

The State of Legal Cannabis Markets

Executive Summary

7th Edition

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The State of Legal Cannabis Markets

7TH EDITION

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2018 put *Cannabis sativa* at the heart of something much bigger than the “legal cannabis market” as it has been thought of in the past. In the U.S. alone, it is forecast that the “Total Cannabinoid Market” (TCM) in state-regulated dispensaries, pharmacies and general retail outlets will soar to \$44.8 billion by 2024

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Additional Thanks

Too many people to mention by name have helped educate our team on the cannabis industry since we began our study of it in 2016. But those who have contributed specifically to the findings in the 7th Edition of the State of Legal Cannabis Markets include: Jonathan Rubin at Cannabis Benchmarks; Matt Schweich and Karen O'Keefe at the Marijuana Policy Project; Diane Czarkowski and the team at Canna Advisors; Scott Fortune at Roth Capital; Bobby Burleson and Jonathan DeCoursey at Canaccord Genuity; Barrington Miller at the Canadian Securities Exchange; Chuck Drake at Grupo Flor; Jeff Chen at UCLA's Cannabis Research Institute; Troy Ivan at ExtractCraft; Jon Trauben at Altitude Investment; Alex Howe at Harvest; Jon Cooper at Canopy Growth; Rob Clarke at BioAgronomics Group; and of course the "brain trust" at BDS Analytics: Roy Bingham, Liz Stahura, Micah Tapman, Greg Schoenfeld, Jessica Lukas, Chris Lohman and Tamar Maritz.

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Letter From the Publisher

Thank you for purchasing the “7th Edition of The State of Legal Cannabis Markets.” It’s an honor to serve you as the worldwide cannabis market continues to evolve.

At every moment before now, prominent elected officials, big investors and big companies entering the cannabis space were considered mavericks and big risk takers. Not anymore. All of a sudden, everyone who hasn’t entered already is trying to play catch-up.

While people in the know have been talking about CBD for years, all of a sudden CBD is everywhere. The passage of the Farm Bill which legalized hemp CBD has made CBD the main entry point for big Fortune 500 companies. I don’t believe we have ever seen a single product go from relative obscurity to this level of interest so quickly.

Nobody is even asking “if” cannabis will become legal in the U.S. anymore. It’s now a question of exactly when and how.

At the same time, the massive increase in the velocity of this market changes the playing field of where money is to be made. Making sense of the enormous amount of fast-moving parts worldwide is dizzying.

That’s why The Arcview Group and BDS Analytics worked tirelessly to produce this report.

Luck favors the most knowledgeable and prepared. With that in mind, good luck out there.

Be well, be free,



A handwritten signature in black ink, appearing to read 'Troy Dayton'.

Troy Dayton

CEO, The ArcView Group

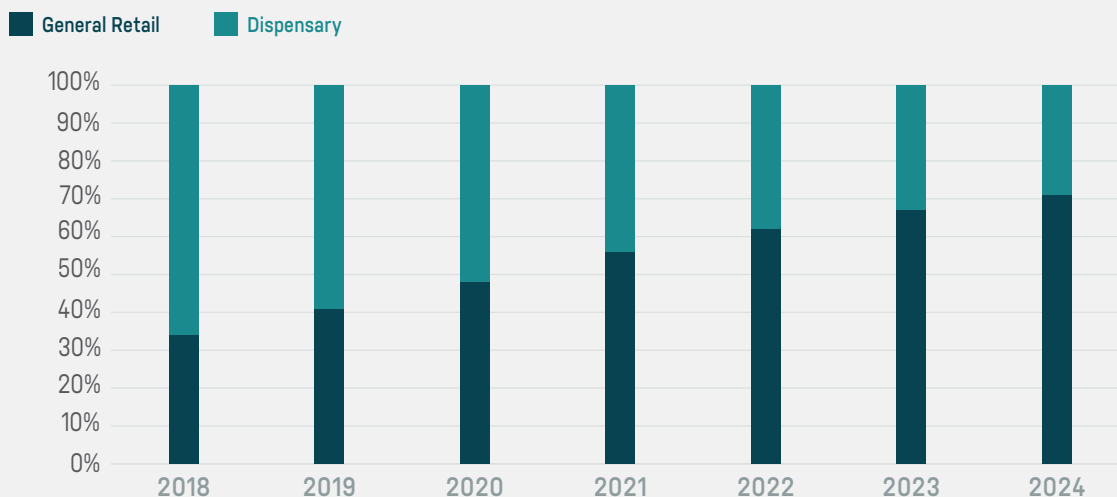
Executive Summary

The cannabis industry was changed in dramatic ways by three major events in 2018:

- June 25—The pharmaceutical market opened up with the U.S. Food and Drug Administration's (FDA) approval of GW Pharmaceutical's Epidiolex.
- Oct. 17—The regulated legal cannabis market saw adult-use legalization come to Canada.
- Dec. 20—The general retail channel was opened to cannabidiol (CBD) product sales by the signing of the Agricultural Improvement Act of 2018 (AKA the "2018 Farm Bill"), legalizing the commercial production of hemp.

The year's events put *Cannabis sativa* at the heart of something much bigger than the "legal cannabis market" as it has been thought of in the past. In the U.S.

US CBD Spending, Licensed Dispensary vs. General Retail Channels, 2018–2024



Source: BDS Analytics/Arcview Market Research

alone, it is forecast that the “Total Cannabinoid Market” (TCM) in state-regulated dispensaries, pharmacies and general retail outlets will soar to \$44.8 billion by 2024.

- The largest percentage of that \$44.8 billion will be spent in regulated cannabis dispensaries that are now coming to all 50 states, Washington, D.C., and the U.S. territories by 2024.
- The second biggest percentage will be spent on CBD products in U.S. general retail outlets, in both online and brick-and-mortar stores of every stripe.
- The smallest piece of the pie in the near term will go to pharmacies, though giant pharmaceutical companies are furiously working now to increase that share with new cannabinoid-related drugs.

The devil is in the regulatory details for all three components of the TCM, as the legal regulated dispensary sector found out to its dismay with California’s disappointing adult-use launch in 2018. Much remains unclear about how Washington, D.C., will handle the regulation of pharmaceutical cannabinoids and the general retail market for CBD products. The FDA just held its first hearing on the subject May 31, 2019 (see “US Leads Total Cannabinoid Revolution”).

Even less certain is the future of CBD sales in other countries, which is why this report only presents detailed analysis of the TCM in the U.S. The Canadian (see “The Noble Experiment”) and other international markets (see “The Seeds of an Enormous Worldwide Market”) are discussed and forecast only in terms of their legal cannabis markets.

Legalization Advances in Washington

CBD’s escape from the state-regulated dispensary via legalization action in Congress and the executive branch is undoubtedly a harbinger of things to come for THC and the hundred-plus other cannabinoids already identified. But for now, Washington, D.C., is sticking to its prohibitionist guns on other *C. sativa*-based products—i.e. those containing more than the 0.3% THC that the 2018 Farm Bill set as the limit to be considered hemp.

With that definition, Congress effectively ceded regulatory control of the cannabis dispensary market to the states. That may, in fact, remain the case for some time since the most likely route to the easing of federal prohibition is the Strengthening the Tenth Amendment Through Entrusting States (STATES) Act. Rather than descheduling or rescheduling “marihuana” out of Schedule 1 of the Controlled Substances Act (CSA), the STATES Act would exempt state-legal cannabis activities from the CSA, allowing businesses to operate free from fear of federal legal action and, at least initially, free from federal regulatory oversight as well.

Given how much regulators abhor a vacuum, federal forbearance may not last long. But the TCM had a good run in Washington, D.C., over the past 18 months despite the troubling Jan. 4, 2018, rescission of the Cole Memo by then Attorney General Jeff Sessions. That internal Justice Department memo advising local U.S. attorneys to forego enforcement actions in medically legal states did not have the force of law, and budget restraints kept Justice in check through Sessions’ November resignation.

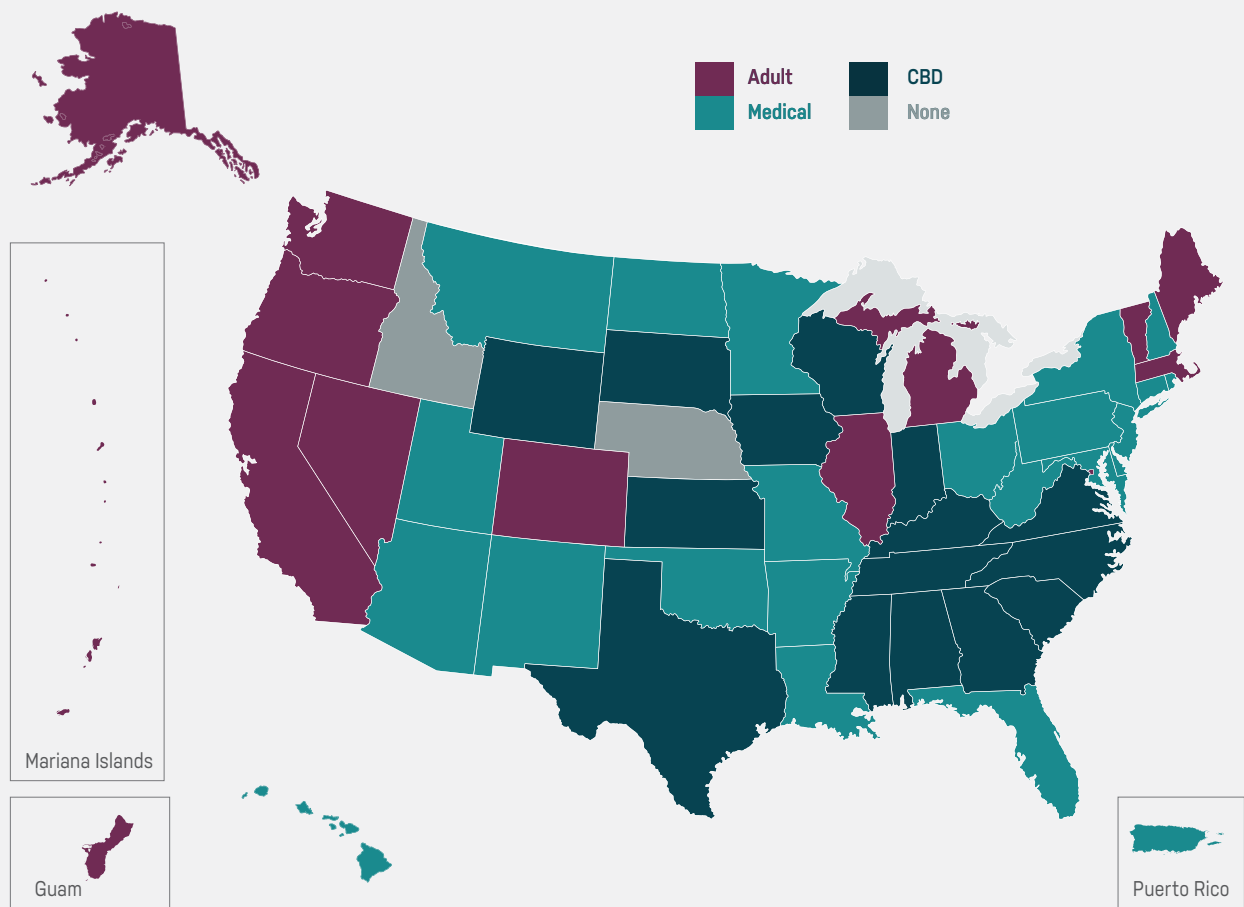
Democrats taking control of the House of Representatives after the midterm 2018 elections removed several roadblocks to incremental progress there. The STATES Act

was introduced on June 7, 2018, and was endorsed by President Trump the next day. It has been reintroduced in the 116th Congress with a growing list of sponsors, along with the SAFE Banking Act, which would allow federally chartered banks to more easily accept money from state-legal cannabis businesses.

Medical and Adult-Use Markets in the US

Total legal cannabis spending in the U.S., putting aside the pharmaceutical and general retail CBD sales, grew to \$9.8 billion in 2018, up from \$8.5 billion in 2017. That 16% growth is less than half the 35% compound annual

US Legal Status



Legal status as of May 31, 2019.

Source: Arcview Market Research/BDS Analytics

growth rate (CAGR) at which the regulated dispensary market grew from 2013 to 2017 as the first adult-use states (Colorado, Washington, Oregon, Alaska and Nevada) came on line.

The main reason for the slowdown was the troubled launch of adult-use sales in California on Jan. 1, 2018. The home of both the hippie movement that sparked wider cannabis popularity in the '60s, and the first public medical cannabis dispensary (the San Francisco Cannabis Buyers Club) in 1992, California surprised most in the industry by becoming the first state to launch adult-use sales and actually shrink its legal cannabis market—from \$3 billion in 2017 to \$2.5 billion in 2018.

Nevertheless, legal cannabis markets are popping up like spring flowers throughout the U.S. and its territories, as detailed in “The Inexorable March of Legalization.” But California is not the only place where the legal market is struggling to compete with a well-established illicit market. Regulators are ambivalent, publicly supporting the value of moving cannabis out of the illicit market and redressing the harms prohibition has done—such as overincarceration of minorities for minor possession offenses—but they have often proved unwilling to allow enough stores and keep regulatory and tax costs low enough to make the legal market competitive.

In the last year, adult-use legalization came to predictably liberal U.S. states like Massachusetts and medical access to swing states like Ohio and even to traditionally conservative states like Oklahoma. The comparative results have been surprising and useful in forecasting states that have not yet begun legal sales.

The range of regulatory schemes and the market results in what are now 33 state “laboratories of legalization,”

with at least medical programs (plus Washington, D.C., and three territories), have provided a growing amount of clarity about what drives (or prevents) growth in legal cannabis markets in the U.S. Six of those factors, from basic measures of the relative popularity of cannabis to the cost and other handicaps of each state's tax and regulatory load, have been factored into a proprietary “Growth Indicator Matrix” that now drives the individual market forecasts (see “Global Legal Cannabis Breaks \$40 Billion by 2024”).

These market and regulatory factors can make a huge difference in eventual market size, but legal status—illicit-only, medical-only or full adult-use legalization—is still the key. The November 2018 election saw a flurry of activity, with voters passing medical and adult-use initiatives in Michigan, Missouri, Oklahoma and Utah, making it second only to the watershed year of 2016, when voters in eight states took action. By 2024, every U.S. state, Washington, D.C., and four U.S. territories are forecast to have active medical cannabis programs, and 20 states, Washington, D.C., and two territories will have active adult-use markets. Despite pockets of regulatory resistance, the wave of legalization actions will drive the U.S. legal cannabis market to nearly \$30 billion in 2024, increasing at a CAGR of more than 20%.

Canada's Noble Experiment

Canada made history when it became the second country to legalize adult-use on the federal level in 2018, and it did so without the severe limits on access that Uruguay—whose legislature voted to legalize in 2013—imposed when it finally launched its retail market in 2017. Canadian spending on adult-use is expected to grow from just under \$113 million in the partial year of 2018 to \$4.8 billion in 2024. Medical cannabis will start to decline as the market shifts to adult-use access with no medical card required.

It will fall from nearly \$457 million in 2018 to just over \$381 million in 2024.

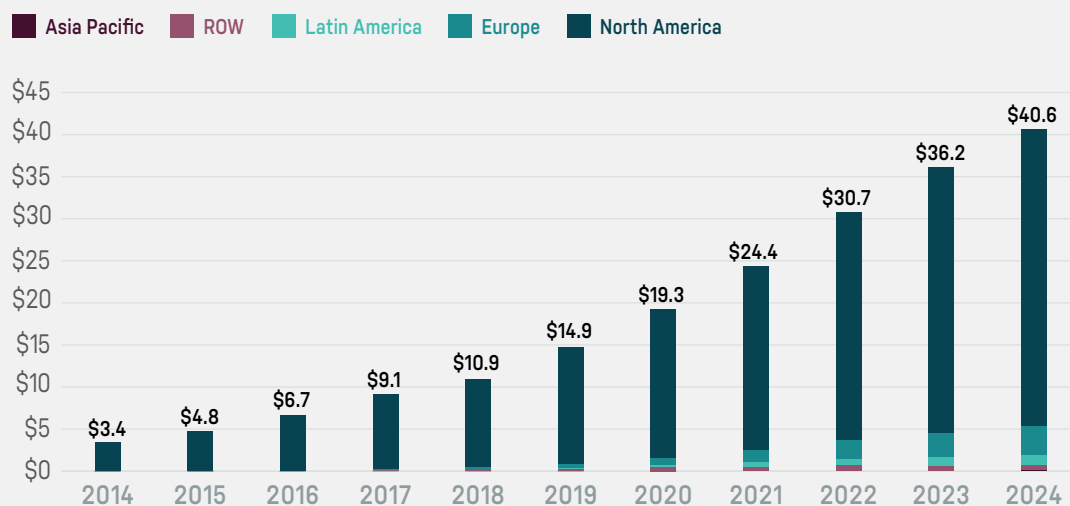
But Canada's market is really 13 different provincial and territorial markets, each with its own regulatory schemes that will substantially impact their success at building a legal market to replace Canada's robust illicit one. For the first time, this year's report analyzes and forecasts Canada on a province-by-province basis.

While total spending will grow, the federal-level prohibition of edibles and most concentrates will be a drag on the market in the near term. Final regulations for sales of those products are expected in October 2019, but it will take time for suppliers to catch up with the branding and marketing strategies that make those products chief drivers of U.S. market growth.

Beyond North America: Planting the Seed

Growth in international markets continues to be characterized by expanding access both through liberalization in existing medical markets and legalization in new medical ones. While international legal cannabis revenue will overwhelmingly come from spending in medical markets, adult-use spending is forecast to see a boost from a few new entrants. In addition to the global adult-use pioneer, Uruguay, and Switzerland's unrestricted adult access to products with less than 1% THC content, several new national markets are expected to begin adult-use sales within the forecast period. Looking forward, markets as diverse as Luxembourg, Mexico and New Zealand have signaled that adult access to cannabis products is in the offing.

Global Legal Spending in Key Markets by Continent (In Billions)



Source: Arcview Market Research/BDS Analytics

Newly broadened access to cannabis products in major European markets such as the U.K. will significantly impact international spending. But more impactful is the news of medical access in places that many assumed were still far from approving any type of cannabis legalization. In Asia, both South Korea and Thailand have approved medical access for qualifying patients, albeit through highly regimented programs. In Africa, Lesotho, South Africa, Zambia and Zimbabwe are in various stages of program development. As the market broadens, growth will accelerate, and spending outside of North America will substantially increase—growing from \$517 million in 2018 to \$5.4 billion in 2024.

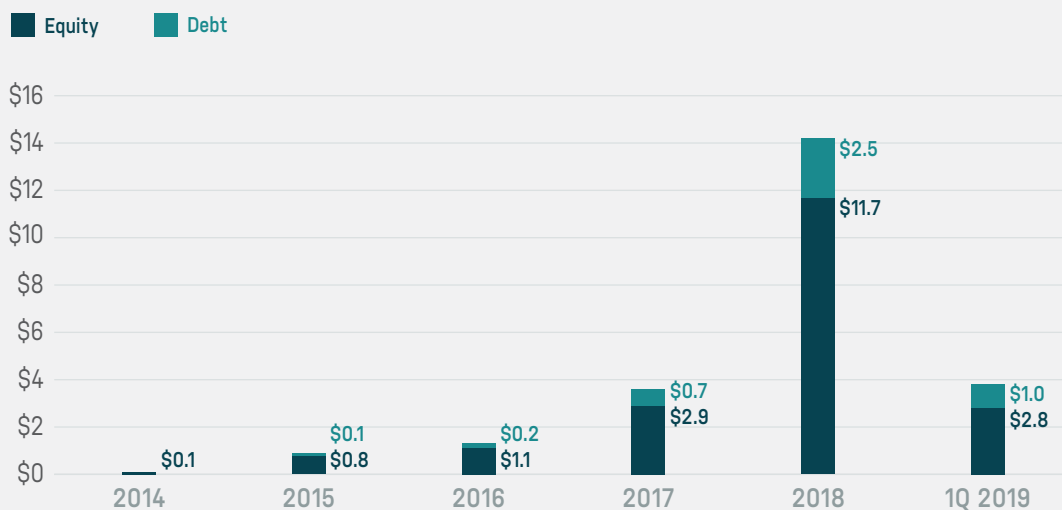
Fortune Passes Everywhere

The immense progress on legalizing cannabis around the world in 2018 and 2019 has completely changed the investment picture for cannabis companies. Even two

years ago, companies struggled to put together a \$10 million tranche, and many investors ruled out companies that “crossed the green line,” meaning they took possession of cannabis-derived substances in the course of conducting their business. By the first quarter of 2019, nine-figure capital raises were not uncommon, and Canadian licensed producers (LPs) Canopy Growth and Cronos Group had taken in billion-dollar investments from beverage conglomerate Constellation Brands and tobacco giant Altria, respectively.

All told, in 2018, cannabis companies raised \$14 billion according to tracking by Viridian Capital Advisors, more than twice the money that was raised in 2014-2017 in total. Investors of every stripe rushed in, emboldened by the willingness of publicly traded companies from adjacent industries to put money into cannabis companies.

Annual Capital Raised (In Billions)



Source: Viridian Capital Advisors

But the events of 2018 have, if anything, increased the volatility of public cannabis stocks. Led by the Cronos Group, which in March 2018 convinced the NASDAQ exchange to list in the U.S. the shares of a Canadian company not in violation of its own country's laws, the largest of the Canadian LPs have now gained listings on American exchanges. Privateer Holdings-backed Tilray conducted its initial public offering on the NASDAQ in July 2018.

That move south for greater access to capital prompted American companies to look north for the same. Los Angeles-based multistate operator MedMen went first with a May 2018 listing on the Canadian Securities Exchange (CSE), which has played a pivotal role in giving cannabis companies access to public money since the mid-2010s. Now some 30 U.S. cannabis companies are traded on Canadian exchanges, according to tracking by New Cannabis Ventures (NCV).

It has been a wild ride. The celebratory mood around California's Jan. 1, 2018, adult-use legalization was quickly punctured by Attorney General Sessions' rescission of the Cole Memo on January 5, and NCV's Global Cannabis Stock Index was down 54.9% for the full calendar year. It has since recovered smartly, though still is well below its early 2018 multiyear peak.

The volatility is nothing new for cannabis stocks: NCV's Global Cannabis Stock Index was set to 100 at launch on Dec. 31, 2012, and broke 1,000 in the excitement around Colorado's launch of adult-use sales on Jan. 1, 2014. After the first-quarter rally in 2019, it stood again at 100.76. But the gyrations should not obscure a fundamental fact: Public cannabis companies are no longer penny stocks being traded over the counter but are instead exchange-traded shares of companies generally following government disclosure

NCV Global Cannabis Stock Index



Source: New Cannabis Ventures

requirements in anticipation of ever-more-certain U.S. legalization.

While they wait to clear that final hurdle to becoming companies like any other, they are aggressively putting the cash they are raising into hard assets in cultivation, processing and product development and retail footprint. Meanwhile, they are using the currency of their exchange-traded shares by rolling up companies in their core sectors and diversifying into other types of operations.

Total Cannabinoid Market: The US Leads the Way

But legal cannabis is just the beginning of the story. The cannabis market—well past its illicit modern roots during prohibition—is now moving beyond the licensed dispensary channel and into the broader general retail and pharmaceutical markets. It is an historical irony that the U.S., which led the world to criminalize cannabis in the first half of the 20th Century, is leading the switch back to legal status. In that context, the regulatory changes in the 2018 Farm Bill in the U.S., which created an opening for hemp-based CBD in general retail channels, and the FDA's approval of the first naturally derived cannabis-based pharmaceutical, Epidiolex, have enormous historical significance.

Hemp-derived CBD is now available in a broad range of general retail channels outside of the licensed cannabis dispensaries including online, drug stores, natural products, beauty, convenience, grocery and even pet stores. After the FDA sorts out the rules for CBD as a food additive, CBD products will also start to appear on the shelves of mass-merchants. CBD product categories with anecdotal evidence of efficacy range from pain relief to anti-aging skin applications to calming treats for pets. It was apparent at the May FDA hearings on cannabinoids

that the complexity of regulation is a big hurdle for the industry, but the FDA is clearly open to how it can successfully regulate CBD separately from other compounds in cannabis, particularly THC.

Including general retail and pharmaceutical channels, the U.S. TCM is expected to grow to \$44.8 billion in 2024. This opens up a whole new set of opportunities for everyone already in the cannabis business ecosystem.

But the TCM opportunity is also there for companies that may be reluctant to join the state-regulated, adult-use—or even medical-use—cannabis market. There was a rush of consolidation in cannabis companies during 2018 and early 2019, but it also marked the first time that giant consumer brands, from Altria to Constellation to Heineken to Molson Coors, entered the market. CBD outside of the licensed dispensary market will make it much easier for other well-known consumer brands to become involved in the booming cannabis business.

To enable all of this market activity, the industry has been hard at work developing the science and intellectual property that will be the bedrock of business assets going forward. The cannabis, CBD and pharmaceutical industries, academics, cultivators and processors, as well as many individual participants have already been involved in scientific research over the last few decades, but the moves in Washington, D.C., in 2018 will prompt a redoubling of those efforts.

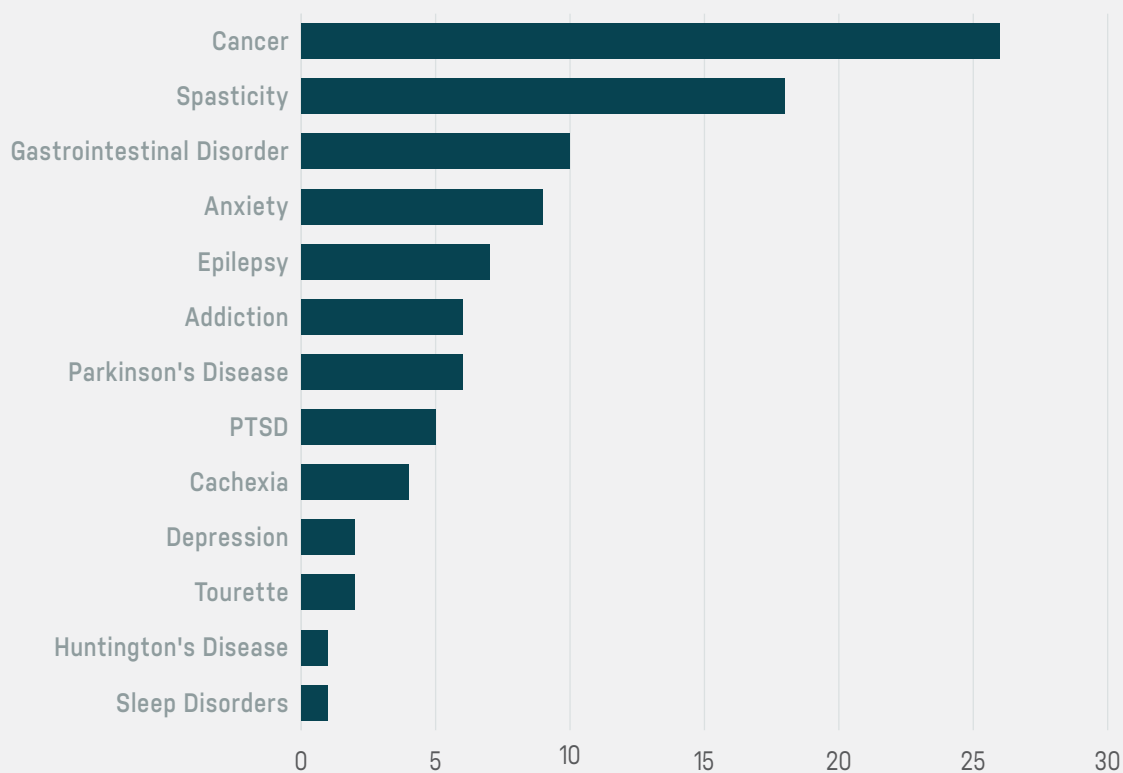
These participants have also begun to use the full force of intellectual property protection through patent and plant protection processes all over the world. The most visible was the FDA's approval of GW's Epidiolex, but the activity around testing the efficacy and effects of cannabis as a medicine is in full swing. Longtime players

and new entrants alike are also lawyering up to more aggressively protect all of their intellectual property, whether that be scientific medical discoveries or the genetics and techniques that bring cannabinoids like THC and CBD to market.

The next few years will see a dramatically quickened pace of innovation in all areas of the cannabinoid ecosystem. Regulatory changes that may allow interstate

commerce, public consumption or export are all being explored in the U.S. and elsewhere. CBD is expanding the potential market in the U.S., and countries around the world are closely watching to see what the FDA does in the wake of its May hearings on the compound. In the Orwellian doublespeak of Washington, there has never really been a “legal cannabis market” all these years. Only FDA rule-setting will act as a starting gun for the creation of a Total Cannabinoid Market.

Clinical Trials by Disease or Disorder



Source: clinicaltrials.gov



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Letter From the Editor

The state of legal cannabis markets has always been complex, but you will find an even more nuanced story than ever before in this seventh edition of our annual report, now renamed “The State of Legal Cannabis Markets.” The new name reflects the industry’s growing maturity and the now common practice of using the scientific name for the product rather than “marijuana,” which, after all, is just one of the many popular names the useful plant has had over the millennia.

But the report’s new name also reflects the dramatic expansion of the ways in which products containing cannabinoids, derived from the *Cannabis sativa* plant, will be developed and distributed in the future, and the regulatory regimes under which that will happen:

- Legal regulated cannabis markets in the U.S. will continue to be regulated at the state level only—for now.
- The pharmaceutical cannabinoid market, launched in earnest in June 2018 with the Food and Drug Administration’s (FDA) approval of Epidiolex, will have the most tightly regulated supply chain at the federal level.
- The U.S. general retail CBD market can now exit its gray market past with the legalization of hemp cultivation by the 2018 Farm Bill while awaiting FDA rulemaking on the compound’s use as a food additive.

It has become clear to our team in this annual exercise that the “legal cannabis market” is quickly becoming the “total cannabinoid market” with three components: 1) regulated dispensaries, 2) pharmacies and 3) general retail. For now, we have modeled it that way just in the U.S., which, ironically given its role in turning cannabis from remedy and relaxant into a controlled substance, is actually leading the world back to a more rational approach.

This year’s report is also different because three years of cannabis industry experience has enabled us to isolate and analyze the factors that drive growth (or kill it) in that regulated dispensary market. We have revised all U.S. state forecasts accordingly and, for the first time, have applied the same thinking to individual Canadian provinces and territories to forecast them individually.

We hope you find reading the “7th Edition of The State of Legal Cannabis Markets” as fascinating as we found researching and writing it.



Tom Adams

Editor in Chief

Arcview Market Research

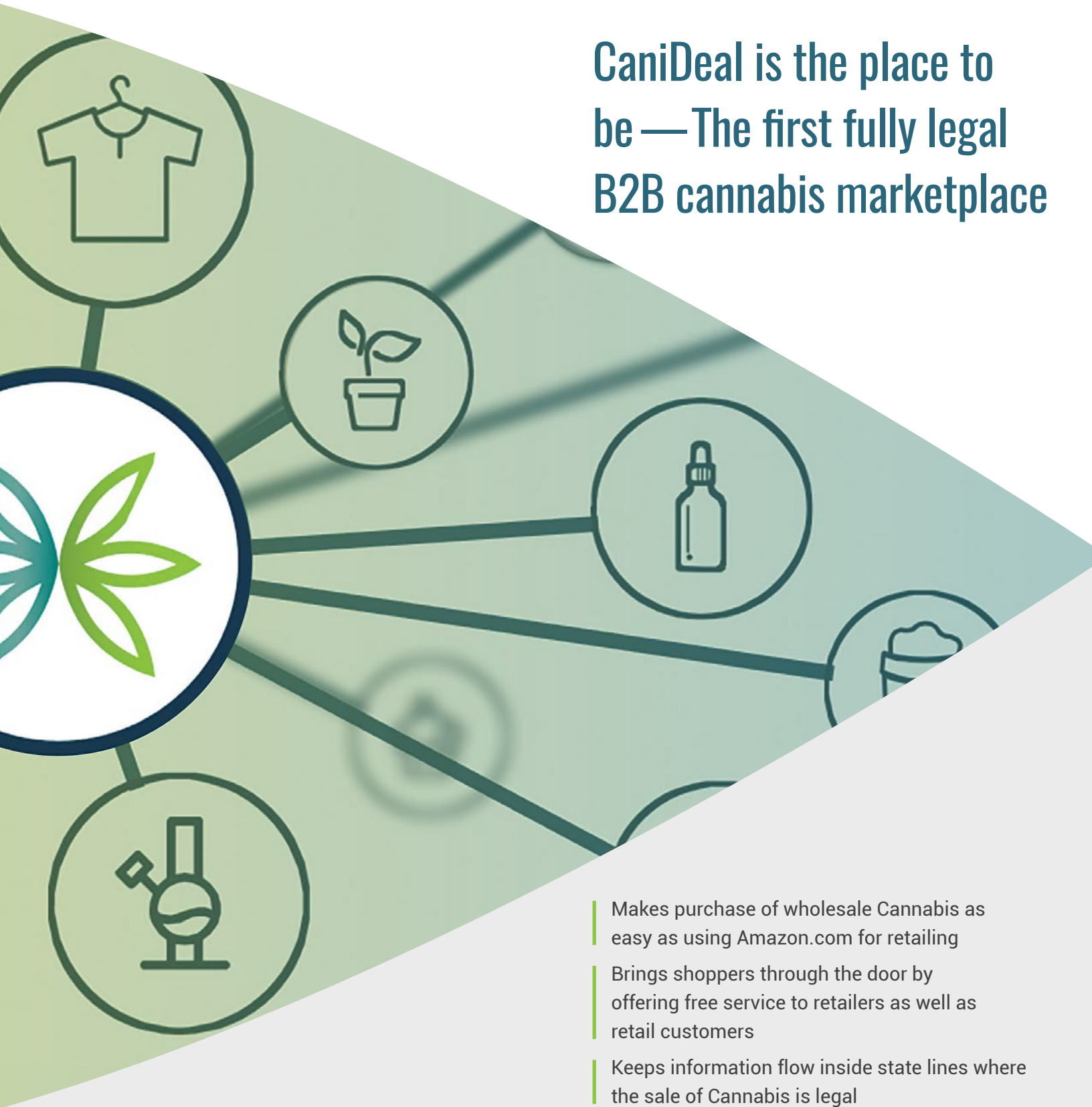
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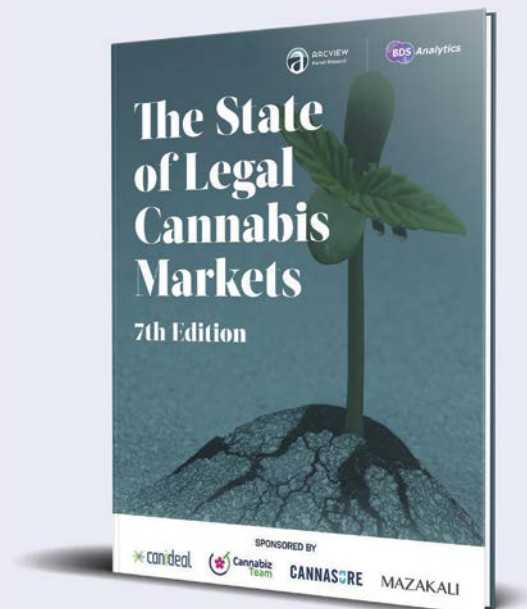
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