



Cannabis Industry Services

*Enhancing the credibility of the cannabis industry
and building consumer trust through research.*

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Cannabis Operator Excellence

Gain a competitive edge in the cannabis industry by leveraging MSA's data analytics expertise to understand your customers. Partner with us to gain valuable insights into the performance of your cannabis products across demographics and other industries, empowering you to make informed decisions and stay ahead of the market.

- ◆ Partner in research with Management Science Associates to:
 - ◆ Reveal valuable company insights; preferred product forms, favored brands, and specific cannabinoid ratios for targeted demographics, enhancing your sales strategy.
 - ◆ Help to validate and legitimize the cannabis industry by providing robust data for informed decision-making, market credibility, and consumer trust.
 - ◆ Discover significant purchase patterns linked to the reduction in state-legal prescriptions.



How Research Works

- ◆ MSA conducts cannabis studies using its multi-patented, HIPAA-compliant de-identification engine to de-identify and link multiple diverse data sources at the individual level while maintaining privacy.
- ◆ MSA can link point-of-sale data with MSA's real-world healthcare data to analyze which cannabis products are most effective in helping patients with specific health and wellness needs.
- ◆ MSA is dedicated to advancing scientific research within the cannabis industry. Its objectives include forming strategic partnerships, collaborating directly with state regulators and government entities, and working alongside legal cannabis operators to enhance education through research.



Benefits to Partner in Summary

- ◆ Increase customer loyalty: use outcomes to improve recommendations for new patrons.
- ◆ Product development tailored to your customers and their needs, increasing sales and customer retention.
- ◆ The ability to understand every demographic of your customers in depth.
- ◆ Improve success of new product development using real world data to tailor products for specific uses.
- ◆ Target market understanding.
- ◆ Maximize return from investment in outreach programs.
- ◆ Forecast sales of new products with trial and repeat models to focus on new products with significant growth potential.



Advancement in Credibility

Through partnership we can accomplish the following:

- ◆ Gain insights into cannabis research, which does not yet have the level of rigorous deep dives that the pharmaceutical industry has had through research and clinical trials.
- ◆ Reach new customers in the health and wellness industry and non consumer markets through conclusive research and education.
- ◆ Support quantitative research and education to help cannabis consumers find the products that work best for them.



MSA Partners with Vireo Health



MSA used its platform - along with its deidentification and matching features - to determine that customers of eight dispensaries in Minnesota were able to reduce their legal opioid use by an average of **30% using cannabis.**

Other highlights from the study:

- Cannabis users who were successful in reducing their use of prescription opioids purchased a higher percentage of their cannabis in tablet form and favored higher THC:CBD ratios.
- Tablets seemed to work the best and the patients who had the most success were younger and female.
- Older patients were less likely to be able to reduce prescription opioid use.

Product Analysis for Manufacturers

Manufacturers can gain insights into the effectiveness of their brand and product form for treating patients with pain and a history of prescription use. Below is an example of opioid reduction. The table below shows the number patients using each brand and the percentage patients filling an opioid prescription in the past 30 days.

Manufacturer/Product Type	Total Customers	Filled Prescription (last 30 days)	Opioid Prescription %
Cosmic Connections	572	96	16.8%
Cartridge	340	83	24.4%
Flower	291	16	5.5%
Dr. Jones Medicinals	398	62	15.6%
Pill	398	62	15.6%
Fantasticals	702	151	21.5%
Beverage	410	81	19.8%
Pre-Rolled	311	96	30.9%
Tincture	187	21	11.2%
Gummies 'R' Us	316	66	20.8%
Edible	316	66	20.8%
Quiet Forest Organics	684	130	19.0%
Cartridge	163	58	35.6%
Flower	487	39	8.0%
Pre-Rolled	206	72	35.0%
Sweet Serenity	245	49	20.0%
Edible	245	49	20.0%

Segment Customers by Health & Wellness Measures

Your customers purchase cannabis products for a wide range of reasons. Combining your sales data with de-identified medical data, MSA can help you understand which medical conditions drive the most sales.

	Your Dispensary	Anxiety	Cancer	Chronic Pain	Heart Disease	Insomnia
Distinct Patients	837	303	35	235	96	311
Visits	2,847	1,082	117	1,046	216	1,114
Visits per Customer	3.40	3.57	3.34	4.45	2.25	3.58
Total Sales	\$127,520.50	\$31,673.10	\$4,520.25	\$42,109.00	\$12,890.50	\$38,420.25
Sales per Customer	\$152.35	\$104.53	\$129.15	\$179.19	\$134.28	\$123.54
Demographic Breakdown						
Female	499	170	19	147	43	155
Male	338	133	16	88	53	156
F21-29	85	44	1	24	3	37
F30-39	81	39	4	28	4	48
F40-49	82	36	5	21	5	26
F50-59	108	27	4	35	14	23
F60+	143	24	5	39	17	21
M21-29	54	24	0	6	2	22
M30-39	52	36	2	13	0	25
M40-49	45	32	0	18	6	42
M50-59	85	26	6	22	18	44
M60+	102	15	8	29	27	23

In addition to the demographic and sales information shown here, the data can also show which products, or types of products, are most popular to clients with specific conditions.

Market Share by Medical Condition

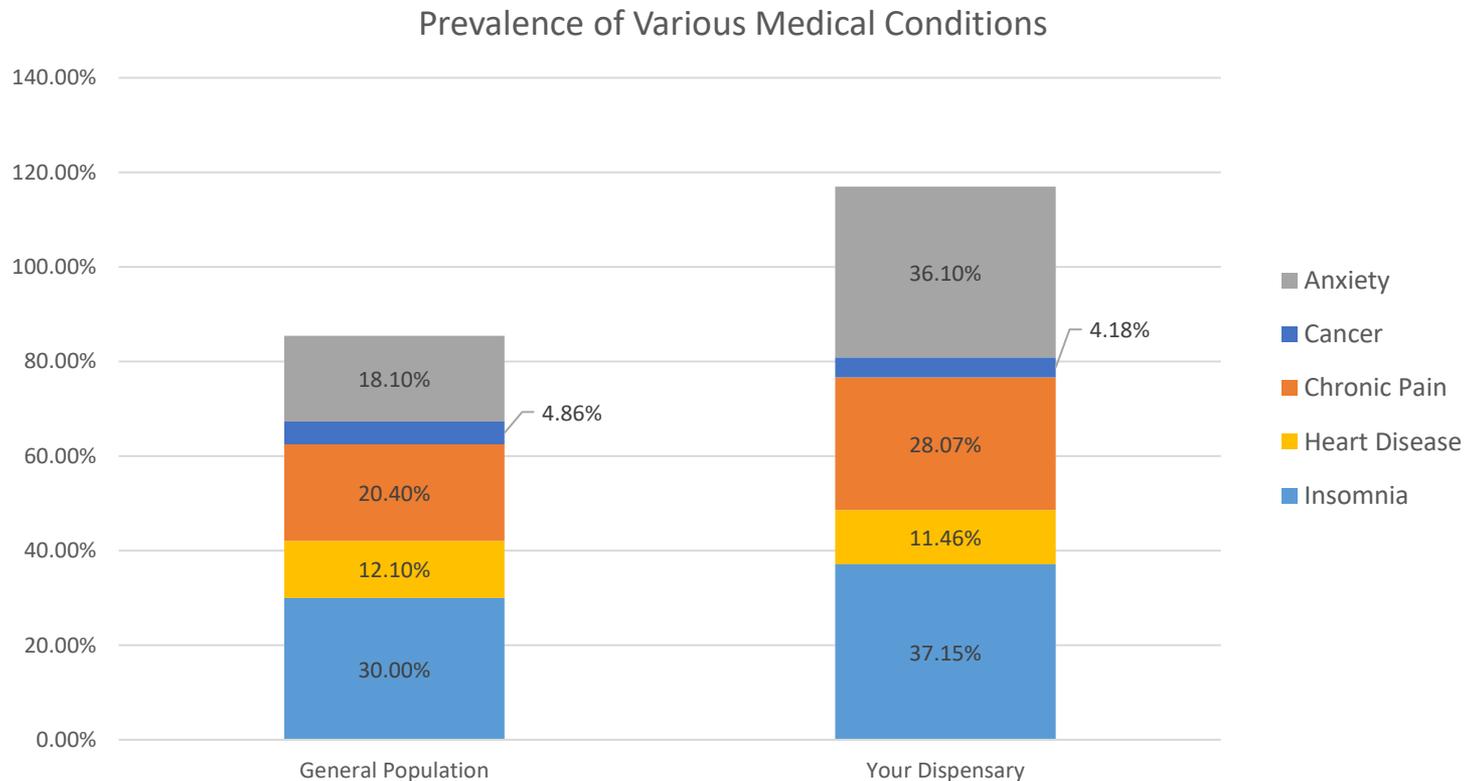
If you believe that your products are particularly beneficial to patients with a certain medical concern (such as pain management) MSA's ability to link sales data with medical data can show how effectively your products are reaching that demographic. Fair share of 1 indicates that a brand is exactly as popular within the target demographic as it is in the market overall. A fair share greater than 1 indicates a brand is particularly effective in reaching that demographic.

Brand	Market Share		Pain Management Fair Share			Potential Gain
	Total	Pain Management	Current Year	Previous Year	% Change YOY	
Ayr	5.23 %	4.90 %	0.94	1.04	- 9.91 %	\$12,076,750
Cresco Labs	7.74 %	9.03 %	1.17	1.05	+ 11.11 %	\$0
Fernway	3.10 %	3.27 %	1.05	1.15	- 8.27 %	\$3,484,000
GTI	8.80 %	7.20 %	0.82	0.88	- 7.02 %	\$30,820,000
Happy Valley	3.82 %	4.20 %	1.10	1.16	- 5.22 %	\$2,579,500
MariMed	3.99 %	4.04 %	1.01	1.07	- 5.37 %	\$6,180,750
All Other Brands	67.32 %	67.36 %	1.00	0.98	+ 2.10 %	

Potential gain is based on a brand's ability to equal the top brand's fair share (in this example, Cresco Labs). The calculation assumes that patients with pain management concerns make up $\frac{1}{4}$ of the total market.

Adjust Product Mix Based on Medical Conditions

You can also discern which conditions are over-represented among your dispensary's clients, relative to the population at large, and which populations might provide opportunities for growth.



Note: Since an individual may have more than one condition (or none) the percentages need not sum to 100%.

Forecast sales of new products with trial and repeat

- ◆ Every cannabis operator tracks its top selling products. Gain deeper insights into which products your customers like, by looking at MSA's trial and repeat data.
- ◆ A top seller with little or no repeat business won't remain popular for long, while a product that inspires loyal customers to come back and purchase it again and again provides a steady stream of revenue.

Manufacturer/Product	Total Sales	Trial Sales	Repeat Sales	Repeat %
Cosmic Connections				
Galaxy Swirl Cartridge	\$150.00	\$90.00	\$60.00	40.00%
Great Unknown Cartridge	\$120.00	\$100.00	\$20.00	16.67%
Groovy Nebula Cartridge	\$120.00	\$105.00	\$15.00	12.50%
Dr. Jones Medicinals				
Dr. J's Pills (20 pack)	\$240.00	\$100.00	\$140.00	58.33%
Dr. J's Pills (10 pack)	\$200.00	\$140.00	\$60.00	30.00%
Dr. J's Pills (5 pack)	\$180.00	\$150.00	\$30.00	16.67%
Sweet Serenity				
Dark Chocolate Bites	\$240.00	\$110.00	\$130.00	54.17%
Dark Chocolate Bar	\$210.00	\$110.00	\$100.00	47.62%
Hot Chocolate Powder	\$200.00	\$135.00	\$65.00	32.50%

MSA Partners with BDSA



- ◆ BDSA is the leading provider of data and insights for the cannabis industry through providing retailers, manufacturers, brands, wholesalers, and investors with actionable insights to drive profitability, increase revenues, eliminate expenses, and outmaneuver the competition.
- ◆ Through MSA's capability to analyze real-world data in coordination with BDSA's extensive insights into the cannabis industry, we offer one-of-kind advisory to help understand your consumers, influence business and sales strategies, and more.

About MSA

Since 1963, Management Science Associates, Inc. has partnered with customers to identify areas in which innovative analytics and applications of data and systems drive growth and create efficiency. Combining its expertise with the tools of information management, analytics, data management, systems engineering and support, MSA develops, integrates, implements, and maintains solutions, products and services for a number of industries. Since 2013, MSA has been developing extensions of its success in CPG, healthcare, media, metals, and information processing into the high growth cannabis industry.

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