a lower price for a longer period. Put simply, Pharmaceutical Processors with large reserves of capital are better positioned to survive large downward pressure on the average price of cannabis. Smaller, standalone operators are not as well-suited to survive extended price competition when the marginal revenue earned from selling a gram of cannabis drops.

**Likely Impact:** Adding standalone licenses in each HSA and allowing the Pharmaceutical Processors to modestly expand dispensing locations will likely have a moderate impact on lowering prices and shifting demand to the regulated market. Prices are likely to drop in the short-term but may not be sustainable to maintain in the long-term which may threaten businesses and market success.

Potential Policy  
Pathway #2 Likely  
Impact



### 03 Pathway 3: Issue additional Pharmaceutical Processor licenses in each HSA and maintain the HSA framework.

**Description:** The General Assembly could adopt legislation allowing for additional Pharmaceutical Processor licenses in each HSA.

**Pros:** Adding new Pharmaceutical Processors in each HSA could increase local competition among medical cannabis operators, which could drive retail prices down as a single Pharmaceutical Processor would no longer be the only operator within their designated HSA. Further, new market entrants could introduce new products into the market, increasing choices and access for medical cannabis patients.

**Potential Challenges:** While additional Pharmaceutical Processors could drive competition in the market and lower retail prices, maintaining the existing HSA structure places unnecessary and inefficient limits on the ability of Pharmaceutical Processors to conduct business. It also gives an unfair advantage to licensees who live in areas of the state with higher population density. Further, the high cost of vertical integration will prevent small and medium-sized businesses from entering the Virginia market and increase the likelihood of multistate operators owning the remaining Pharmaceutical

Processor licenses. Additionally, with no current limitations on ownership of licensees, this pathway could contribute to further consolidation and ultimately result in the same outcomes seen in this report.

**Likely Impact:** Adding additional Pharmaceutical Processors to each HSA may have a moderate impact on lowering prices and shifting demand to the regulated market. Prices are likely to drop in the short and medium-term but may not be sustained in the long-term.

### Potential Policy Pathway #3 Likely Impact



## 04

### **Pathway 4: Issue additional Pharmaceutical Processor licenses, eliminate the HSA framework, and allow Pharmaceutical Processors to expand past their six-store maximum across the state.**

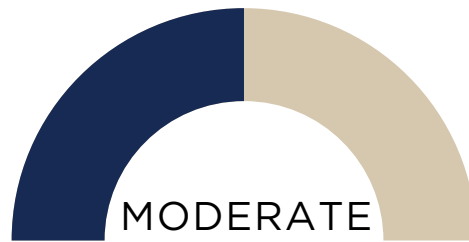
**Description:** The General Assembly could adopt legislation that would provide for additional Pharmaceutical Processor licenses in the state and would remove the HSA structure entirely, allowing existing operators to reasonably expand their maximum of six dispensing locations across the state.

**Pros:** As mentioned in Pathway 3, adding additional Pharmaceutical Processors will increase competition among operators and potentially reduce prices for consumers. Removing the HSA structure will allow operators to locate their business based on consumer demand and strategic business opportunities as opposed to mandated borders. Removing the HSAs and adding additional Pharmaceutical Processors may also help prevent one business from exercising total domination of a single region in the state. This also provides opportunities to existing Pharmaceutical Processors who may wish to expand across regions. If this pathway were pursued, existing Pharmaceutical Processors should be provided the opportunity to expand operations even if they have met their six-dispensary maximum. However, the timing of this allowance must be strategic to limit the first-mover advantage afforded by the Pharmaceutical Processor's existing supply chain.

**Potential Challenges:** As mentioned in the prior pathways, the high cost of vertical integration will prevent small and medium-sized businesses from entering the Virginia market and increase the likelihood of multistate operators owning the remaining Pharmaceutical Processor licenses. Similar to pathway 3, this pathway could contribute to further consolidation and ultimately result in the same outcomes seen in this report.

**Likely Impact:** Adding additional Pharmaceutical Processors across the state and removing the HSA boundaries may have a moderate impact on lowering prices and shifting demand to the regulated market. Prices are likely to drop in the short and medium-term but may not be sustained in the long-term.

Potential Policy  
Pathway #4 Likely  
Impact



05

**Pathway 5: Add limited standalone medical cultivation, manufacturing, and dispensary licenses, adopt permissive vertical integration for new and existing operators, allow Pharmaceutical Processors to expand in specialized supply chain functions, and remove the HSA framework.**

**Description:** The state may create a series of new standalone medical cannabis licenses—including for cultivation, manufacturing, and dispensing—and allow operators to hold multiple licenses across the supply chain at once, known as “permissive vertical integration.” This pathway creates lower barriers to entry for new businesses, while granting them the flexibility to scale their business through vertical integration if they choose to do so. This model also provides opportunity to the existing Pharmaceutical Processors to maximize their comparative advantage, the concept of gaining efficiencies through specialization by focusing on one area of the supply chain. Removing the HSA structure will further facilitate the benefits proposed by these additions.



**Pros:** The provision of standalone licenses for each step of the cannabis supply chain is standard practice in most states with regulated cannabis programs, including medical programs. Allowing for standalone license types, in addition to the economic considerations outlined in the previous paragraph, provides small and medium-sized operators who may have highly specialized skillsets a meaningful pathway into the Virginia medical cannabis market. The existing vertical integration framework not only establishes economic and financial barriers for smaller operators, but it also limits access for those who might be highly skilled in one area, such as cultivation practices, but not another area, such as in retail operations. Additionally, the removal of mandatory vertical integration provides existing operators the opportunity to shed assets by focusing on one area of the supply chain that they best specialize in. This has been a recent trend as formerly vertically integrated operations in other states have recently begun to shed upward supply chain functions to focus on retail. The removal of the HSA framework will further support statewide competition.

**Potential Challenges:** The most notable challenge for this pathway is crafting and implementing these policies. Opening the market to new entrants, allowing expansion, and removing the HSA framework all at once may cause significant interruptions in the market. There is a necessity to identify the necessary volume of new licenses per each supply chain function and for the expansion of the existing operators prior to establishing this policy change. This can only be done with quantitative supply and demand data. While all policy proposals should include stakeholder outreach, this pathway requires significant engagement from existing operators.

**Likely Impact:** Adding limited standalone medical cultivation, manufacturing, and dispensary licenses, adopting permissive vertical integration for new and existing operators, allowing Pharmaceutical Processors to expand in specialized supply chain functions, and removing the HSA framework will likely have a moderate to high impact on lowering prices and shifting demand to the regulated market if pursued correctly.

Potential Policy  
Pathway #5 Likely  
Impact



## 4.2 Other Policy and Programmatic Considerations

### **Recommendation: Update Data Collection and Reporting Requirements**

As discussed previously, lack of verifiable supply data is a significant barrier to thoroughly and quantitatively determining whether supply is adequately meeting demand, and to what degree price changes are contributing to this. To obtain verifiable supply data, Pharmaceutical Processors must track their supply chain through a database, or at minimum establish uniform metrics. Updating regulations to require a uniform system in reporting of inventory and product movement within the supply chain will allow future analyses to be better informed through validated data, making subsequent regulatory, statutory, or administrative actions defensible and scientifically sound. Such data is imperative to collect and analyze routinely, but especially for informing future policy. As traditional centralized databases typically impose costs to businesses, it is worth considering avenues that enhance traceability without undue additional costs burdens. Novel decentralized systems coupled with uniform reporting requirements may be cost-effective for licensees.

### **Recommendation: Invest in Patient Education**

According to our survey, 48% of respondents reported not knowing how to obtain a certification for medical cannabis, 15% claimed they do not believe they are qualified for a certification, and 12% indicated they do not have transportation to obtain a written certification. Considering that telehealth is permitted to obtain a medical cannabis certification, it can be inferred that the 12% who reported not having transportation to obtain a certification are unaware that this is an option for them. To address these gaps in awareness of the certification process, the Virginia Cannabis Control Authority should consider deploying resources into prospective and current patient outreach and educational campaigns. These campaigns should focus on educating potential patients on how to obtain a certification to access cannabis legally and safely through the regulated medical marketplace. Strategic educational campaigns could increase the number of certified patients, ensure program participation by patients who could benefit from medical cannabis, and increase the total number of consumers purchasing cannabis from regulated sources.



---

PART 2:

**VIRGINIA PATIENT  
POPULATION SURVEY  
AND DEMAND STUDY**

# 5.0 SURVEY OVERVIEW AND RESEARCH DESIGN

This study was commissioned by the Virginia Cannabis Control Authority. Given the Authority does not assume regulatory oversight over the medical cannabis program from the Board of Pharmacy until January 1, 2024, a list of enrolled medical cannabis patients and contact information was not available for survey recruitment. As a result of this, our study design included the recruitment of a population-representative sample from the state of Virginia (N) with specific qualifying criteria for certified medical cannabis patients (n). Although the primary population of interest is Virginia medical cannabis patients, the general population sample of past-year consumers was analyzed to validate the study's findings and provide meaningful comparisons to medical cannabis consumers. Much of this report will focus on the medical cannabis patient sample unless specified otherwise.

To qualify for participation in this study, respondents must have reported that they currently reside in Virginia and are past-year cannabis consumers. A total of 1,827 respondents met all qualifying criteria to participate in this study (N).<sup>28</sup> A total of 476 respondents were reported to be certified medical cannabis patients (n).

## 5.1 Methodology of Survey Design

Participants were recruited from community research panels sourced by Qualtrics.<sup>29</sup> The sample for both the state-wide past-year cannabis consumers and the medical cannabis patients are within recommended ranges for population studies. The overarching methods employed for the current survey studies are supported by the publication of over 10 peer-reviewed, scientific studies or reviews that were authored by one of the principal investigators of this study,

[28] FOR MORE INFORMATION ON PAST-YEAR CANNABIS CONSUMERS ACROSS THE STATE, PLEASE REFER TO THE DATA IN APPENDICES B AND C.

[29] QUALTRICS. (N.D.) UNLOCK BREAKTHROUGH INSIGHTS WITH MARKET RESEARCH PANELS. RETRIEVED NOVEMBER 16, 2023, FROM [HTTPS://WWW.QUALTRICS.COM/RESEARCH-SERVICES/ONLINE-SAMPLE](https://www.qualtrics.com/research-services/online-sample)

Michael Sofis, Ph.D.<sup>30-42</sup> Many of the cannabis survey questions used in the current study were validated or further validated by the co-PI of this study, Dr. Sofis, and the CPPC research team in studies for which they led the online recruitment of thousands of individuals who use cannabis to study patterns of cannabis use.

Many of the items used in this survey are supported by their use in academic and peer-reviewed cannabis publications or have been validated prior to their use in federal surveys, such as our survey question probing past-month frequency of cannabis-use days derived from the National Survey on Drug Use and Health (NSDUH). Scientific work on cannabis published by CPPC's research teams includes successfully predicting future cannabis use outcomes, examining the impacts of cannabis legalization on cannabis-related outcomes, and leading or assisting in the recruitment, data collection, analysis, write-up, and interpretation of large national or state studies of cannabis use patterns, products, and trends.

Additionally, the authors and investigators of this study administer, recruit, and analyze the nation's largest and most frequently issued cannabis outcomes survey, which has been utilized for numerous academic, legislative, and regulatory commissioned studies.

[30] KELLEGHAN, A. R., SOFIS, M. J., BUDNEY, A., CEASAR, R., & LEVENTHAL, A. M. (2022). ASSOCIATIONS OF CANNABIS PRODUCT SOURCE AND SUBSEQUENT CANNABIS USE AMONG ADOLESCENTS. *DRUG AND ALCOHOL DEPENDENCE*, 233, 109374.

[HTTPS://DOI.ORG/10.1016/J.DRUGALCDEP.2022.109374](https://doi.org/10.1016/j.drugalcdep.2022.109374)

[31] BORODOVSKY, J. T., SOFIS, M. J., SHERMAN, B. J., GRAY, K. M., & BUDNEY, A. J. (2022). CHARACTERIZING CANNABIS USE REDUCTION AND CHANGE IN FUNCTIONING DURING TREATMENT: INITIAL STEPS ON THE PATH TO NEW CLINICAL ENDPOINTS. *PSYCHOLOGY OF ADDICTIVE BEHAVIORS*, 36(5), 515-525. [HTTPS://DOI.ORG/10.1037/ADB0000817](https://doi.org/10.1037/adb0000817)

[32] SOFIS, M. J., BORODOVSKY, J. T., PIKE, C. K., LIU, L., JACOBSON, N. C., & BUDNEY, A. J. (2021). SIFTING THROUGH THE WEEDS: RELATIONSHIPS BETWEEN CANNABIS USE FREQUENCY MEASURES AND DELAY DISCOUNTING. *ADDICTIVE BEHAVIORS*, 112, 106573.

[HTTPS://DOI.ORG/10.1016/J.ADDBEH.2020.106573](https://doi.org/10.1016/j.addbeh.2020.106573) [1] FOR MORE INFORMATION ON PAST-YEAR CANNABIS CONSUMERS ACROSS THE STATE, PLEASE REFER TO THE DATA IN APPENDICES B AND C.

[33] BUDNEY, A. J., SOFIS, M. J., & BORODOVSKY, J. T. AN UPDATE ON CANNABIS USE DISORDER WITH COMMENT ON THE IMPACT OF POLICY RELATED TO THERAPEUTIC AND RECREATIONAL CANNABIS USE. *EUROPEAN ARCHIVES OF PSYCHIATRY AND CLINICAL NEUROSCIENCE*, 269, 73-86 (2019). [HTTPS://DOI.ORG/10.1007/S00406-018-0976-1](https://doi.org/10.1007/s00406-018-0976-1)

[34] BORODOVSKY, J. T., SOFIS, M. J., GRUCZA, R. A., & BUDNEY, A. J. (2021). THE IMPORTANCE OF PSYCHOLOGY FOR SHAPING LEGAL CANNABIS REGULATION. *EXPERIMENTAL AND CLINICAL PSYCHOPHARMACOLOGY*, 29(1), 99-115. [HTTPS://DOI.ORG/10.1037/PHA0000362](https://doi.org/10.1037/pha0000362)

[35] PIKE, C. K., SOFIS, M. J., & BUDNEY, A. J. (2021). CORRELATES OF CONTINUED CANNABIS USE DURING PREGNANCY. *DRUG AND ALCOHOL DEPENDENCE*, 227, 108939. [HTTPS://DOI.ORG/10.1016/J.DRUGALCDEP.2021.108939](https://doi.org/10.1016/j.drugalcdep.2021.108939)

[36] SHERMAN, B. J., SOFIS, M. J., BORODOVSKY, J. T., GRAY, K. M., MCRAE-CLARK, A. L., & BUDNEY, A. J. (2022). EVALUATING CANNABIS USE RISK REDUCTION AS AN ALTERNATIVE CLINICAL OUTCOME FOR CANNABIS USE DISORDER. *PSYCHOLOGY OF ADDICTIVE BEHAVIORS*, 36(5), 505-514. [HTTPS://DOI.ORG/10.1037/ADB0000760](https://doi.org/10.1037/adb0000760)

[37] SOFIS, M. J., LEMLEY, S. M., BUDNEY, A. J., STANGER, C., & JARMOLOWICZ, D. P. (2020). PERSISTING ON THE PAST: CROSS-SECTIONAL AND PROSPECTIVE ASSOCIATIONS BETWEEN SUNK COST PROPENSITY AND CANNABIS USE. *EXPERIMENTAL AND CLINICAL PSYCHOPHARMACOLOGY*, 28(2), 225-234. [HTTPS://DOI.ORG/10.1037/PHA0000299](https://doi.org/10.1037/pha0000299)

[38] SOFIS, M. J., LEMLEY, S. M., & BUDNEY, A. J. (2021). THE EFFECTS OF CANNABIS USE FREQUENCY AND EPISODIC SPECIFICITY TRAINING ON THE RECALL OF SPECIFIC AND REWARDING EVENTS. *FRONTIERS IN PSYCHIATRY*, 12, [HTTPS://DOI.ORG/10.3389/FPSYT.2021.643819](https://doi.org/10.3389/fpsy.2021.643819)

[39] SOFIS, M. J., LEMLEY, S. M., JACOBSON, N. C., & BUDNEY, A. J. (2022). INITIAL EVALUATION OF DOMAIN-SPECIFIC EPISODIC FUTURE THINKING ON DELAY DISCOUNTING AND CANNABIS USE. *EXPERIMENTAL AND CLINICAL PSYCHOPHARMACOLOGY*, 30(6), 918-927.

[HTTPS://DOI.ORG/10.1037/PHA0000501](https://doi.org/10.1037/pha0000501)

[40] SOFIS, M. J., LEMLEY, S. M., LEE, D. C., & BUDNEY, A. J. (2020). A WEB-BASED EPISODIC SPECIFICITY AND FUTURE THINKING SESSION MODULATES DELAY DISCOUNTING IN CANNABIS USERS. *PSYCHOLOGY OF ADDICTIVE BEHAVIORS*, 34(4), 532-540.

[HTTPS://DOI.ORG/10.1037/ADB0000557](https://doi.org/10.1037/adb0000557)

[41] BUDNEY, A. J., & SOFIS, M. J. (2021). CANNABIS USE DISORDER AND ITS TREATMENT. IN N. EL-GUEBALY, G. CARRÀ, M. GALANTER, & A. M. BALDACCHINO (EDS.), *TEXTBOOK OF ADDICTION TREATMENT* (PP. 157-171). SPRINGER, CHAM. [HTTPS://DOI.ORG/10.1007/978-3-030-36391-8\\_12](https://doi.org/10.1007/978-3-030-36391-8_12)

[42] SOFIS, M. J., BUDNEY, A. J., STANGER, C., KNAPP, A. A., & BORODOVSKY, J. T. (2020). GREATER DELAY DISCOUNTING AND CANNABIS COPING MOTIVES ARE ASSOCIATED WITH MORE FREQUENT CANNABIS USE IN A LARGE SAMPLE OF ADULT CANNABIS USERS. *DRUG AND ALCOHOL DEPENDENCE*, 207, 107820. [HTTPS://DOI.ORG/10.1016/J.DRUGALCDEP.2019.107820](https://doi.org/10.1016/j.drugalcdep.2019.107820) [1] FOR MORE INFORMATION ON PAST-YEAR CANNABIS CONSUMERS ACROSS THE STATE, PLEASE REFER TO THE DATA IN APPENDICES B AND C.



Like other population studies, it is impossible to be 100% confident in the “true” value of any of the outcomes assessed here or in any scientific or population study. To do so would require surveying or acquiring data from every relevant individual in the area of interest (e.g., state or country). However, when using the estimated 48,000 assumed certified patient count, the subsample of 476 exceeds 95% confidence levels with a 5% margin of error.<sup>43</sup> This sample size and research design provides additional confidence in our findings and their general applicability to the larger medical cannabis patient population in Virginia. However, there are several steps and evaluation methods that can help strongly increase confidence in the veracity and quality of the findings.

Examples of the approaches used and evidence supporting the validity of our methods are noted here:

- Best practices in using previously empirically supported survey items, and survey duration of approximately 15 minutes or less;
- Validity checks throughout the survey methodology to increase the likelihood of accurate self-reports;
- Attention checks to ensure respondents are paying appropriate levels of attention in self-reporting;
- Bot checks to ensure all respondents were human;
- Data cleaning procedures to eliminate inconsistent or incomplete respondents;
- Survey items that have been validated and are popular in regulatory and industry cannabis settings, such as willingness to pay questions,<sup>44</sup> instead of reliance on questions more commonly sourced from research settings;
- Statistical testing to determine 95% or higher confidence when relevant; and
- Statistically controlling for relevant covariates when analyzing data to increase the odds that any direct relationships observed in the study are indeed directly related.

## 5.2 Past-Year Cannabis Consumers Sample Population (N)

The percentage of survey participants residing in each county correlates highly with the percentage of actual Virginia residents in each county ( $r = .85$ ), suggesting that our recruitment of Virginia residents is geographically consistent with actual county populations in the state. Demographic characteristics between the survey sample and the population of Virginia matched by 92%. Together, these correlations strengthen our confidence that the findings shown in this report are likely to accurately reflect trends in the state of Virginia despite modest deviations between the survey and the actual general population of Virginia.

[43] QUALTRICS. (2023, AUGUST 4). SAMPLE SIZE CALCULATOR. [HTTPS://WWW.QUALTRICS.COM/BLOG/CALCULATING-SAMPLE-SIZE/](https://www.qualtrics.com/blog/calculating-sample-size/)

[44] OLSEN, M.C., & SMITH, K.M. (2019). THE CANNABIS INDUSTRY: A NATURAL LABORATORY FOR MARKETING STRATEGY RESEARCH. MARKETING LETTERS, 31, 7-12 (2020). [HTTPS://DOI.ORG/10.1007/S11002-019-09502-X](https://doi.org/10.1007/s11002-019-09502-x)

Key demographic characteristics of the general Virginia population can be found on the U.S. Census Bureau's website.<sup>45</sup> Most of the respondents in this survey were White (60.0%) and slightly over half were female (52%). Twenty-five percent were Black or African American, 1.4% were American Indian, Native American, or Alaska Native, and 6.5% were multi-race. Median age of this sample was 35 years, like that of the Virginia population.

### 5.3 Medical Cannabis Patients Subsample Population (n)

As discussed in Part 1, the five geographic divisions within the state of Virginia, are known as Health Service Areas (HSAs).<sup>46, 47</sup> Each HSA has a designated Pharmaceutical Processor to serve that region. A Pharmaceutical Processor is a facility that is permitted to cultivate cannabis plants and dispense medical cannabis products to patients who have received a written certification from a practitioner for the use of cannabis.<sup>48</sup> The only exception is HSA I, which does not yet have a Pharmaceutical Processor. Please refer to Table 4 for information regarding the distribution of our medical patient population by HSA.

**Table 4. Medical Patient Sample Size (n) Per HSA**

HSA	Sample (n)
HSA I	65
HSA II	120
HSA III	97
HSA IV	59
HSA V	135

[45] U.S. CENSUS BUREAU. (N.D.). QUICKFACTS VIRGINIA. U.S. DEPARTMENT OF COMMERCE. RETRIEVED SEPTEMBER 22, 2023, FROM [HTTPS://WWW.CENSUS.GOV/QUICKFACTS/FACT/TABLE/VA/PST045222](https://www.census.gov/quickfacts/FACT/TABLE/VA/PST045222)

[46] DIVISION OF HEALTH STATISTICS. (N.D.). HEALTH DISTRICTS AND HEALTH SERVICE AREAS: COMMONWEALTH OF VIRGINIA. VIRGINIA DEPARTMENT OF HEALTH. RETRIEVED NOVEMBER 16, 2023, FROM [HTTPS://APPS.VDH.VIRGINIA.GOV/HEALTHSTATS/DOCUMENTS/2010/PDFS/HDMAP.PDF](https://apps.vdh.virginia.gov/healthstats/documents/2010/pdfs/hdmap.pdf)

[47] BOARD OF PHARMACY. (N.D.). [HEALTH SERVICE AREAS LIST]. VIRGINIA DEPARTMENT OF HEALTH PROFESSIONS. RETRIEVED NOVEMBER 16, 2023, FROM [HTTPS://WWW.DHP.VIRGINIA.GOV/PHARMACY/DOCS/VAHEALTHSERVICEAREAS.PDF](https://www.dhp.virginia.gov/pharmacy/docs/vahealthserviceareas.pdf)

[48] BOARD OF PHARMACY. (N.D.). PHARMACEUTICAL PROCESSORS - MEDICAL CANNABIS. VIRGINIA DEPARTMENT OF HEALTH PROFESSIONS. RETRIEVED NOVEMBER 16, 2023, FROM [HTTPS://WWW.DHP.VIRGINIA.GOV/PHARMACY/PHARMACEUTICALPROCESSING/](https://www.dhp.virginia.gov/pharmacy/pharmaceuticalprocessing/)

## 5.4 Confidence in Findings from Sample Size for Population of Primary Interest

The Board of Pharmacy, the regulatory authority of the medical cannabis program until January 2024, does not publicly disclose the total number of patients registered with the program. Further, patients are no longer required to register with the Board to participate in the medical cannabis program, making it difficult to assess the true number of medical cannabis patients in Virginia. However, in a 2022 Fiscal Impact Statement estimating the loss of revenue due to the policy changes that no longer mandate that patients register and maintain their patient status with the Board, the Board indicated that the program had no less than 40,000 active registered patients, with 8,000 applications pending.<sup>49</sup> When using the estimated 48,000 assumed certified patient count, the subsample of 476 exceeds 95% confidence levels with a 5% margin of error, strengthening our confidence in these findings.<sup>50, 51, 52</sup>

[49] DEPARTMENT OF PLANNING AND BUDGET. (N.D.). 2022 FISCAL IMPACT STATEMENT. RETRIEVED NOVEMBER 16, 2023, FROM [HTTPS://LIS.VIRGINIA.GOV/CGI-BIN/LEGP604.EXE?221+OTH+SB772FS1122+PDF](https://lis.virginia.gov/cgi-bin/legp604.exe?221+OTH+SB772FS1122+PDF)

[50] QUALTRICS. (2023, AUGUST 14.) SAMPLE SIZE CALCULATOR. [HTTPS://WWW.QUALTRICS.COM/BLOG/CALCULATING-SAMPLE-SIZE/](https://www.qualtrics.com/blog/calculating-sample-size/)

[51] FOR MORE INFORMATION ON PAST-YEAR CANNABIS CONSUMERS ACROSS THE STATE, PLEASE REFER TO THE DATA IN APPENDICES B AND C.

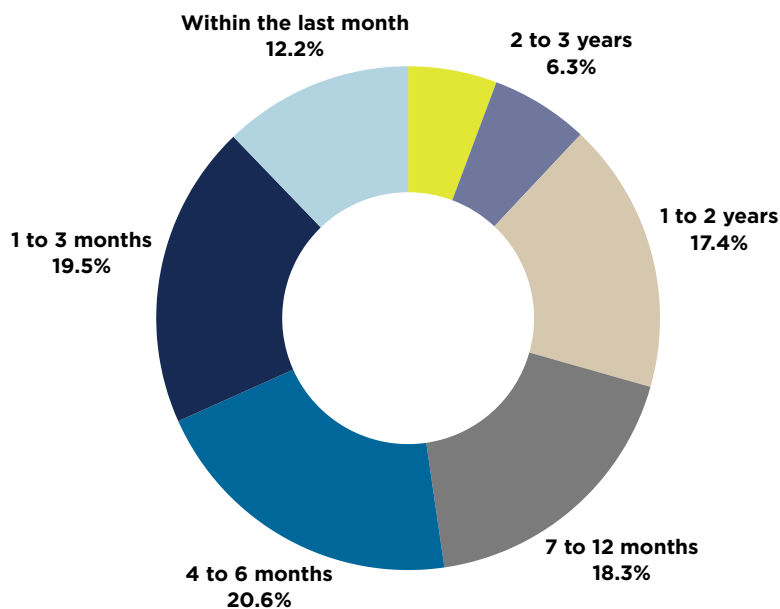
[52] QUALTRICS. (N.D.) UNLOCK BREAKTHROUGH INSIGHTS WITH MARKET RESEARCH PANELS. RETRIEVED NOVEMBER 16, 2023, FROM [HTTPS://WWW.QUALTRICS.COM/RESEARCH-SERVICES/ONLINE-SAMPLE](https://www.qualtrics.com/research-services/online-sample)

# 6.0 MEDICAL CANNABIS PATIENT OVERVIEW

## 6.1 Patient Characteristics

After data cleaning procedures, 476 (26.1%) respondents who qualified for this study reported being certified as a medical cannabis patient in the state of Virginia. Data presented in Section 4 will focus solely on these consumers who are certified medical cannabis patients, unless otherwise specified. Of medical cannabis patients in this sample, most (70.6%) reported that they became certified as a medical cannabis patient in Virginia

within the past 12 months and 29.4% reported that they became certified over one year ago. Please refer to Figure 5 for more detailed information.



**Figure 5. Length of Time as a Certified Medical Cannabis Patient.**

Beginning in 2018, medical cannabis patients were required to register with the Virginia Board of Pharmacy in addition to receiving a physician's recommendation for medical cannabis. In 2022, the Virginia General Assembly eliminated this requirement for certified patients to register with the Virginia Board of Pharmacy.<sup>53</sup> Since this registration with the Board of Pharmacy is currently optional for patients, we asked medical patients whether they are actively registered (i.e., have an active registration card) with the Board of Pharmacy. In this sample, 80% of medical patients indicated that they do have a registration card from the Board of Pharmacy. Ten percent indicated that they do not have a registration card, and the remaining 10% indicated that they do not know if they have a registration card from the Board of Pharmacy. Most individuals who reported that

hey do have a registration card from the Board of Pharmacy reported that they have been a medical patient for 2 years or less, suggesting that individuals may not be aware that the requirement to register with the Board of Pharmacy has been removed.

## 6.2 Factors Preventing Cannabis Consumers from Obtaining a Written Certification for the Use of Medical Cannabis

The remainder of the total sample (N) who indicated that they are not a certified medical patient were asked whether they have ever considered obtaining a written certification for medical cannabis. Of these respondents, 63% indicated that they have considered obtaining a written certification at some point. These respondents were then presented with a follow-up question inquiring about factors that may have prevented them from pursuing obtaining a written certification for medical cannabis. Nearly half (48%) of these respondents reported that they did not know how to obtain a medical certification, and many others (35%) also indicated that obtaining a certification would be too costly for them. Twenty-two percent indicated that they already have access to cannabis and therefore do not need a certification for medical cannabis, 15% said they do not believe they would qualify for a certification, and 12% indicated that they do not have transportation to obtain a written certification. Only 1% of these respondents reported that they have no interest in obtaining a written certification. Seven percent reported that they plan to obtain a written certification in the future.

### Proxy Variable #1

22% of the total population sample indicated that they already had access to cannabis, and therefore did not need to obtain a medical certification.

Some respondents opted to select the “other” response option for this question and provide a text response explaining factors that have prevented them from obtaining a written certification. Several participants wrote that the cost of the entire process is too high for them—specifically the costs of the appointment with a physician, registration for a medical card, and renewal fees altogether. Several other participants specified that their employment prevents them from obtaining a medical certification, or that they would not be able to obtain a certification due to their current prescription medications.



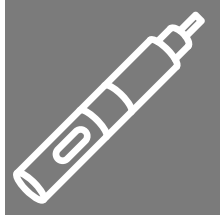

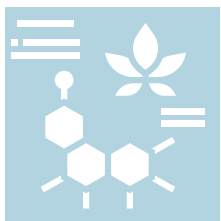

[53] [HTTPS://WWW.CCA.VIRGINIA.GOV/FAQS/GENERAL\\_INFORMATION?LANGUAGE\\_CONTENT\\_ENTITY=EN#PANEL-3](https://www.cca.virginia.gov/faqs/general_information?language_content_entity=en#panel-3)

### **6.3 Cannabis Consumption Patterns Among Medical Patients**

Fifty-three percent of medical cannabis patients in this sample reported that they consume cannabis daily or almost daily, and 30% consume cannabis once or twice per week. These figures are similar to national data from medical patients in other states with medical cannabis use only, in which 57% report consuming cannabis daily or almost daily, and 23% report consuming cannabis once or twice per week. When examining days of cannabis use by product type, medical patients in this sample consumed flower products an average of 15 days within the past month, 9 days for edible and vape products, and 8 days for concentrate products. Based on these data, patients in this sample consume each type of cannabis product significantly more often than those who do not have a medical certification. On average, certified medical patients also reported consuming products with significantly higher THC and CBD potency compared to non-medical patients. Please refer to Table 5 for more detailed information.

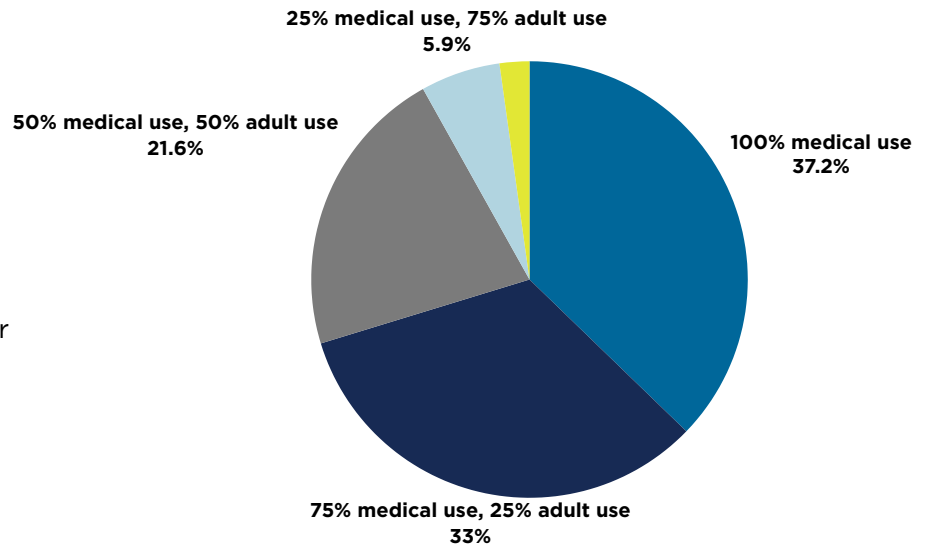


**Table 5. Comparison of Consumption Patterns (Days in the Last Month) Among Certified Medical Cannabis Patients and Non-Medical Patients.**

	PATIENTS	NON-PATIENTS
 FLOWER 15 DAYS	15 DAYS	12 DAYS
 EDIBLES 9 DAYS	9 DAYS	4 DAYS
 VAPE 9 DAYS	9 DAYS	5 DAYS
 CONCENTRATES 8 DAYS	8 DAYS	3 DAYS
 AVG THC POTENCY 52%	52%	48%
 AVG CBD POTENCY 45%	45%	34%

When examining purposes for cannabis consumption among certified medical cannabis patients, 37% reported that they consume cannabis exclusively for medical purposes and 92% reported that at least 50% of their cannabis consumption is for medical purposes. This finding suggests that individuals who consume and purchase medical cannabis products are doing so for medical purposes, as intended by the legislation. However, these findings are lower than what is observed in other states. When compared to national data, medical patients in New Mexico report that 42% of their cannabis use is exclusively for medical purposes and 69% of medical patients in Maryland report that their cannabis use is exclusively for medical purposes. For more detailed breakdown on reasons for use, please refer to Figure 6.

**Figure 6. Percentage of Cannabis Consumed for Medical Versus Adult Use Purposes Among Certified Medical Patients.**



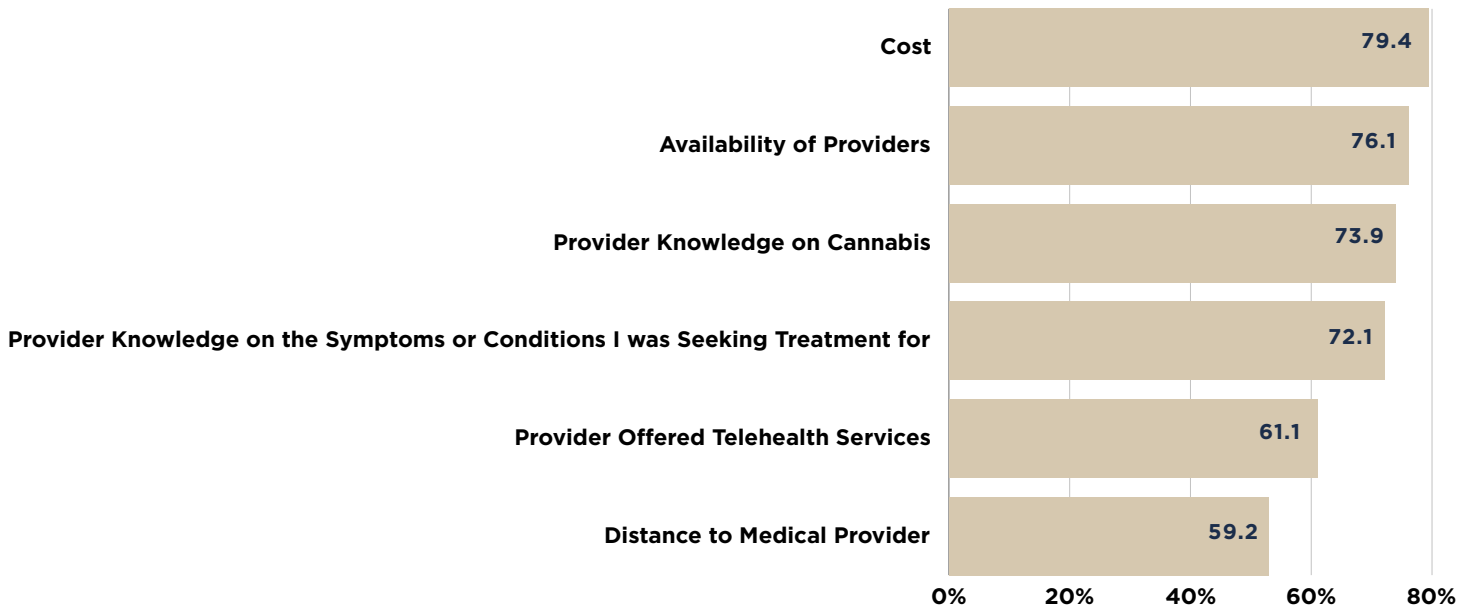
#### 6.4 Medical Provider and Medical Dispensary Interactions

Patients in this survey were asked how they chose a medical provider to certify them for the use of medical cannabis. Fifty-seven percent reported that they spoke with their primary care provider, 30% reported that they found a provider through an online search, 10.5% reported that they received a recommendation from a friend, patient, or social worker, and 2.7% reported that they found a provider another way. Of these patients who indicated “other,” nearly all reported that they were referred to a medical cannabis provider by a specialist physician (e.g., neurologist).

When asked which factors were most important when choosing a provider to recommend medical cannabis to them, most patients (79.4%) rated cost as the most important factor, followed closely by availability of the provider (76.1%), provider knowledge about cannabis (73.9%), and provider knowledge about the condition(s) or symptom(s) they were seeking treatment for (72.1%). Based on these findings, the importance of cost, availability, and a medical provider’s knowledge outweighs other factors such as the offering of telehealth services and convenience (distance).

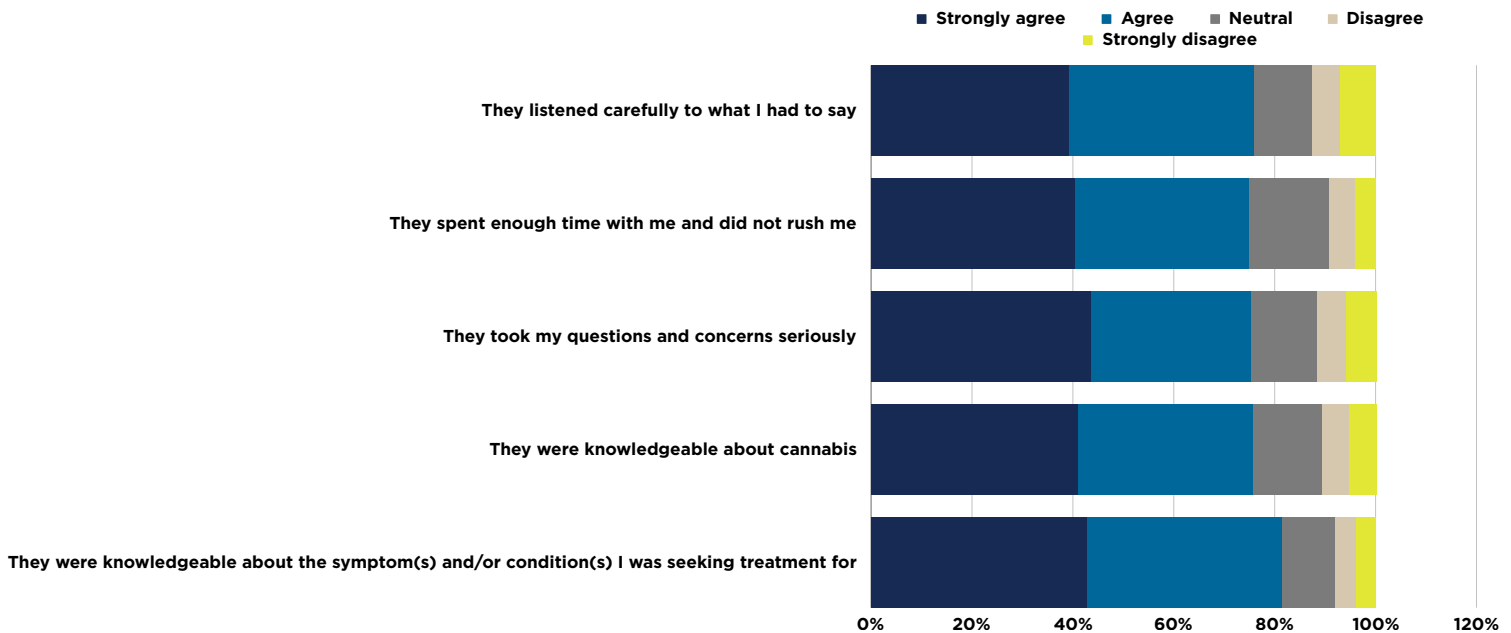
Only about 30% of patients indicated that they met with a practitioner via a telehealth appointment, further suggesting that the offering of telehealth appointments does not appear to be a meaningful factor among patients in this sample. This information can be found in Figure 7 below.

**Figure 7. Factors Influencing Patients' Decision When Choosing a Provider to Certify Them for Medical Cannabis.**



Patients were, on average, neutral about the difficulty of the medical cannabis certification process. Provided a scale of 1 (extremely easy) to 10 (extremely difficult), patients rated the process of finding a medical provider to certify them for medical cannabis at 5 out of 10, on average. Nevertheless, most reported a high level of satisfaction with the medical provider who certified them for the use of medical cannabis (80.9% reported that they were at least somewhat satisfied). Over 75% of patients reported that their medical provider listened carefully to what they had to say, spent enough time with them during their appointment, took their concerns seriously, were knowledgeable about cannabis, and were knowledgeable about the symptom(s) or condition(s) they were seeking treatment for. Please refer to Figure 8 on the following page for more detailed information.

**Figure 8. Patient Experiences with the Medical Provider Who Certified Them for Medical Cannabis.**



Patients reported similar levels of satisfaction when asked about their experiences with medical dispensary employees. Seventy-nine percent reported that medical dispensary employees provide useful recommendations for medical cannabis products, 78% reported that medical dispensary employees are helpful when answering questions about medical cannabis, and 80% reported that medical dispensary employees are knowledgeable about medical cannabis. When instructed to rank their likelihood of consulting a variety of sources with questions they have about cannabis, patients reported that they are most likely to consult a doctor or other medical provider, followed by the dispensary pharmacist on duty, with their questions. See Table 6 for more information.

**Table 6. Sources Patients Are Most Likely to Consult with Their Questions About Cannabis, In Order from Most Likely to Least**

1	A doctor/medical provider.
2	The dispensary pharmacist on duty.
3	A medical dispensary employee (budtender).
4	Online search.
5	A friend or family member.
6	The Virginia Cannabis Control Authority.

## 6.5 Accessibility and Barriers to Obtain Medical Cannabis

In an effort to better understand the potential access challenges medical cannabis patients may face, they were presented with a series of questions inquiring about their satisfaction with dispensaries near them and barriers they have faced when accessing medical cannabis. Tables 10 and 11 present findings from these questions across the full medical patient sample, as well as separated by individual HSAs.

The most common barrier reported by participants was the cost of cannabis products. Those in HSA I reported the greatest barriers related to cost (75% of participants), followed closely by HSA II (72% of participants). Those in HSA V had the lowest reporting of cost as a barrier (60%). Despite the overall high reporting of cost as a barrier, over half of participants in each HSA reported that they are moderately to highly satisfied with the pricing of medical cannabis products. Altogether, these data indicate that although the price of cannabis has been a barrier for many people, this does not directly lead to overall dissatisfaction with cannabis prices. Nearly three-quarters of participants in each HSA reported that they are moderately to highly satisfied with the quality of the cannabis they purchase; therefore, it may be that individuals are more willing to pay more if they perceive the quality of the cannabis they purchase to be high or higher than average. Upon further analysis, individuals who reported higher satisfaction with the quality of cannabis they purchase were also statistically significantly more likely to report that cost has been less of a barrier for them when purchasing medical cannabis, further supporting this hypothesis.

### Proxy Variable #2

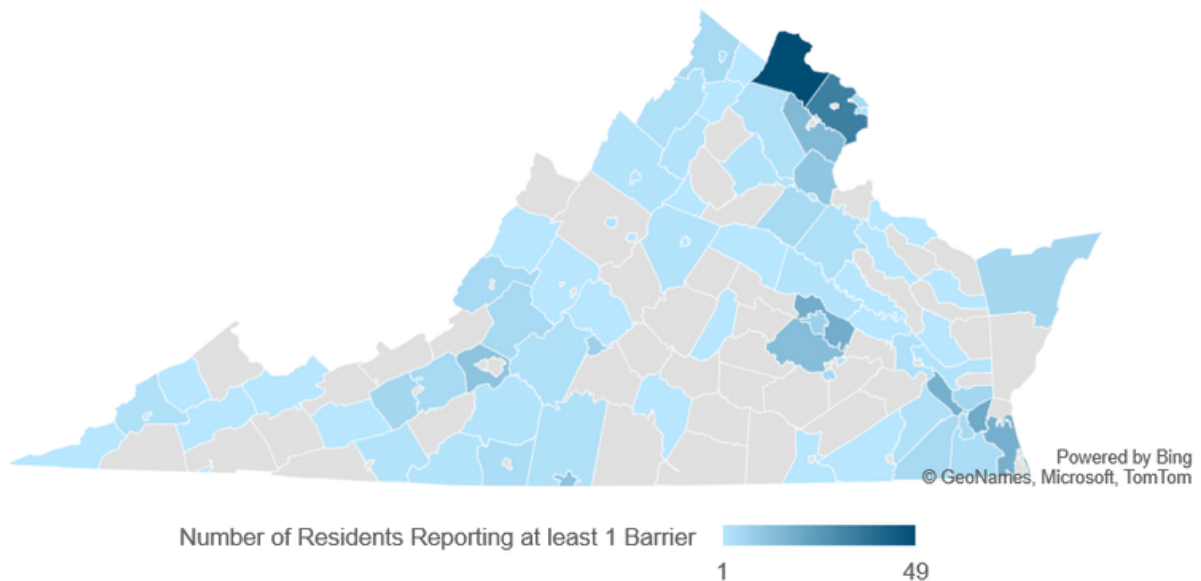
Over half of participants in each HSA reported that the cost of cannabis products has been a barrier for them when accessing medical cannabis (66%).

### Proxy Variable #3

Despite price being listed as the highest barrier for accessing cannabis products from regulated dispensaries, patients are satisfied with the quality of the products.

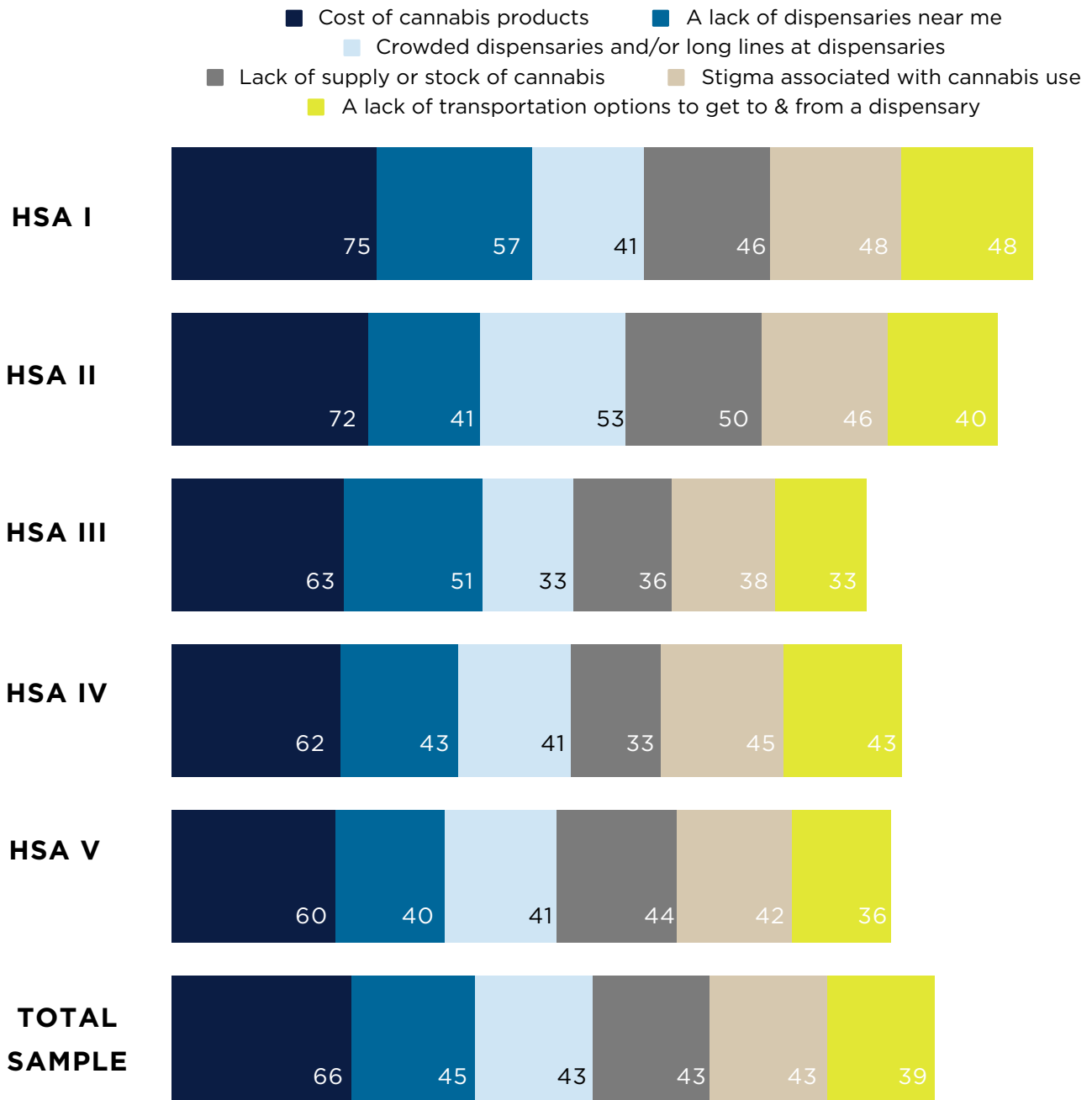
Those in HSA I reported experiencing more barriers to access cannabis compared to those in other HSAs. Ninety-two percent of those in HSA I reported experiencing at least one barrier. The most notable barriers were for the cost of cannabis, a lack of dispensaries near them, and a lack of transportation to get to and from dispensaries. Considering that there are no Pharmaceutical Processors and regulated dispensaries in this region, these findings are sensible. Aside from price, however, most participants in this region reported moderate to high satisfaction with the quality, supply, and variety of cannabis products available near them, as shown in Figure 11 on page 55. Participants in HSA I also reported the highest ratings of satisfaction for the availability of cannabis strains near them, compared to those in other regions. Figure 9 provides a heat map of patients reporting at least one barrier to access cannabis by county. Figure 10 provides a more detailed breakdown of the reported barriers for each HSA.

**Figure 9. Number of Patients Reporting at Least One Barrier to Access Cannabis, by County.**





**Figure 10. Percent of Participants Reporting Barriers When Accessing Medical Cannabis, Among the Total Sample and Separated by HSA.**

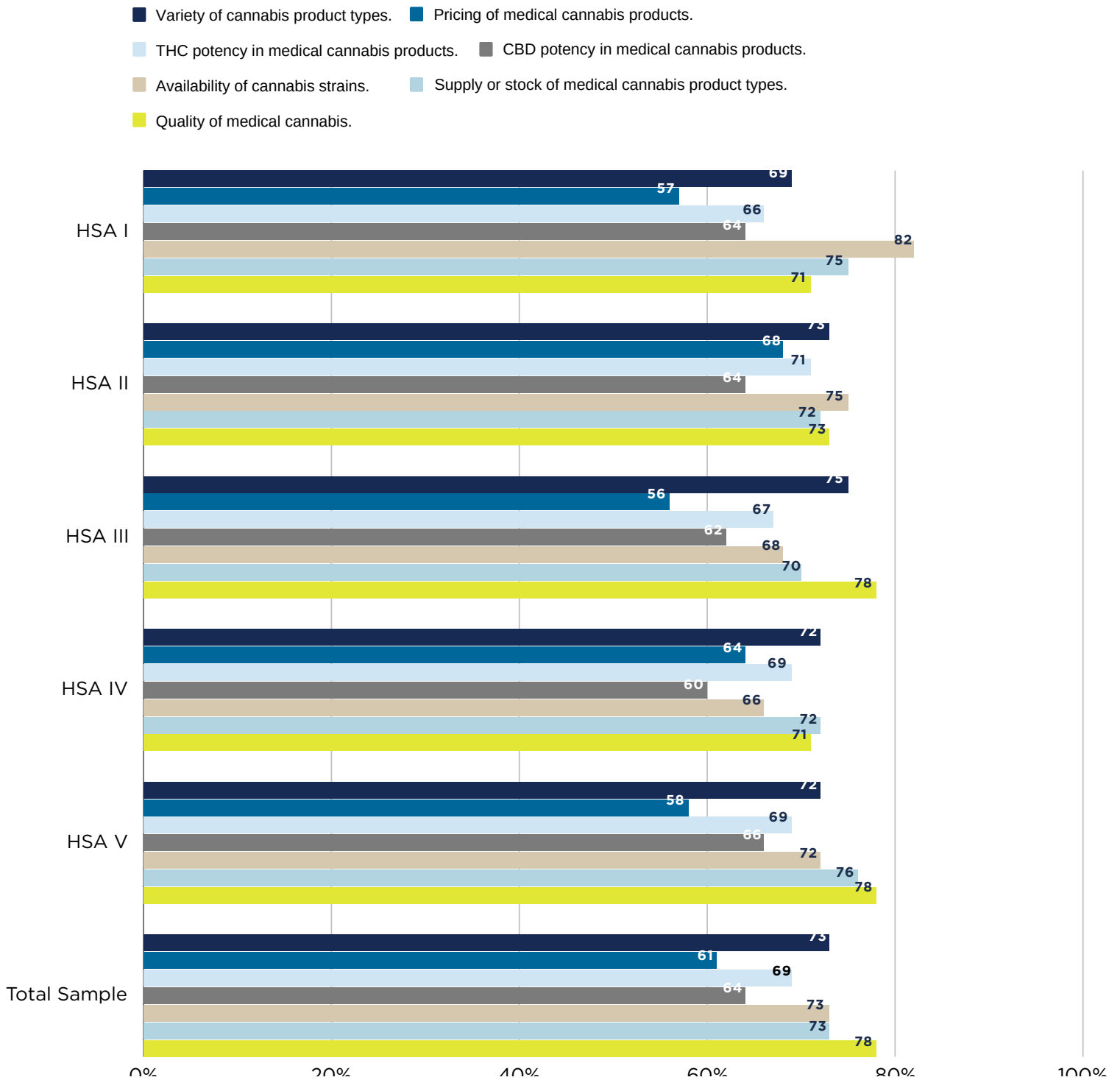


Across all regions in Virginia, those who reported lower satisfaction ratings overall were significantly more likely to report that most of the cannabis they obtained within the past month was from a dealer source, given or gifted to them for free, or was purchased from friends and family. These findings suggest that many of those reporting poor experiences with regulated medical dispensaries are more likely to choose to obtain cannabis outside of the regulated market.

**Proxy  
Variable #4**

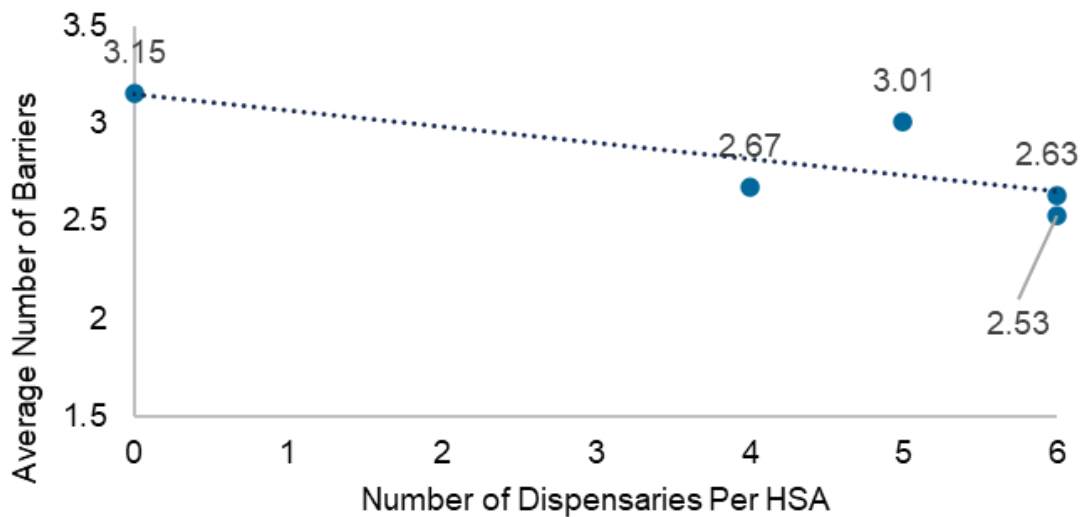
Patients who reported lower satisfaction with the accessibility of medical cannabis were more likely to report obtaining cannabis from sources other than a dispensary.

**Figure 11. Percent of Moderate to High Satisfaction Ratings for a Variety of Dispensary Factors, Among the Total Sample and Separated by HSA.**



At the time of writing this report, each Pharmaceutical Processor is allowed a maximum of six dispensing locations per HSA. For the following analyses, data was separated into categories by the number of dispensaries per region.<sup>54</sup> The number of regulated medical dispensaries within each HSA are as follows: HSA I = 0, HSA II = 5, HSA III = 6, HSA IV = 4, HSA V = 6.<sup>55</sup>

**Figure 12. Average Number of Reported Barriers to Access Cannabis, by Number of Dispensaries Per HSA.**



The analysis in Figure 12 shows that patients in HSAs with more dispensaries generally reported fewer barriers to accessing medical cannabis than patients in HSAs with less dispensaries.

**Proxy  
Variable #5**

Patients in HSAs with more dispensaries generally reported fewer barriers to accessing medical cannabis overall.

[54] BOARD OF PHARMACY. (N.D.). PHARMACEUTICAL PROCESSORS - MEDICAL CANNABIS. VIRGINIA DEPARTMENT OF HEALTH PROFESSIONS. RETRIEVED NOVEMBER 16, 2023, FROM [HTTPS://WWW.DHP.VIRGINIA.GOV/PHARMACY/PHARMACEUTICALPROCESSING/](https://www.dhp.virginia.gov/pharmacy/pharmaceuticalprocessing/)

[55] BOARD OF PHARMACY. (N.D.) MEDICAL CANNABIS DISPENSARY LOCATIONS. VIRGINIA DEPARTMENT OF HEALTH PROFESSIONS. RETRIEVED NOVEMBER 16, 2023, FROM [HTTPS://WWW.DHP.VIRGINIA.GOV/PHARMACY/PHARMACEUTICALPROCESSING/DOCS/DISPENSINGLOCATIONS.PDF](https://www.dhp.virginia.gov/pharmacy/pharmaceuticalprocessing/docs/dispensinglocations.pdf)

# 7.0 MEDICAL CANNABIS PATIENT PURCHASING BEHAVIOR AND DEMAND

## 7.1 Patient Purchasing Behavior

Medical patients in this survey were presented with a series of questions inquiring about details of their most recent transaction when purchasing cannabis from a regulated dispensary. This task was modified from a series of purchasing questions in the International Cannabis Policy Study.<sup>56</sup> Participants were first prompted to choose when their most recent transaction occurred (within the past week, month, year, over a year ago, or never) for each cannabis product type (flower, edibles, vape, concentrates). If participants reported that their most recent purchase for each given product type occurred within the past year, they were presented with follow-up questions inquiring about the total amount (grams or milligrams), average potency, and amount they paid (in dollars) for the cannabis they purchased in that transaction.<sup>57, 58</sup>

- Flower products. During their most recent transaction of flower cannabis products within the past year, patients reported purchasing a total of 4.2 grams of cannabis. The average cost of this transaction was \$82. (Figure 13)
- Vape products. During their most recent transaction of vape cannabis products within the past year, patients reported purchasing a total of 2.9 grams of cannabis. The average cost of this transaction was \$153. (Figure 14)
- Edible products. During their most recent transaction of edible cannabis products within the past year, patients reported purchasing three units and/or packages of edible products. The average cost of this transaction was \$104. Sixty percent of patients reported purchasing more than one type of edible product during this

[56] HAMMOND, D., GOODMAN, S., WADSWORTH, E., ABRAMOVICI, H., ACTON, R., CARNIDE, N., CHAITON, M., CHAN, G., DILLEY, J., DRIEZEN, P., FREEMAN, T., GREAVES, L., HALL, W., HEMSING, N., HOBIN, E., KAUFMAN, P., MAHAMAD, S., OWUSU-BEMPAH, A., PORATH, A., ... WILKINS, C. (2022, AUGUST). INTERNATIONAL CANNABIS POLICY STUDY SURVEY. UNIVERSITY OF WATERLOO SCHOOL OF PUBLIC HEALTH SCIENCES. [1] [BOARD OF PHARMACY, \(N.D.\), PHARMACEUTICAL PROCESSORS - MEDICAL CANNABIS, VIRGINIA DEPARTMENT OF HEALTH PROFESSIONS. RETRIEVED NOVEMBER 16, 2023, FROM](https://www.dhp.virginia.gov/pharmacy/pharmaceuticalprocessing/) [HTTPS://WWW.DHP.VIRGINIA.GOV/PHARMACY/PHARMACEUTICALPROCESSING/](https://www.dhp.virginia.gov/pharmacy/pharmaceuticalprocessing/)

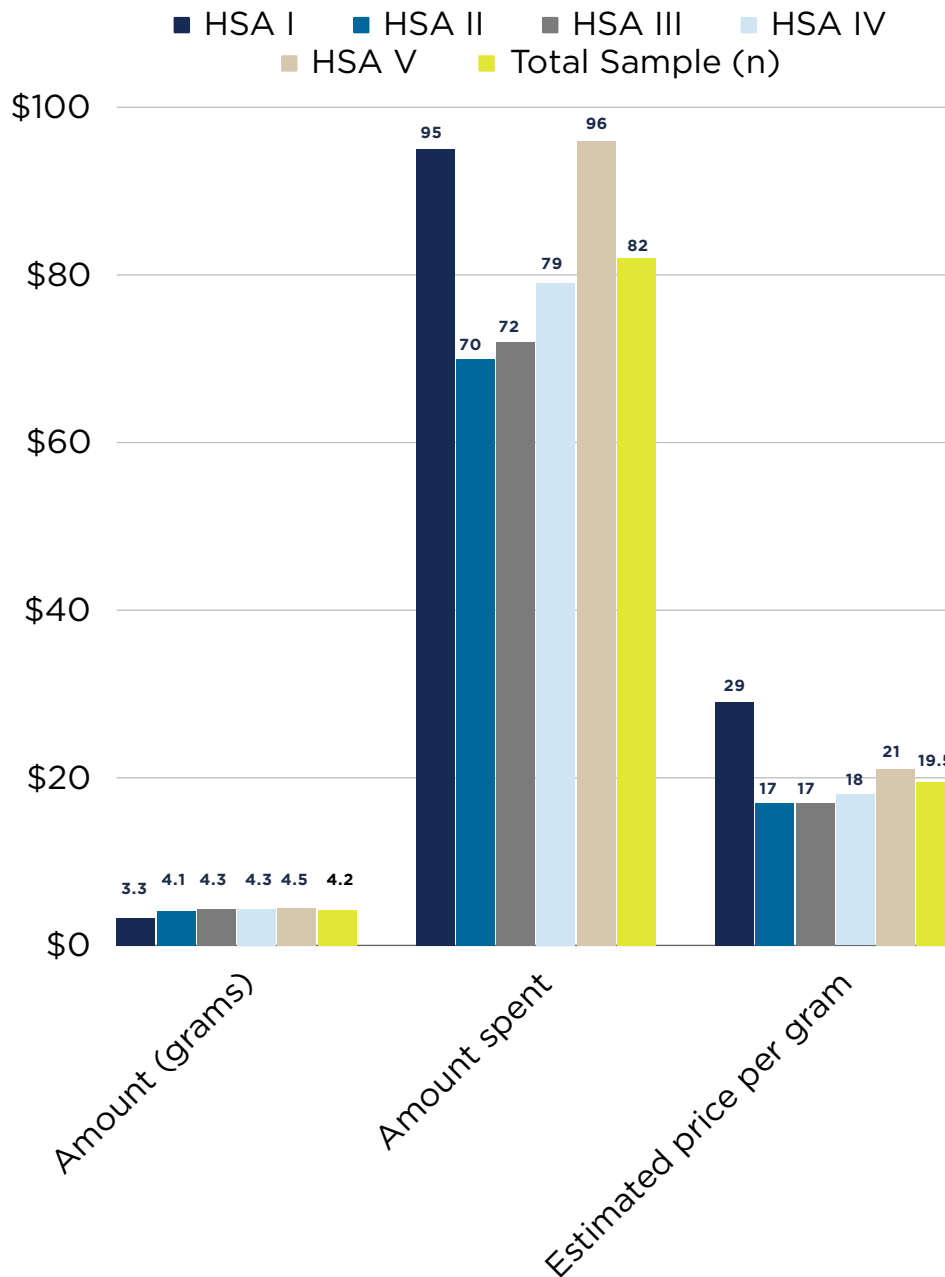
[57] [BOARD OF PHARMACY, \(N.D.\) MEDICAL CANNABIS DISPENSARY LOCATIONS, VIRGINIA DEPARTMENT OF HEALTH PROFESSIONS. RETRIEVED NOVEMBER 16, 2023, FROM](https://www.dhp.virginia.gov/pharmacy/pharmaceuticalprocessing/docs/dispensinglocations.pdf) [HTTPS://WWW.DHP.VIRGINIA.GOV/PHARMACY/PHARMACEUTICALPROCESSING/DOCS/DISPENSINGLOCATIONS.PDF](https://www.dhp.virginia.gov/pharmacy/pharmaceuticalprocessing/docs/dispensinglocations.pdf)

[58] QUESTIONS ASSESSING CANNABIS POTENCY WERE PRESENTED ON A SLIDING BAR FORMAT, FROM 0-100% THC. ONLY THOSE WHO REPORTED PURCHASING CONCENTRATE AND VAPE PRODUCTS WITH 50% THC AND GREATER, OR 40% THC AND LOWER FOR FLOWER PRODUCTS, WERE INCLUDED IN THE ANALYSES. THESE QUALIFICATIONS WERE BASED ON TYPICAL THC POTENCIES OF CANNABIS PRODUCTS AVAILABLE IN REGULATED DISPENSARIES IN VIRGINIA, AS VALIDATED BY DISPENSARY RESEARCH.

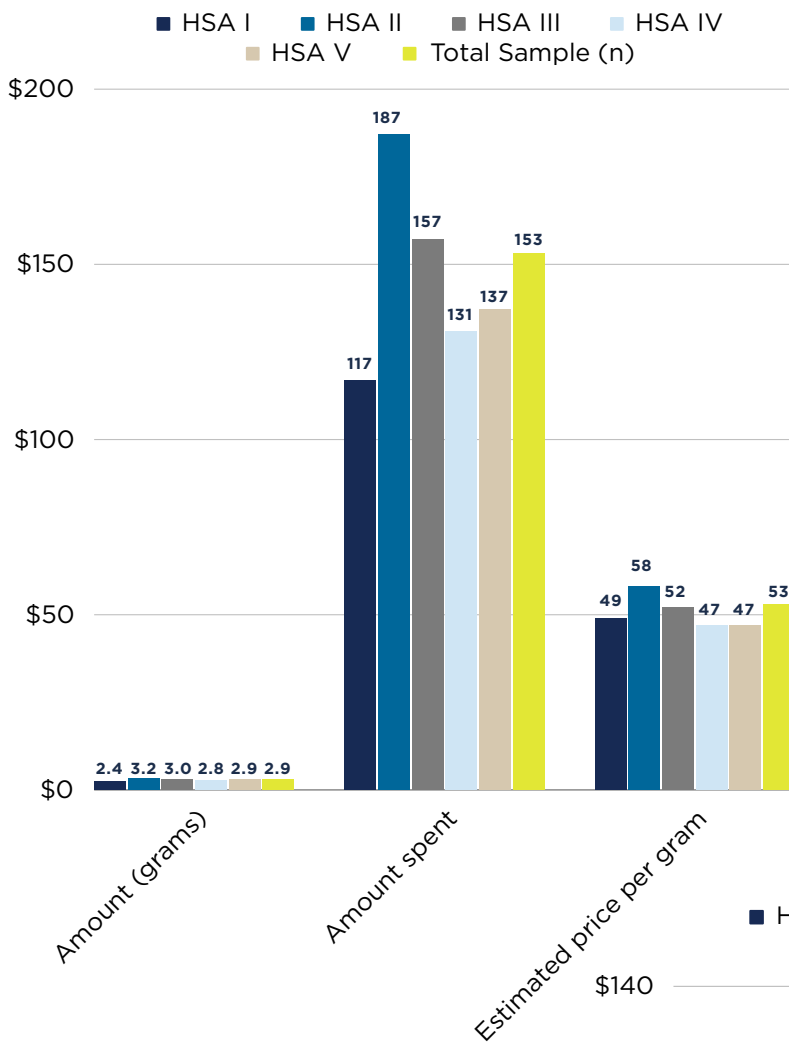
transaction. Forty-eight percent of patients purchased gummy edible products, 29% purchased brownie or other baked goods, 25% purchased chocolates, and 22% purchased candy products. (Figure 15)

- Concentrate products. During their most recent transaction of concentrate cannabis products within the past year, patients reported purchasing a total of 3.5 grams of cannabis. The average cost of this transaction was \$193. (Figure 16)

**Figure 13. Details of Medical Patients Most Recent Purchase of Cannabis Flower, Among the Total Patient Sample and Separated by HSA.**

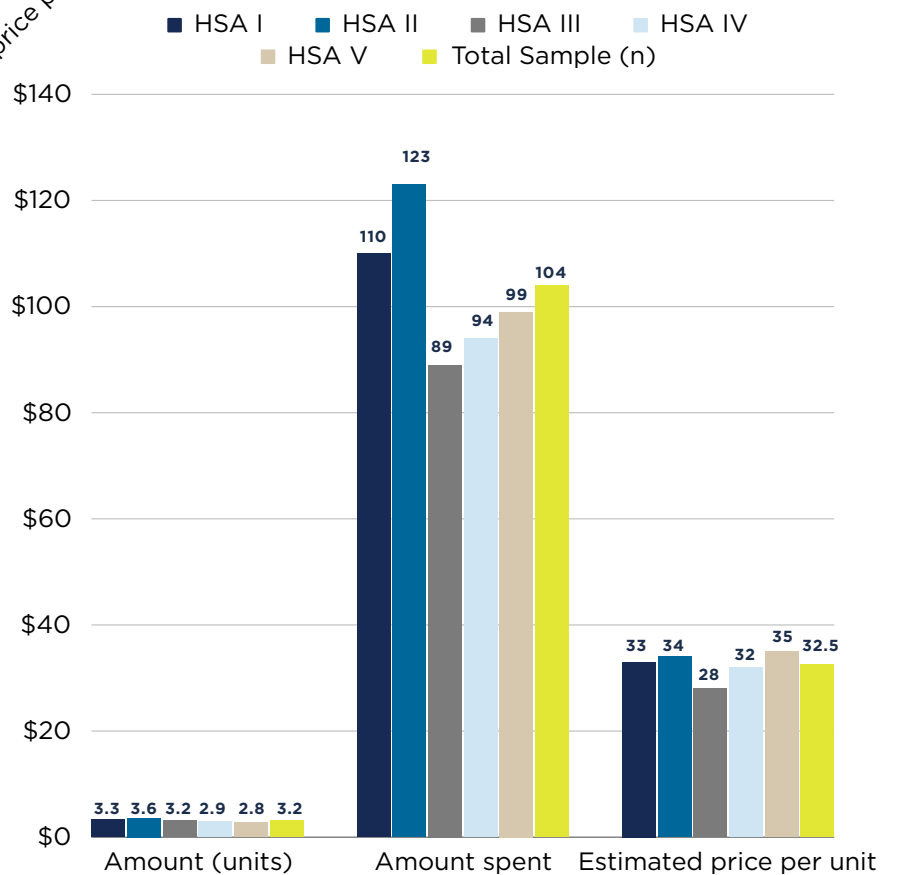




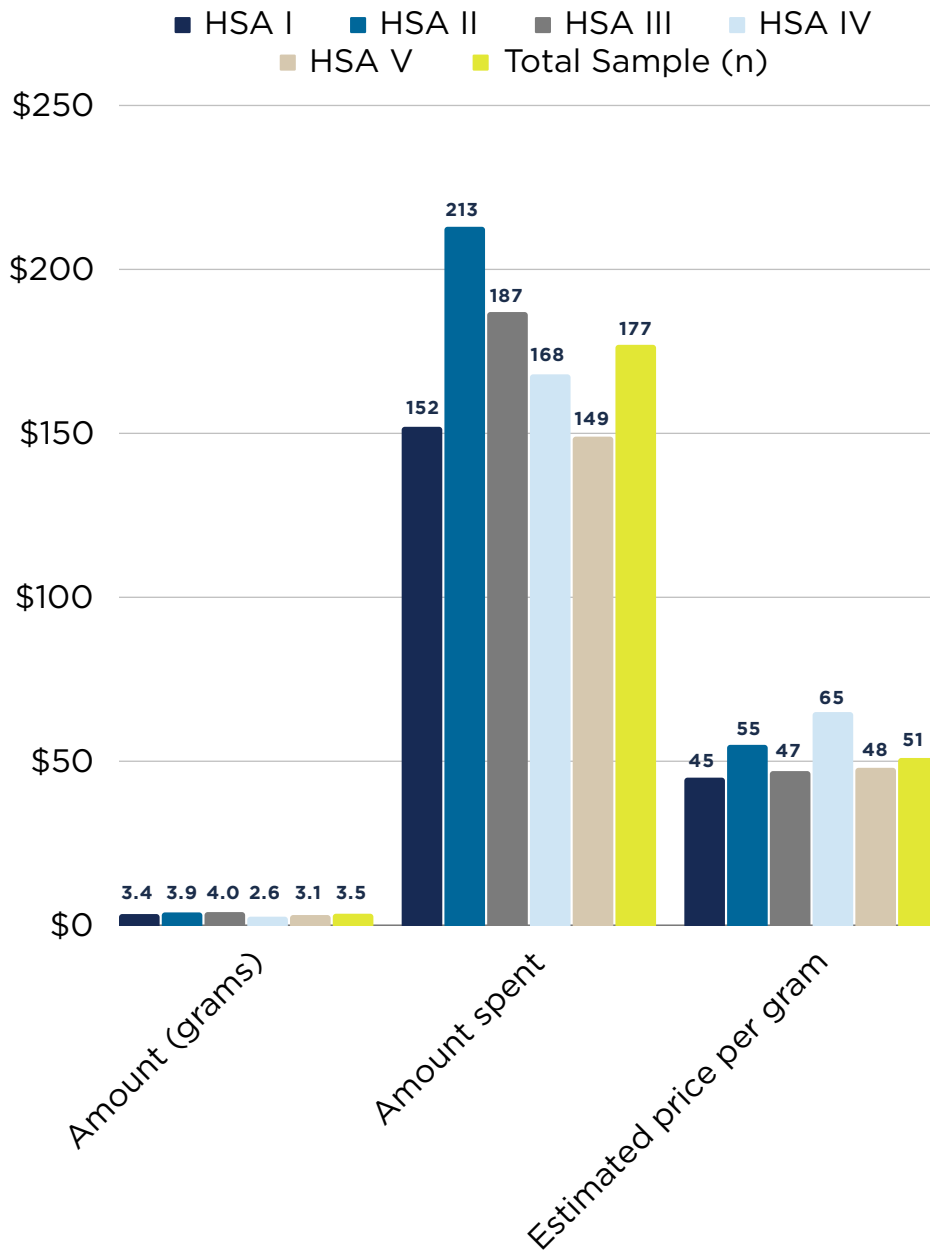


**Figure 14. Details of Medical Patients Most Recent Purchase of Cannabis Vapes, Among the Total Patient Sample and Separated by HSA.**

**Figure 15. Details of Medical Patients Most Recent Purchase of Cannabis Edibles, Among the Total Patient Sample and Separated by HSA.**



**Figure 16. Details of Medical Patients Most Recent Purchase of Cannabis Concentrates, Among the Total Patient Sample and Separated by HSA.**



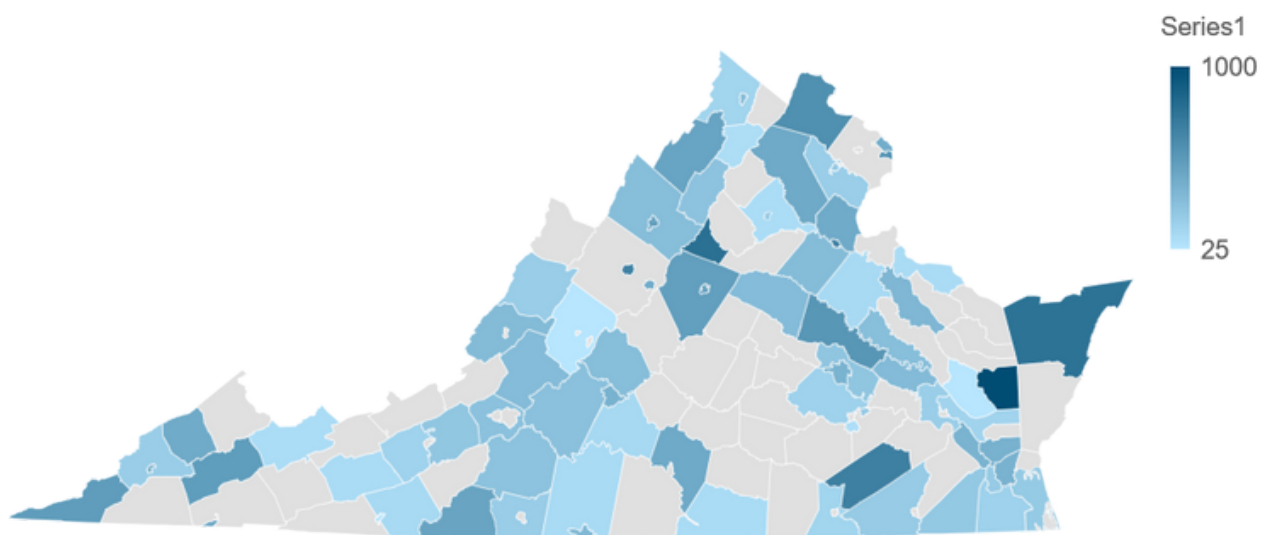
Medical patients in this survey spent a median of \$255 on cannabis within the past month. The remainder of the sample (non-medical patients) spent a median of \$101 on cannabis within the past month, which is statistically significantly lower than past-month spending by medical patients. These figures are also significantly higher when compared to national data. When comparing these findings to national data, medical patients in other states with similar medical cannabis programs spent a median of \$75 on cannabis within the past month. Those in HSA II reported the highest median spending on cannabis within the past month (\$301), followed by HSA I (\$260) and HSA V (\$254) and those in HSA IV reported the lowest median spending on cannabis (\$200).

**Proxy  
Variable #6**

Medical cannabis patients spend more on cannabis than non-medical cannabis patients in Virginia, and medical cannabis patients across the country.

Patients in this survey spent a median of \$255 on cannabis within the past month, which is significantly higher than medical patients in states with similar medical cannabis regulations. The figure below shows provides a heatmap of medical cannabis spending across the state.

**Figure 17. Median Cannabis Spending in the Past Month, Separated by County**



As expected, patients who spent more money on cannabis within the past month also reported consuming cannabis more frequently within the past month. Those who spent more money on cannabis and consumed cannabis more frequently were also more likely to report experiencing more barriers to access cannabis. Upon further examination of the relationship between prevalence of barriers and preferred product types, patients who purchased edible, vape, and concentrate cannabis products within the past six months also reported experiencing a greater number of barriers to access cannabis compared to those who purchased flower products. The most frequently endorsed barrier was expensive prices for cannabis.

**Proxy  
Variable #7**

Medical cannabis patients report spending an average of \$19 per gram of medical cannabis flower, which is higher than the national average.

## 7.2 Medical Cannabis Access

### Retail and Transportation

Among all medical patients, a majority (76.5%) utilize a car to get to and from a dispensary, and 6% walk, use rideshare services or taxi, or take public transportation. Most patients reported that it takes them 30 minutes or less each way to travel to purchase cannabis from a dispensary or other sources, with 21% reporting a travel time of 21-30 minutes, 33% reporting 11-20 minutes, and 22% reporting 5-10 minutes.

Importantly, there were no statistically significant differences in travel times between HSAs. As the question did not specify travel times to a dispensary, the lack of difference across HSAs with multiple dispensaries and those with limited or no dispensary provides additional context into the availability of cannabis locally, despite the volume and proximity of regulated outlets. This, paired with the statistically significant finding that more barriers to access (i.e., lack of dispensaries) increased access of unregulated cannabis suggests that the regulated cannabis has room to expand and compete with other localized markets.

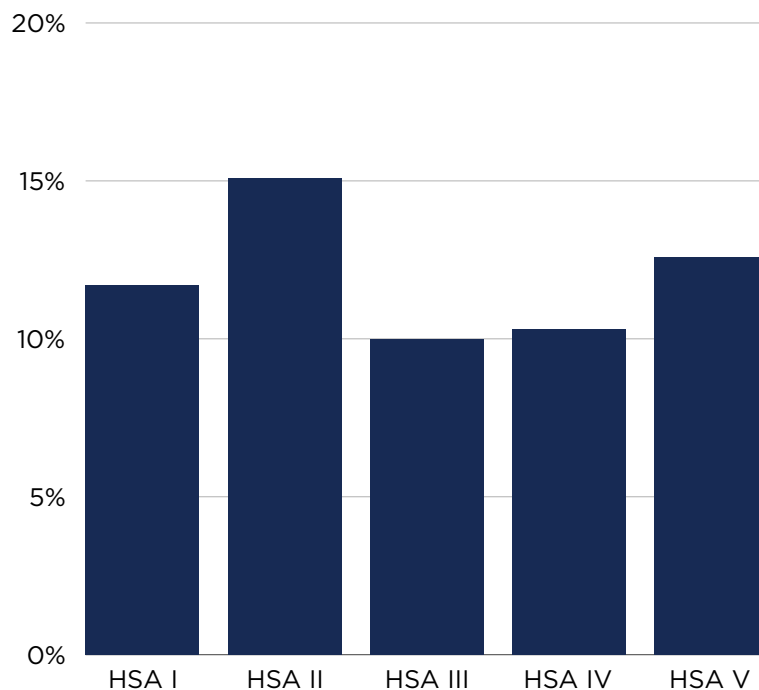
Participants were asked whether they have traveled to a different state or jurisdiction within the past month to purchase cannabis. Twelve percent of medical patients reported that they have traveled to a different state or jurisdiction outside of Virginia in the past month to purchase cannabis. The most common places patients reported traveling to were Washington, DC (16.1%), Colorado (16.1%), West Virginia (10.7%), California (10.7%), and New York (10.7%) as seen in Figure 18.

### Proxy Variable #8

The presence and volume of regulated dispensaries did not influence travel time to access cannabis when looking across all sources of cannabis.

Figure 19 provides a map of the counties in which participants resided who reported traveling out of state to purchase cannabis. Fairfax, Loudoun, Newport News, and Virginia Beach counties had the highest number of respondents who reported traveling out of state to purchase cannabis. Relatedly, participants from HSAs II and HSA V had the highest proportion of patients who traveled out of state among this sample. This stands to reason as HSA II is approximate to Washington, DC.

**Figure 18. Percent of Patients in Each HSA Who Report Traveling Out of State to Purchase Cannabis.**







Non-medical cannabis patients purchased an average of 27.6 grams of cannabis. 5.2 of these grams were purchased from friends and family, 4.6 grams were given or gifted for free, 4.5 grams were purchased from a dealer, and 4.5 grams were obtained from other sources, including the gray market.

Virginia has a thriving gray and unregulated market. While medical patients reported purchasing 10% of their total grams obtained in the past month from a dealer, which is unequivocally illicit, there is a significant portion of patients who report obtaining cannabis from what may be gray market sources. For the purposes of this paper, “gray market” is defined as legally grown or purchased cannabis that is illegally sold or transferred. When Virginia legalized home grow and possession, a new source of legal cannabis was created. Although adults can legally gift up to one ounce of cannabis to other adults, a number of patients reported purchasing cannabis from a friend or family, which is considered unlawful. Patients reported purchasing 11% of their total grams of cannabis obtained in the past month from friends and family, compared to 17% purchased from a medical dispensary. Another possible source of illicit or gray market activity includes pop-up shops, community events, and private unlicensed cannabis clubs.<sup>59, 60</sup>

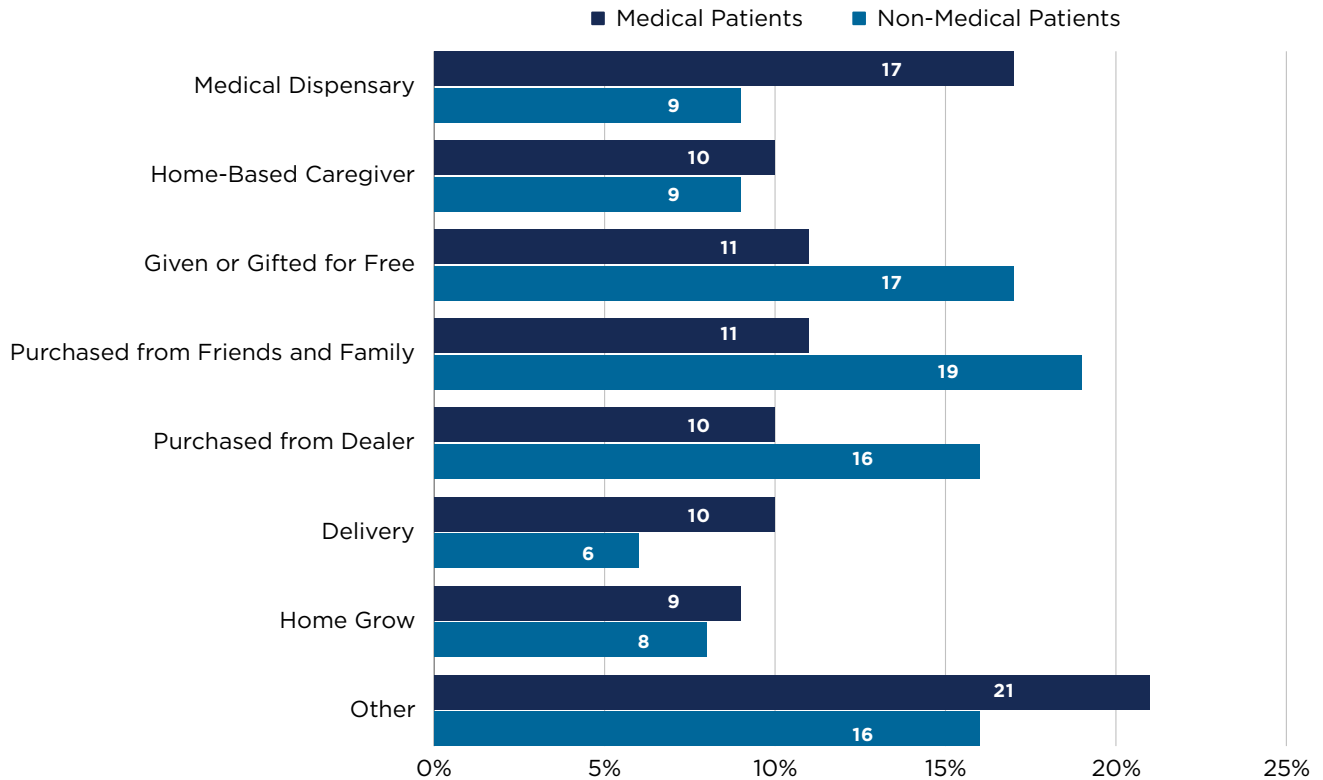
**Proxy  
Variable #10**

Medical patients are diversifying the source of their cannabis, with only 23.6% of their past-month grams sourced from regulated medical cannabis dispensaries.

[59] ELWOOD, K. (2022, AUGUST 26). INSIDE THE 'WILD, WILD, WEST' OF VIRGINIA'S MARIJUANA MARKET. THE WASHINGTON POST. [HTTPS://WWW.WASHINGTONPOST.COM/DC-MD-VA/2022/08/26/VIRGINIA-MARIJUANA-GRAY-MARKET/](https://www.washingtonpost.com/dc-md-va/2022/08/26/virginia-marijuana-gray-market/)

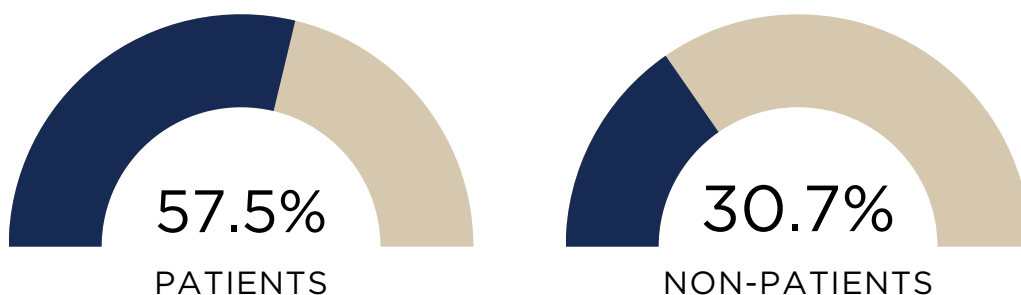
[60] CAMERON, S. (2023, SEPTEMBER 6). CANNABIS-RELATED STORES ARE POPPING UP ACROSS VIRGINIA AMID CONFUSION OVER THE STATE'S MARIJUANA LAWS. CARDINAL NEWS. [HTTPS://CARDINALNEWS.ORG/2023/09/06/CANNABIS-RELATED-STORES-ARE-POPPING-UP-ACROSS-VIRGINIA-AMID-CONFUSION-OVER-THE-STATES-MARIJUANA-LAWS/](https://cardinalnews.org/2023/09/06/cannabis-related-stores-are-popping-up-across-virginia-amid-confusion-over-the-states-marijuana-laws/)

**Figure 20. Percent of Total Grams Obtained in the Past Month Among Medical Patients and Non-Medical Patients.**



The distribution of demand across all sources tells arguably the most important story in this analysis. For one, nearly all medical cannabis patients reported obtaining their cannabis from multiple sources, and among medical cannabis patients reporting obtaining at least .1 gram of cannabis within the past month, only 10% reported obtaining cannabis exclusively from regulated medical cannabis dispensaries or from a medical caregiver. While it is not uncommon for diversification of sources to be observed nationally, the percentage of grams being obtained from the many sources is a deviation from what is expected.

**Figure 21. Percent of Patients and Non-Patients that Cultivate at Home**



The majority of grams of cannabis being obtained by patients are accessed from the “other” category, which as discussed above is likely the unregulated gray market that has become prominent amidst adult-use quasi-legalization. The volume of cannabis being procured from the medical cannabis dispensaries makes up only 17% of total patient grams. Delivery from medical cannabis dispensaries is legal, however, the data does not distinguish whether these delivery purchases were from medical cannabis dispensaries or the growing illicit platforms that have risen to notoriety.<sup>61, 62</sup> As a result of this, we can make a conservative assumption that no less than two-thirds of these purchases are regulated, resulting in approximately 23.6% of cannabis demand being met through regulated dispensaries, which is lower than one would anticipate in a medical market. The remaining cannabis grams are being obtained at a consistent rate across the remaining five sources, including home cultivation.

Figure 21 shows that home cultivation is particularly popular among medical cannabis patients, despite legislation being intended for adult-use purposes.

### Proxy Variable #11

Over half of medical patients (57.5%) reported that they obtained cannabis they grew from home, 26.8% higher than non-patients, suggesting that Virginia’s new home cultivation law has received notable uptake, specifically among medical cannabis patients.

[61] CORDES, J. (2023, FEBRUARY 2). FEDERAL PROSECUTORS CRACK DOWN ON WEED DELIVERY SERVICE IN VIRGINIA AND D.C. ABC 8 NEWS.

[62] KOLENICH, E. (2023, JUNE 9). ILLEGAL MARIJUANA DELIVERY IS FLOURISHING IN RICHMOND — FOR NOW. RICHMOND TIMES-DISPATCH. [HTTPS://RICHMOND.COM/NEWS/STATE-REGIONAL/GOVERNMENT-POLITICS/POT-CANNABIS-RICHMOND-VIRGINIA-MARIJUANA-DELIVERY/ARTICLE\\_3619AA56-FBC9-11ED-8765-A7F2CA1D5E32.HTML](https://richmond.com/news/state-regional/government-politics/pot-cannabis-richmond-virginia-marijuana-delivery/article_3619AA56-FBC9-11ED-8765-A7F2CA1D5E32.HTML)

## Appendix A: Policy Benchmarking

Policy benchmarking research was conducted for select jurisdictions across the country that have legal medical cannabis programs. The information contained in the tables below outlines key similarities and differences between Virginia's medical cannabis market and the markets existing in other states with varying degrees of similarity.

**Table A1: Qualitative Policy Benchmarking**

State	Storefronts	Storefront Cap	Local Bans	Vertical Integration Mandate	Potency Restrictions (THC)	Home Grow	Delivery	Caregivers	HSA Model
FL	603	No	Yes	Yes	Edibles: 10mg/serving 200mg/package	No	Yes	Yes	No
LA	9	30	No	Yes	No	No	Yes	No	No
MS	368	No	No	No	Flower: 30% Non-Flower: 60%	No	No	Yes	No
SD	78	Local	No	No	Edibles: 10mg/serving 200mg/package* (*Excludes tinctures, oils, or capsules)	Yes	No	Yes	No
OH	111	130	Yes	No	Flower: 35% Manufactured Products: 70%	No	No	Yes	No
PA	178	180	Yes	No	No	No	No	Yes	No
VA	22	30	No	Yes	Edibles: 10mg/serving Oils: 10mg/dose	No	Yes	Yes (Agents)	Yes

**Table A2: Quantitative Policy Benchmarking**

State	Registered Patients	Program Enrollment Fee (Annual)	State License Fees	State Taxation (Retail)
<b>FL</b>	846,585	\$75	\$141,000 application, \$1,332,124 renewal	6% sales tax
<b>LA</b>	25,482	Varies*	All Permits: \$100,000 annually	7% sales tax + \$3.50/gram tax stamp
<b>MS</b>	18,000	\$25	Dispensary: \$40,000 first year \$25,000 renewal Micro-Cultivator: \$1,500-2,500 application \$2,000-3,500 renewal Cultivator: \$5,000-60,000 application \$15,000-150,000 renewal Processor: \$15,000 application Transporter: \$5,000 application Testing Facility: \$10,000 application	7% sales tax + local taxes in Jackson/Tupelo
<b>SD</b>	10,914	\$75 + \$20 for home cultivation	\$5,000 application and renewal	4.5% sales tax + up to 2% municipal tax
<b>OH</b>	182,068	\$50	Cultivator: \$2,000-20,000 application \$18,000-180,000 first year \$20,000-200,000 renewal Processor: \$10,000 application, \$90,000 certificate \$100,000 renewal Testing Lab: \$2,000 application, \$18,000 certificate \$20,000 renewal Dispensary: \$5,000 application, \$70,000 certificate \$70,000 renewal (biennial)	5.75% sales tax
<b>PA</b>	430,293	\$50	Grower/Processor: \$10,000 fee, \$200,000 application Dispensary: \$5,000 fee, \$30,000 application	6% sales tax
<b>VA</b>	X	\$50	Pharmaceutical Processors: \$10,000 application \$60,000 permit \$10,000 renewal	5.3% sales tax

Program enrollment fees indicated do not include additional fees that may be charged by a recommending physician. Additionally, license fees listed are for state-provided licenses only. Local licensing may also be required, potentially increasing licensing costs.

\*Louisiana does not use a "registration card" system through the state. Any licensed physician can recommend cannabis, and fees may vary.

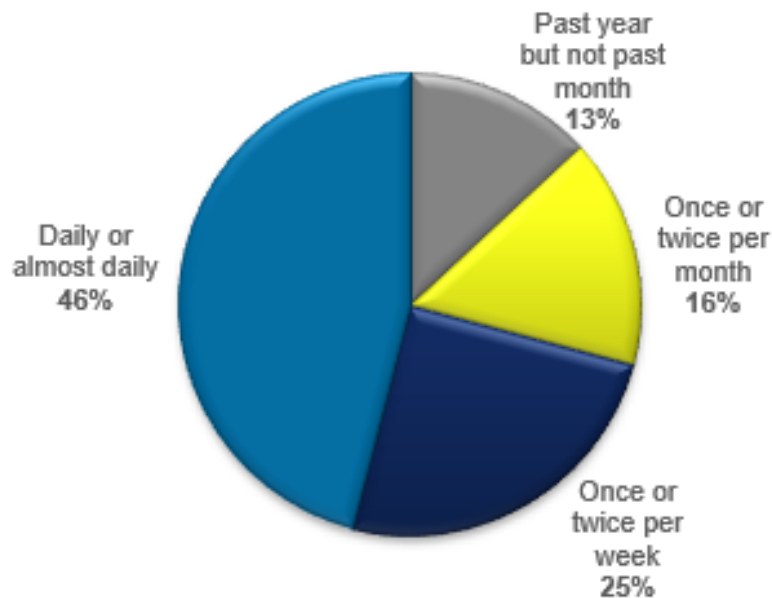
## Appendix B. General Population Findings on Cannabis Consumption

### 1.1. Cannabis Use and Prevalence

To qualify for participation in this study, all respondents must have indicated that they have consumed cannabis within the past year. Eighty-seven percent of participants consumed cannabis at least monthly and 46% consumed cannabis daily or almost daily.

Table B1 summarizes findings from those who reported consuming cannabis products within the past month. Flower products appear to be the most favored method of consumption, with past-month consumers reporting an average of 13 days of use within the past month. Respondents reported consuming edibles, vape, and concentrate products for an average of 5, 6, and 4 days within the past month, respectively. There were few differences in these figures when separated by HSA, indicating that participants in Virginia have consistent cannabis consumption patterns regardless of region. When examining cannabis use patterns among individuals in other U.S. states with similar medical-use cannabis regulations, the data from this sample is similar to the national data. Individuals in this sample had equivalent consumption days for flower products, and consumed edibles, vape, and concentrate products slightly less often than individuals in the national sample. The average age of first use of cannabis among consumers in this sample was 17 years old.

**Figure B1. Cannabis Use Frequency Among Respondents.**



**Table B1. Comparison of Consumption Patterns (Days in the Last Month) Among Total Respondents in Virginia to National Data (From Medical Use–Only States).**

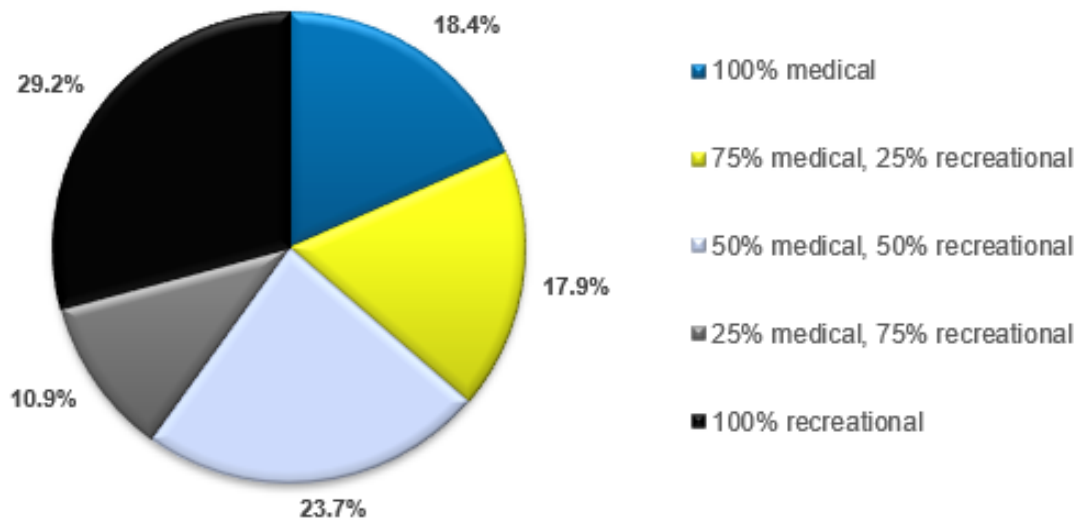
	Flower	Edibles	Vape	Concentrates
Virginia	13 days	5 days	6 days	4 days
National Data	12 days	7 days	7 days	5 days

*The average cannabis potency participants reported consuming within the past month was 50% THC and 40% CBD.*

### 1.2. Medical and Recreational Patterns of Use

Even those who typically consume cannabis for recreational purposes regularly utilize it for medicinal benefits. For this reason, we assessed all past-year cannabis consumers in this study, regardless of whether they were certified medical cannabis patients. For instance, only 29% of consumers in this study indicated that their cannabis use is exclusively for recreational purposes. Approximately 52.5% of consumers indicated that their cannabis use is for a combination of both medicinal and recreational purposes, and around 18% indicated that their cannabis use is exclusively for medical purposes. Please refer to Figure B2 for more detailed information regarding the percentages of medical and recreational cannabis consumption among all respondents sampled in this survey.

**Figure B2. Percentage of Cannabis Consumed for Medical Versus Recreational Purposes Among Total Respondents.**





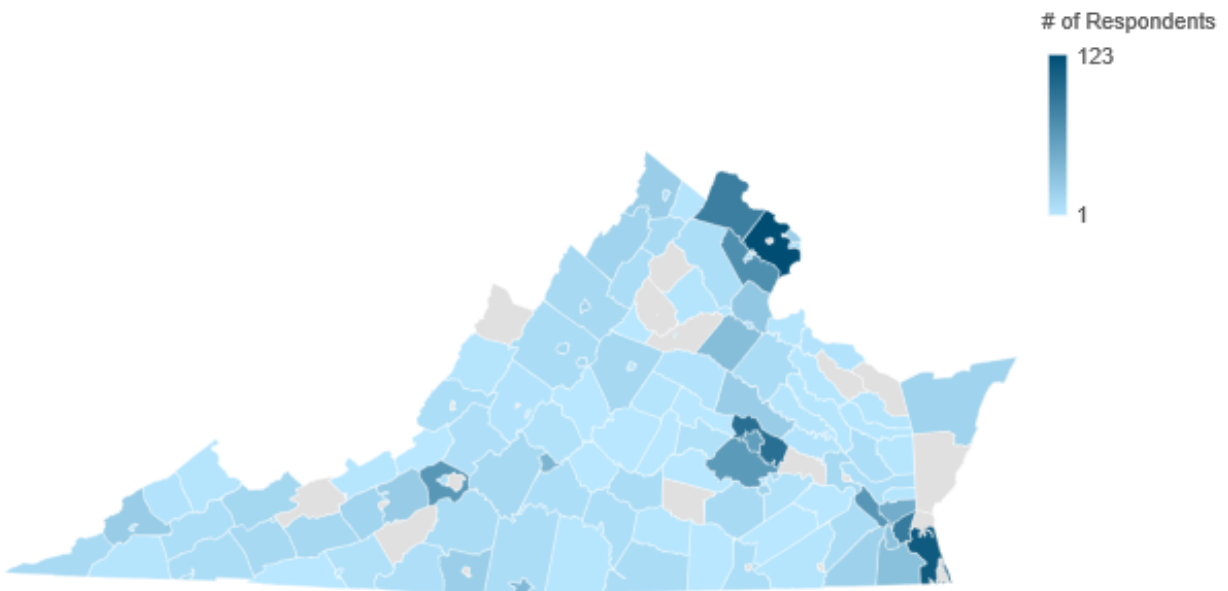
### 1.3. Alternative Cannabinoid Consumption

Frequency of various alternative cannabinoid product use is listed in Table B2. While many of those listed are included and featured in many regulated cannabis products, participants were asked to report use of products that contained a majority of cannabinoids other than Delta-9 THC, which are typically sold in convenience stores, online, and in tobacco shops. The catalogue of alternative cannabinoids is extensive and continuously evolving; although this is not an exhaustive list, it represents the most commonly used products in our most recent surveys. Approximately 64% of those surveyed indicated use of these alternatives at least once in the past, and slightly over one quarter (26%) have used these in the past month. Important to note is that CBD is not known to produce intoxicating effects, and others (e.g., CBN) are considered “mild intoxicants.”

**Table B2. Frequency of Alternative Cannabinoid Consumption Among Respondents.**

Alternative cannabinoid product	I used this in the past month	I used this before, but not in the past month	I've never used this	I don't know if I've ever used this
Delta-8 THC	22%	29%	33%	16%
Delta-8 THCO	10%	20%	47%	23%
Delta-10 THC	12%	22%	45%	21%
THCP	9%	14%	50%	27%
THCV	8%	13%	51%	28%
CBD	26%	40%	22%	12%
CBN	7%	13%	51%	29%
HHC	8%	12%	51%	29%

**Figure B3. Geographic Distribution of Survey Respondents.**



Powered by Bing  
© GeoNames, Microsoft, TomTom

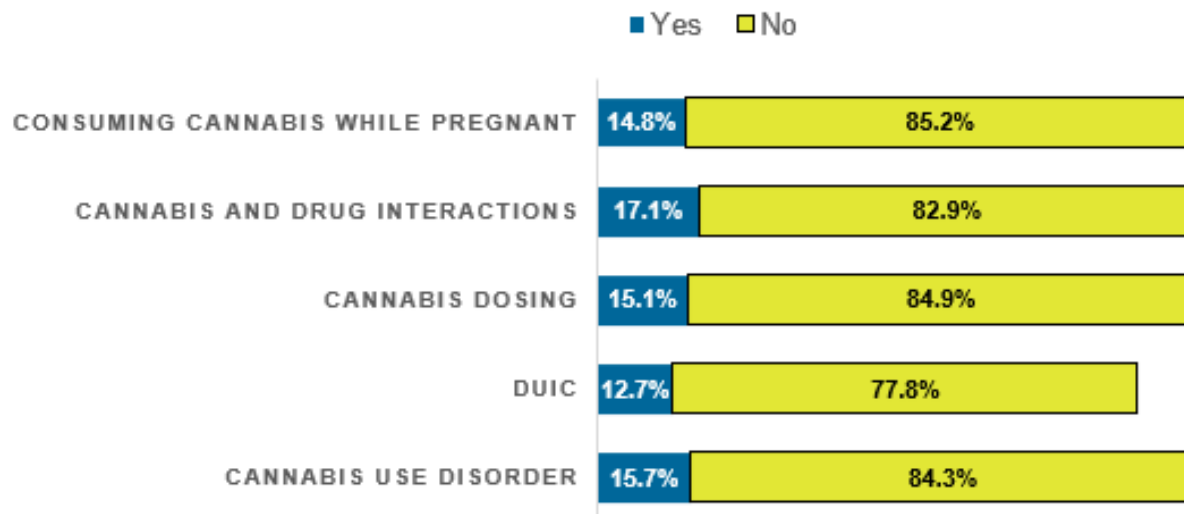
Microsoft product screenshot reprinted with permission from Microsoft Corporation.

## Appendix C. Virginia Cannabis-Related Public Health Outcomes

Data examining a variety of cannabis use outcomes on public health were assessed in this study. On average, participants reported a total of 4.5 driving under the influence of cannabis (DUIC) days within the past month. There was a significant positive correlation between number of DUIC days in the past month and reporting the ability to drive safely with higher levels of cannabis intoxication. In other words, those who reported more DUIC days within the past month also reported feeling that they can still drive safely despite being heavily intoxicated after cannabis consumption. Certified medical patients reported more DUIC days in the past month (5 days) compared to those who were not certified medical patients (4 days); these differences were statistically significant.

Around 70% of participants among the total sample reported that a doctor or medical provider has not provided them with verbal or written information about a variety of cannabis-related health and safety topics, including cannabis dosing, cannabis and drug interactions, and cannabis use disorder. A revised version of the Cannabis Use Disorder Identification Task (CUDIT-SF) was used to assess prevalence of cannabis use disorder (CUD). Fifty percent of participants in this sample met criteria for CUD. However, only 10% reported that they have been diagnosed with CUD from a medical professional. Together, these data indicate that there may be a gap in the discussion of negative outcomes associated with cannabis use between cannabis consumers and medical professionals. Importantly, however, a significantly higher proportion of medical patients reported that a doctor or other medical professional has provided them with cannabis safety and health-related information (around 30% for each health and safety topic), suggesting that there may be more open dialogue about the potential risks associated with cannabis use between medical professionals and medical cannabis patients. This may be attributed to the fact that individuals must receive a certification for the use of medical cannabis from a physician, and therefore have additional opportunities for these discussions compared to those who are not medical patients.

**Figure C1. Percent of Participants Among the Total Sample Reporting That a Medical Provider Has Provided Them with Information About Various Cannabis Safety- and Health-Related Topics.**



**Table C1. Percent of Participants Reporting Experiencing the Following Events Immediately After Cannabis Consumption by HSA.**

	HSA I	HSA II	HSA III	HSA IV	HSA V
Nausea or vomiting	14%	14%	8%	8%	9%
Relief from stress, anxiety, or depression	82%	75%	87%	86%	85%
Headaches or migraines	17%	24%	19%	16%	19%
Elevated anxiety or nervousness	27%	34%	25%	23%	26%
Suicidal thoughts	6%	13%	7%	5%	8%
Delusions or feelings of psychosis	8%	19%	9%	8%	13%
Cannabis-related hospitalization	5%	14%	5%	4%	8%

## Cannabis Package Labeling

A series of questions about participant experiences with cannabis package labeling were included in the survey. It is important that cannabis products contain accurate and detailed package labeling to inform the consumer of the type and potency of cannabinoids present in the product, as well as the amount (grams or milligrams) in the package, among other factors. Among certified medical patients, nearly 51% reported that the cannabis products they purchase always have labels and 39% reported that the cannabis products they purchase sometimes have labels. Positively, only 10% indicated that the products they purchase never have labels. When examining the reported prevalence of cannabis labeling among medical patients who did not travel out of state within the past month to purchase cannabis, these figures are nearly identical, suggesting that most medical cannabis products that are obtained in Virginia include sufficient package labeling. Among respondents who reported that they are not a certified medical patient, 34% reported that the cannabis products never have labels and only 28.5% reported that the products they purchase always have labels. There were no significant differences in the reported prevalence of cannabis package labeling across HSAs among medical patients.

Participants who indicated that the cannabis products they purchase either sometimes or always have labels were prompted with a follow-up question asking them to report information that they specifically look for on cannabis package labeling (please refer to Table C2 for detailed information). Cannabinoids present in the product was most frequently reported by participants, followed by strain, terpenes, grams/amount of the product, and flavor. Only half (50.8%) of patients reported that they specifically look for concentration and/or potency of the cannabis products they purchase.

**Table C2. Responses to the Question, “When Purchasing a Cannabis Product, Do You Specifically Look for the Following Information on the Package Labeling?”**

	Yes	No
<b>Cannabinoids (i.e., THC or CBD)</b>	79.5%	20.5%
<b>Grams and/or amount of the product</b>	69.0%	31.0%
<b>Flavor</b>	66.2%	33.8%
<b>Strain</b>	71.0%	29.0%
<b>Concentration and/or potency</b>	50.8%	49.2%
<b>Ingredients and/or nutritional information</b>	53.3%	46.7%
<b>Testing information</b>	47.9%	52.1%
<b>Producer and/or manufacturing information</b>	41.8%	58.2%
<b>Whether the product is organic</b>	49.5%	50.5%
<b>Terpenes</b>	69.7%	30.3%

## **Appendix D. Letter from Virginia House Health, Welfare and Institutions Committee Requesting this Study**

*Dear Mr. Preiss,*

*As Chair of the House Health, Welfare and Institutions Committee, I request that you consider whether a study by the Cannabis Control Authority is needed regarding the content of SB 1090 (2023), and the necessity and feasibility of adding licenses to the existing medical cannabis program established in VA Code § 54.1-3442. You may want to consider issues such as: the total number of patients per dispensary; the distance and time traveled by patients to access dispensaries; the cost and variety of pharmaceutical cannabis product offerings; and the inclusion of Virginia-based businesses and non-vertically integrated participants in any additional licensing.*

*If you have any recommendations before November 30, 2022, please forward them to the Secretary of Public Safety, the Secretary of Health and Human Resources, the Chair of the Senate Committee on Education and Health, the Chair of the Virginia Cannabis Oversight Commission, and me.*

*Thank you.*

*Sincerely yours,*

*Bobby Orrock*