



Minnesota Department of Health  
Office of Medical Cannabis

## Report on Medical Cannabis Price Study



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## 1.0 Introduction

### 1.1 Project Background

The State of Minnesota (State) is one of 33 states that allow qualifying patients to purchase cannabis for healthcare treatment. Legislation passed in 2014 legalized the sale of cannabis to Minnesotans who are diagnosed with certain medical conditions.

Patients must enroll in the medical cannabis patient registry maintained by the State to be eligible to legally purchase and possess medical cannabis. The annual enrollment fee is \$200; however, a reduced annual fee of \$50 is available for Minnesotans receiving medical assistance, such as:

- MinnesotaCare
- Social Security Disability (SSD)
- Supplemental Security Income (SSI)
- Medicaid/Medical Assistance (MA)

As part of the application process, the patient's qualifying condition (QC) must be certified by a healthcare practitioner as having at least 1 of the 14 QCs listed below. The patient must be reevaluated and have their qualifying medical condition(s) recertified annually by a healthcare practitioner.

- 1 Cancer associated with severe/chronic pain, nausea, severe vomiting, cachexia, or severe wasting
- 2 Glaucoma
- 3 Human immunodeficiency virus/Acquired immunodeficiency syndrome (HIV/AIDS)
- 4 Tourette's syndrome
- 5 Amyotrophic lateral sclerosis (ALS)
- 6 Seizures, including those characteristic of epilepsy
- 7 Severe and persistent muscle spasms, including those characteristic of multiple sclerosis
- 8 Inflammatory bowel disease, including Crohn's disease
- 9 Terminal illness, with a life expectancy of less than one year, if the illness or treatment produces severe/chronic pain, nausea, severe vomiting, cachexia, or severe wasting
- 10 Intractable pain (effective August 1, 2016)
- 11 Post-traumatic stress disorder (effective August 1, 2017)
- 12 Autism (effective August 1, 2018)

13 Obstructive sleep apnea (effective August 1, 2018)

14 Alzheimer's disease (effective August 1, 2019)

According to the January 2020 Medical Cannabis Program Update issued by Minnesota Department of Health (MDH), 18,249 patients were actively enrolled in the patient registry as of December 31, 2019. This was a 27% increase (3,851) over the 14,398 enrollees as of December 27, 2018.

## 1.2 Office of Medical Cannabis (OMC)

OMC was formed in 2014 as a unit within MDH. OMC oversees the State's medical cannabis program to help ensure that patients and medical cannabis manufacturers comply with eligibility requirements, payment requirements, and other legal requirements. The key roles and responsibilities of OMC include<sup>1</sup>:

- Explaining program requirements and therapeutic uses of medical cannabis
- Enrolling and overseeing healthcare practitioners providing treatment to participating patients
- Verifying and enrolling qualifying patients, designated caregivers, parents, legal guardians, and spouses
- Collecting annual registration fees from patients and registered medical cannabis manufacturers
- Examining business and financial affairs, practices, and conditions of registered medical cannabis manufacturers

## 1.3 Registered Medical Cannabis Manufacturers

Two manufacturers, LeafLine Labs (LeafLine) and Minnesota Medical Solutions (MinnMed), were registered on December 1, 2014. The manufacturers are responsible for the cultivation, production, and distribution of medical cannabis in the State. OMC assigned geographical service areas to each manufacturer, and each manufacturer is limited to two distribution facilities, also known as Cannabis Patient Centers (CPCs), per assigned geographical area.

Each manufacturer established four CPCs within the State, for a total of eight CPCs. Registered patients can purchase medical cannabis from any one of these eight CPCs. As of March 2020, MinnMed operates CPCs in Bloomington, Minneapolis, Moorhead, and Rochester; and LeafLine operates CPCs in Eagan, Hibbing, St. Cloud, and St. Paul.

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<sup>1</sup>Office of the Legislative Auditor, Minnesota Department of Health Office of Medical Cannabis – Internal Controls and Compliance Audit of July 2016 through December 2018 (January 2020)

## 1.4 Products Offered in Minnesota and Definitions

Two primary therapeutic cannabinoids— delta-9-tetrahydrocannabinol (THC) and cannabidiol (CBD) —are found in varying ratios in the cannabis plant. THC is the more widely known of the two because of its psychoactive effects, which create a “high” in users. CBD is non-psychoactive (i.e., it does not create a “high”), and might be useful in reducing pain and inflammation, controlling epileptic seizures, and possibly treating mental illness and addictions.

The 2014 legislation that legalized medical marijuana production and sale also limited products to pills or liquids (including oil). All products offered in Minnesota are considered concentrates, which means the marijuana has undergone processing to isolate the desirable properties of cannabis. Minnesota does not allow the sale of flower cannabis, edibles, or other forms of non-liquid concentrates that can be sold in other states.

LeafLine and MinnMed offer a variety of products, including cartridges, syringes, bulk oils, oral suspension solutions, and tinctures. We grouped these products into the following four categories:

1. **Vape Oil:** General term for cannabis concentrate in an oil form that is vaporized.
  - **Cartridge:** Vape oil that has been prefilled into a glass cartridge for vaporization with a battery.
  - **Syringe:** A syringe of cannabis concentrate; similar to a cartridge, except it must be transferred from the syringe to another vaporizing device to be consumed.
  - **Bulk Oil:** Similar to a syringe, bulk oil is cannabis concentrate that is often used as a “refill” for a patient’s vaporizer.
2. **Oral Suspension:** General term for a cannabis concentrate that is consumed orally or sublingually (i.e., not eaten, smoked, or vaporized).
  - **Oral Solution:** Another general term for a cannabis concentrate that is consumed orally.
  - **Sublingual:** Cannabis concentrate that is consumed through absorption under the tongue.
  - **Tincture:** Cannabis concentrate infused with alcohol that can be consumed orally or sublingually.
3. **Capsule:** Cannabis concentrate in pill form.
4. **Topical:** Cannabis concentrate that is applied directly to the body’s surface. This is often in the form of a balm or bar (similar to deodorant).

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## 2.0 Purpose and Scope

### 2.1 Purpose

OMC asked BerryDunn to conduct a study of medical cannabis product prices. The objectives of this study included:

- Documentation of available medical cannabis products and historical prices during the review period (Section 3.1)
- Analysis and documentation of the current prices of sampled medical cannabis products in the states of Colorado, Michigan, New York, Ohio, Pennsylvania, and Washington that are comparable to the medical cannabis products offered in Minnesota (Section 3.2)
- Documentation of discount programs offered during the review period (Section 3.3)
- Documentation of the total number of units sold, sales, discounts applied, and net sales from medical cannabis sales in each quarter during the review period (Section 3.3)
- Calculation of the average amount spent for a 30-day supply of medical cannabis by registered patients (Section 3.4)

### 2.2 Scope

We requested and obtained data containing all sales transactions for all products sold by the two registered manufacturers, LeafLine and MinnMed, from June 2015 to December 2019. However, due to a variety of factors, OMC agreed that the study would include sales data from October 2016 through December 2020.

We also obtained from MDH sales data that the two manufacturers reported to the State. This data was used to verify the sales data from the two manufacturers by cross-referencing patient IDs and medicine IDs, as well as to extract patients' QCs information.

We excluded the sales data of nonmedical products, such as vaporizer kits, batteries, and manufacturers' merchandises. We also excluded the sales data we were not able to verify due to unrecognized patient ID numbers.

MinnMed provides a partial or full refund to patients who return faulty medical products. The refunds are recorded as a modification of the original price. For example, a sale of a \$20 product with a subsequent \$10 refund would be recorded as if the medicine was originally sold for \$10. Including the sales that were modified for refunds would skew the calculation of average price for those products. Additionally, the number of such transactions was not significant; hence, we excluded those transactions from our analysis.

In this study, we categorized medical cannabis products into the four categories mentioned above, and further broke down each category into three classifications of THC:CBD content as described below:

- 
1. THC Dominant – products that contain more THC than CBD
    - a. All THC dominant products LeafLine offered in December 2019 contained more than 95% of THC.
    - b. Of the 23 THC dominant products MinnMed offered in December 2019, four contained 83% of THC, four contained 75% of THC, and the remaining 15 contained more than 95% of THC.
  2. THC=CBD – products that contain the equal amount of THC and CBD
  3. CBD Dominant – products that contain more CBD than THC
    - a. All CBD dominant products LeafLine offered in December 2019 contained more than 95% CBD.
    - b. Of the nine CBD dominant products MinnMed offered in December 2019, one contained 83% of CBD and the other eight contained over 95% of CBD.

## 3.0 Results

### 3.1 Minnesota Medical Cannabis Price Study

In this section, we document the medical cannabis products sold by the two manufacturers in December 2019, as well as product pricing. See **Appendix A** for a full listing of historical prices and products sold from October 2016 to December 2019 for both manufacturers.

Table 3.1-1 shows the total number of unique medical cannabis products, by category, offered and sold in December 2019 by LeafLine and MinnMed.

**Table 3.1-1: Number of Unique Medical Cannabis Products Available in Minnesota in December 2019**

Medicine Type	Mfr.	THC Dominant	THC=CBD	CBD Dominant	Total
Vape Oil	LeafLine	4	1	1	6
	MinnMed	9	5	1	15
	<b>MN Total</b>	<b>13</b>	<b>6</b>	<b>2</b>	<b>21</b>
Oral Suspension	LeafLine	5	4	1	10
	MinnMed	6	2	4	12
	<b>MN Total</b>	<b>11</b>	<b>6</b>	<b>5</b>	<b>22</b>
Capsule	LeafLine	1	0	0	1
	MinnMed	6	2	2	10
	<b>MN Total</b>	<b>7</b>	<b>2</b>	<b>2</b>	<b>11</b>
Topical	LeafLine	0	1	0	1
	MinnMed	2	2	2	6
	<b>MN Total</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>7</b>
<b>Total</b>		<b>33</b>	<b>17</b>	<b>11</b>	<b>61</b>

#### 3.1.1 Current Medicine Price List – LeafLine

Tables 3.1.1-1 – 3.1.1-4 show the price for all cannabis products LeafLine offered in December 2019. During the review period, LeafLine made two significant changes in their prices and products. Effective April 26, 2017, the prices of all cannabis products were reduced by 23% to 26%. Effective January 7, 2019, some medical cannabis products were discontinued.

**Table 3.1.1-1: LeafLine Medical Cannabis Prices as of December 2019 – Vape Oil**

LeafLine Medical Cannabis Prices as of December 2019 – Vape Oil			
Medicine Type	SKU	Product	Price as of Dec 2019
THC Dominant	51032	Tangerine vaporizer oil cartridge, 0.5 mL	\$72.54
	51031	Tangerine vaporizer oil syringe, 1 mL	\$145.08
	51033	Tangerine vaporizer oil syringe, 1 mL	\$145.08
	51034	Tangerine vaporizer oil cartridge, 0.5 mL 2-pack	\$145.08
THC=CBD	52006	Heather vaporizer oil cartridge, 0.5 mL	\$60.90
CBD Dominant	53004	Cobalt vaporizer oil cartridge, 0.5 mL	\$43.78

**Table 3.1.1-2: LeafLine Medical Cannabis Prices as of December 2019 – Oral Suspension**

LeafLine Medical Cannabis Prices as of December 2019 – Oral Suspension			
Medicine Type	SKU	Product	Price as of Dec 2019
THC Dominant	51007	Tangerine oral suspension unflavored, 120 mL	\$45.78
	51008	Tangerine oral suspension orange cream, 120 mL	\$45.78
	51009	Tangerine sublingual spray vanilla mint, 15 mL	\$57.22
	51014	Tangerine oral suspension orange cream, 240 mL	\$91.55
	51024	Tangerine oral suspension unflavored, 60 mL	\$228.89
THC=CBD	52005	Heather sublingual spray vanilla mint, 15 mL	\$59.36
	52003	Heather oral suspension unflavored, 60 mL	\$79.14
	52004	Heather oral suspension cherry vanilla, 60 mL	\$79.14
	52009	Heather oral suspension cherry vanilla, 120 mL	\$158.28
CBD Dominant	53001	Cobalt oral suspension unflavored, 60 ml	\$99.96

**Table 3.1.1-3: LeafLine Medical Cannabis Prices as of December 2019 – Capsule**

LeafLine Medical Cannabis Prices as of December 2019 – Capsule			
Medicine Type	SKU	Product	Price as of Dec 2019
THC Dominant	51029	Tangerine capsules, 5 mg, 30 count	\$28.61

**Table 3.1.1-4: LeafLine Medical Cannabis Prices as of December 2019 – Topical**

LeafLine Medical Cannabis Prices as of December 2019 – Topical			
Medicine Type	SKU	Product	Price as of Dec 2019
THC=CBD	52012	Heather topical gel cream, 30 mL	\$39.57

### 3.1.2 Current Medicine Price List – MinnMed

Tables 3.1.2-1 – 3.1.2-4 show the price for all cannabis products MinnMed offered in December 2019. During the 4<sup>th</sup> quarter of 2019, the prices of most medical cannabis products were reduced by 20% to 22%, with several exceptions:

- Prices increased by 90% to 111% for the following products:
  - Two THC dominant vape oil products
  - One THC=CBD vape oil product
  - Two THC dominant capsule products
  - One THC=CBD capsule product
- The prices of two THC=CBD oral suspension products were reduced by 33%.

**Table 3.1.2-1: MinnMed Medical Cannabis Prices as of December 2019 – Vape Oil**

MinnMed Medical Cannabis Prices as of December 2019 – Vape Oil			
Medicine Type	SKU	Product	Price as of Dec 2019
THC Dominant	2150	Red Distillate Bulk Oil syringe, 1 g	\$118
	2151	Red Distillate Prefilled Vaporizer cartridge, 200 mg	\$46
	2152	Red Distillate Prefilled Vaporizer cartridge, 500 mg	\$65
	2153	Red Distillate Prefilled Vaporizer cartridge, 1,000 mg	\$125
	2250*	Yellow (6:1) Distillate Bulk Oil syringe, 1 g	\$118
	2251*	Yellow (6:1) Distillate Prefilled Vape cartridge, 200 mg	\$46
	2252*	Yellow (6:1) Distillate Prefilled Vape cartridge, 500 mg	\$65
	2253*	Yellow (6:1) Distillate Prefilled Vape cartridge, 1,000 mg	\$125
	2901	Silver Prefilled Vaporizer cartridge, 0.5 mL	\$23
THC=CBD	2301	Green (1:1) Prefilled Vaporizer cartridge, 0.5 mL	\$37
	2350	Green (1:1) Distillate Bulk Oil syringe, 1 g	\$99
	2351	Green (1:1) Distillate Prefilled Vape cartridge, 200 mg	\$46
	2352	Green (1:1) Distillate Prefilled Vape cartridge, 500 mg	\$54
	2353	Green (1:1) Distillate Prefilled Vape cartridge, 1,000 mg	\$105
CBD Dominant	2401*	Blue (1:6) Prefilled Vaporizer cartridge 0.5 mL	\$46

\* Product is less than 95% THC or CBD but greater than 50%

**Table 3.1.2-2: MinnMed Medical Cannabis Prices as of December 2019 – Oral Suspension**

MinnMed Medical Cannabis Prices as of December 2019 – Oral Suspension			
Medicine Type	SKU	Product	Price as of Dec 2019

MinnMed Medical Cannabis Prices as of December 2019 – Oral Suspension			
THC Dominant	2105	Red MCT Oral Solution, 25mL	\$94
	2106	Red Tincture, 25 mL	\$94
	2205*	Yellow (4:1) MCT Oral Solution, 25 mL	\$94
	2206*	Yellow (4:1) Tincture, 25 mL	\$94
	2705	Red XS MCT Oral Solution, 25 mL	\$189
	2706	Red XS Tincture, 25 mL	\$189
THC=CBD	2305	Green (1:1) MCT Oral Solution, 25 mL	\$160
	2306	Green (1:1) Tincture, 25 mL	\$160
CBD Dominant	2505	Indigo (1:19) MCT Oral Solution, 25 mL	\$99
	2506	Indigo (1:19) Tincture, 25 mL	\$99
	2605	Violet MCT Oral Solution, 25 mL	\$195
	2606	Violet Tincture, 25 mL	\$195

\* Product is less than 95% THC or CBD but greater than 50%

**Table 3.1.2-3: MinnMed Medical Cannabis Prices as of December 2019 – Capsule**

MinnMed Medical Cannabis Prices as of December 2019 – Capsule			
Medicine Type	SKU	Product	Price as of Dec 2019
THC Dominant	2104	Red capsules, 30 count	\$23
	2114	Red capsules, 12 count	\$19
	2204*	Yellow (4:1) capsules, 30 count	\$31
	2214*	Yellow (4:1) capsules, 12 count	\$20
	2704	Red XS capsules, 30 count	\$62
	2804	Black capsules, 30 count	\$141
THC=CBD	2304	Green (1:1) capsules, 30 count	\$31
	2314	Green (1:1) capsules, 12 count	\$19
CBD Dominant	2504	Indigo (1:19) capsules, 30 count	\$118
	2604	Violet capsule, 30 count	\$236

\*\* Product is less than 95% THC or CBD but greater than 50%

**Table 3.1.2-4: MinnMed Medical Cannabis Prices as of December 2019 – Topical**

<b>MinnMed Medical Cannabis Prices as of December 2019 – Topical</b>			
<b>Medicine Type</b>	<b>SKU</b>	<b>Product</b>	<b>Price as of Dec 2019</b>
<b>THC Dominant</b>	<b>2145</b>	Red balm unscented, 1.5 oz	\$29
	<b>2146</b>	Red bar unscented, 2.5 oz	\$46
<b>THC=CBD</b>	<b>2345</b>	Green balm unscented, 1.5 oz	\$29
	<b>2346</b>	Green bar unscented, 2.5 oz	\$46
<b>CBD Dominant</b>	<b>2545</b>	Indigo balm unscented, 1.5 oz	\$29
	<b>2546</b>	Indigo bar unscented, 2.5 oz	\$46

### 3.2 Medical Cannabis Price Comparison

In this section, we document our analysis of the current prices of sampled medical cannabis products in the states of Colorado, Michigan, New York, Ohio, Pennsylvania, and Washington that are comparable to the Medical cannabis products offered in Minnesota.

Tables 3.2-1 and 3.2-2 summarize the competitive landscape and tax environment in the states included in the price comparison. Table 3.2-1 shows an approximate number of companies that operate distribution facilities, also known as dispensaries, in the state, while the number of locations is the total number of distribution facilities in the state as of March 2020. The far-right column indicates whether a state has a legalized recreational market (REC), a medical market (MED), or both (REC/MED). Table 3.2-2 shows the direct taxes levied on medical cannabis in the states used in the price comparison.

**Table 3.2-1: Approximate Number of Dispensary Companies and Locations**

Approximate Number of Dispensary Companies and Locations			
Location	Approx. No. of Medical Dispensary Companies	No. of Locations	REC/MED
Minnesota	2	8	MED
Colorado	258	437	REC/MED
Michigan	58	228	REC/MED
New York	12	40	MED
Ohio	27	51	MED
Pennsylvania	12	23	MED
Washington	135	179	REC/MED

**Table 3.2-2: Medical Cannabis Taxes by State**

Medical Cannabis Taxes by State			
State	Tax Type	Tax Paid By	Tax Amount
Minnesota			Exempt
Colorado	Sales	Consumer	2.90%
Michigan	Sales	Consumer	6%
New York	Excise	Grower/Seller	7% of Gross Receipts on Sale to Patient
Ohio	Sales	Consumer	6.875% (average rate—varies by county)
Pennsylvania	Excise	Grower/Processor	5% on gross receipts from sale to dispensary
Washington			Exempt

We selected a minimum of five distribution facilities for each of the six states for this price study, and collected medical cannabis product prices directly from each facility’s websites. In order to collect the prices of medical cannabis products that are comparable to the products offered in

Minnesota, we attempted to collect the prices of THC-Dominant, THC=CBD, and CBD-Dominant products of the following product categories from each sample distribution facility:

- Vape Oil: Including cartridge, bulk oil, and syringe
- Oral Suspension: Including tincture and sublingual
- Capsule
- Topical: Including lotions, and balms

Our price data collection efforts were subject to the following limitations and constraints:

- Neither the price of THC nor CBD was readily available. Therefore, we calculated the price using the following methods.
  - For THC-dominant and CBD-dominant products, we calculated the approximate price of THC or CBD by dividing the unit price by the amount (mg) of THC or CBD contained in the product.

In order to calculate the approximate price of THC and CBD more accurately, we only included medical cannabis products that contain over 95% of THC or over 95% of CBD for this study. As a result, eight medical cannabis products offered by MinnMed were excluded from this study.
  - For products that contain equal amounts of THC and CBD (THC=CBD), we calculated the approximate price of cannabis, not the individual prices of THC and CBD, by dividing the unit price by the amounts (mg) of THC and CBD combined.
- None of the sampled distribution facilities offered all of the product types listed above, which necessitated varying sample sizes among product types.
- Detailed product information, such as THC and CBD content, was not consistently available.
- The THC and CBD contents were obtained from publicly viewable information on dispensary websites. We did not perform any additional procedures to confirm the accuracy of this information with the distribution facilities or manufacturers.
- The low and high prices listed in the tables under Sections 3.2.1 – 3.2.4 are based upon our sample selections. The actual low and high prices for the six comparison states could be different.
- Prices were recorded in March 2020.
- We were not able to obtain the prices of equivalent products for all product types in our sample for comparison. This was due to the fact that for some products either the sampled facilities did not offer equivalent products, or THC and CBD content was not readily available on websites for verification. For example, none of the sampled

distribution facilities offered CBD dominant vape oil that contains over 95% of CBD. We experienced the same issue in our sampling for THC dominant topical from the comparison states (except for Pennsylvania).

Tables 3.2-3 – 3.2-6 show the number of products we sampled for our price study by each category. For example, we obtained the prices of 13 THC dominant vape oil products, but were not able to obtain the prices of THC=CBD or CBD dominant vape oil products from the sampled distribution facilities in Colorado.

**Table 3.2-3: Vape Oil Sample Size Information**

Vape Oil Sample Size Information				
Location	Number of Products Sampled			No. of Distribution Facilities Sampled
	THC Dominant (Over 95% THC)	THC = CBD	CBD Dominant (Over 95% CBD)	
Minnesota	9	6	1	2
Colorado	13			6
Michigan	10			5
New York	10	5		5
Ohio	17	3		5
Pennsylvania	18	12		5
Washington	19	4		5

**Table 3.2-4: Oral Suspension Sample Size Information**

Oral Suspension Sample Size Information				
Location	Number of Products Sampled			No. of Distribution Facilities Sampled
	THC Dominant (Over 95% THC)	THC = CBD	CBD Dominant (Over 95% CBD)	
Minnesota	9	6	5	2
Colorado	11	4	7	8
Michigan	10	3	6	7
New York	11	6	5	5
Ohio	19	7	5	5
Pennsylvania	10	7		5
Washington	9	6	8	6

**Table 3.2-5: Capsule Sample Size Information**

Capsule Sample Size Information				
Location	Number of Products Sampled			No. of Distribution Facilities Sampled
	THC Dominant (Over 95% THC)	THC = CBD	CBD Dominant (Over 95% CBD)	
Minnesota	4	2	2	2
Colorado	10	5		9
Michigan	9		6	7
New York	5	7	4	5
Ohio	6	4		5
Pennsylvania	10	4		5
Washington	5	4	3	6

**Table 3.2-6: Topical Sample Size Information**

Topical Sample Size Information				
Location	Number of Products Sampled			No. of Distribution Facilities
	THC Dominant (Over 95% THC)	THC = CBD	CBD Dominant (Over 95% CBD)	
Minnesota	2	3	2	2
Colorado		13		10
Michigan		10	9	6
New York			10	5
Ohio		9		6
Pennsylvania	3			5
Washington		7	7	7

Below, we document the lowest and the highest prices of medical cannabis products offered in Minnesota as of December 2019, and the lowest and the highest prices of sampled medical cannabis products in the six comparison states. The prices are grouped by four categories; Vape Oil, Oral Suspension, Capsule, and Topical. Prices are noted in:

- Price/mg of THC for THC dominant (over 95% THC) products
- Price/mg of cannabis (THC and CBD combined) for THC=CBD products
- Price/mg of CBD for CBD dominant (over 95% CBD) products

Each subsection includes a series of graphs that show the spread between the lowest and the highest observed prices of sampled products. In addition to the lowest and highest observed prices in a given state, additional prices might fall in between those two points.

The Lowest/Highest in the tables below indicates the lowest and highest prices of all of our samples for each product type.

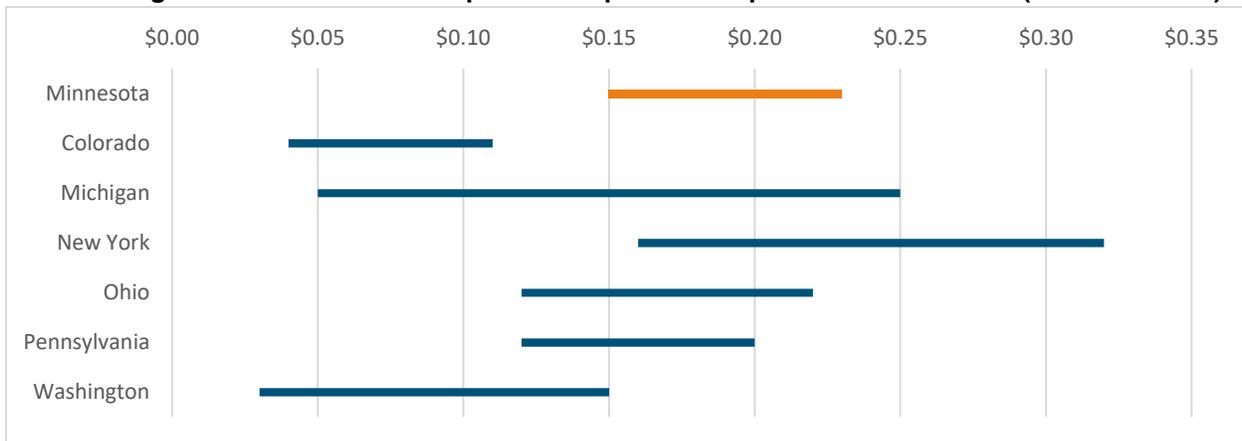
We observed that Minnesota offers medical cannabis products at comparable prices to equivalent products in the six comparison states. We also observed that the other states offer a wider variety of product categories such as flower, edibles (food items that contain marijuana product), and additional types of topical. All six comparison states sell flower products.

### 3.2.1 Sampled Price Comparison: Vape Oil

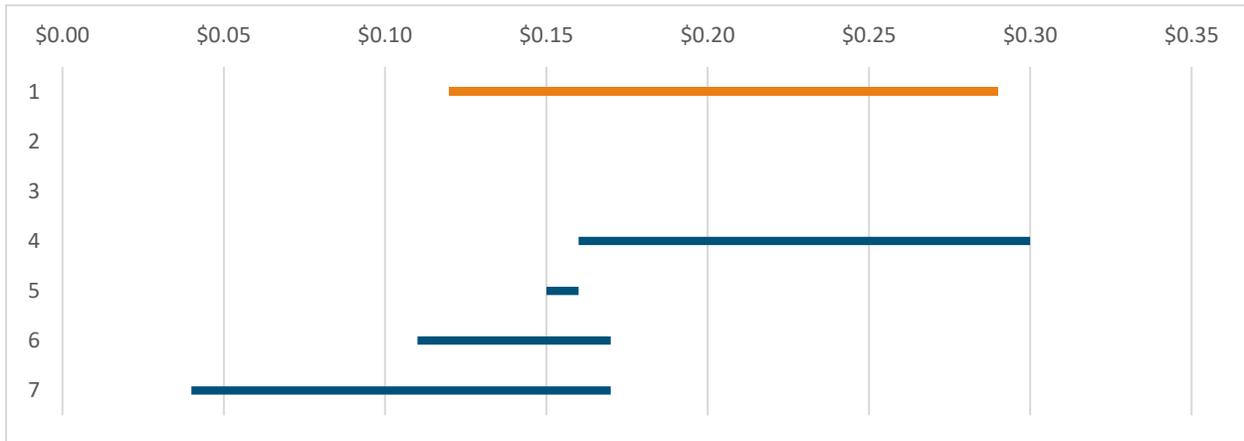
**Table 3.2.1-1: Sampled Prices of Vape Oil Products**

Sampled Prices of Vape Oil Products						
Location	THC Dominant (Over 95% THC)		THC=CBD		CBD Dominant (Over 95% CBD)	
	price/mg THC		price/mg cannabis		price/mg CBD	
	Low	High	Low	High	Low	High
Minnesota	\$0.15	\$0.23	\$0.12	\$0.29	\$0.10	\$0.10
Colorado	\$0.04	\$0.11				
Michigan	\$0.05	\$0.25				
New York	\$0.16	\$0.32	\$0.16	\$0.30		
Ohio	\$0.12	\$0.22	\$0.15	\$0.16		
Pennsylvania	\$0.12	\$0.20	\$0.11	\$0.17		
Washington	\$0.03	\$0.15	\$0.04	\$0.17		
Lowest/Highest	<b>\$0.03</b>	<b>\$0.32</b>	<b>\$0.04</b>	<b>\$0.30</b>		

**Figure 3.2.1-1: THC Price Spread Comparison: Vape Oil THC Dominant (Over 95% THC)**



**Figure 3.2.1-2: Cannabis Price Spread Comparison: Vape Oil THC=CBD**

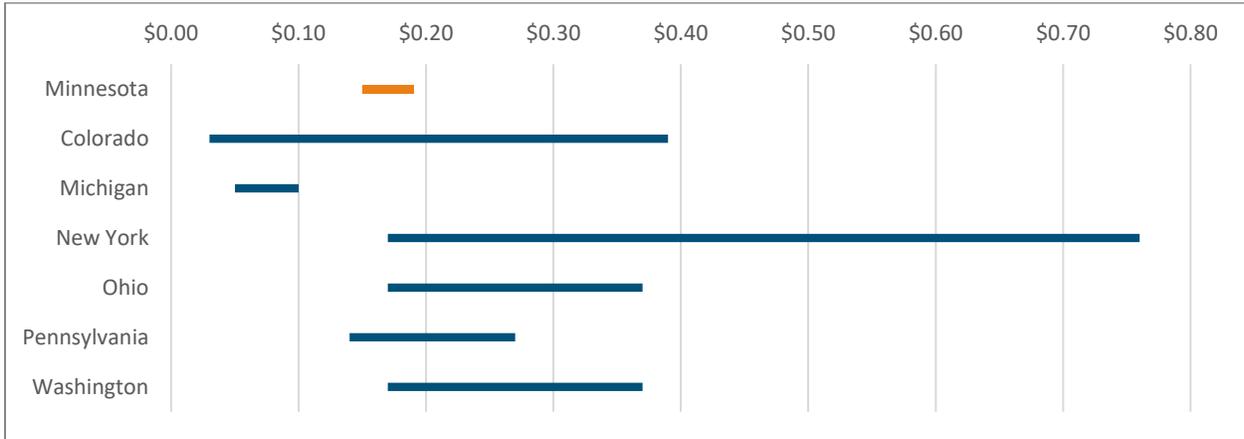


**3.2.2 Sampled Price Comparison: Oral Suspension Products**

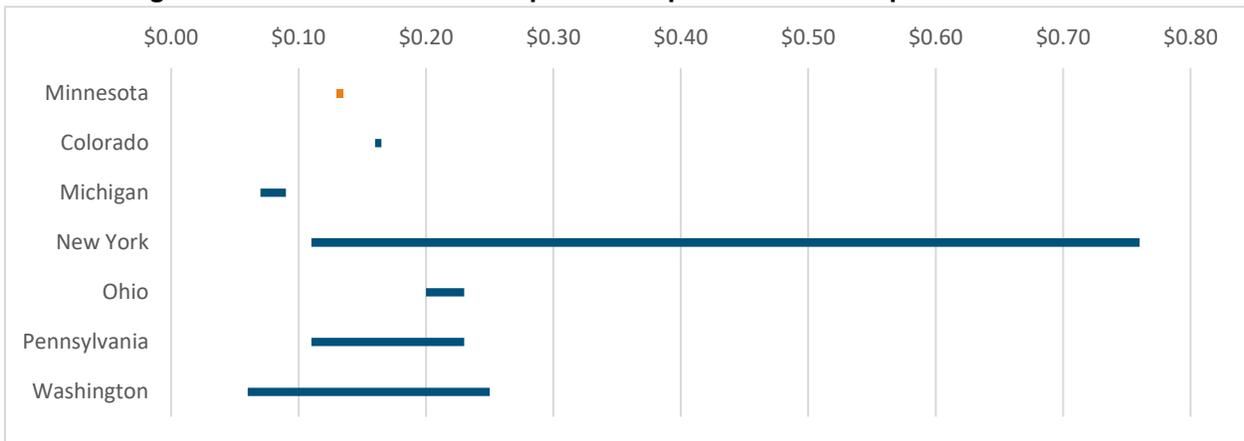
**Table 3.2.2-1: Sampled Prices of Oral Suspension Products**

Sampled Prices of Oral Suspension Products						
Location	THC Dominant (Over 95% THC)		THC=CBD		CBD Dominant (Over 95% CBD)	
	price/mg THC		price/mg cannabis		price/mg CBD	
	Low	High	Low	High	Low	High
Minnesota	\$0.15	\$0.19	\$0.13	\$0.13	\$0.08	\$0.08
Colorado	\$0.03	\$0.39	\$0.16	\$0.16	\$0.04	\$0.13
Michigan	\$0.05	\$0.10	\$0.07	\$0.09	\$0.05	\$0.18
New York	\$0.17	\$0.76	\$0.11	\$0.76	\$0.08	\$0.18
Ohio	\$0.17	\$0.37	\$0.20	\$0.23	\$0.13	\$0.20
Pennsylvania	\$0.14	\$0.27	\$0.11	\$0.23		
Washington	\$0.17	\$0.37	\$0.06	\$0.25	\$0.07	\$0.24
Lowest/Highest	<b>\$0.03</b>	<b>\$0.76</b>	<b>\$0.06</b>	<b>\$0.76</b>	<b>\$0.04</b>	<b>\$0.24</b>

**Figure 3.2.2-1: THC Price Spread Comparison: Oral Suspension THC Dominant (Over 95% THC)**



**Figure 3.2.2-2: Cannabis Price Spread Comparison: Oral Suspension THC=CBD**



**Figure 3.2.2-3: CBD Price Spread Comparison: Oral Suspension CBD Dominant (Over 95% CBD)**

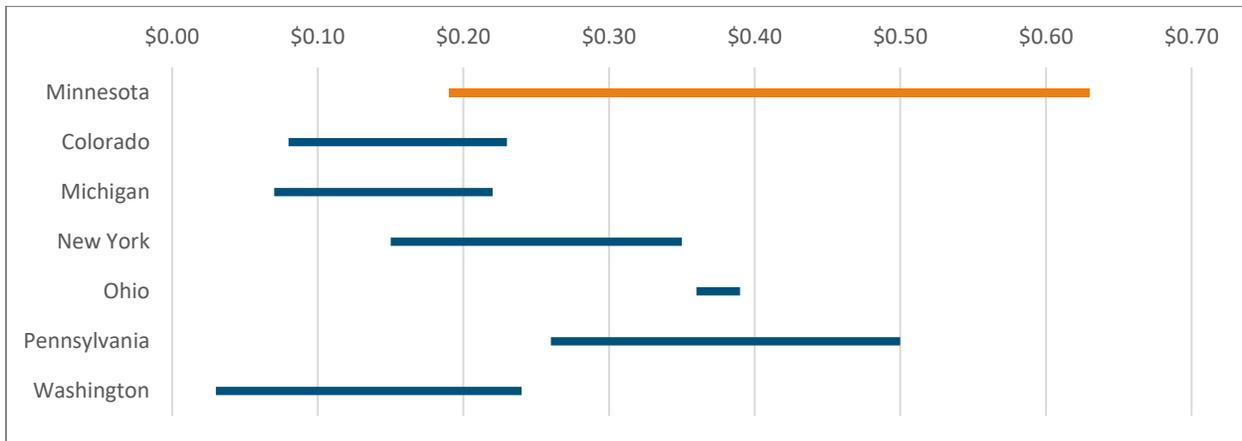


**3.2.3 Sampled Price Comparison: Capsules Products**

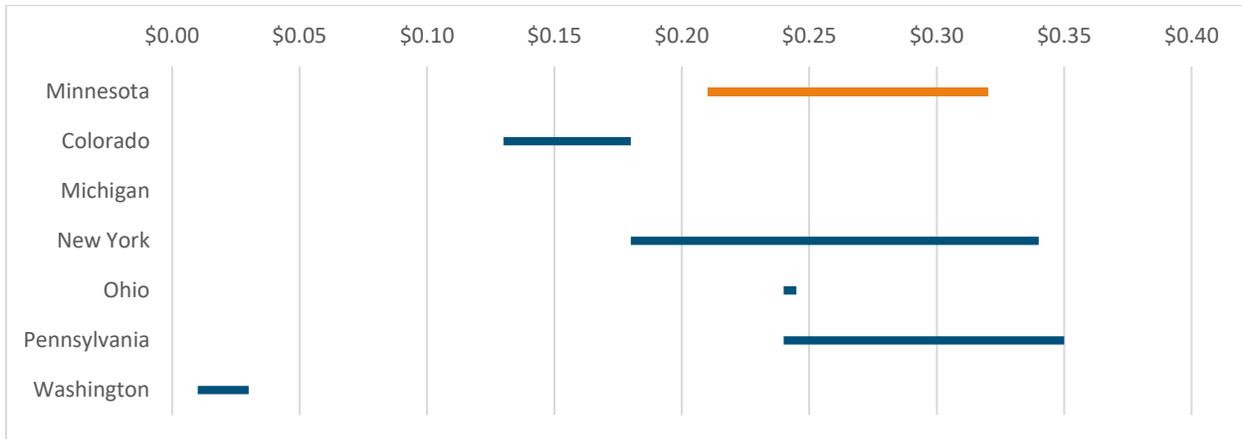
**Table 3.2.3-1: Sampled Prices of Capsules**

Sampled Prices of Capsules						
Location	THC Dominant (Over 95% THC)		THC=CBD		CBD Dominant (Over 95% CBD)	
	price/mg THC		price/mg cannabis		price/mg CBD	
	Low	High	Low	High	Low	High
Minnesota	\$0.19	\$0.63	\$0.21	\$0.32	\$0.08	\$0.08
Colorado	\$0.08	\$0.23	\$0.13	\$0.18		
Michigan	\$0.07	\$0.22			\$0.05	\$0.17
New York	\$0.15	\$0.35	\$0.18	\$0.34	\$0.08	\$0.20
Ohio	\$0.36	\$0.39	\$0.24	\$0.24		
Pennsylvania	\$0.26	\$0.50	\$0.24	\$0.35		
Washington	\$0.03	\$0.24	\$0.01	\$0.03	\$0.06	\$0.06
<b>Lowest/Highest</b>	<b>\$0.03</b>	<b>\$0.63</b>	<b>\$0.01</b>	<b>\$0.35</b>	<b>\$0.05</b>	<b>\$0.20</b>

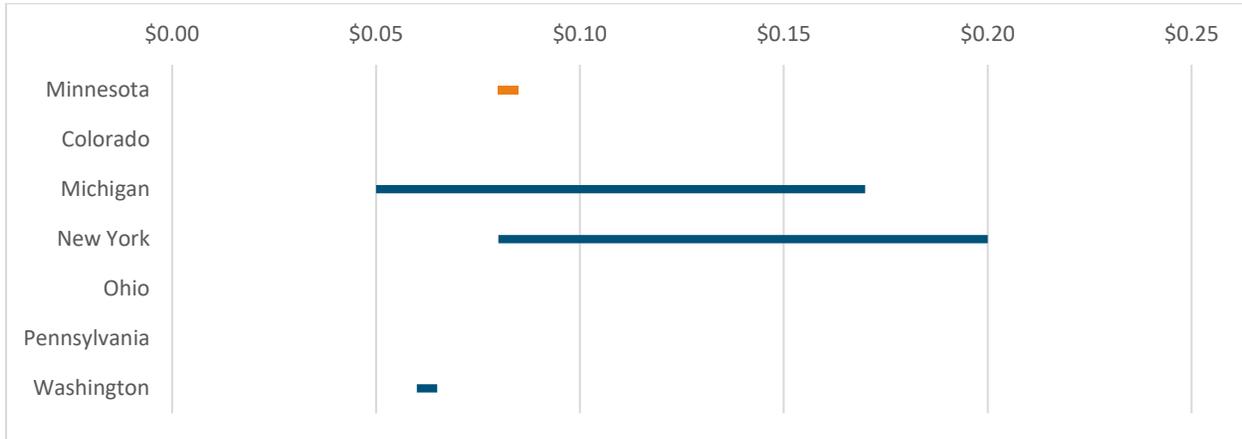
**Figure 3.2.3-1: THC Price Spread Comparison: Capsules THC Dominant (Over 95% THC)**



**Figure 3.2.3-2: Cannabis Price Spread Comparison: Capsules THC=CBD**



**Figure 3.2.3-3: CBD Price Spread Comparison: Capsules CBD Dominant (Over 95% CBD)**

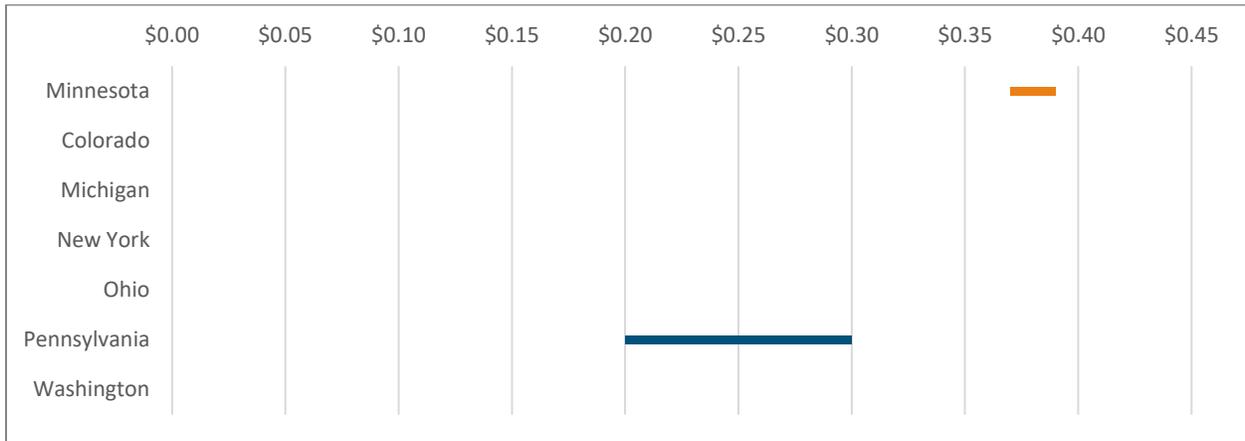


**3.2.4 Sampled Price Comparison: Topical Products**

**Table 3.2.4-1: Sampled Prices of Topical**

Sampled Prices of Topical						
Location	THC Dominant (Over 95% THC)		THC=CBD		CBD Dominant (Over 95% CBD)	
	price/mg THC		price/mg cannabis		price/mg CBD	
	Low	High	Low	High	Low	High
Minnesota	\$0.37	\$0.39	\$0.13	\$0.39	\$0.39	\$0.37
Colorado			\$0.11	\$0.48		
Michigan			\$0.10	\$0.48	\$0.05	\$0.37
New York					\$0.07	\$0.77
Ohio			\$0.10	\$0.36		
Pennsylvania	\$0.20	\$0.30				
Washington			\$0.02	\$0.17	\$0.05	\$0.26
<b>Lowest/Highest</b>	<b>\$0.20</b>	<b>\$0.39</b>	<b>\$0.02</b>	<b>\$0.48</b>	<b>\$0.05</b>	<b>\$0.77</b>

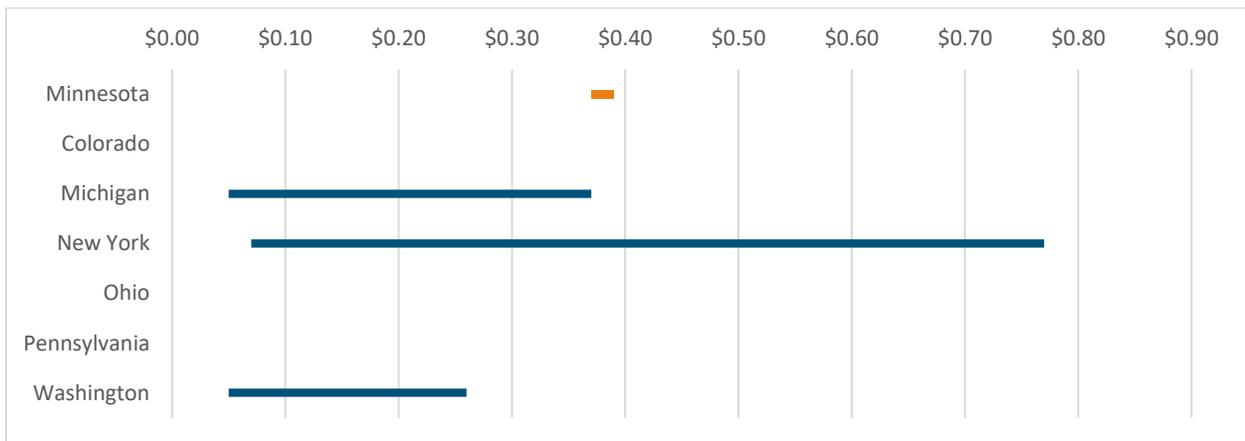
**Figure 3.2.4-1: THC Price Spread Comparison: Topical THC Dominant (Over 05% THC)**



**Figure 3.2.4-2: Cannabis Price Spread Comparison: Topical THC=CBD**



**Figure 3.2.4-3: CBD Price Spread Comparison: Topical CBD Dominant (Over 95% CBD)**



### 3.3 Sales Data by Category

This section presents the following data for the State:

- Number of units sold by medical cannabis product type and category
- Revenue from the sales of medical cannabis
- Discounts applied to the sales
- Net sales of medical cannabis in each quarter during the review period

#### Discount Programs

The manufacturers offer discount programs for the sales of medical cannabis products. These discounts are not applicable to the sales of non-cannabis products and cannot be combined.

Both manufacturers offer 15% off the price of medical cannabis products for the patient who has the following types of medical assistance documented on her/his MDH profile:

- SSI
- SSD
- Medicaid/MA
- MinnesotaCare
- Indian Health Service (IHS)
- VA Disability

In addition, MinnMed offers 50% off the price of medical cannabis, up to \$100, for new customers, and 15% off for military patients of active or veteran status as well as their spouse and child(ren).

Since May 2019, LeafLine offers 15% off for military patients of active or veteran status.

#### Loyalty Programs

Both manufacturers offered loyalty programs that allow customers to accumulate points on any purchases. The earned points can be used on any purchases of medical cannabis products, equipment, or merchandise.

MinnMed's initial program offered loyalty points based on 2% of each net purchase, where patients earned \$1 worth of points for each \$50 spent. MinnMed upgraded the program on June 21, 2017, to increase the points earned to 20% of each net purchase, where patients earned \$1 worth of points for each net \$5 spent. However, MinnMed discontinued its loyalty program in the

4<sup>th</sup> quarter of 2019; therefore, patients can no longer earn points on purchases, but they can redeem the points they earned until the end of 2020.

LeafLine offers \$1 worth of point for each net \$20 spent on any purchase.

### Sales Data

We organized the data by four product categories: Vape Oil, Oral Suspension, Capsule, and Topical.

Within these categories, we further broke down the data by three product types when available:

- THC Dominant – contains more THC than CBD
- THC=CBD – contains equal amount of THC and CBD
- CBD Dominant – contains more CBD than THC

#### 3.3.1 Number of Units Sold and Sales by Product Type and Category

Tables 3.3.1-1 – 3.3.1-4 show the number of units sold and sales of medical cannabis (excluding any discounts applied) combined for both LeafLine and MinnMed in each quarter during the review period by product category.

**Table 3.3.1-1: Number of Units Sold and Sales – Vape Oil**

Number of Units Sold and Sales – Vape Oil								
Quarter	THC Dominant		THC=CBD		CBD Dominant		Total	
	Units Sold	Sales	Units Sold	Sales	Units Sold	Sales	Units Sold	Sales
2016 Q4	7,997	\$895,307	1105	\$89,911	0	\$0	9,102	\$985,217
2017 Q1	7,756	\$817,435	1201	\$88,170	0	\$0	8,957	\$905,605
2017 Q2	11,488	\$1,098,726	1870	\$126,045	4	\$175	13,362	\$1,224,946
2017 Q3	16,940	\$1,486,085	2,759	\$172,322	673	\$29,464	20,372	\$1,687,871
2017 Q4	22,485	\$1,912,779	3,713	\$217,476	1,433	\$65,278	27,631	\$2,195,533
2018 Q1	28,088	\$2,160,509	5,082	\$280,415	2,028	\$97,309	35,198	\$2,538,232
2018 Q2	32,593	\$2,512,284	6,660	\$369,795	2,425	\$116,973	41,678	\$2,999,052
2018 Q3	37,125	\$2,818,754	7,870	\$433,744	2,776	\$136,525	47,771	\$3,389,023
2018 Q4	42,293	\$3,234,392	8,915	\$487,594	2,974	\$147,781	54,182	\$3,869,767
2019 Q1	42,607	\$3,256,174	8,321	\$460,399	2,689	\$133,492	53,617	\$3,850,065
2019 Q2	46,935	\$3,556,947	9,481	\$529,577	2,857	\$141,837	59,273	\$4,228,360
2019 Q3	52,551	\$3,978,945	9,911	\$565,375	2,557	\$126,027	65,019	\$4,670,348
2019 Q4	55,345	\$4,499,214	10,441	\$622,823	2,032	\$94,511	67,818	\$5,216,548
<b>Total</b>	<b>404,203</b>	<b>\$32,227,551</b>	<b>77,329</b>	<b>\$4,443,646</b>	<b>22,448</b>	<b>\$1,089,372</b>	<b>503,980</b>	<b>\$37,760,567</b>

**Table 3.3.1-2: Number of Units Sold and Sales – Oral Suspension**

Number of Units Sold and Sales – Oral Suspension								
Quarter	THC Dominant		THC=CBD		CBD Dominant		Total	
	Units Sold	Sales	Units Sold	Sales	Units Sold	Sales	Units Sold	Sales
2016 Q4	2,067	\$202,064	1,638	\$241,182	1,065	\$184,224	4,770	\$627,470
2017 Q1	2,120	\$210,405	1,795	\$263,285	1,048	\$189,171	4,963	\$662,862
2017 Q2	3,174	\$286,676	2,801	\$353,551	1,618	\$255,197	7,593	\$895,423
2017 Q3	3,769	\$331,205	3,188	\$368,194	2,068	\$310,636	9,025	\$1,010,035
2017 Q4	4,079	\$358,607	3,859	\$399,489	2,569	\$349,115	10,507	\$1,107,212
2018 Q1	4,917	\$387,252	4,816	\$386,111	3,061	\$361,398	12,794	\$1,134,760
2018 Q2	5,478	\$426,416	5,230	\$418,463	3,871	\$440,386	14,579	\$1,285,265
2018 Q3	5,938	\$496,665	5,525	\$443,539	4,342	\$496,626	15,805	\$1,436,830
2018 Q4	7,233	\$586,926	6,570	\$525,522	5,089	\$583,676	18,892	\$1,696,124
2019 Q1	7,378	\$614,196	6,430	\$517,930	4,775	\$543,909	18,583	\$1,676,036
2019 Q2	7,741	\$636,924	6,842	\$553,315	4,638	\$530,408	19,221	\$1,720,646
2019 Q3	8,327	\$692,257	6,636	\$547,742	4,396	\$503,461	19,359	\$1,743,459
2019 Q4	8,216	\$714,950	6,334	\$568,723	4,340	\$474,922	18,890	\$1,758,595
<b>Total</b>	<b>70,437</b>	<b>\$5,944,542</b>	<b>61,664</b>	<b>\$5,587,046</b>	<b>42,880</b>	<b>\$5,223,128</b>	<b>174,981</b>	<b>\$16,754,716</b>

**Table 3.3.1-3: Number of Units Sold and Sales – Capsule**

Number of Units Sold and Sales – Capsule								
Quarter	THC Dominant		THC=CBD		CBD Dominant		Total	
	Units Sold	Sales	Units Sold	Sales	Units Sold	Sales	Units Sold	Sales
2016 Q4	2,685	\$149,488	757	\$37,043	377	\$75,667	3,819	\$262,198
2017 Q1	2,475	\$119,797	710	\$23,486	293	\$53,407	3,478	\$196,690
2017 Q2	3,707	\$168,047	1,129	\$35,481	398	\$72,052	5,234	\$275,580
2017 Q3	5,345	\$240,068	1,673	\$52,737	526	\$93,074	7,544	\$385,879
2017 Q4	6,976	\$311,550	1,880	\$59,550	583	\$103,967	9,439	\$475,067
2018 Q1	8,938	\$359,428	2,111	\$64,959	544	\$96,656	11,593	\$521,043
2018 Q2	10,528	\$428,778	2,347	\$73,083	759	\$128,991	13,634	\$630,852
2018 Q3	13,022	\$509,497	2,787	\$82,983	873	\$150,027	16,682	\$742,507
2018 Q4	15,726	\$622,197	3,241	\$98,649	1,118	\$186,832	20,085	\$907,678
2019 Q1	15,505	\$619,092	2,955	\$91,515	975	\$160,575	19,435	\$871,182
2019 Q2	16,913	\$656,811	3,246	\$103,044	1,010	\$165,940	21,169	\$925,795
2019 Q3	18,075	\$705,050	3,305	\$106,155	1,019	\$169,231	22,399	\$980,436
2019 Q4	19,373	\$745,299	3,097	\$99,801	997	\$147,190	23,467	\$992,290

Number of Units Sold and Sales – Capsule								
Total	139,268	\$5,635,103	29,238	\$928,486	9,472	\$1,603,609	177,978	\$8,167,198

**Table 3.3.1-4: Number of Units Sold and Sales – Topical**

Number of Units Sold and Sales – Topical								
Quarter	THC Dominant		THC=CBD		CBD Dominant		Total	
	Units Sold	Sales	Units Sold	Sales	Units Sold	Sales	Units Sold	Sales
2016 Q4	0	\$0	0	\$0	0	\$0	0	\$0
2017 Q1	0	\$0	0	\$0	0	\$0	0	\$0
2017 Q2	0	\$0	0	\$0	0	\$0	0	\$0
2017 Q3	370	\$17,232	340	\$15,569	169	\$7,903	879	\$40,704
2017 Q4	575	\$27,628	892	\$37,221	270	\$12,806	1,737	\$77,655
2018 Q1	657	\$31,195	1,119	\$46,215	229	\$10,937	2,005	\$88,347
2018 Q2	829	\$39,429	1,440	\$58,890	330	\$15,356	2,599	\$113,675
2018 Q3	1,123	\$55,125	1,317	\$53,973	308	\$14,542	2,748	\$123,640
2018 Q4	1,344	\$65,194	1,525	\$62,235	270	\$12,256	3,139	\$139,685
2019 Q1	1,246	\$59,170	1,469	\$59,677	245	\$10,847	2,960	\$129,695
2019 Q2	1,316	\$60,858	1,669	\$67,946	252	\$11,458	3,237	\$140,262
2019 Q3	1,396	\$65,732	1,742	\$70,885	277	\$12,427	3,415	\$149,044
2019 Q4	1,689	\$69,905	1,700	\$67,497	268	\$10,576	3,657	\$147,978
Total	10,545	\$491,468	13,213	\$540,109	2,618	\$119,108	26,376	\$1,150,685

### 3.3.2 Number of Units Sold and Sales by Product Type

Table 3.3.2-1 shows the total number of units sold and sales combined for both LeafLine and MinnMed in each quarter during the review period by the type of medicine: THC Dominant, THC=CBD, and CBD Dominant.

**Table 3.3.2-1: Summary of Total Number of Units Sold and Sales**

Summary of Total Number of Units Sold and Sales								
Quarter	THC Dominant		THC=CBD		CBD Dominant		Total	
	Units Sold	Sales	Units Sold	Sales	Units Sold	Sales	Units Sold	Sales
2016 Q4	12,749	\$1,246,859	3,500	\$368,135	1,442	\$259,891	17,691	\$1,874,885
2017 Q1	12,351	\$1,147,637	3,706	\$374,941	1,341	\$242,578	17,398	\$1,765,156
2017 Q2	18,369	\$1,553,449	5,800	\$515,076	2,020	\$327,424	26,189	\$2,395,949
2017 Q3	26,424	\$2,074,590	7,960	\$608,822	3,436	\$441,077	37,820	\$3,124,489
2017 Q4	34,115	\$2,610,564	10,344	\$713,736	4,855	\$531,167	49,314	\$3,855,467
2018 Q1	42,600	\$2,938,383	13,128	\$777,699	5,862	\$566,300	61,590	\$4,282,382
2018 Q2	49,428	\$3,406,907	15,677	\$920,231	7,385	\$701,706	72,490	\$5,028,844

Summary of Total Number of Units Sold and Sales								
<b>2018 Q3</b>	57,208	\$3,880,041	17,499	\$1,014,239	8,299	\$797,720	<b>83,006</b>	<b>\$5,692,000</b>
<b>2018 Q4</b>	66,596	\$4,508,710	20,251	\$1,174,000	9,451	\$930,544	<b>96,298</b>	<b>\$6,613,254</b>
<b>2019 Q1</b>	66,736	\$4,548,632	19,175	\$1,129,522	8,684	\$848,823	<b>94,595</b>	<b>\$6,526,977</b>
<b>2019 Q2</b>	72,905	\$4,911,539	21,238	\$1,253,882	8,757	\$849,642	<b>102,900</b>	<b>\$7,015,063</b>
<b>2019 Q3</b>	80,349	\$5,441,984	21,594	\$1,290,157	8,249	\$811,146	<b>110,192</b>	<b>\$7,543,287</b>
<b>2019 Q4</b>	84,623	\$6,029,368	21,572	\$1,358,843	7,637	\$727,200	<b>113,832</b>	<b>\$8,115,411</b>
<b>Total</b>	<b>624,453</b>	<b>\$44,298,664</b>	<b>181,444</b>	<b>\$11,499,284</b>	<b>77,418</b>	<b>\$8,035,217</b>	<b>883,315</b>	<b>\$63,833,166</b>
<b>Percent</b>	<b>70.69%</b>	<b>69.40%</b>	<b>20.54%</b>	<b>18.01%</b>	<b>8.76%</b>	<b>12.59%</b>	<b>100%</b>	<b>100%</b>

Table 3.3.2-2 shows the total number of units sold, sales, discounts, and net sales combined for MinnMed and LeafLine in each quarter during the review period. The Discount % column shows the percentage of total discounts over the total sales of medical cannabis products. While Table 3.3.2-2 below combines the MinnMed and LeafLine data, the two manufacturers had different processes for recording discounts in their sales data.

- Until the 2<sup>nd</sup> quarter of 2017, LeafLine recorded all discounts independently from sales transactions. For example, if a patient received a 15% discount on a purchase of a medical cannabis product, the system recorded a sales transaction of the medical cannabis at a full price and a discount transaction with negative sales in a separate transaction. Similarly, if a patient used her/his accumulated loyalty points on a purchase of either medical cannabis or nonmedical products, the discount transaction was recorded separately from the sales transaction. Therefore, we were not able to identify which discounts were applied to the sales of medical cannabis as opposed to nonmedical products.

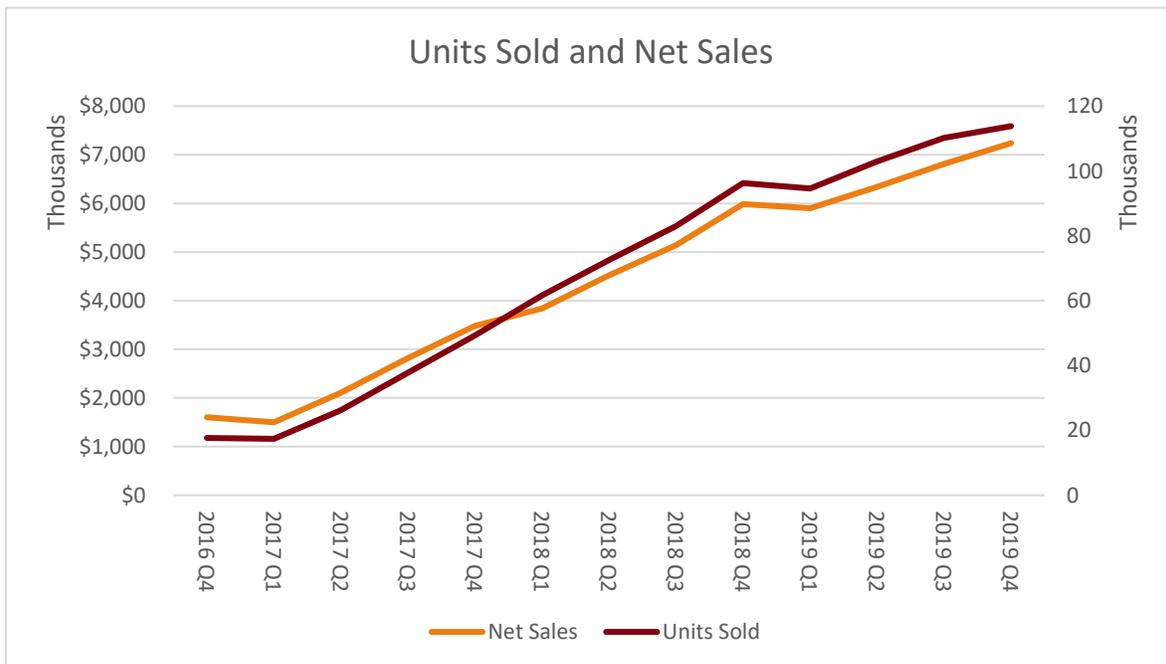
As a result, the total discounts from the 4<sup>th</sup> quarter of 2016 through the 2<sup>nd</sup> quarter of 2017 in Table 3.3.2-2 include those that were applied to nonmedical product sales, although the number of units sold and sales only represent medical products. This inconsistency in data may have caused the higher Discount % up to the 2<sup>nd</sup> quarter of 2017 in Table 3.3.2-2.

- MinnMed had a loyalty program during the review period where patients could redeem points on their purchases. These loyalty points could be applied to sales of medical and nonmedical products. The redemption of points on a sale of multiple products was recorded as a discount on only one of the products. Therefore, we were not able to identify how much discount was applied to medical cannabis sales or nonmedical sales. As a result, the Discounts column in Table 3.3.2-2 for MinnMed includes the total discounts from redemption of loyalty points on sales of medical cannabis and nonmedical products.

**Table 3.3.2-2: Number of Units Sold, Sales, Discounts, and Net Sales**

Number of Units Sold, Sales, Discounts, and Net Sales					
Quarter	Units Sold	Sales	Discounts	Discount %	Net Sales
2016 Q4	17,691	\$1,874,885	\$268,728	14%	\$1,606,157
2017 Q1	17,398	\$1,765,156	\$264,927	15%	\$1,500,229
2017 Q2	26,189	\$2,395,949	\$286,316	12%	\$2,109,632
2017 Q3	37,820	\$3,124,489	\$307,296	10%	\$2,817,193
2017 Q4	49,314	\$3,855,467	\$377,487	10%	\$3,477,980
2018 Q1	61,590	\$4,282,382	\$439,777	10%	\$3,842,604
2018 Q2	72,490	\$5,028,844	\$507,173	10%	\$4,521,670
2018 Q3	83,006	\$5,692,000	\$552,125	10%	\$5,139,875
2018 Q4	96,298	\$6,613,254	\$629,803	10%	\$5,983,452
2019 Q1	94,595	\$6,526,977	\$624,372	10%	\$5,902,605
2019 Q2	102,900	\$7,015,063	\$676,243	10%	\$6,338,820
2019 Q3	110,192	\$7,543,287	\$735,197	10%	\$6,808,090
2019 Q4	113,832	\$8,115,411	\$876,115	11%	\$7,239,297
<b>Total</b>	<b>883,315</b>	<b>\$63,833,166</b>	<b>\$6,545,560</b>	<b>10%</b>	<b>\$57,287,605</b>

**Figure 3.3.2-1: Units Sold and Net Sales of Medical Cannabis Products**



### 3.4 Average 30-Day Supply Cost by QCs

In this section, we present our analysis of the average dollar amount spent by a registered patient in the State for a 30-day supply of medical cannabis.

#### 3.4.1 Average 30-Day Spend by the Number of QCs

We analyzed the data by grouping patients by the number of diagnosed QCs.

Table 3.4.1-1, below, shows the number of patients and sales by the number of diagnosed QCs. 1 QC included the patients who were diagnosed with 1 of the 14 approved QCs. 2 QCs included the patients who were diagnosed with two qualifying conditions, and so on. When a patient had multiple diagnoses during the review period with different QCs, we counted the patient in each of applicable QC groups; therefore, some patients were counted more than once. Approximately 85% of Minnesota patients had only one QC during the review period.

**Table 3.4.1-1: Total Number of Patients during the Review Period and Sales by the Number of QCs**

QC#	Number of Patients	Sales	Patient %	Sales %
1 QC	26,709	\$54,093,848	85.19%	84.74%
2 QCs	3,622	\$7,812,005	11.55%	12.24%
3 QCs	874	\$1,637,768	2.79%	2.57%
4 QCs	126	\$255,813	0.40%	0.40%
5 QCs	16	\$22,595	0.05%	0.04%
6 QCs	4	\$11,609	0.01%	0.02%
<b>Total</b>	<b>31,351</b>	<b>\$63,813,768</b>	<b>100.00%</b>	<b>100.00%</b>

Table 3.4.1-2 shows an average 30-day spend per patient. Patients were grouped by the number of diagnosed QCs. The data indicates that, on average, patients with multiple QCs have spent more for a 30-day supply than patients with one condition.

**Table 3.4.1-2: Average 30-Day Spend by Number of QCs**

QC#	2016	2017	2018	2019
1 QC	\$530	\$496	\$497	\$477
2 QCs	\$692	\$670	\$691	\$721
3 QCs	\$449	\$329	\$339	\$343
4 QCs	\$751	\$432	\$407	\$354
5 or 6 QCs	N/A	N/A	\$321	\$377
<b>Overall Average</b>	<b>\$362</b>	<b>\$327</b>	<b>\$328</b>	<b>\$316</b>

Figure 3.4.1-2 shows the trend of overall average 30-day spend in Minnesota 2016 – 2019. The data shows overall average 30-day spend decreased by \$46, from \$362 in 2016 to \$316 in 2019. Because the study in Section 3.3 shows that total cannabis sales continuously increased from 2016 to 2019, a decrease in cannabis prices, not a decrease in sales, likely caused the decrease in the overall average 30-day spend.

**Figure 3.4.1-1 Average 30-Day Spend in Minnesota 2016 – 2019**

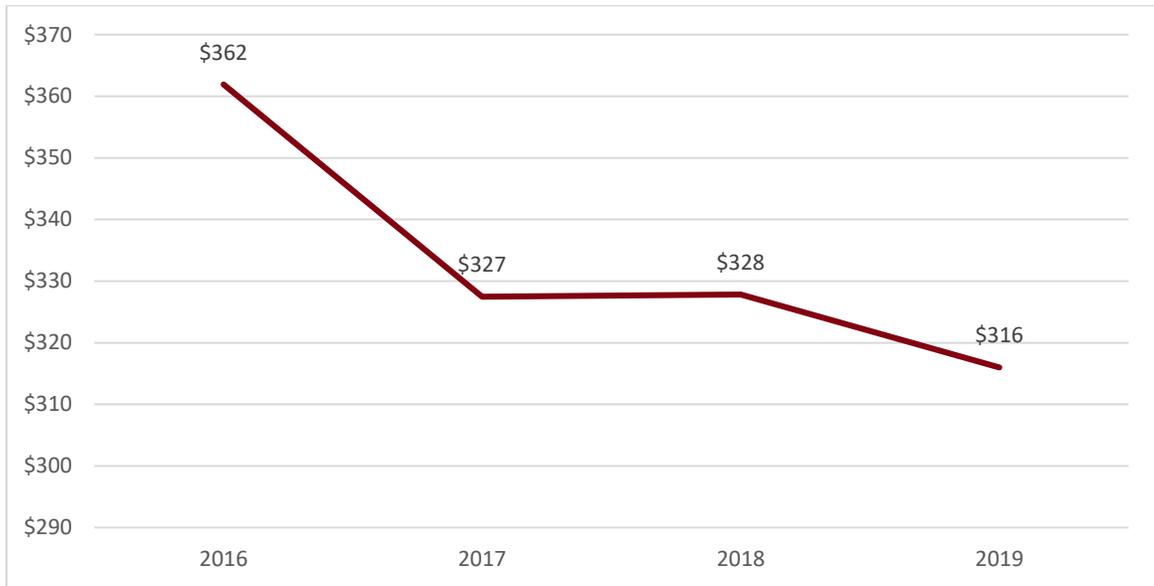
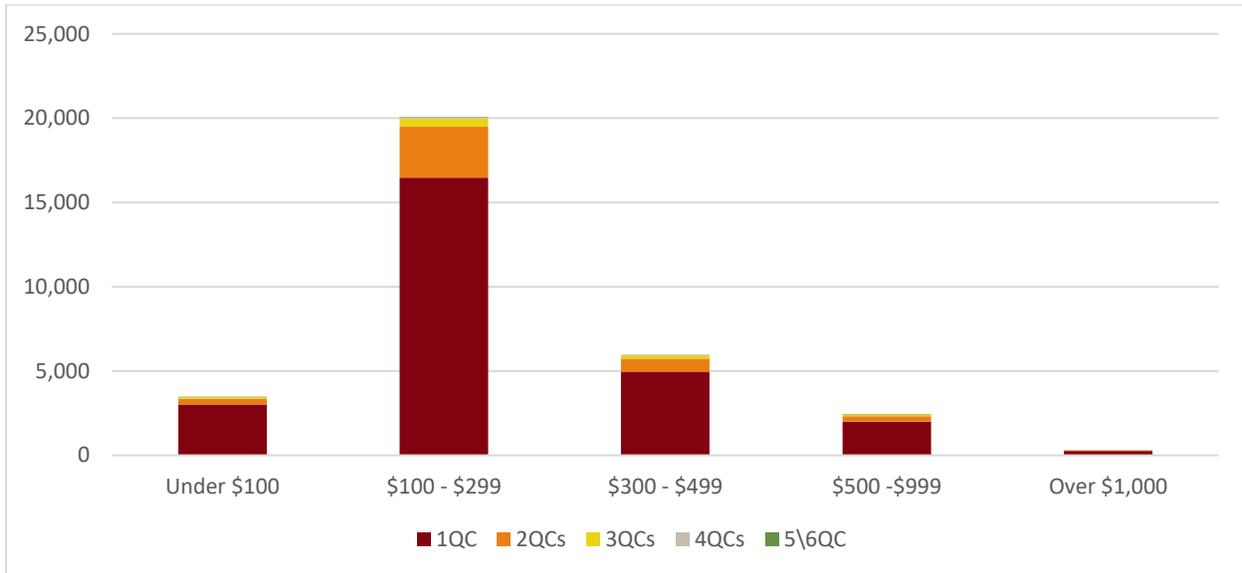


Table 3.4.1-3 shows the number of patients by their average 30-day spend during the review period. The data indicates that 73% of patients spend less than \$300 a month on average for medical cannabis.

**Table 3.4.1-3: Number of Patients by Average 30-Day Spend**

QC#	Under \$100	\$100 – \$299	\$300 – \$499	\$500 – \$999	Over \$1,000	Total Number of Patients During the Review period
1 QC	3,016	16,475	4,960	2,002	256	26,709
2 QCs	341	2,149	765	322	45	3,622
3 QCs	87	489	187	101	10	874
4 QCs	8	81	21	12	4	126
5 or 6 QCs	1	12	4	3	0	20
<b>Total</b>	3,453	19,206	5,937	2,440	315	31,351
<b>Percentage</b>	11%	62%	18%	8%	1%	100%

**Figure 3.4.1-3: Number of Patients by Average 30-Day Spend by Number of QCs**



**3.4.2 Average 30-Day Spend by Specific QC**

We further analyzed the data of patients with only one QC (85% of the population), to examine if any spending patterns by specific QC exist. The 14 approved QCs in Minnesota are:

1. Cancer
2. Glaucoma
3. HIV/AIDS
4. Tourette's
5. ALS
6. Seizures
7. Muscle spasms
8. IBD
9. Terminal
10. Intractable pain (IP)
11. PTSD
12. Autism
13. OSA
14. Alzheimer's disease

Table 3.4.2-1, below, shows the breakdown of average 30-day spend by patients with only one QC. The data indicates that in 2019 the patients with seizures had the highest average 30-day

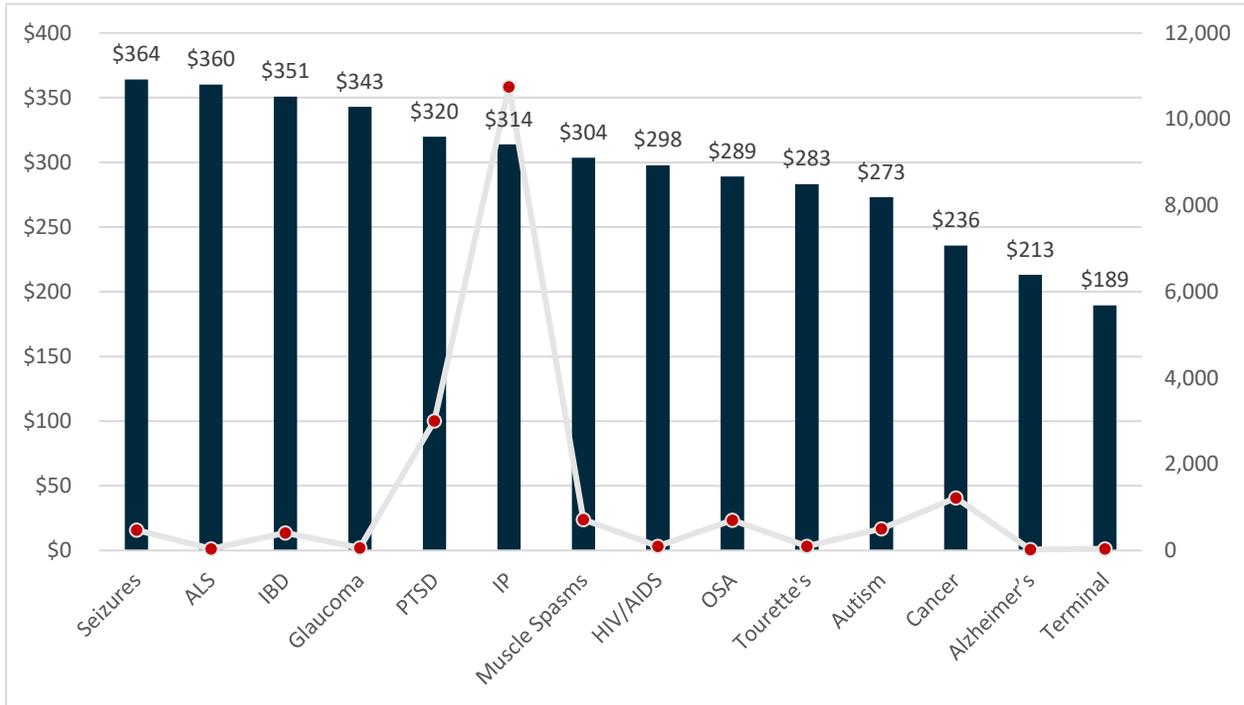
spend and the patients with terminal disease had the lowest. However, the average 30-day spend of patients with terminal disease was significantly lower in 2019 compared to the previous years. Patients with Alzheimer’s disease also had a low 30-day spend average; however, there might not be sufficient historical data of patients with Alzheimer’s disease to present a general spending pattern because it was only added as a QC on August 1, 2019.

**Table 3.4.2-1: Average 30-Day Spend Per Patient With One QC**

QC	2016	2017	2018	2019	# of Patients in 2019
Seizures	\$452	\$401	\$390	\$364	475
ALS	\$304	\$262	\$309	\$360	39
IBD	\$390	\$345	\$336	\$351	407
Glaucoma	\$262	\$318	\$272	\$343	66
PTSD		\$335	\$337	\$320	3,008
IP	\$335	\$321	\$324	\$314	10,755
Muscle Spasms	\$379	\$318	\$325	\$304	721
HIV/AIDS	\$300	\$288	\$341	\$298	101
OSA			\$273	\$289	703
Tourette’s	\$328	\$279	\$293	\$283	98
Autism			\$262	\$273	504
Cancer	\$340	\$280	\$258	\$236	1,223
Alzheimer’s				\$213	23
Terminal	\$310	\$250	\$345	\$189	37
Overall Average	\$530	\$496	\$497	\$477	18,160

Figure 3.4.2-1 is a visual presentation of the data shown in Table 3.4.2-1 of the average 30-day spend and the number of patients with only one QC in 2019. The number of patients for each QC is represented by a red dot based on the axis scale on the right side. It shows that the number of patients with IP, is significantly higher than any other conditions.

**Figure 3.4.2-1: Average 30-Day Spend in 2019 by QC and Number of Patients**



## Appendix A

### A.1 Historical Cannabis Prices – LeafLine and MinnMed

Below, we document the medical cannabis products each of the two manufacturers offered and their historical prices during the review period from October 2016 to December 2019.

#### A.1.1 Current and Historical Medicine Price List – LeafLine

Tables A.1.1-1 – A.1.1-4 show the historical prices of unique medicines offered by LeafLine during the review period grouped by the four medicine categories: Vape Oil, Oral Suspension, Capsule, and Topical. If the cell is blank, the medicine was not offered during the given period.

The products offered as of October 2016 and their prices are shown under Price 1 column. Since then, LeafLine made two significant changes in their prices and product offerings.

- Price 2: Effective as of April 26, 2017, the prices of all medicines were reduced by approximately 24% (excluding the medicine that was discontinued). The reduction percentage from Price 1 to Price 2 is shown under the Change % column.
- Price 3: Effective as of January 7, 2019, many products were discontinued while maintaining consistent pricing. Throughout the period, the number of medicines offered by LeafLine was decreased from 35 to 18.

**Table A.1.1-1: LeafLine Historical Medicine Prices – Vape Oil**

LeafLine Historical Medicine Prices – Vape Oil						
Medicine Type	SKU	Product	Price 1 From 5/11/16	Price 2 From 4/26/17	Price 3 From 1/7/19	Change % Price 2/ Price 1
THC Dominant	51032	Tangerine vaporizer oil cartridge, 0.5 mL		\$72.54	\$72.54	
	51031	Tangerine vaporizer oil syringe, 1 mL		\$145.08	\$145.08	
	51033	Tangerine vaporizer oil syringe, 1 mL		\$145.08	\$145.08	
	51034	Tangerine vaporizer oil cartridge, 0.5 mL 2-pack			\$145.08	
	51001	Tangerine vaporizer oil cartridge, 0.5 mL	\$95.39	\$72.54		-24%
	51002	Tangerine vaporizer oil syringe, 1 mL	\$190.78			
	51003	Tangerine vaporizer oil syringe, 0.5 mL	\$95.39	\$72.54		-24%
	51010	Tangerine vaporizer cartridge, 0.75 mL	\$143.09			
	51011	Tangerine vaporizer cartridge, 0.25 mL	\$47.70			
	51012	Tangerine vaporizer oil syringe, 2 mL	\$381.56	\$290.17		-24%
	51015	Tangerine vaporizer oil cartridge, 0.5 mL 2-pack	\$190.78	\$145.08		-24%
	51016	Tangerine vaporizer oil cartridge, 0.75 mL 2-pack	\$286.18			
	51017	Tangerine vaporizer oil cartridge, 0.5 mL	\$95.39	\$72.54		-24%
	51018	Tangerine vaporizer oil syringe, 1 mL	\$190.78	\$145.08		-24%

LeafLine Historical Medicine Prices – Vape Oil						
Medicine Type	SKU	Product	Price 1 From 5/11/16	Price 2 From 4/26/17	Price 3 From 1/7/19	Change % Price 2/ Price 1
	51019	Tangerine vaporizer oil syringe, 0.5 mL	\$95.39	\$72.54		-24%
	51020	Tangerine vaporizer oil cartridge, 0.75 mL	\$143.09			
	51021	Tangerine vaporizer oil cartridge, 0.25 mL	\$47.70			
	51022	Tangerine vaporizer oil syringe, 2 mL	\$381.56	\$290.17		-24%
	51030	Tangerine vaporizer oil cartridge, 0.5 mL		\$72.54		
THC=CBD	52006	Heather vaporizer oil cartridge, 0.5 mL	\$82.65	\$60.90	\$60.90	-26%
	52007	Heather vaporizer oil syringe, 0.5 mL	\$82.65	\$60.90		-26%
	52008	Heather vaporizer oil syringe, 1 mL	\$165.30	\$121.80		-26%
	52011	Heather vaporizer oil cartridge, 0.5 mL 2-pack	\$165.30	\$121.80		-26%
CBD Dominant	53004	Cobalt vaporizer oil cartridge, 0.5 mL		\$43.77	\$43.78	

**Table A.1.1-2: LeafLine Historical Medicine Prices – Oral Suspension**

LeafLine Historical Medicine Prices – Oral Suspension						
Medicine Type	SKU	Product	Price 1 From 5/11/16	Price 2 From 4/26/17	Price 3 From 1/7/19	Change % Price 2/ Price 1
THC Dominant	51007	Tangerine oral suspension unflavored, 120 mL	\$60.00	\$45.78	\$45.78	-24%
	51008	Tangerine oral suspension orange cream, 120 mL	\$60.00	\$45.77	\$45.78	-24%
	51009	Tangerine sublingual spray vanilla mint, 15 mL	\$75.03	\$57.22	\$57.22	-24%
	51014	Tangerine oral suspension orange cream, 240 mL	\$120.00	\$91.55	\$91.55	-24%
	51024	Tangerine oral suspension unflavored, 60 mL	\$300.00	\$228.89	\$228.89	-24%
	51005	Tangerine oral tincture vanilla, 15 mL	\$75.03	\$57.22		-24%
	51008	Tangerine oral suspension creamsicle, 120 mL	\$60.00			
	51013	Tangerine oral suspension unflavored, 240 mL	\$120.00	\$91.55		-24%
THC=CBD	52005	Heather sublingual spray vanilla mint, 15 mL	\$75.21	\$59.36	\$59.36	-21%
	52003	Heather oral suspension unflavored, 60 mL	\$103.50	\$79.14	\$79.14	-24%
	52004	Heather oral suspension cherry vanilla, 60 mL	\$103.50	\$79.14	\$79.14	-24%
	52009	Heather oral suspension cherry vanilla, 120 mL	\$207.00	\$158.28	\$158.28	-24%
	52010	Heather oral suspension, unflavored, 120 mL	\$207.00	\$158.28		-24%
CBD Dominant	53001	Cobalt oral suspension unflavored, 60 ml	\$129.00	\$99.96	\$99.96	-23%
	53003	Cobalt oral suspension unflavored, 120 ml	\$258.00	\$199.92		-23%

**Table A.1.1-3: LeafLine Historical Medicine Prices – Capsule**

Historical Medicine Prices – Capsule						
Medicine Type	SKU	Product	Price 1 From 5/11/16	Price 2 From 4/26/17	Price 3 From 1/7/19	Change % Price 2/ Price 1
THC Dominant	51029	Tangerine capsules, 5 mg, 30 count		\$28.61	\$28.61	
	51025	Tangerine capsules, 10 mg, 30 count	\$75.00	\$57.22		-24%

**Table A.1.1-4: LeafLine Historical Medicine Prices – Topical**

Historical Medicine Prices – Topical						
Medicine Type	SKU	Product	Price 1 From 5/11/16	Price 2 From 4/26/17	Price 3 From 1/7/19	Change % Price 2/ Price 1
THC=CBD	52012	Heather topical gel cream, 30 mL		\$39.57	\$39.57	

### A.1.2 Historical Medicine Price List – MinnMed

Tables A.1.2-1 – A.1.2-4 show the historical prices of unique medicines offered by MinnMed during the review period grouped by the four medicine categories: Vape Oil, Oral Suspension, Capsule, and Topical. If the cell is blank, the medicine was not offered during the given period.

- Price 1: The price in November 2016.
- Price 2: The price from December 2016 to October 2019. In December 2016, MinnMed lowered the prices of all medicines (excluding the medicine that was discontinued). This period is the longest and most consistent with price for all MinnMed medicines.
- Price 3: The average price the medicine sold for in November 2019. Several price changes were observed for most medicines within November 2019. Some medicines changed prices once, but some changed up to four times. MinnMed explained that the reason for the multiple price changes was that it lowered its prices in waves to sell out gradually until it reached its next consistent price. The prices in November 2019 were the steps between Price 2 and Price 4. The table shows the average price because the number of price changes was not consistent for all medicines.
- Price 4: The price in December 2019. The prices were reduced for most medical cannabis products by 20% to 22% during the 4th quarter of 2019 with several exceptions:
  - The prices were increased by 90% to 111% for the following products:
    - Two THC Dominant vape oil products
    - One THC=CBD vape oil product
    - Two THC Dominant capsule products

- One THC=CBD capsule products
  - The prices of two THC=CBD oral suspension products were reduced by 33%.

MinnMed explained that it changed the prices as a result of its financial analysis. Price-setting is based on several factors, including, but not limited to: cannabinoid content, costs to produce, customer demand, and internal supply capabilities. The change percentage from Price 2 to Price 4 is shown under the Change % column.

**Table A1.2-1: MinnMed Historical Medicine Prices – Vape Oil**

MinnMed Historical Medicine Prices – Vape Oil							
Medicine Type	SKU	Product	Price 1: Up to Nov 16	Price 2: Dec 16 – Oct 19	Price 3: Average Nov 19	Price 4: Dec 19	Change % Price 4/ Price 2
THC Dominant	2150	Red Distillate Bulk Oil syringe, 1 g*		\$149	\$131	\$118	-20.81%
	2151	Red Distillate Prefilled Vaporizer cartridge, 200 mg*		\$23	\$35	\$46	100.00%
	2152	Red Distillate Prefilled Vaporizer cartridge, 500 mg*		\$84	\$75	\$65	-22.62%
	2153	Red Distillate Prefilled Vaporizer cartridge, 1,000 mg*		\$159	\$138	\$125	-21.38%
	2201	Yellow (4:1) Prefilled Vaporizer cartridge, 0.5 mL	\$77	\$59	\$52		
	2250	Yellow (6:1) Distillate Bulk Oil syringe, 1 g*		\$149	\$131	\$118	-20.81%
	2251	Yellow (6:1) Distillate Prefilled Vape cartridge, 200 mg*		\$23	\$35	\$46	100.00%
	2252	Yellow (6:1) Distillate Prefilled Vape cartridge, 500 mg*		\$84	\$75	\$65	-22.62%
	2253	Yellow (6:1) Distillate Prefilled Vape cartridge, 1,000 mg*		\$159	\$138	\$125	-21.38%
	2901	Silver Prefilled Vaporizer cartridge, 0.5 mL	\$59	\$29	\$26	\$23	-20.69%
	2101	Red Prefilled Vaporizer cartridge, 0.5 mL	\$77	\$59			
	2102	Red Oil vial, 3 mL	\$293				
	2111	Red Prefilled Vaporizer cartridge, 0.2 mL	\$41	\$13	\$13		
	2112	Crimson Oil vial, 2 mL	\$249	\$239	\$219		
	2121	Red Oil vial, 1 mL		\$99	\$95		
	2122	Red Oil vial, 2 mL	\$195	\$179	\$175		
	2202	Yellow (4:1) Oil vial, 3 mL	\$292				
	2211	Yellow (4:1) Prefilled Vaporizer cartridge, 0.2 mL	\$41	\$13	\$13		
	2221	Yellow (4:1) Oil vial, 1 mL		\$99	\$99		
2222	Yellow (4:1) Oil vial, 2 mL	\$195	\$179				

MinnMed Historical Medicine Prices – Vape Oil							
Medicine Type	SKU	Product	Price 1: Up to Nov 16	Price 2: Dec 16 – Oct 19	Price 3: Average Nov 19	Price 4: Dec 19	Change % Price 4/ Price 2
	2802	Black Oil syringe, 1 mL	\$239	\$229	\$195		
THC=CBD	2301	Green (1:1) Prefilled Vaporizer cartridge, 0.5 mL	\$77	\$47	\$41	\$37	-21.28%
	2350	Green (1:1) Distillate Bulk Oil syringe, 1 g*		\$129	\$114	\$99	-23.26%
	2351	Green (1:1) Distillate Prefilled Vape cartridge, 200 mg*		\$23	\$35	\$46	100.00%
	2352	Green (1:1) Distillate Prefilled Vape cartridge, 500 mg*		\$69	\$60	\$54	-21.74%
	2353	Green (1:1) Distillate Prefilled Vape cartridge, 1,000 mg*		\$134	\$118	\$105	-21.64%
	2302	Green (1:1) Oil vial, 3 mL	\$292				
	2311	Green (1:1) Prefilled Vaporizer cartridge, 0.2 mL	\$41	\$13	\$13		
	2321	Green (1:1) Oil vial, 1 mL		\$88/\$99			
	2322	Green (1:1) Oil vial, 2 mL		\$179/ \$159			
CBD Dominant	2401	Blue (1:6) Prefilled Vaporizer cartridge 0.5 mL		\$59	\$52	\$46	-22.03%

\*MinnMed introduced distillate vape products in October 2019.

### A1.2-2: MinnMed Historical Medicine Prices – Oral Suspension

MinnMed Historical Medicine Prices – Oral Suspension							
Medicine Type	SKU	Product	Price 1: Up to Nov 16	Price 2: Dec 16 – Oct 19	Price 3: Average Nov 19	Price 4: Dec 19	Change % Price 4/ Price 2
THC Dominant	2105	Red MCT Oral Solution, 25mL	\$128	\$119	\$106	\$94	-21.01%
	2106	Red Tincture, 25 mL	\$128	\$119	\$106	\$94	-21.01%
	2205	Yellow (4:1) MCT Oral Solution, 25 mL	\$128	\$119	\$106	\$94	-21.01%
	2206	Yellow (4:1) Tincture, 25 mL	\$128	\$119	\$106	\$94	-21.01%
	2705	Red XS MCT Oral Solution, 25 mL	\$246	\$238	\$212	\$189	-20.59%
	2706	Red XS Tincture, 25 mL	\$246	\$238	\$212	\$189	-20.59%
THC=CBD	2305	Green (1:1) MCT Oral Solution, 25 mL	\$245	\$239	\$200	\$160	-33.05%
	2306	Green (1:1) Tincture, 25 mL	\$245	\$239	\$200	\$160	-33.05%
CBD Dominant	2505	Indigo (1:19) MCT Oral Solution, 25 mL	\$131	\$125	\$118	\$99	-20.80%
	2506	Indigo (1:19) Tincture, 25 mL	\$131	\$125	\$118	\$99	-20.80%

MinnMed Historical Medicine Prices – Oral Suspension							
	2605	Violet MCT Oral Solution, 25 mL	\$256	\$249	\$222	\$195	-21.69%
	2606	Violet Tincture, 25 mL	\$256	\$249	\$222	\$195	-21.69%

**Table A1.2-3: MinnMed Historical Medicine Prices – Capsule**

MinnMed Historical Medicine Prices – Capsule							
Medicine Type	SKU	Product	Price 1: Up to Nov 16	Price 2: Dec 16 – Oct 19	Price 3: Average Nov 19	Price 4: Dec 19	Change % Price 4/ Price 2
THC Dominant	2104	Red capsules, 30 count	\$33	\$29	\$25	\$23	-20.69%
	2114	Red capsules, 12 count	\$29	\$10	\$15	\$19	90.00%
	2204	Yellow (4:1) capsules, 30 count	\$55	\$39	\$35	\$31	-20.51%
	2214	Yellow (4:1) capsules, 12 count	\$29	\$10	\$15	\$20	100.00%
	2704	Red XS capsules, 30 count	\$100	\$79	\$69	\$62	-21.52%
	2804	Black capsules, 30 count	\$250	\$179	\$153	\$141	-21.23%
THC=CBD	2304	Green (1:1) capsules, 30 count	\$55	\$39	\$35	\$31	-20.51%
	2314	Green (1:1) capsules, 12 count	\$29	\$9	\$14	\$19	111.11%
CBD Dominant	2504	Indigo (1:19) capsules, 30 count	\$160	\$149	\$134	\$118	-20.81%
	2604	Violet capsule, 30 count	\$306	\$299	\$268	\$236	-21.07%

**Table A1.2-4: MinnMed Historical Medicine Prices – Topical**

MinnMed Historical Medicine Prices – Topical							
Medicine Type	SKU	Product	Price 1: Up to Nov 16	Price 2: Dec 16 – Oct 19	Price 3: Average Nov 19	Price 4: Dec 19	Change % Price 4/ Price 2
THC Dominant	2145	Red balm unscented, 1.5 oz		\$37	\$32	\$29	-21.62%
	2146	Red bar unscented, 2.5 oz		\$59	\$52	\$46	-22.03%
	2142	Red balm scented, 1.5 oz		\$37			
	2143	Red bar scented, 2.5 oz		\$59			
THC=CBD	2345	Green balm unscented, 1.5 oz		\$37	\$32	\$29	-21.62%
	2346	Green bar unscented, 2.5 oz		\$59	\$52	\$46	-22.03%
	2342	Green balm scented, 1.5 oz		\$37			
	2343	Green bar scented, 2.5 oz		\$59			
CBD Dominant	2545	Indigo balm unscented, 1.5 oz		\$37	\$32	\$29	-21.62%
	2546	Indigo bar unscented, 2.5 oz		\$59	\$53	\$46	-22.03%
	2542	Indigo balm scented, 1.5 oz		\$37			
	2543	Indigo bar scented, 2.5 oz		\$59			