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The State of Legal Cannabis Markets

7th Edition

2020 UPDATE

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The State of Legal Cannabis Markets, 7th Edition—2020 Update

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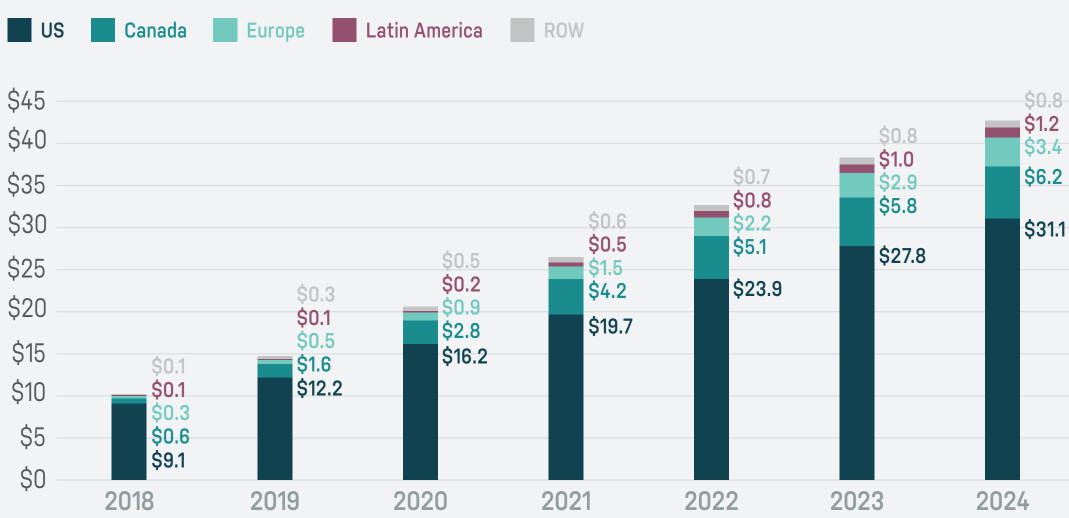
Legal Cannabis Growth Revives in 2019

The worldwide legal cannabis industry generated an estimated $14.9 billion in 2019, up 45.7% from 2018, which saw just 17% growth to $10.2 billion. That estimate is in line with the $14.9 billion Arcview Market Research and BDS Analytics forecast in June 2019 in "The State of Legal Cannabis Markets, 7th Edition" (SOLCM), to which this report is an update ("2020 Update"), though some of the components have changed as markets evolved over the latter half of the year.

That 2018 growth rate of 17%, enviable in any other industry, was the lowest rate of growth the legal cannabis

Global Spending by Region (In Billions)



Source: Arcview Market Research/BDS Analytics

industry had experienced since BDS Analytics launched its retail sales tracking service in 2014 and then partnered with Arcview Market Research to build the forecast model behind the annual SOLCM report. That slowdown can be laid largely to the difficulties seen in California, the world's largest legal cannabis market, as it transitioned from a loosely regulated medical-only market to a strictly regulated and heavily taxed adult-use market.

California's hiccup and the slow start of adult-use sales in Canada caused us to be somewhat conservative in our SOLCM forecast of 24.4% compound annual growth rate (CAGR) to $40.6 billion in 2024, now revised to 26.9% growth to $42.7 billion by that year. As detailed in this "2020 Update," strong 2019 results in Florida, Massachusetts and other significant population centers—and explosive growth in modestly sized, but politically important, Oklahoma—prompted at least minor changes in 15 U.S. states' forecasts.

Just as the decade of the 2010s ended, two major Midwestern states joined the ranks of adult-use cannabis markets, Michigan on Dec. 1, 2019 and Illinois on Jan. 1, 2020.

What Success Looks Like

The U.S. forecast is built around a new classification of the states by the launch date of the legal cannabis program in effect by 2024. Adult-use states at that point will include the following:

- **Mature adult-use:** states like Colorado and Washington that launched adult-use programs prior to January 2017; on track to grow at a 5.8% CAGR 2018-2024 and to represent 15% of the 2024 market.

- **Emerging adult-use:** states like California, Nevada and Massachusetts that launched programs between January 2017 and January 2020; forecast to grow at a 20.8% CAGR and to generate 41% of U.S. legal revenue in 2024.

- **New adult-use:** states like Arizona, New York and Florida, and territories like Guam, for whom program start dates were forecast (in consultation with the Marijuana Policy Project) before 2024; forecast to grow at a 39% CAGR from their 2018 medical-only bases to become 32% of the 2024 market.

- **Mature medical:** long-time medical states Hawaii, Minnesota, Montana and New Hampshire, not expected to go to adult-use by 2024; forecast to see the slowest growth (a 16.7% CAGR) and be just 2% of U.S. sales in 2024.

- **Emerging medical:** states that legalized medical between January 2017 and January 2020 such as Arkansas, Oklahoma and Pennsylvania; forecast to grow fastest of all from low 2018 bases (52.5% CAGR) and become 5% of the 2024 market.

- **New medical:** 19 states and the U.S. Virgin Islands, with no legal revenue in 2018; expected to go medical before 2024 when they will represent 5% of sales.

Internationally, a whole new route to legalization opened up in Mexico when the country's supreme court ordered the legislative branch to approve, and hence the executive branch to implement, adult-use legalization in 2018. Legislators bought themselves a six-month extension in November 2019. But judicially mandated legalization could represent a whole new model from the traditional one in which voters have had to use the initiative process—or in more recent cases, political pressure—to force legislators to legalize. If successful, the adult-use change in Mexico would make it co-leader with Germany's medical-only market in driving total legal sales outside of the U.S. and Canada from $517 million in 2018 to $5.4 billion in 2024 at a 47.7% CAGR.

A Big Year for Cannabis Everywhere Except Washington and Wall Street

While patients from Munich to Mexico City were finally getting relief with medical cannabis and adults across North America were rushing to take advantage of the crumpling of prohibition, the industry also suffered through the sudden neglect of its issues in Washington. Congress failed to enact what had looked like promising reforms in June, while the FDA made it clear that it will not be rushed into clearing the way for CBD ingestibles to appear outside the pharmaceutical channel—except, of course, in state-legal dispensaries where it has no say in the matter.

Far more consequential, and a bigger threat to the kind of future revenue growth forecast here, was the souring of many on cannabis investments. After driving stocks, as tracked in New Cannabis Ventures' Global Cannabis Stock Index, to a 57% gain in the first quarter of 2019, investors pulled the rip cord after an April 22 peak, leading to a 58% decline by year's end. The New Cannabis Ventures index was just down a net 34% in a year in which the S&P 500 gained 29%.

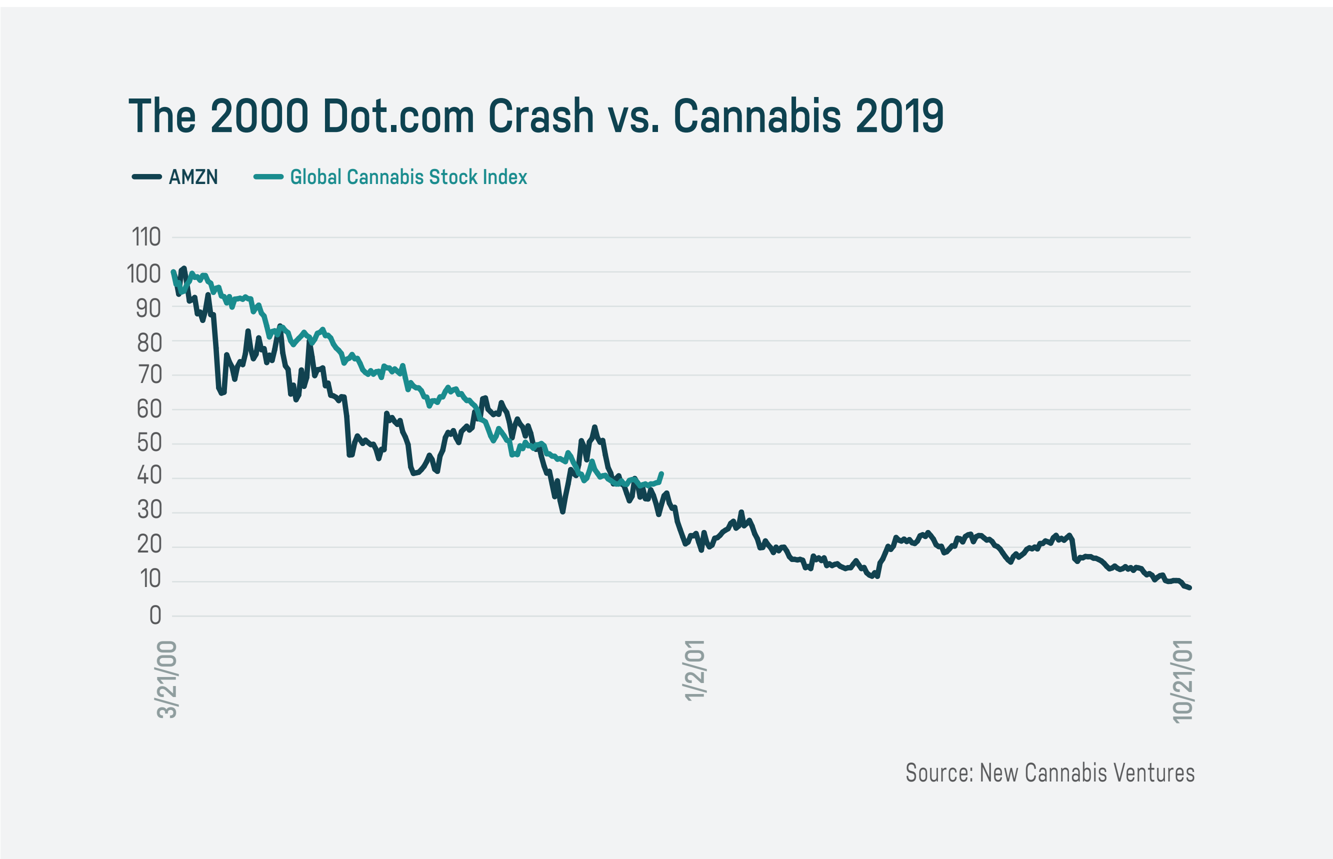
The declines eased in December, and by mid-January, the lines forming on the streets of a freezing Chicago in the early weeks of adult-use legalization there had sparked a modest recovery on Wall Street. While valuations of public cannabis stocks may indeed have gotten ahead of themselves in the wake of Canada making history in October 2018 by legitimizing legal cannabis on the world stage, the subsequent sell-off looks extreme from the midpoint of a two-year period in which a $10.2 billion 2018 market appears on track to more than double to $20.7 billion in 2020.

Consumer spending on legal cannabis worldwide grew by an estimated 45.7% to $14.9 billion in 2019

Letter From the Editor

Hindsight is always 20/20, of course, making it easy today to see that cannabis public stocks were overvalued in April 2019, when several had market caps bigger than the total consumer spending in the worldwide legal market. It was reminiscent of the 2000 peak of the dot-com mania, as was the subsequent deflation. Then as now, fear of missing out on a new consumer phenomenon of obviously immense potential created billions of dollars of wealth on paper.

In both cases, just as the actual consumer marketplace shifted into overdrive, Wall Street bailed (U.S. e-commerce spending jumped 94% in 2000, for example, U.S. legal cannabis 34% in 2019). In the case of internet



stocks, hindsight shows the dot-com crash was a huge buying opportunity for investors with patience. Will the same prove true for cannabis stocks?

A comparison of New Cannabis Venture's Global Cannabis Stock Index to the post-peak history of Amazon shares (as a proxy for internet stocks) shows there are reasons for caution. First, it should be noted, not every company survives such trauma in the capital markets: Amazon lived through its 78% drop in 2000; Webvan and eToys did not. Furthermore, Amazon went on to post a subsequent 46% decline as the 2001 recession set in, before bottoming late that year.

So, it took nerves of steel to hang on: Amazon's shares only returned to their March 21, 2000, high of $72.38/share on June 5, 2007. But anybody able to pick Jeff Bezos out of the Y2K wreckage as "Most Likely to Succeed" has been amply rewarded: Amazon closed out 2019 at $1,847.84/share. Similar tales will undoubtedly be told, with 20/20 hindsight, about the "cannabis crash of 2019."

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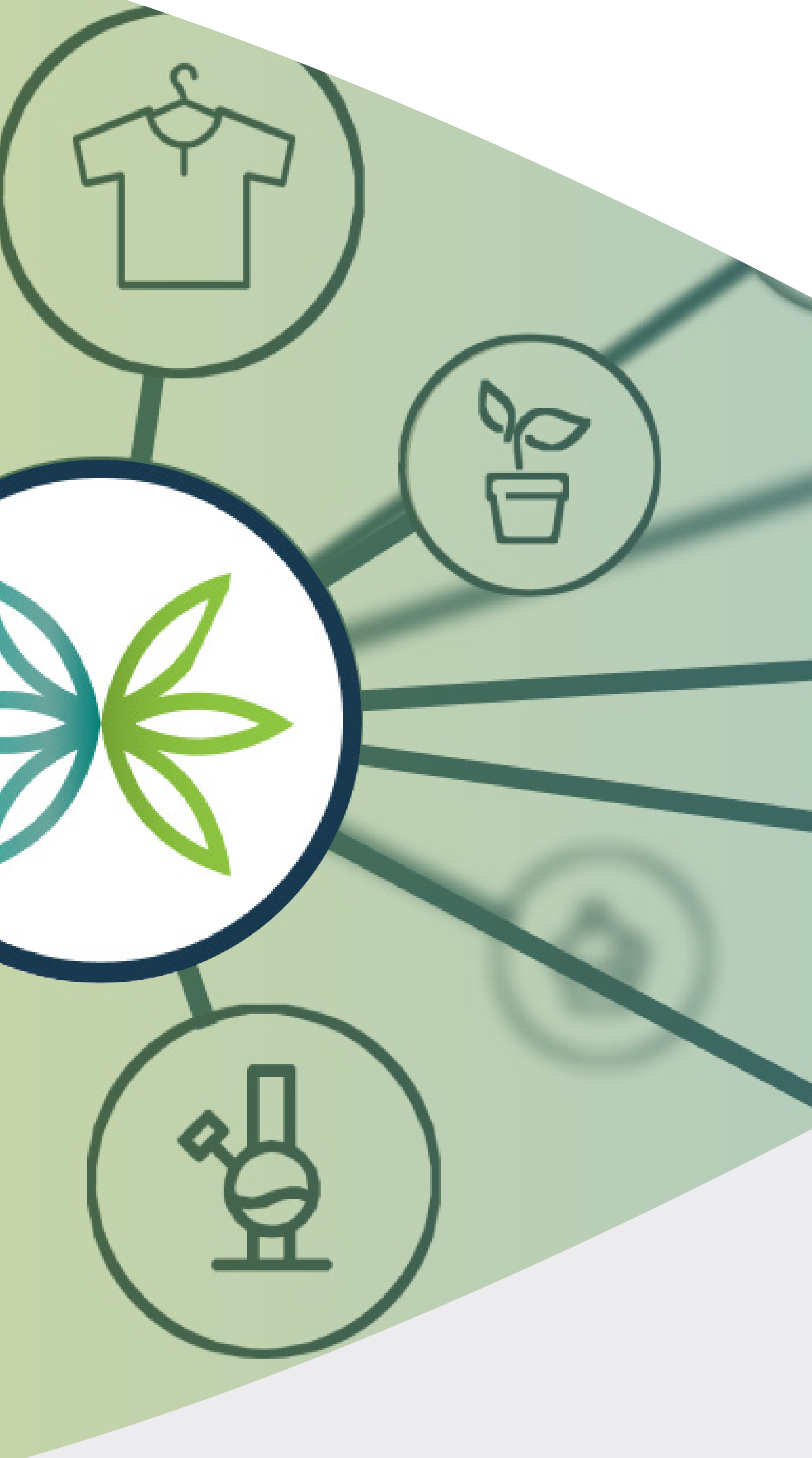

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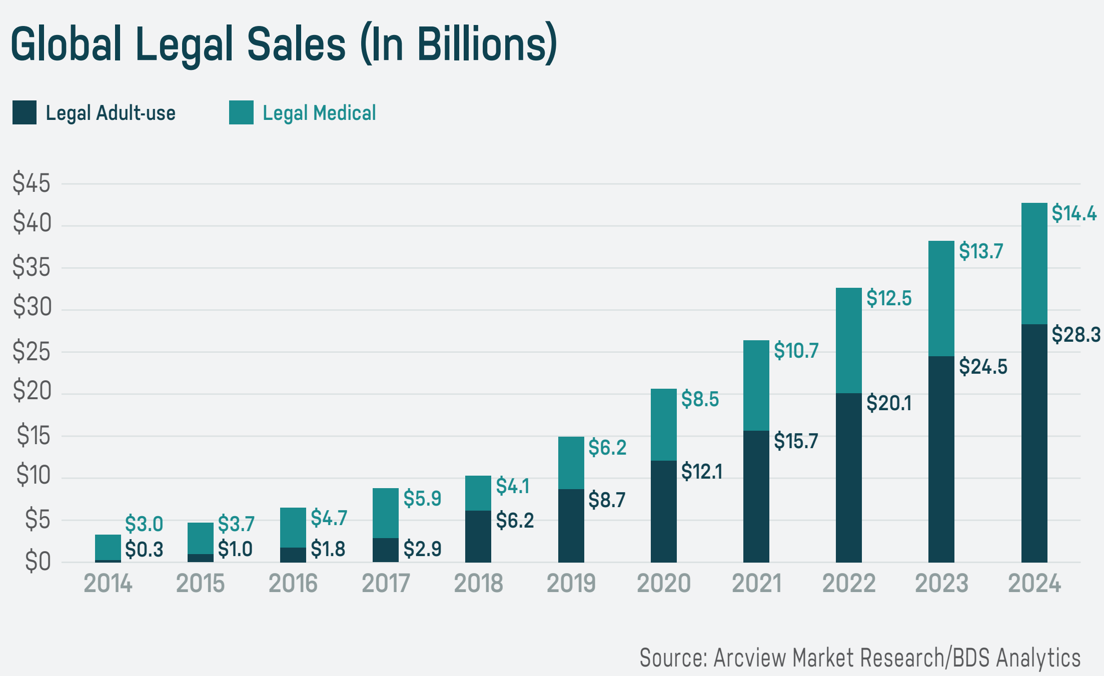
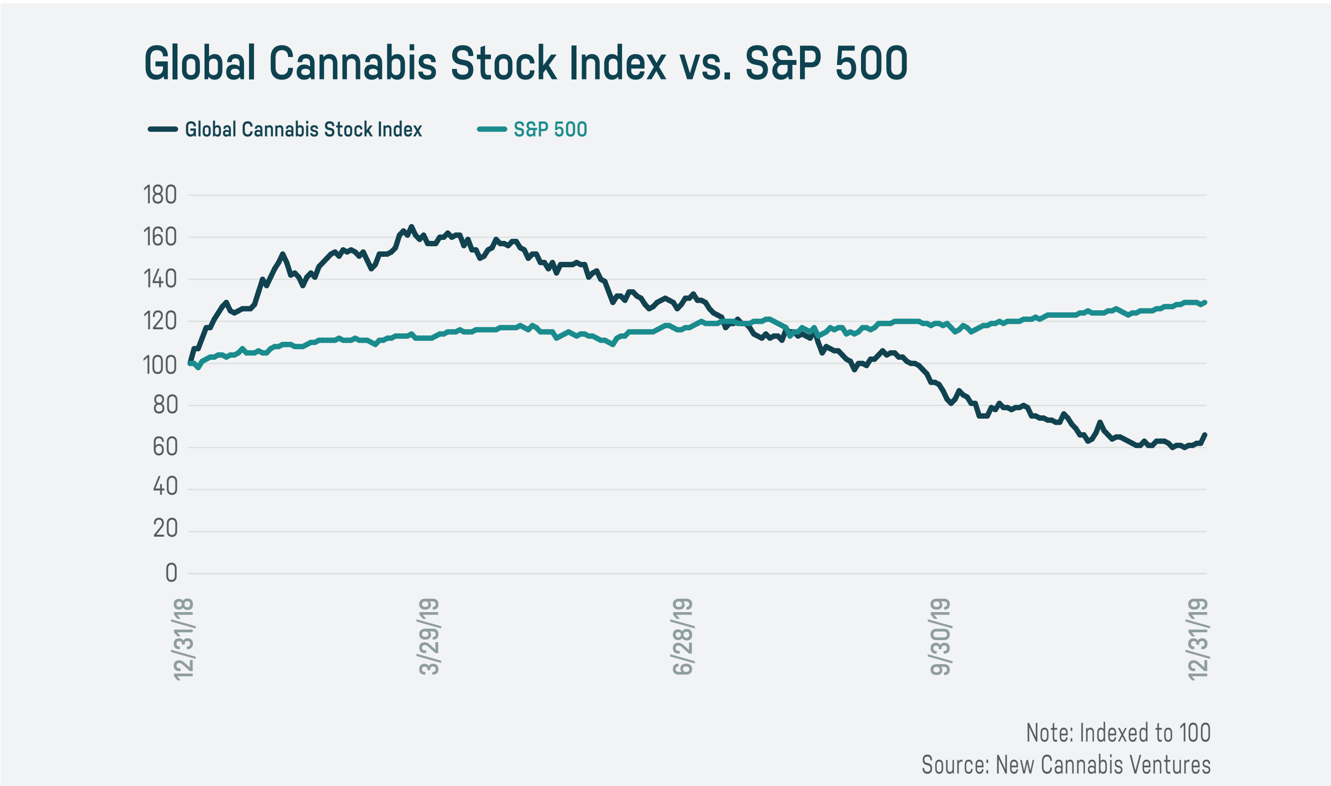
Legal Cannabis Reality Check

The legal cannabis industry has always lived with a split between reality and perception, but never has the gap yawned as wide as it did in 2019. Reality: Consumer spending on legal cannabis worldwide grew by an estimated 45.7% to $14.9 billion. Perception: Public cannabis stocks fell by 58% from an April 22 high in New Cannabis Ventures' Global Cannabis Stock Index.

That 45.7% growth was nearly triple the 17% growth rate the industry posted in 2018, when the world's largest single market in California struggled during the transition to an overtaxed adult-use business. It represents the biggest annual expansion since BDS Analytics launched its retail sales tracking service in 2014 and then partnered with Arcview Market Research to build the forecast





model behind the "The State of Legal Cannabis Markets, 7th Edition" (SOLCM) and this update ("2020 Update"). The estimated $14.9 billion in 2019 revenue was about the same as our original SOLCM forecast of $14.9 billion, published in June. The 2019 estimate will be finalized when Canadian regulators report fourth-quarter totals for the country and when December sales reports from states covered by BDS Analytics' GreenEdge® retail sales tracking service are analyzed next month.

For context, the $4.7 billion in growth from 2018 is as much as the entire $4.7 billion consumers spent legally on cannabis in 2015. Global sales are forecast to grow another $5.7 billion (an increase of 38%) to $20.9 billion in 2020, up from the $19.3 billion forecast in June. The worldwide legal market is now expected to grow to $42.7 billion in 2024, rising at a compound annual growth rate (CAGR) of 26.9% from 2018; that is up from the June forecast of a 2018-2024 CAGR of 24.4% to $40.6 billion in spending.

Companies in any industry blowing through what were already robust growth forecasts would have expected spectacular gains on the stock market, especially in a year in which the S&P 500 gained 29%. Instead, the New Cannabis Ventures' Global Cannabis Stock Index fell a net 34% in 2019 despite a 57% first-quarter run-up. Canadian licensed producers (LPs) led the way for cannabis stocks to go public in 2016-2017 after adult-use legalization there was scheduled for October 2018. U.S. multistate operators (MSOs) pursued reverse takeovers of Canadian

Securities Exchange companies to go public in 2018 in the wake of the first full legalization in a G6 economy. Fears that LP and MSO valuations were getting ahead of themselves proved well-founded, as the challenges legal operators face in competing with a well-established illicit market while being handicapped by high taxes and stern regulatory oversight came into focus in the second half of 2019.

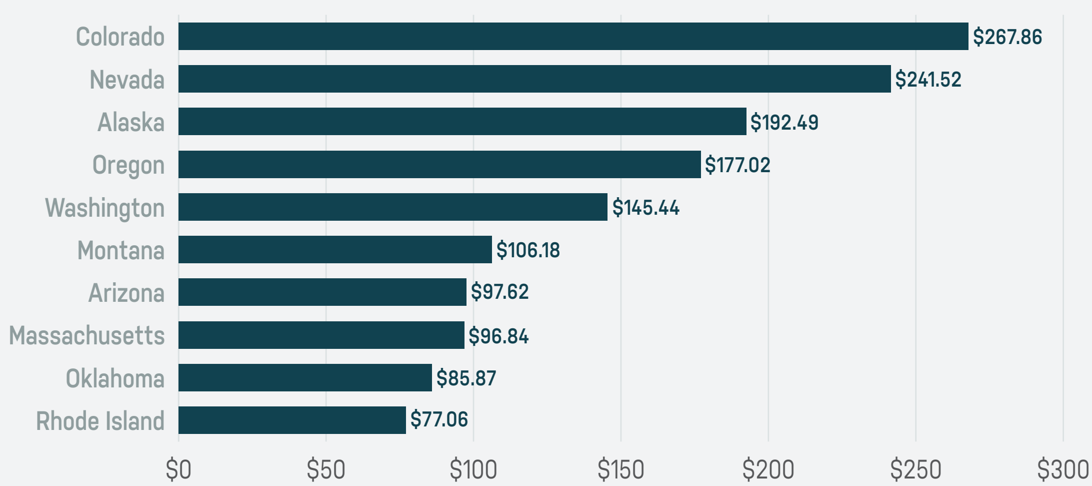
Across the cannabis industry, it was a “Jekyll and Hyde” year since Arcview Market Research and BDS Analytics published SOLCM in June 2019:

- Vapes continued to be the industry’s hottest product. In August they became its biggest problem with the announcement of the first death from what came to be known as “e-cigarette, or vaping, product use associated lung injury” (EVALI).

- Cannabinoids had finally escaped from dispensaries via FDA approval of Epidiolex and Congress’ legalization of hemp in the 2018 Farm Bill. Then it became clear the FDA will hold up approval of CBD as a food additive indefinitely, at least outside dispensaries in legal cannabis states, where it still has some control of the situation.

- Cannabis companies had just finished raising $11.5 billion in public equity in 2018 by Viridian Capital Advisors tally. By year’s end, the public equity window was firmly closed and finance pros were revamping or unwinding far more deals than they were creating.

Top US Markets Spending Per Capita



Source: Arcview Market Research/BDS Analytics

Not all was dark in 2019, however. In fact, in a seesaw industry like legal cannabis, just as many troubling trends in June turned positive by year's end:

- California had spooked the industry in 2018 when its heavily taxed and regulated legal players actually lost ground to illicit sales upon adult-use launch. In 2019, despite many of the same tax and regulatory challenges as California, Massachusetts' legal industry tripled from $217 million to $672 million in its first full year of adult-use sales, putting it among the top 10 U.S. markets in per-capita legal spending.

- Canada's Oct. 17, 2018, launch of adult-use sales was plagued by product shortages and too few stores. But an inefficient, province-run supply chain began catching up to booming demand in 2019, and the market ended up generating $1.2 billion within nine months, according to the Ottawa government, almost twice the $582 million generated in all of 2018.

- Robust U.S. legal cannabis markets had been a Western state phenomenon since Californians voted to legalize medical sales in 1996 and seemed likely to remain that way when Colorado and Washington launched adult-use sales in 2014. Then, medical-only spending in Oklahoma shot to $346 million in its first full year of operation. That $86 per capita in spending puts the state among the top 10 U.S. markets by that measure.

What Drives, or Stymies, Growth in Cannabis Markets?

The forecasts presented in SOLCM were based on an advance in understanding the key factors impacting legal cannabis markets that were codified in a Growth Indicator Matrix (monthly percentage of adults consuming, licensing and taxation, retail market coverage, resilience to extra-legal market, consumption regulation, and supply chain regulation).

In this update, that thinking has been coupled with a life-cycle-categorization scheme that provides useful insight into where the growth in U.S. markets will be coming from in the years ahead. It also provides solid support for a forecasted tripling of U.S. revenue from $9.1 billion in 2018 to $31.1 billion 2024, or $22 billion in new spending during the forecast period.

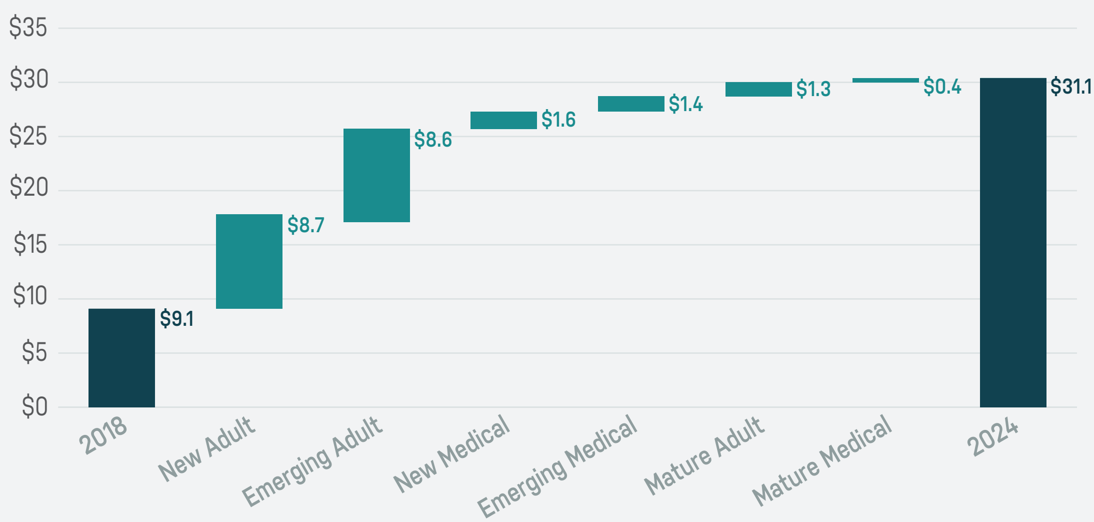
It was inevitable that the key drivers of growth since 2014, the four markets that went adult-legal before 2017 (Colorado, Washington, Oregon and Alaska), would mature into slower-growth markets at some point. It is clearly happening in at least two of them now given estimated 2019 growth rates of 5% in Colorado and 7% in Washington. Hence these mature adult markets account for only $1.3 billion (6%) of the $22 billion in new legal spending forecast to be generated in the U.S. between 2018 and 2024. Similarly, the mature medical markets that launched before 2017 and are not expected to go fully legal by 2024 (Hawaii, Minnesota, Montana, New Hampshire and Puerto Rico) will account for just $400 million (2%) of the growth.

Emerging medical markets (launched since January 2017 but not expected to graduate into adult-use markets by 2024) account for $1.4 billion (6%) of the growth ahead. But emerging markets certainly outgrow mature ones, and Oklahoma is among the emerging medical group (forecast to grow to $815 million in spending during that time frame) as is Pennsylvania (forecast to grow to $526 million by 2024).

Emerging adult-use markets (California, Illinois, Massachusetts, Michigan and Nevada) launched between January 2017 and January 2020 are of even more interest. They generally have (in contrast to the emerging medical group) enormous populations, tourist traffic or both and should represent fully 39% ($8.6 billion) of the five-year forecast growth.

In past years, forecast five-year totals depended very little on new legalization events. But as the new decade of the 2020s begins, a substantial amount of forecast revenue growth depends on new markets opening up in the years ahead. Simply put, time has marched on toward what is now clearly going to be a world in which legal cannabis markets are ubiquitous. State-by-state legalization momentum is growing, given the 80%-plus support of American voters for medical cannabis legalization. On top of that, grassroots support is the growing political influence of the corporate players in a $15 billion market, which offers tax revenue, job creation and amelioration of societal woes ranging from opioid addiction to the disrespect for the rule of law inherent in the criminalization of an activity engaged in by more than one-quarter of all-American adults.

US Legal Spending Growth by Market Category (In Billions)



Source: Arcview Market Research/BDS Analytics

Hence, implicit in the new forecast is the legalization of medical cannabis in every U.S. state and territory from the Virgin Islands to Idaho by 2024. Laws are likely to start changing as soon as the 2020 election but implementing them will take time. Most of these markets other than Texas have small populations, and the revenue potential of new medical-only markets is thus inherently small: $1.6 billion in new revenue by 2024, just 7% of the $22 billion in growth ahead.

But 66% of American adults, and now even 51% of Republicans, supported complete legalization in the October 2019 Gallup Poll, which has tracked legalization support since it stood at 12% in 1969. Some of the largest states in the country, led by Florida and New York, are expected to legalize sale to all adults by 2024, driving $8.7 billion in new spending or 40% of growth in the forecast period.

The new way of categorizing markets—adult/medical, mature/emerging/new—has limited application outside the U.S. Canada's provinces are united under one federal regulatory regime (albeit with many provincial wrinkles), but the whole country is essentially in the emerging adult market category. Elsewhere on the planet, only Uruguay and Switzerland have emerging adult revenue streams, while Mexico and Liechtenstein are forecast to become new adult markets. As the new decade begins, 26 countries have extremely limited medical programs, so limited that it is meaningless to categorize them as mature or emerging. But there are some large countries (especially in Europe) now moving to liberalize those programs, so that the non-North American component of worldwide legal spending is forecast to grow from 5.1% to 12.6% of spending by 2024.

What Drives Growth for Cannabis Companies?

Of course, operating in fast-growing markets does not guarantee fast growth for individual companies. In fact, many of the fastest growing U.S. state markets are booming because stores are everywhere and there are plenty of growers and brands—hence competition is limiting the growth prospects of many individual companies. The mature adult markets of Colorado, Washington and Oregon had CAGRs above 50% in their first three years of full legality, but many companies struggled in hyper-competitive conditions.

That is why many of the MSOs that generally started up after the adult-use legalization wave of 2014, have focused on medical-only markets in the East. That has paid off for all the top 10 MSOs (by year-end market capitalization) with double-digit consecutive-quarter growth rates. The largest of the 10 by third-quarter revenue is Trulieve, which has parleyed its position as one of just 22 vertically integrated licensees in Florida, the state with the country's third largest population, with 29% quarterly growth since the first quarter of 2018 and $70.7 million in revenue in the third quarter of 2019.

Most of the other major retailers are also focused on limited-license, medical-only Eastern markets and it shows in their ability to grow consecutive-quarter revenue at enviable compound rates of 17%-39%. That history suggests that all these companies will double, and some will triple, annual revenue in 2019. Analysis of such fundamentals was certainly not a major reason for the retail stocks' run-up to the 4/19 peak, nor the subsequent meltdown. At today's shrunken valuations, though, cannabis stocks can finally start to be compared on fundamentals against other investment options, opening a whole new swath of growth-stock professionals as potential buyers.

Largest Public US Retailers Ranked by 3Q 2019 Revenue

COMPANY	3/31/18	6/30/18	9/30/18	12/31/18	3/31/19	6/30/19	9/30/19	GROWTH RATE*
Trulieve Cannabis	$ 15,247	$ 23,299	$ 28,326	$ 35,945	$ 44,476	$ 57,920	$ 70,730	29.1%
Green Thumb Industries	$ 10,926	$ 13,625	$ 17,172	$ 20,771	$ 27,913	$ 44,727	$ 67,991	35.6%
Curaleaf Holdings	$ 9,082	$ 14,644	$ 21,370	$ 31,961	$ 35,251	$ 48,489	$ 61,820	37.7%
MedMen Enterprises**	$ 14,346	$ 20,555	$ 21,460	$ 29,930	$ 36,601	$ 41,972	$ 43,975	20.5%
Cresco Labs	$ 5,093	$ 8,473	$ 12,729	$ 16,957	$ 21,055	$ 29,890	$ 36,207	38.7%
Harvest Health & Recreation	$ 8,335	$ 10,524	$ 11,153	$ 16,983	$ 19,240	$ 26,596	$ 33,151	25.9%
Ayr Strategies	$ —	$ —	$ —	$ —	$ —	$ 10,823	$ 32,088	n/a
Acreage Holdings	$ 2,197	$ 2,951	$ 5,504	$ 10,472	$ 12,897	$ 17,745	$ 22,402	47.3%
Columbia Care	$ 8,849	$ 9,571	$ 9,925	$ 10,983	$ 12,870	$ 19,297	$ 22,120	16.5%
Planet 13 Holdings	$ 3,588	$ 4,408	$ 4,892	$ 8,280	$ 13,836	$ 16,522	$ 16,697	29.2%

* Compound consecutive-quarter growth rate.
** Reports 13-week periods. Shown here aligned with nearest month ending dates.
Source: BDS Analytics

STATES Act and Other Federal (In)Action

As in the stock market, so in Washington: What started out as a year of hope turned very dark very quickly. Multiple initiatives toward legalization or at least normalization at the federal level were on the table in June, but advanced little over the second half of the year.

With more and more states and territories blazing their own path toward legalization, either through referendum or legislative action, the Strengthening of the Tenth Amendment through Entrusting States (STATES) Act was the talk of the industry after it was first introduced in 2018, and as late as June, many thought it might actually become law in 2019.

The STATES Act would radically change federal enforcement of cannabis laws by exempting state-legal cannabis operations from the Controlled Substance Act (CSA). Aside from fixing the dissonance between state and federal laws, another significant implication of this law would be its effect on IRS code 280E. By effectively removing commercial activity in state-legal cannabis markets from the CSA, the STATES Act would pave the way for a much more favorable profitability situation for the industry by allowing operators to deduct normal operating expenses from their taxable income.

While the STATES Act initiative languished in the year's second half in the face of a small but powerful opposition, the SAFE Banking Act first introduced in 2017 remained formally on Congress' agenda. The bill is intended to fix some of the financial woes of legal cannabis businesses by blocking federal regulators from intervening with banks that do business with the legal cannabis industry. This would be a huge boon for the industry, as many cannabis businesses still resort to dealing entirely in cash or are, at a minimum, extremely limited in their choices when it comes to banks or other service providers reliant on bank cooperation. While the bill passed through the Democrat-controlled House in September 2019, it sat in the stack of House-approved legislation being held up by impeachment proceedings and reluctance by leadership in the GOP-held Senate to advance any cannabis-friendly legislation through the end of 2019.

The House also advanced what in some ways was an even bolder proposal for cannabis law reform just before the August 2019 recess. The Marijuana Opportunity Reinvestment and Expungement (MORE) Act, supported by a number of high-profile representatives, would remove cannabis from the CSA, effectively ending federal prohibition, and institute a 5% national tax to fund grants to ensure that communities disproportionately affected by the War on Drugs would be able to benefit from the financial opportunities of legalization. The bill would also expunge all federal convictions. It passed through the House Judiciary Committee in November 2019 but has not advanced further through the legislative process since.

Hence, 2019 saw greater support in Congress for cannabis reform bills than ever seen before. Despite seeing the introduction of the boldest proposals ever, such as the MORE Act, the year ended without anything passing, a situation that is unlikely to change in 2020 heading into the November national election.

Outside of Congress, the year also started well but then turned dark in the halls of executive branch agencies like the Food and Drug Administration (FDA). The year kicked off with the December 2018 passage of the Agricultural Improvement Act of 2018 (aka 2018 Farm Bill), which reclassified hemp as a legal agricultural product and distanced hemp from cannabis around a 0.3% by weight THC limit. While the Agricultural Act of 2014 opened up the possibility of pilot programs for states to pursue their own legal hemp industries, the 2018 Farm Bill's passage was momentous due to the fact that it removed federal prohibitions on the plant and promised to alleviate the legal confusion that some hemp and CBD companies are still dealing with at the state level.

While the Farm Bill opened the doors for hemp-derived CBD products, exactly what products and formulations will be allowed is still yet to be determined by the FDA. The agency held hearings May 31, 2019, to gather testimony from stakeholders on how it should regulate CBD. Recent statements from FDA officials have worried advocates of legal cannabis by echoing pharmaceutical company testimony in May recommending a highly restrictive federal program, essentially limiting orally ingested CBD to the pharmaceutical channel.

That could certainly hamper the growth of CBD sales in general retail channels, where major chains are stocking topicals but are waiting on the FDA before bringing ingestible products into their stores. But the precedent has long been set with other compounds of commercial coexistence of both pharmaceutical and over-the-counter versions just across the aisle from each other.

Even if the FDA were to adopt a highly restrictive pharmaceutical model for CBD, there is little chance the cannabinoid genie can be put back in the bottle. With states and cities now counting on legal cannabis taxes to meet their budgets, it is highly likely that states and the hemp industry will follow the path the legal cannabis market has already established by asserting state's authority. That will allow hemp-derived CBD to continue to enjoy broad legality and availability, though it might block a quick move of ingestible products into general retail channels. In any case, only a small portion of the CBD market is currently composed of food and beverage sales, so the CBD sector as a whole likely would not see its growth hampered by such a decision, and the cannabis dispensary sector of that market could actually benefit from continued FDA inaction.

Vapes Are Down Recently, but Are They Out?

The legal cannabis year of 2019 also had tragedy: The Aug. 23, announcement by the director of the U. S. Centers for Disease Control and Prevention (CDC) of the first death attributable to "e-cigarette, or vaping, product use associated lung injury," aka EVALI. As of a Dec. 27 report by the CDC, 2,561 cases of EVALI and 55 EVALI-related deaths had been recorded in the U.S.

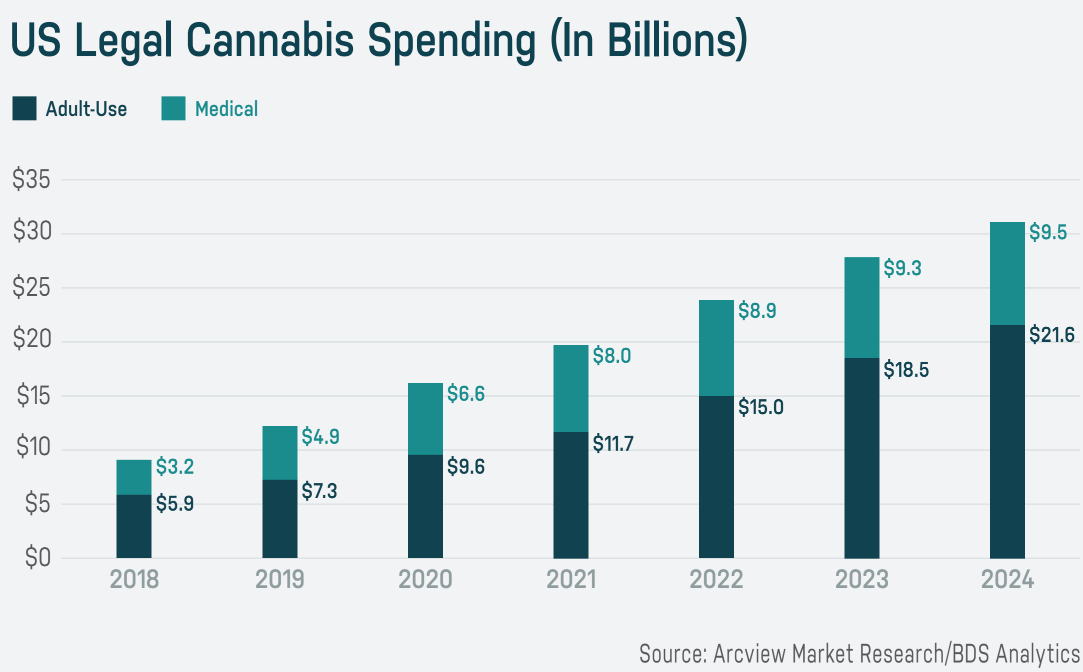
But the CDC also tied nearly all of those cases to illicit market products that use vitamin E acetate as a low-cost cutting agent. That news came as a relief to players up and down the supply chain and no doubt disappointed prohibitionists such as those behind the Wall Street Journal's Oct. 11 scaremongering opinion page headline "Pot Legalization Makes Vaping Deadly." But as industry players and legalization advocates turned their attention to positioning legal cannabis as the solution to the "vape crisis" rather than its cause, the crisis clearly represented an existential threat to the industry for the simple reason that vaping—the industry's fastest growing category—is likely to be central to the future growth of cannabis product sales.

The year ended with some provisionally good news on vape trends. With illicit vapes now clearly the danger, consumer flight from the legal market appears to be easing up. Retail sales tracking from BDS Analytics in five states (Colorado, Oregon, California, Nevada, Arizona and Maryland) shows that monthly vape sales reached an all-time high of $160 million in August. After plummeting 21% in September, and a further 5% in October, vape sales were flat in November. That $119 million represents a rewind to about February 2019 levels.

World's Largest Cannabis Market Expands 34%

Last year was a mixed bag of results for the dozens of independent state markets that together constitute the world's largest legal cannabis market. Total legal spending on medical and adult-use cannabis in the U.S. reached an estimated $12.2 billion in 2019, an increase of 34% over 2018's total of $9.1 billion. While regulatory and legal issues hindered growth in the largest adult-use and medical-only markets in California and Florida, respectively, bustling activity in states from Illinois to Maryland, and even tiny Oklahoma, helped boost overall spending growth nationwide.

Legal adult-use spending in the U.S. grew to $7.3 billion in 2019, accounting for just under 60% of total cannabis



spending. That is a slight decline from the peak of nearly 65% in 2018—while adult-use spending grew by more than 24% in 2019, existing and emerging state medical markets increased sales by 52% during the year. In 2019, the U.S. accounted for more than 82% of total worldwide legal cannabis spending—maintaining a lead that will lessen over the next five years but not by much, as additional legal cannabis markets around the globe emerge and flourish.

Total legal cannabis spending nationwide is forecast to increase by an additional 32% in 2020 to total nearly $16.2 billion. New adult-use markets in Illinois and Michigan will contribute just over $700 million in

US Market Summary, 2019–2024

	TOTAL SPENDING		2018–2024
	2019	2024	CAGR
California	$ 2,961.6	$ 7,130.1	18.9%
Florida	$ 659.6	$ 2,547.3	48.1%
Colorado	$ 1,616.0	$ 2,049.2	4.8%
New York	$ 143.9	$ 1,656.1	87.2%
Arizona	$ 705.4	$ 1,471.6	16.8%
Massachusetts	$ 672.2	$ 1,463.5	37.5%
Nevada	$ 750.2	$ 1,407.6	16.4%
Illinois	$ 232.9	$ 1,402.9	47.5%
Washington	$ 1,078.8	$ 1,270.6	3.9%
Michigan	$ 639.5	$ 1,250.2	12.0%
Maryland	$ 254.8	$ 1,099.2	46.5%
New Jersey	$ 107.1	$ 1,066.1	64.7%
Oregon	$ 752.3	$ 1,020.0	8.0%
Oklahoma	$ 346.2	$ 814.5	205.7%
New Mexico	$ 124.4	$ 570.4	32.3%
Pennsylvania	$ 310.2	$ 525.5	27.8%
Ohio	$ 62.4	$ 521.3	n/a
Texas	$ —	$ 489.1	n/a
Georgia	$ —	$ 338.0	n/a
Connecticut	$ 100.2	$ 336.4	26.3%
Alaska	$ 147.2	$ 285.5	19.7%
Missouri	$ —	$ 268.6	n/a
Maine	$ 50.0	$ 219.5	26.1%

continued on following page

	TOTAL SPENDING				2018–2024
	2019		2024		CAGR
Rhode Island	$	81.9	$	215.6	19.6%
Puerto Rico	$	109.5	$	178.6	20.1%
District of Columbia	$	22.9	$	165.6	41.3%
Montana	$	114.1	$	143.6	7.2%
South Carolina	$	—	$	119.9	n/a
Minnesota	$	60.6	$	114.4	17.7%
Vermont	$	21.6	$	108.1	32.2%
Delaware	$	24.0	$	102.7	37.9%
Arkansas	$	23.5	$	95.4	n/a
Hawaii	$	28.2	$	94.1	36.2%
Utah	$	—	$	83.5	n/a
Mississippi	$	—	$	66.3	n/a
Louisiana	$	3.3	$	63.2	n/a
Virginia	$	—	$	58.5	n/a
New Hampshire	$	27.1	$	55.4	18.8%
West Virginia	$	—	$	29.4	n/a
Idaho	$	—	$	27.6	n/a
Nebraska	$	—	$	27.6	n/a
North Dakota	$	2.2	$	26.4	n/a
South Dakota	$	—	$	19.7	n/a
Alabama	$	—	$	19.7	n/a
Wyoming	$	—	$	17.3	n/a
Tennessee	$	—	$	16.0	n/a
Wisconsin	$	—	$	15.7	n/a
North Carolina	$	—	$	7.5	n/a
Kentucky	$	—	$	7.1	n/a
Guam	$	—	$	5.0	n/a
Marianas	$	—	$	3.0	n/a
Kansas	$	—	$	2.2	n/a
Indiana	$	—	$	2.2	n/a
Iowa	$	—	$	2.1	n/a
US Virgin Islands	$	—	$	1.5	n/a
Total	$	12,234	$	31,098	22.7%

Note: Spending in millions.
Source: Arcview Market Research/BDS Analytics

new spending growth in 2020. U.S. legal spending is forecast to reach $31.1 billion in 2024, rising at a compound annual growth rate (CAGR) of nearly 23% from $9.1 billion in 2018. In 2024, adult-use is expected to account for almost 70% of the national total. The U.S. will account for nearly 73% of total global legal cannabis spending that year.

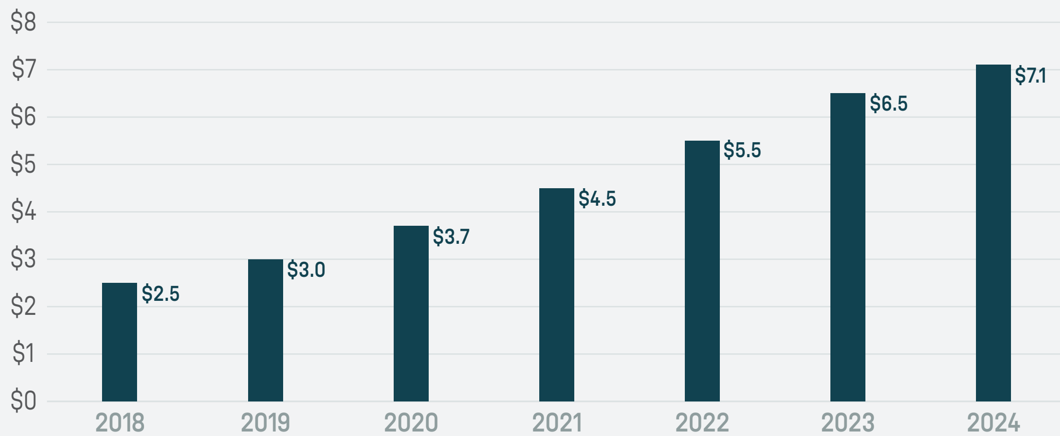
Key US Markets

California

The Golden State, the largest legal cannabis market in the U.S., launched its regulated market Jan. 1, 2018—kicking off the rockiest transition to date of any state to legalize adult-use cannabis sales and making it the only new adult-use state to see total legal sales decline in the first year after launch. High taxes, stringent regulations, slow retail rollout in some areas as well as relaxed rules on illicit operations combined to reduce legal sales from $3.1 billion in 2017 to $2.5 billion 2018.

Initially, based on point-of-sale data from BDS Analytics' GreenEdge® retail tracking service, it seemed 2019 could be the year California would surpass its 2017 sales peak, with total sales forecast to reach $3.1 billion during the year—but events during the latter half slowed progress. In particular, the emergence of the EVALI crisis in April and the first reported death from this new illness in August put a significant dent in sales for the final quarter of 2019. Additionally, recent regulatory actions will likely continue to negatively impact cannabis businesses in the state, at least in the near term.

California Legal Cannabis Spending (In Billions)



Source: Arcview Market Research/BDS Analytics

Legal cannabis sales in California are estimated to have totaled $2.96 billion in 2019, less than the $3.1 billion in the forecast presented in SOLCM, and are forecast to grow 24% in 2020 to $3.7 billion—barring further dampening of sales due to a tax increase enacted Jan. 1, 2020. Sales in 2024 are forecast to reach $7.1 billion, representing a CAGR of nearly 19% from 2018's $2.5 billion in sales.

Contributing to the 2019 shortfall as compared to the forecast, vape sales in California took a major hit in the second half of the year, plummeting 20% in September and a further 6% in October. While there is typically a seasonal reduction in sales during these months, the decline in vape sales led to a larger-than-usual 9% decline in total sales in September and an additional 2% in October.

Further, regulators introduced a new wave of uncertainty when the Bureau of Cannabis Control suspended 407 cannabis business licenses in early November due to noncompliance with the state's mandated track-and-trace registration and training—a serious concern in a state that already has some of the lowest license counts per capita of any adult-use market. California was home to 7,392 cannabis supply chain licenses, paling in comparison to even some medical markets in much lower population states such as Oklahoma, which had 8,526 cannabis business licenses as of Dec. 5, 2019. While 130 of the 407 businesses that received license suspensions had been reactivated by late November, the remainder of those suspended licenses remain inactive.

Finally, California's market is facing yet another hinderance to growth in 2020 with the introduction of a significant tax increase beginning Jan. 1. The California Department of Tax and Fee Administration (CDTFA) announced Nov. 21, 2019, that it would raise excise and cultivation taxes on legal cannabis.

On the positive side, in early January, Gov. Gavin Newsom's new budget plan seemed to signal his administration's willingness to address market concerns, which may help streamline the industry and lower costs for legal businesses operating in the regulated market. Notably, the budget calls for the creation of a new Department of Cannabis Control to consolidate the regulation of the industry, currently managed by three separate entities: the Bureau of Cannabis Control (under the Department of Services and Housing Agency), Manufactured Cannabis Safety Branch (under the Department of Public Health) and CalCannabis (under the California Department of Food and Agriculture). Aside from potentially lowering costs for the state, this change will consolidate the bureaucratic burden of the legal market and make it easier for legal businesses to navigate the complications of the regulated market.

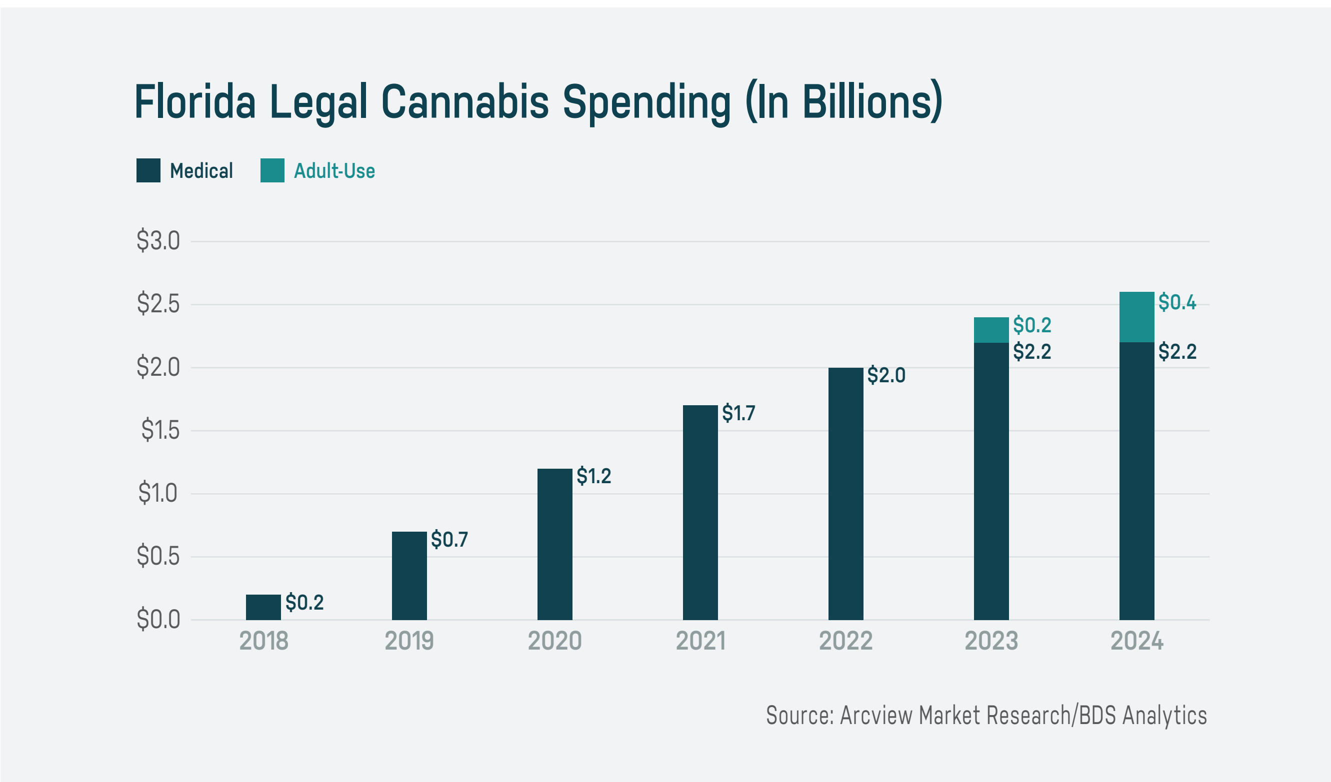
The state's move to increase tax rates on legal cannabis and crack down on licensed businesses that fail to fulfill track-and-trace requirements are not discretionary moves but are instead the consequence of the language in Prop. 64 and the trailer bill passed by the legislature in 2017, making it unlikely that significant progress will be made on these issues by petitioning the governor's office or the legislature to take incremental actions to fix the system. This has prompted some in the industry to begin pushing for a new ballot measure to fix the systemic problems in California's market. Getting a new referendum measure on the ballot in time for the 2020 election may seem like a longshot at this point, but it is one that both consumers and industry insiders are warming to as it becomes clear that Prop. 64 has failed to live up to so many of its promises.

Florida

The Sunshine State has quickly become the world's second-largest medical-only cannabis market—not surprising given Florida's 21.5 million residents (who skew older, on average, than the rest of the nation) and a fairly liberal list of qualifying conditions. Even so, the state's medical market has been mired in regulatory constraint throughout its first three years of operation, and expectations for early market growth have proven overly optimistic—leading to less spending in 2017 through 2019 than in the estimates and forecast presented in SOLCM.

Based on weekly market updates—patient, physician and dispensary counts, as well as amount of product sold—from the Florida Department of Health's Office of Medical Marijuana Use, the estimate for legal cannabis spending in the state for 2019 has been revised to just under $660 million. A number of recent and expected regulatory changes should spur growth over the next several years, but regulatory overkill, especially the requirement that licensees be vertically integrated, will continue to hobble growth unless repealed. Still, the revised forecast presented here shows Florida on track to break $1.2 billion in legal spending in 2020, a growth of 85% over 2019, and shows total sales growing at a CAGR of 48% from 2018 to reach $2.5 billion in 2024.

Early growth in Florida's medical-only market was hindered by a ban on smokable flower, licensing challenges,



mandatory vertical integration, limited product availability and multiple lawsuits. The state made two major changes in March 2019: repealing the ban on smokable flower and lifting the cap on the number of dispensaries allowed per licensed producer. Since then, the market has seen substantial growth, with flower becoming the leading product category for consumers. Flower prices average $10–$15 per gram, and sales of flower immediately added a boost to overall market growth.

While those two actions did much to alleviate the regulatory drag on the market, mandatory vertical integration is still a hurdle to be overcome before the full opportunity of the Florida market can be realized. In July 2019, the First District Court of Appeals found the mandate unconstitutional. That decision has been appealed, however, and a hearing with the state Supreme Court is pending. Gov. Ron DeSantis has expressed support for repealing the provision on the basis that it violates free market principles.

Despite the slower-than-expected start and continuing regulatory concerns, Florida's medical program is experiencing significant growth. The state added an average of 3,500 new patients weekly in 2019, and with the dispensary cap repealed, access will continue to improve in the nation's third most populous state. Medical spending in 2020 is expected to reach $1.2 billion and to grow to $2.2 billion by 2024.

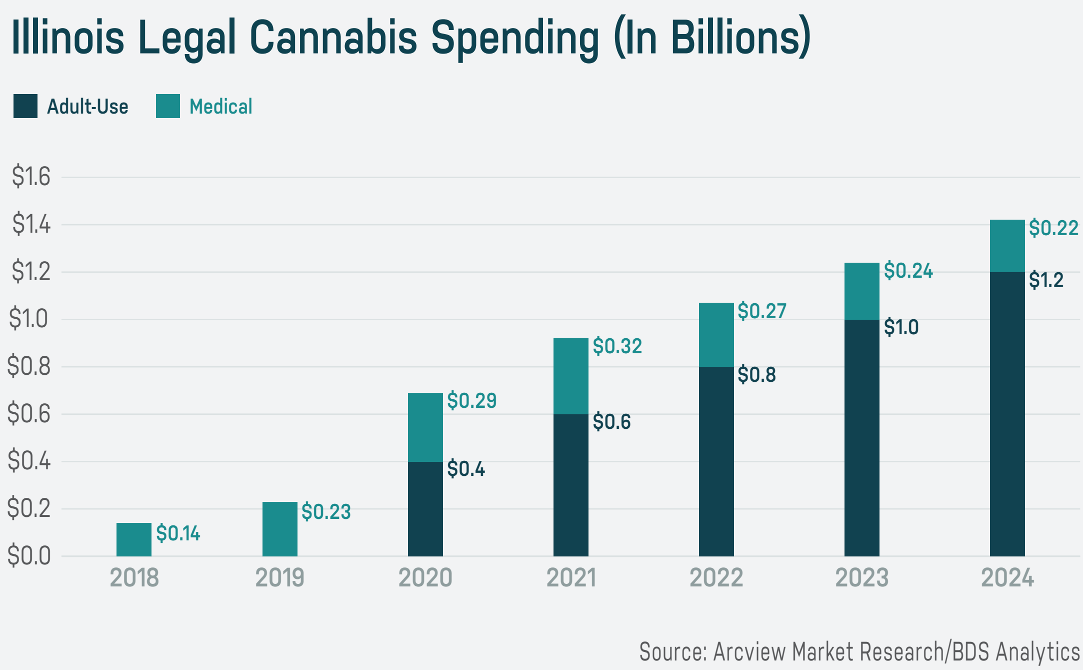
The current forecast has also been adjusted to include the expected start of adult-use sales in 2023. There is an active campaign to include adult-use legalization on the 2020 ballot and allow voters once again to weigh in. But formidable opposition has been mounted, and activists deem it unlikely that enough signatures will be collected to qualify the two proposed amendments. However, it is expected that voters will get to vote on—and will pass—an adult-use legalization measure in 2022, with sales starting in 2023. Adult-use spending is forecast to add an additional $0.4 billion to total legal spending in 2024.

Illinois

Adult-use sales began in Illinois Jan. 1, 2020, and initial signs point to the potential for strong growth over the next several years. Forecasts for adult-use sales in 2020 have been significantly increased based on a very strong start—sales for the first day totaled $3.2 million and had reached nearly $11 million in the first week, making the Illinois market one of the strongest adult-use sales starts to date.

The forecasts presented in SOLCM were deliberately conservative: based on high tax rates, local bans on stores and other regulatory hindrances reminiscent of those that have hampered growth in California. But Illinois' 2019 medical-only base is less than one-tenth the size of California's $3 billion 2017 market, meaning overall market growth rates through 2024 will be substantially higher than previously seen in California's early years of adult-use sales.

Medical-only sales in Illinois neared $233 million in 2019, growth of almost 71% over 2018 sales of $136 million. With the addition of adult-use sales in 2020, total legal cannabis spending in the state is expected to nearly triple to reach $688 million. Medical patients in Illinois are granted lowered taxes and other perks that should

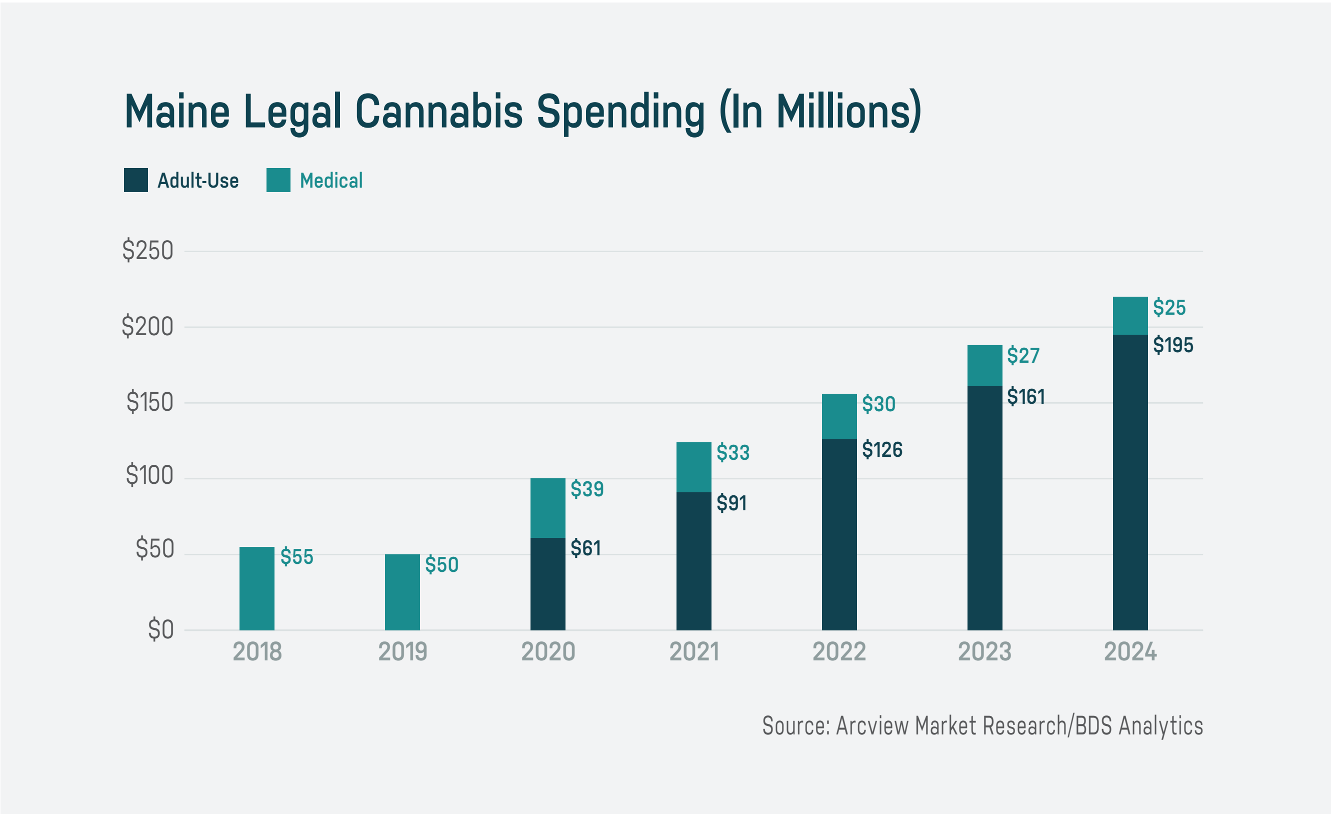


keep the sector growing through 2021. At that point, the medical market is forecast to decline slightly as total cannabis spending rises to $1.4 billion in 2024, a CAGR of nearly 48% from 2018.

Maine

Adult-use cannabis sales in Maine have been “just around the corner” since approval by voters in November 2016. Since legalization in 2016, regulatory issues have continued to delay the commencement of adult-use sales. Final rules have been adopted, and the state began accepting license applications in November 2019. When SOLCM was published in June, the expectation was for a late 2019 official start of adult-use sales, but that has been delayed and sales are expected to begin, for select products, March 15, 2020.

A thorough reassessment of available data has led to the restatement of medical-only sales for 2019 in Maine to $50 million, versus $76.5 million in the previous model. Total legal cannabis sales in the state are forecast to reach nearly $100 million in 2020 as adult-use sales begin and reach $60 million while medical sales retreat to just under $40 million.

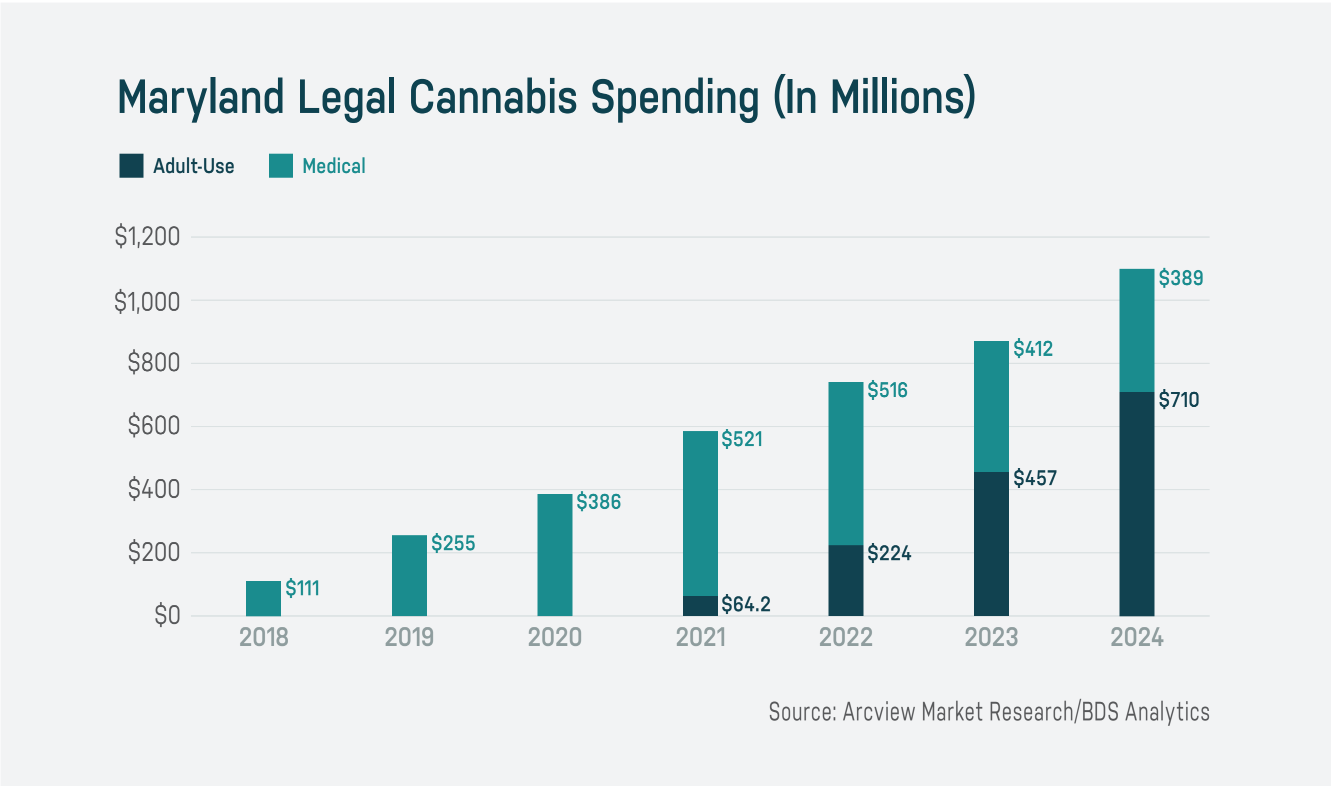


Total sales are forecast to approach $220 million in 2024, having risen at a CAGR of 26% from 2018, while medical-only sales are forecast to drop to $55 million. At that time, adult-use cannabis will account for the bulk of legal cannabis sales in the state—nearly 89% or $195 million in total.

Maryland

Maryland's nascent medical-only cannabis market reached critical mass in 2019. Expanded product availability and retail dispensary coverage yielded higher consumer spending than the forecast presented in SOLCM. BDS Analytics' GreenEdge® retail tracking service initiated coverage in the state in November 2019, showing legal cannabis sales in Maryland dispensaries reaching $175 million in the first nine months of the year. Total sales for 2019 are estimated at $255 million, an increase of 129% from $111 million in 2018. The number of registered patients in the state nearly doubled in 2019.

After a slow start to its 2014 medical cannabis program, caused by a combination of legislative, regulatory and judicial delays, Maryland has seen a notable spike in patient counts and spending in 2019, driven by a



loosening of product restrictions (most notably lifting a ban on edibles) and an expansion of retail dispensary availability, with store counts growing from 22 to 87 between late 2018 and 2019.

The product mix in the state's cannabis market differs somewhat from other states reported in BDS Analytics' GreenEdge® tracking system. Combined flower and pre-rolled sales in 2019 contributed 60% of revenue in Maryland, more than in any other state. Total concentrates sales, including vape, contributed more to sales than in Nevada but less than in Arizona, California, Colorado or Oregon. The sale of many forms of edibles were not allowed before May 2019, as reflected in relatively meager edibles sales in the first half of the year, though that changed rapidly in the second half.

Further expansion of retail coverage to the current statutory limit of 122 stores is expected throughout 2020 as total legal cannabis sales in the state grow by more than 51% to reach $386 million. Legalization of adult-use by legislative action is expected in the 2020 session, with sales beginning in late 2021 or early 2022. Adult-use spending is expected to surpass medical spending in 2023, and the combined channels are forecast to reach

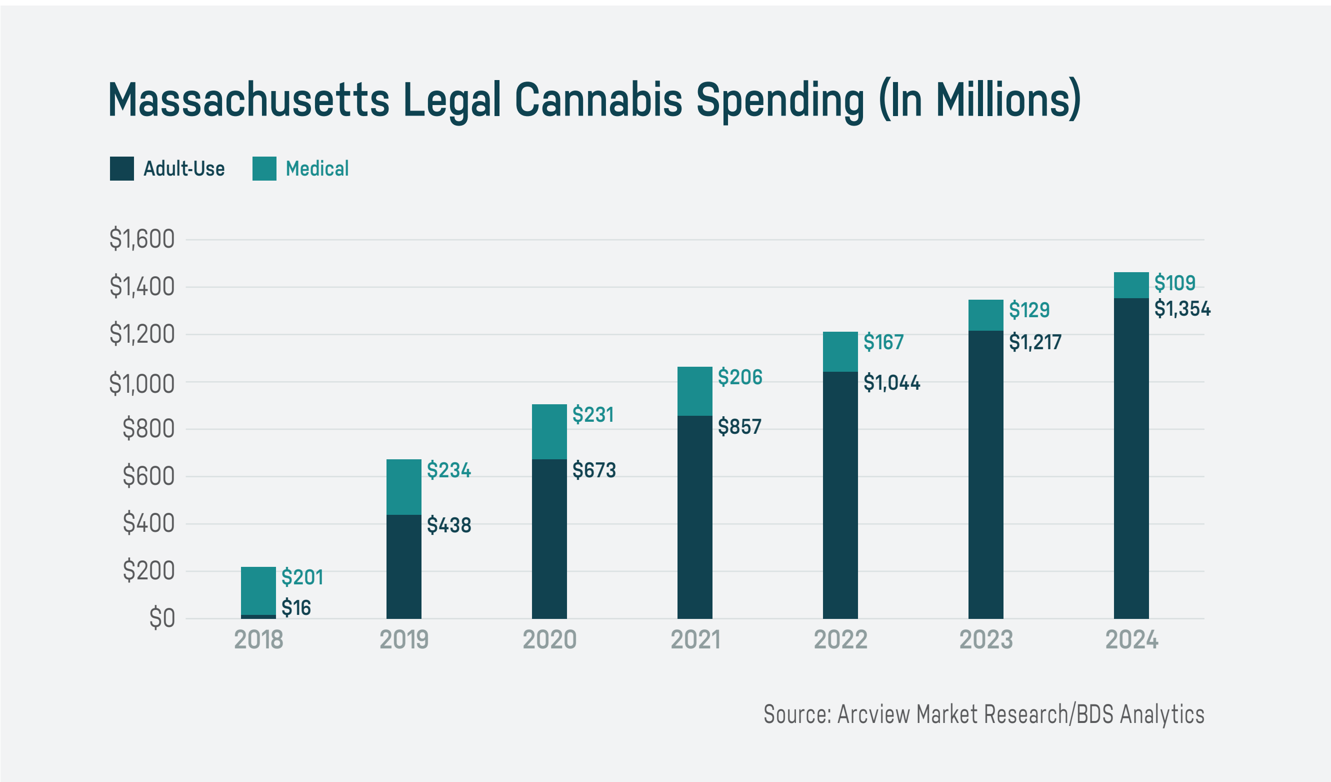
$1.1 billion in 2024, rising at a CAGR of nearly 47% from 2018's $111 million.

Massachusetts

Massachusetts voters approved a ballot initiative legalizing adult-use cannabis in November 2016, and provisions for home use and cultivation went into effect a month later. The commencement of legal sales, however, was delayed for nearly two years—until late November 2018, when the first two dispensaries in the state went into operation. Estimated adult-use sales in 2018 reached nearly $16 million alongside $201 million in medical sales.

Results from the state's medical cannabis market in 2019 were largely in line with the forecast presented in SOLCM, with sales reaching an estimated $234 million. Actual adult-use sales during the year, now estimated at $438 million, were substantially higher than the previous forecast, however. As initial temporary moratoriums have expired across the state, Massachusetts' adult-use retail footprint has expanded considerably.

Adult-use sales in the state are forecast to top $673 million in 2020, while medical spending is expected to decline only slightly to $231 million. That total legal cannabis

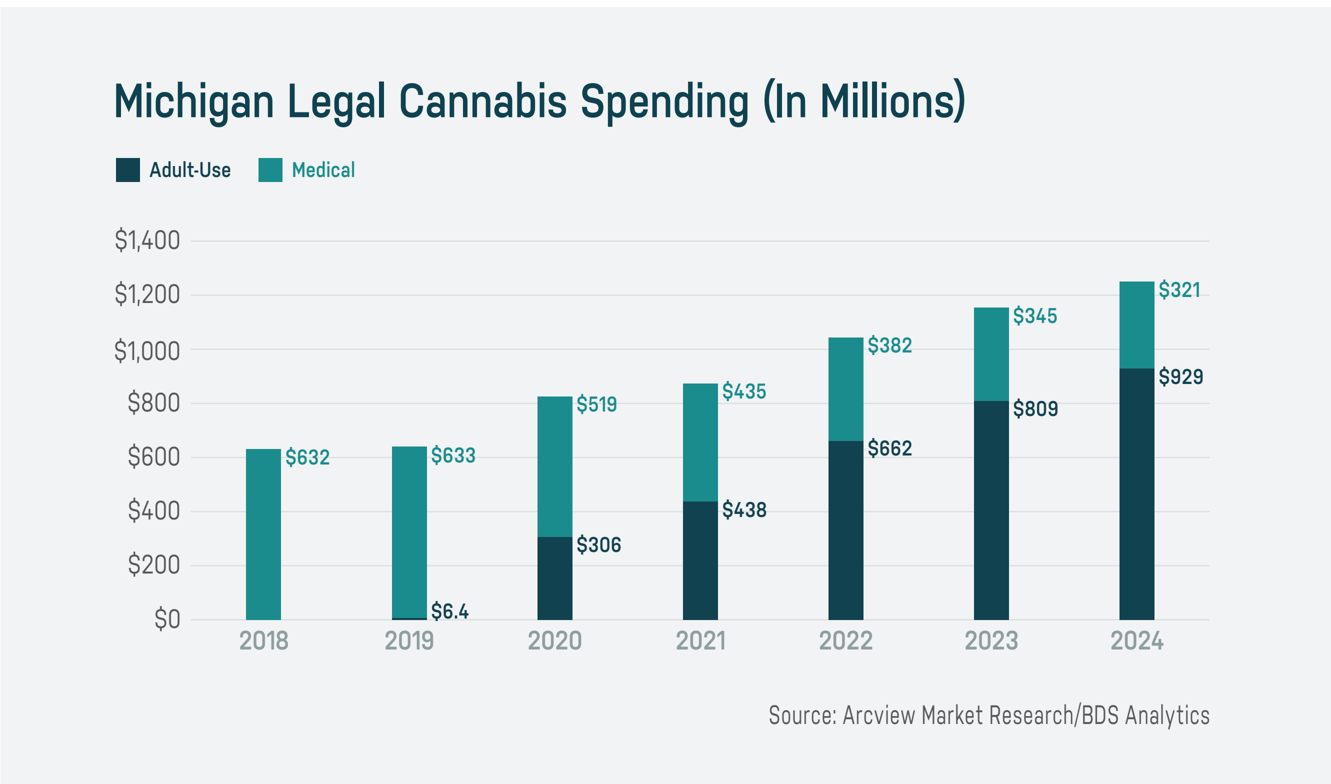


spending of $905 million represents nearly 35% growth over 2019's estimated total of $672 million. By 2024, total spending is forecast to near $1.5 billion, rising at a CAGR of nearly 38% from 2018's $217 million.

Michigan

Formerly a medical-only market, Michigan commenced adult-use sales Dec. 1, 2019, earlier than expected when SOLCM was published in June. Voters in the state legalized adult-use in November 2018. The state generated an estimated $3.1 million in adult-use spending during the first two weeks of sales and $6.4 million during the full month of December. Total medical and adult-use sales in 2019 are now estimated to have been just $640 million, a recalibration of the levels estimated in prior models based on growing visibility into the market as it goes adult-legal.

Growth over the next year is expected to be hindered by product shortages due to the lack of licensed cultivators. State regulators estimate that it could take up to 18 months before supply increases to meet demand. Total sales in 2020 are expected to grow by 29% to reach $825 million in 2020 and are then expected to grow to $1.25 billion in 2024—rising at a CAGR of 12% from 2018's $632 million.



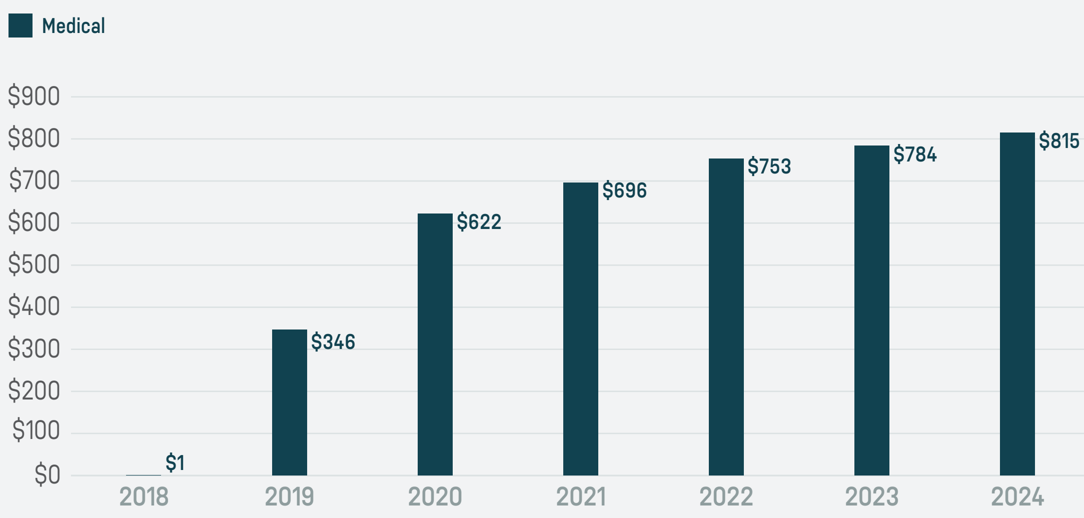
Oklahoma

Since its launch in October 2018, Oklahoma's medical-only cannabis market has expanded at an unprecedented pace, setting several cannabis industry records. Sales in the state during 2019 reached an estimated $346 million in 2019, versus the previous forecast of $263 million. Medical-only sales in the state are forecast to nearly double to $622 million in 2020 and to grow to $815 million in 2024, a CAGR of nearly 206% from the $1 million spent late in 2018 as the market opened up.

The Oklahoma cannabis boom is the result of a combination of business-friendly regulations, easy access to medical cards and stiff penalties for illicit activity. Though this medical program is one of the youngest in the nation, the rapid growth in registered patients as a percentage of overall population and average patient spending suggest that the state's market has the potential to quickly eclipse the sales in similarly populated states with older medical programs. Registered patients in the state reached an estimated 220,730 by the end of the year—nearly 5.5% of all Oklahomans and the highest patient count relative to population of any medical market.

The number of retail and other cannabis supply chain licenses in the state has exploded over the past year. Oklahoma had one operating dispensary for every 4,674 registered patients as of late October 2019—among the best ratios in the country with only about 600 of the 2,127 licenses issued by that time in operation.

Oklahoma Legal Cannabis Spending (In Millions)



Source: Arcview Market Research/BDS Analytics

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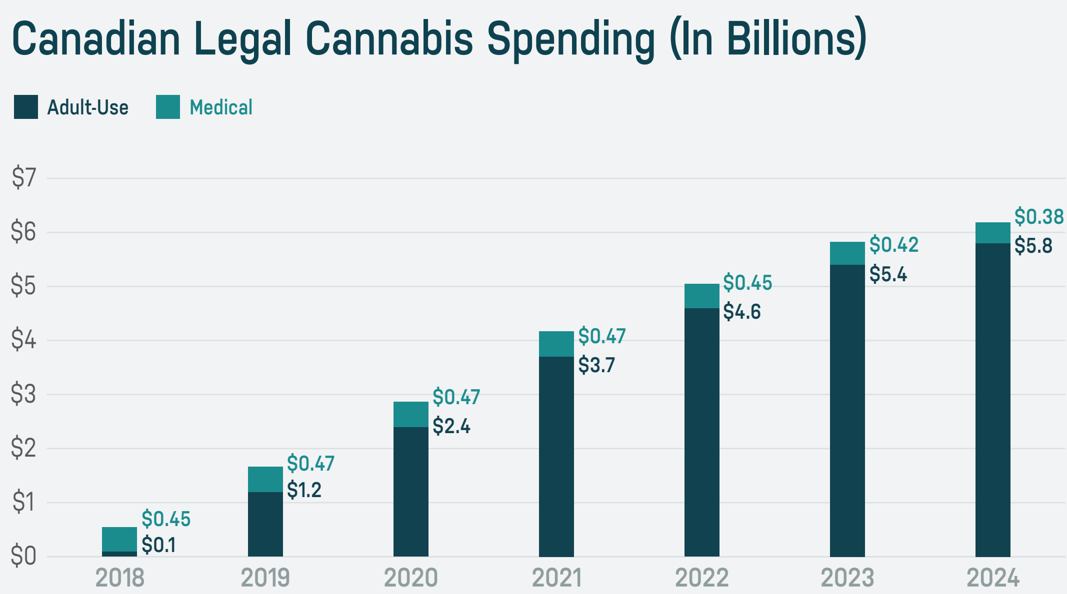
Will Cannabis 2.0 Bolster Adult-Use Growth?

Canada's bold experiment with national legalization followed much the same pattern as that seen in U.S. states starting with Colorado and Washington in 2014. The country kicked off its adult-use market Oct. 17, 2018, to much fanfare but little actual sales action. Underwhelming sales of just $129 million during the fourth quarter of 2018 were largely due to supply chain issues between licensed producers (LPs) and retail outlets and the limited rollout of regulated physical retail beyond certain provinces, primarily Alberta.

But in its first full year of adult-use sales, 2019, things seem to be improving with a spate of store openings in Ontario and elsewhere and improvement in the flow of



Source: Arcview Market Research/BDS Analytics

product from producers to customers. Adult-use sales for the year are estimated at just under $1.2 billion, alongside medical sales of nearly $473 million. That total of more than $1.6 billion for 2019 is significantly higher than the forecast of $1.1 billion presented in "The State of Legal Cannabis Markets, 7th Edition," due mainly to the increased strength of Canada's new adult-use market.

Products allowed via licensed medical and adult-use retail channels had been restricted to cannabis flower and oil until recently. The government released potency and packaging rules for edibles, concentrates and topicals in late 2019 to kick off its "Cannabis 2.0" initiative, and those products finally began hitting retailer menus Dec. 17, 2019. The effect the introduction of these products—all of which have become important categories in U.S. adult-use markets such as Colorado—on overall sales is unknown at this point. A half month of expanded product offerings in December likely had little effect on fourth-quarter 2019 sales, but the impact on full-year 2020 sales is likely to be substantial in this California-sized market of 38 million (29 million adults).

The number of registered patients under the Health Canada program continues to grow nationally, though some provinces—primarily Alberta, with its relatively well-developed physical retail footprint—have begun to shed them in earnest since the launch of adult-use cannabis sales in October 2018. Canada added a net 24,094 registered patients to its rolls between the end of October 2018 and September 2019, representing growth of about 7%.

Provincially, the picture is more varied. Excluding the territories, whose limited populations skew the numbers, Quebec saw the largest percentage growth in registered patients, increasing more than 49% to 15,987 in September 2019 from 10,708 in October 2018. Quebec

Quarterly Cannabis Market Data

	Q3 2018	Q4 2018	Q1 2019	Q2 2019	Q3 2019
Medical	$ 101.1	$ 116.3	$ 119.3	$ 117.8	$ 117.8
Adult-Use	$ —	$ 129.2	$ 228.0	$ 282.0	$ 316.9
Patients	342,103	353,642	355,302	363,917	369,614

Note: Spending figures in millions of U.S. dollars.
Source: Health Canada, Statistics Canada

features the lowest cannabis usage rates in the country and the lowest level of patients as a percentage of population—0.2% in September 2019. But it also has the most limited adult-use availability of all the major provinces.

Quebec's patient penetration is just behind that of British Columbia, which saw the second-highest growth in the number of registered patients over that same time—just over 32% to 4,599, or 0.4% of the population. Whereas in Quebec, cannabis simply is not that popular, and its consumption is generally discouraged by the provincial government, in B.C., particularly in its largest city of Vancouver, there are hundreds of unlicensed dispensaries that are known to serve customers, registered or not.

In Alberta, where the number of licensed retail outlets had reached 327 by Nov. 22, 2019, more than half of the national total by that time, the number of registered

Analysis of Canadian Patient Trends by Province/Territory

PROVINCES	OCTOBER 2018	PERCENT OF POPULATION	SEPTEMBER 2019	PERCENT OF POPULATION	NET CHANGE	PERCENT CHANGE
Alberta	110,189	2.6%	91,210	2.1%	-18,979	-17.2%
British Columbia	14,237	0.3%	18,836	0.4%	4,599	32.3%
Manitoba	13,356	1.0%	15,987	1.1%	2,631	19.7%
New Brunswick	7,902	1.0%	9,104	1.1%	1,202	15.2%
Newfoundland and Labrador	4,143	0.8%	5,196	1.0%	1,053	25.4%
Nova Scotia	13,993	1.5%	13,443	1.4%	-550	-3.9%
Ontario	160,374	1.1%	187,444	1.3%	27,070	16.9%
Prince Edward Island	1,546	1.0%	1,565	1.0%	19	1.2%
Quebec	10,708	0.1%	15,987	0.2%	5,279	49.3%
Saskatchewan	8,681	0.7%	8,635	0.7%	-46	-0.5%
TERRITORIES						
Northwest Territories	169	0.4%	1,978	4.3%	1,809	1070.4%
Nunavut	60	0.2%	89	0.2%	29	48.3%
Yukon	162	0.4%	140	0.3%	-22	-13.6%
Total	**345,520**	**0.9%**	**369,614**	**1.0%**	**24,094**	**7.0%**

Source: BDS Analytics analysis of Health Canada data

Licensed Retailers by Province

	GOVERNMENT	CHAIN	INDEPENDENT	TOTAL
British Columbia	8	17	62	**87**
Alberta	0	187	140	**327**
Saskatchewan	0	26	12	**38**
Manitoba	0	25	2	**27**
Ontario	0	12	13	**25**
Quebec	28	0	0	**28**
Nova Scotia	12	0	0	**12**
New Brunswick	20	0	0	**20**
Newfoundland	0	15	7	**22**
Prince Edward Island	4	0	0	**4**
Total	72	241	236	549

Note: As of Nov. 14, 2019.
Source: BDS Analytics

patients has continued to decline steadily. Alberta ended October 2018 with a higher patient penetration than any other province or territory, 2.6% versus the next-closest province of Nova Scotia with 1.5%. By September 2019, that penetration had declined to 2.1%—with a 17% decline in the number of registered patients to 91,210 from 110,189.

Slight declines were also seen in Nova Scotia (–3.9%) and Saskatchewan (–0.5%). The tiny territory of Nunavut, with a population of less than 40,000, saw a drop of –13.6%, though that represents a net decline of just 22 patients. Presented here are just the book ends of October 2018 and September 2019. Monthly data shows crucial details about trends in patient changes. For instance, in Nova Scotia, the number of registered patients actually peaked at 15,072 in June 2019, so the drop from the peak is closer to 11% than the 3.9% decline noted over the entire period. All of that supports the theory that Canada will see the same kind of long-term declines in patient counts, and thus medical cannabis spending, as U.S. states have seen with the advent of adult-use sales.

The burning question in Canada for 2020 is whether Cannabis 2.0, alongside continued supply chain improvement and retail footprint growth, can bolster adult-use spending as much as might be expected. In maturing U.S. adult-use markets including Colorado, Oregon and Washington (and even California, which has been adult-legal for two years now and also had a rough start), concentrates, edibles and topicals now account for a majority of sales. This holds true for the majority of medical-only U.S. markets as well, in fact.

The absence of these products in Canada has without a doubt hindered sales to this point—especially on the adult-use side, where in the U.S. the experience has been that new non-traditional cannabis consumers have been attracted by the wide range of available derivative products, causing a knock-on effect of encouraging manufacturers and retailers to further expand those products. Canada's adult-use market was in operation for 14 months before those products were even available for purchase legally.

A couple of additional wrinkles are in effect north of the U.S. border—and these have real potential to dampen growth of legal cannabis sales in Canada.

First, government rules on potency severely limit the appeal and marketability of edible products. In U.S. adult-use markets, potency is typically limited to 10mg of THC per piece with a limit of 100mg of THC per package. In Canada this limit is 10mg and 10mg, meaning all edibles sales are essentially "by the dose." Additionally, the weight of inert ingredients in these products counts against the overall 30g purchase limit imposed on customers.

Next, the EVALI health crisis in the U.S. strongly affected vape sales in legal states during the fourth quarter of 2019 following the first recorded death from the epidemic in August. Regulators in Canada have taken note and have begun to adopt a range of strategies to prevent an outbreak of EVALI within their jurisdictions. Newfoundland and Labrador and Quebec have both banned cannabis vape products entirely. Alberta, the strongest provincial adult-use retail market to date, has put sales of cannabis vapes on hold in the near term. British Columbia regulators have imposed a flat 20% tax on vape products.

In U.S. markets, cartridge and disposable vapes have historically been a strong seller because of convenience and discreteness and had increased rapidly in share over the past few years as new non-traditional consumers have entered the market and existing consumers switched over from smoking or vaping dried flower. Continued crackdown on legal vape products in Canada could limit overall sales growth—or, worse, lead consumers who want to access these products to the illicit market where quality and safety issues led to the development and spread of EVALI in the U.S. in the first place.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International Markets to Reach 13% of Total Sales by 2024

Legal cannabis markets in the U.S. and Canada are thriving, largely because of substantial growth in the adult-use channels in those countries. But, because the nascent nature of most other worldwide markets, they boast some of the highest forecast growth rates in the coming years. Beyond the U.S. and Canada, legal sales worldwide are forecast to grow at a compound annual growth rate (CAGR) of 47.7%, nearing $5.4 billion in 2024, up from just $517 million in 2018.

Most international markets fall into the new medical or emerging medical categories when comparing them to the more clearly developed hierarchy of U.S. markets. However, succinctly categorizing international markets like in the U.S. is not completely analogous since many markets beyond the U.S. and Canada are still working through clearly defining what constitutes medical cannabis, versus pharmaceutical cannabis, and because of the near-complete lack of adult-use markets beyond North America.

International medical spending more than doubled in 2019, rising from $367 million to $840 million (an increase of 129%), driven by the two largest markets in Germany and Mexico. That medical spending is forecast to grow to $4.5 billion in 2024, a CAGR of 52% from 2018 levels, again driven largely by Germany and Mexico but also by the U.K. and the dozens of countries around the world now making medical cannabis legal.

Global medical cannabis markets range from those offering cannabis-based pharmaceutical products like Sativex and Marinol, permitted for highly specific medical conditions and accessible to a limited patient pool, to markets with relatively easy access to cannabis flower and full-spectrum extracts dispensed by traditional white-coat pharmacists. No other countries in the world currently allow the kind of regulated, but non-pharmaceutical, dispensaries selling just cannabis-derived products seen in the U.S. since the 2010s and now spreading in Canada with the introduction of regulated adult-use sales.

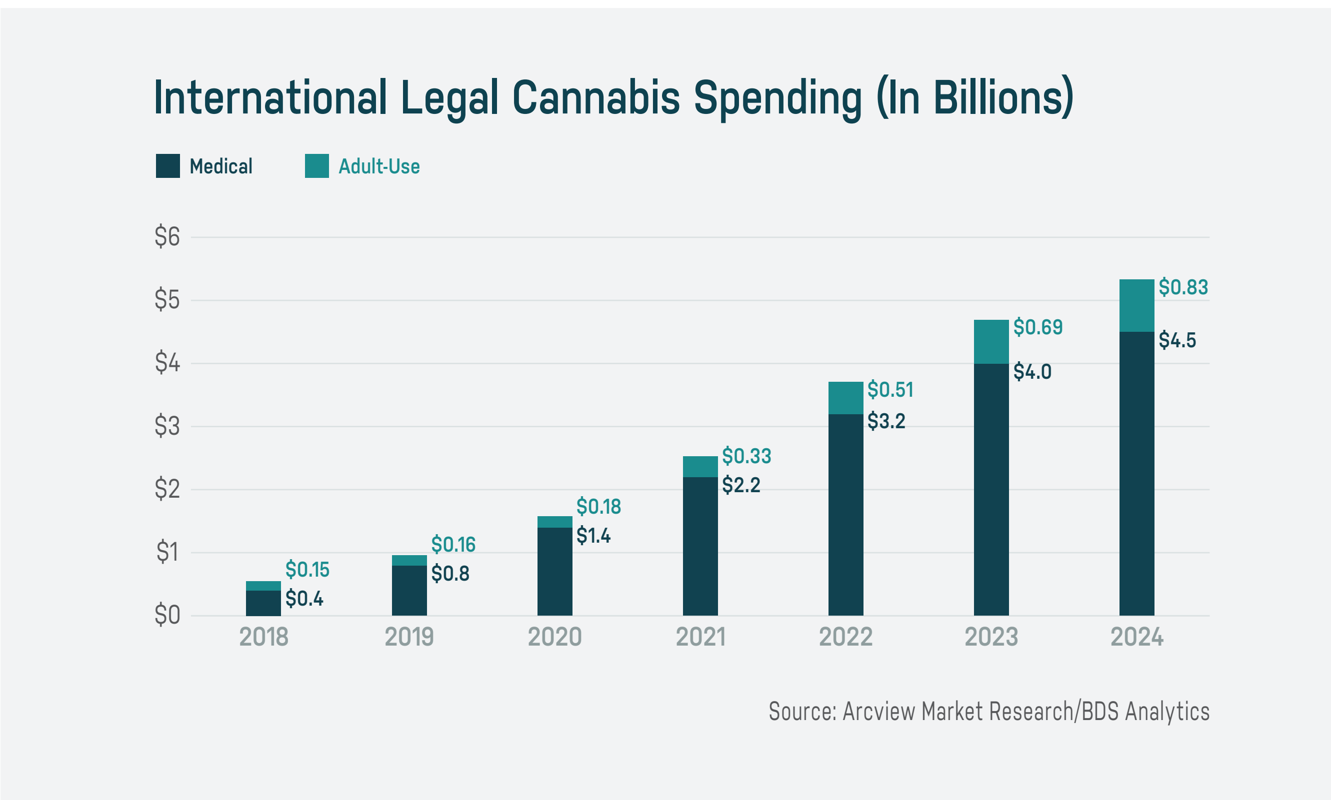
Throughout this forecast period, most markets are expected to remain highly restrictive in nature. Even so, cannabis legalization will likely continue to spread internationally at a rapid pace. Most major countries have medical access, but revenues are generally in the seven-figure range, given pharmaceutical-only rules.

While the growth in international markets outside of North America largely will be based on broadening medical access in existing tightly regulated markets and developing infrastructure in new medical markets, a handful are expected to have adult-use spending within the forecast period.

- **Uruguay** was the first country to federally legalize adult-use sales in 2013, although actual sales did not commence until regulations were finalized in 2017.

- In addition to **Switzerland's** sale of products with less than 1% THC through the general retail channel, the country also started a pilot program to embark upon the full legalization process.

- In November 2018, **Luxembourg's** ruling party announced that adult-use legalization was on the horizon and adult residents would be



allowed to legally purchase cannabis. Legislation has not officially passed, but authorities have said that details are being worked out, with sales expected to start within the next two years.

- **South Africa** and **Georgia** permit the possession and consumption by adults but do not allow sales. It is possible that the framework for commercial sales in these markets will be developed within the forecast period.

- **New Zealand** regulators announced that its Ministry of Justice is currently developing a referendum to establish legal adult production and consumption within the country.

- **Mexico** released a proposal for legalization late in 2019. Due to some pushback from lobbyists about details of the proposal, a "one-time only" extension was granted to April 30, 2020, for a decision about legalization.

Adult-use spending in international markets is forecast to grow at a CAGR of 33.1% from $150 million in 2018 to roughly $834 million in 2024. The current forecast could be significantly impacted if major markets move toward legalization within the forecast period given the transformative effect adult-use legalization has had on U.S. states and, now, Canadian provinces.

By the Region

As the spread of legalization happens at a notable pace around the globe, regional leaders are becoming clear. North America (composed of the U.S. and Canada in this report) will make up the overwhelming bulk of worldwide sales into the foreseeable future, while Europe heads the international market. Many Latin American markets are focused on becoming early leaders in the legal supply chain at the cultivation level rather than by liberalizing local distribution and consumption rules; thus, legal spending there is relatively low. The rest of the world is playing catch up, but recent moves by populous giants like South Korea and Thailand have the industry excited about its international future.

Europe

Not surprisingly, Europe is expected to be the largest contributor to international spending throughout this forecast period. With large European markets like Germany and the U.K. significantly broadening their medical cannabis programs in the last two years, and France aggressively pushing to follow suit, spending in Europe is forecast to grow at a CAGR of 48.9% from $308 million in 2018 to $3.4 billion—62.5% of international sales—in 2024.

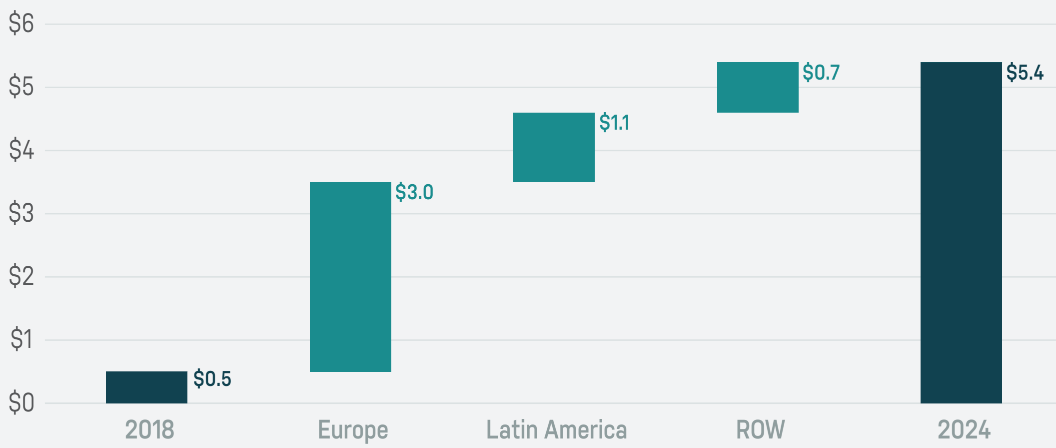
- In October 2019, authorities in **France** approved a budget to finally begin a medical cannabis pilot program. The French Agency for the Safety of Medicines and Health Products (ANSM) created a scientific committee to write rules before the launch of the two-year pilot program. Rules will address product availability, education for patients, pharmacists and physicians as well as the creation of a patient registry.

- **Germany** is, and will remain, the largest European market throughout the forecast period, on track to cross the billion-in-spending mark by 2022.

In 2024, spending is estimated to reach nearly $1.4 billion, making it one of the top 10 legal markets in the world. Adequate supply remains an issue in Germany even though it is the largest importer of flower in the world since domestic production is not yet operational. Currently, cannabis is imported primarily from Canada and the Netherlands, but imports from Portugal and Australia also have been received. Patients continue to have difficulty getting prescriptions filled. The market is showing some signs of slowdown due to the supply issues, but because of its liberal laws, strong growth is still forecast through 2024. Spending on medical cannabis there is forecast to grow at a CAGR of 60.6%.

- Even with the recent moves to greatly expand access in the **U.K.**, the market is still underdeveloped. A major factor holding back patient growth is the fact that cannabis can only be prescribed by

Regional Growth Drivers (In Billions)



Source: Arcview Market Research/BDS Analytics

specialist doctors and not general practitioners. Many in need of cannabis treatments cannot bear the cost of meeting with a specialist to obtain a pharmacy prescription. This has resulted in sluggish growth of the new program. Patient advocates and cannabis clinics alike are lobbying the government to allow general practitioners to prescribe cannabis, which would greatly increase the patient pool and lead to the market becoming truly viable. The first medical cannabis clinic opened in March 2019 in Manchester following the first bulk import of medical cannabis in February 2019. As of Jan. 16, 2020, seven medical cannabis clinics had opened across the U.K., with more to follow in the coming months. While greater coverage for cannabis clinics is likely to expand the program significantly, the importation of products for these clinics to distribute could be complicated by the U.K.'s coming exit from the European Union.

Latin America

All eyes are on Mexico in the Latin American region, and rightfully so. In October 2019, the Supreme Court gave Congress until April 30, 2020, to approve legalizing all forms of cannabis. The move would not only create one of the largest global medical markets but would also give access to the largest single population of legal adults in the world. Hopes are high that Congress will be able to complete the legislation even though they could not do it by the original October 2019 deadline. Current estimates for legal spending in Mexico are conservative, growing from $62.4 million in 2018 to just over $1 billion in 2024, or 85.3% of the Latin America market.

Latin American markets outside of Mexico and Uruguay are still operating restrictive medical programs. Total spending in the region is forecast to grow at one of the highest CAGRs in the world: 62.7% from $64.7 million in 2018 to $1.2 billion in 2024.

ROW

Steps are being taken around the world to allow cannabis-based treatments that have been off the table for many decades. Those steps range from incremental broadening of extremely restrictive existing programs to completely liberalizing medical markets and eventually full legalization. Spending in territories not within the regions outlined above will likely remain low throughout the forecast period but is expected to grow steadily given the sheer number of countries now moving to allow at least some access to cannabis. In 2024, spending is expected to reach $815 million up from $144 million in 2018.

Global Market Summary, 2019–2024

	TOTAL SPENDING		2018–2024
	2019	2024	CAGR
Germany	$ 235.2	$ 1,353.2	60.6%
Mexico	$ 62.4	$ 1,023.3	85.8%
UK	$ 25.4	$ 546.9	95.0%
France	$ 2.6	$ 432.3	164.4%
Italy	$ 8.6	$ 323.1	99.9%
Switzerland	$ 146.1	$ 245.1	11.0%
Spain	$ 3.2	$ 111.2	86.2%
Israel	$ 49.5	$ 103.7	19.7%
Netherlands	$ 57.7	$ 101.4	12.9%
Australia	$ 15.6	$ 94.4	52.8%
Poland	$ 17.7	$ 66.1	48.9%
Greece	$ 22.0	$ 63.9	71.5%
New Zealand	$ 3.0	$ 51.8	65.4%
Uruguay	$ 30.6	$ 41.2	7.5%
Austria	$ 3.8	$ 36.8	52.0%
Brazil	$ 6.2	$ 35.2	44.3%
Peru	$ 1.6	$ 34.4	n/a
Argentina	$ —	$ 29.4	n/a
Chile	$ 7.8	$ 28.5	29.6%
Czech Republic	$ 8.4	$ 18.9	20.1%
Belgium	$ 5.8	$ 18.1	24.7%
Portugal	$ 1.6	$ 14.9	50.4%
Croatia	$ 4.0	$ 9.7	28.8%
Colombia	$ 4.6	$ 7.6	15.0%
Jamaica	$ 0.9	$ 7.5	58.8%
Macedonia	$ 1.2	$ 5.0	37.5%
Turkey	$ 2.9	$ 3.2	2.7%
Finland	$ 0.6	$ 1.1	13.6%
ROW	$ 275.5	$ 557.7	33.5%
Total	**$ 1,004.3**	**$ 5,365.6**	**47.7%**

Note: Spending in millions.
Source: Arcview Market Research/BDS Analytics