



BRYAN, GARNIER & CO

Medical cannabis in Western Europe

THE NEW FRONTIER



CONSUMER WHITE PAPER **JUNE 2020**

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The global cannabis market is evolving from an illegal and mainly recreational market dominated by drug cartels to a legal medical and recreational market in the hands of public and private companies.

Western Europe boasts some of the world's fastest-evolving and most significant opportunities in medical cannabis, with countries reassessing their restrictions as public support for legalization grows and commercial and social benefits become apparent.

Existing medical cannabis markets such as Germany, Italy and the Netherlands are expanding their programs whilst new medical markets like the UK, France and Spain are reviewing current legislation. And the seeds of a second wave of growth to allow recreational adult use of cannabis are being planted.

Western Europe is on track to become the world's largest legal medical cannabis market over the next ten years, projected to be worth EUR15.3bn in 2029, up 60x from EUR250m in 2019. Germany, the leading European medical market, is expected to grow to EUR4.9bn by 2029 from EUR210m in 2019¹. In this paper, we examine the dynamics and developments in European medical cannabis, with a detailed look at the German market.

¹ Bryan, Garnier & Co estimates

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1. Cannabis and how it works

Cannabis, also known as marijuana, is a chemical substance derived from the cannabis plant that can be used for medical or recreational purposes. Hemp is a term generally used to describe varieties of cannabis plants that contain less than 0.2% (Europe) or 0.3% (Americas and Asia) THC, the main psychoactive cannabinoid that gives a “high” but also has medical properties.

In addition to medical use, hemp has numerous industrial applications, including rope, textiles, clothing, shoes, food, paper, bioplastics, insulation, fiberboard and biofuel.

Cannabis plants produce a group of chemicals called cannabinoids, which produce mental and physical effects when consumed. THC and CBD are the two most well-known

of the over 100 different cannabinoids. CBD is non-psychoactive and non-intoxicating and has a variety of medicinal and wellness applications.

The effects of cannabis result from its interaction with the endocannabinoid system, a complex cell-signaling system identified in the early 1990s.

The endocannabinoid system

The endocannabinoid system is a distributed network of receptors, signaling molecules and degrading enzymes naturally present in the human body. It appears to play a part in maintaining homeostasis, in which biological systems are actively regulated to maintain conditions within a narrow range.

Because of its crucial role in homeostasis, the endocannabinoid system is widespread throughout all vertebrate species. Endocannabinoid receptors are not only present in the brain and nerves, but can be found throughout the body, including our skin, immune cells, bone, fat tissue, liver, pancreas, skeletal muscle, heart, blood vessels, kidney, and gastrointestinal tract. As a result, the endocannabinoid system is involved in a wide variety of processes, including pain, memory, mood, appetite, stress, sleep, metabolism, immune function, and reproductive function.

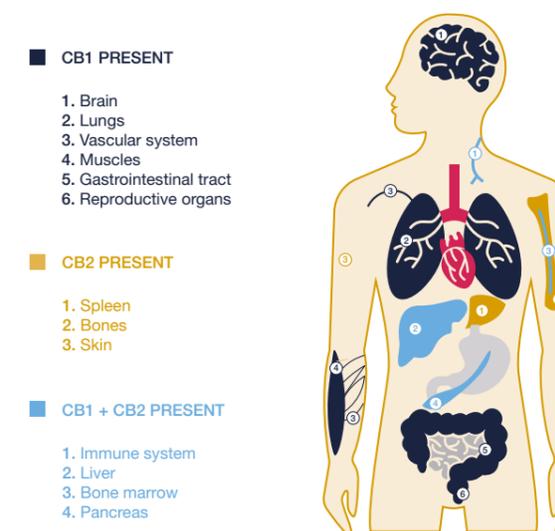
The three key components of the endocannabinoid system are:

1. cannabinoid receptors found on the surface of cells

2. endocannabinoids, small molecules that activate cannabinoid receptors

3. metabolic enzymes that break down endocannabinoids after they are used.

FIG. 1: DISTRIBUTION OF THE CB1 AND CB2 RECEPTORS IN THE HUMAN BODY

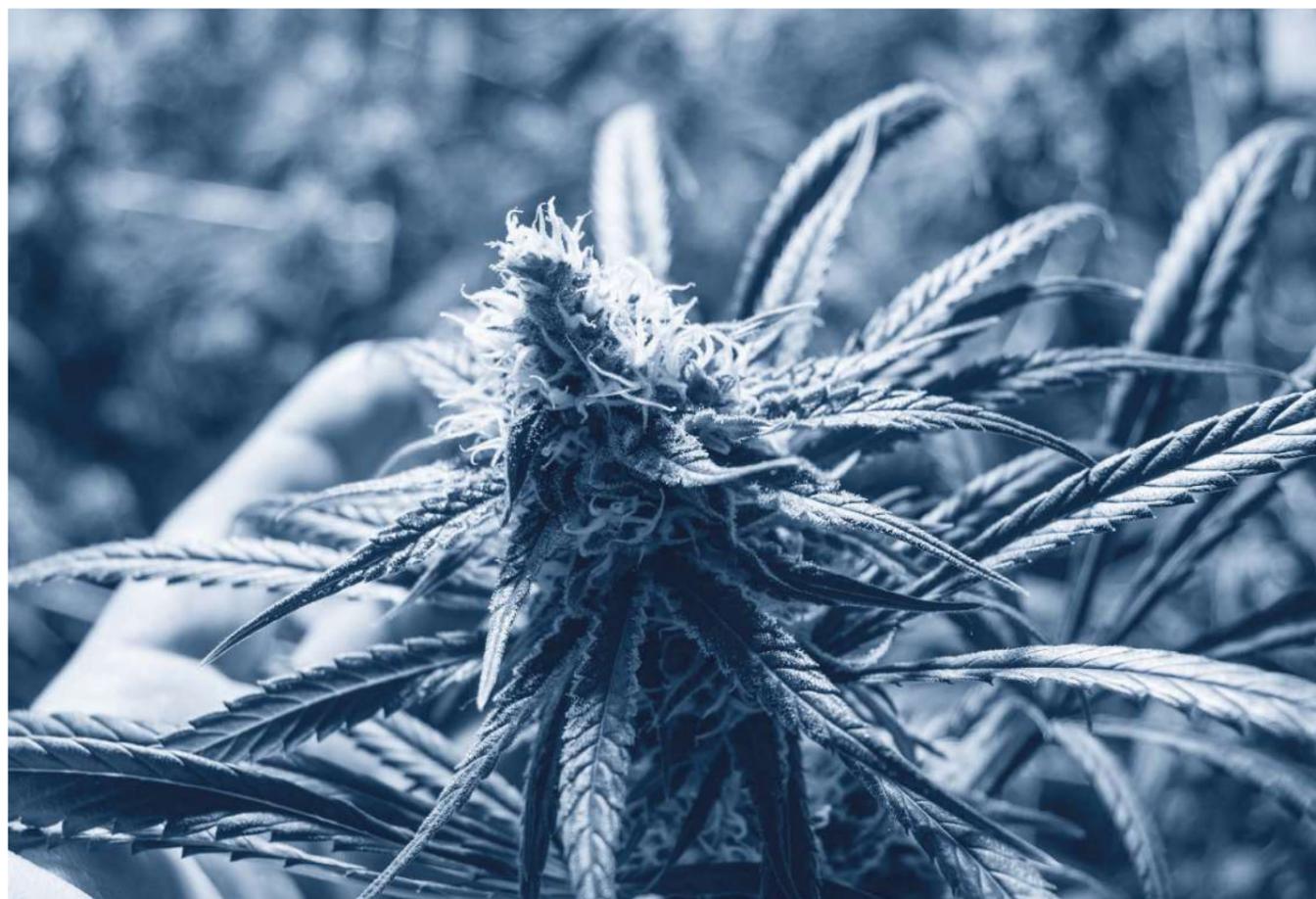


Source: Janosch W. Kratz, Mariano Garcia de Palau, Medicinal Cannabis Manual, First edition, Kalapa Clinic, 2018

Cannabinoid receptors: from the surface of cells, cannabinoid receptors “listen” to conditions outside the cell and transmit information about changing conditions to the inside of it, kick-starting the appropriate cellular response. There are two major cannabinoid receptors: CB1 and CB2.

Endocannabinoids: are produced naturally by cells in the human body and bind with the CB1 and CB2 receptors. They are synthesized on demand from within cell membranes.

Metabolic enzymes: these break down endocannabinoids once they are used.



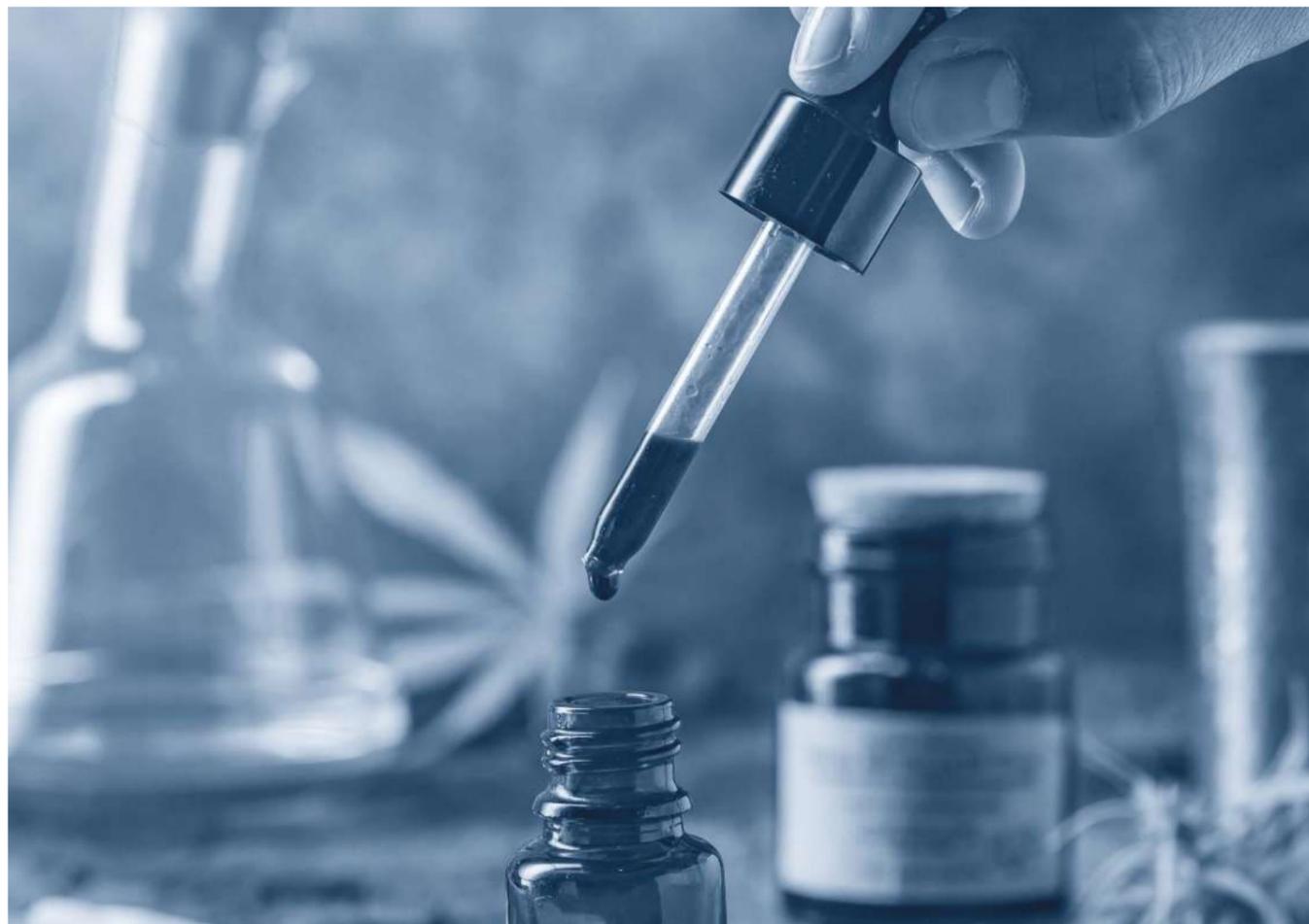
Plant cannabinoids

Cannabinoids synthesized by the body itself are the natural keys to activate endocannabinoid receptors. Other substances also fit the system's receptors. Because plant cannabinoids, or phytocannabinoids, are similar in molecular and electronic structure to endocannabinoids, they can interact

with the endocannabinoid system and produce physiological effects.

For example, THC causes a high because it activates the CB1 receptor within the brain. Cannabinoids can also be produced synthetically and there are claims that these are as effective as extracted CBD. Proponents of plant cannabinoids will argue that synthetic cannabinoids

are less effective because they lack the "entourage effect", by which cannabis compounds are thought to act synergistically to modulate the overall effects of the plant. The two best known synthetic cannabinoids are dronabinol, a synthetic form of delta-9-tetrahydrocannabinol (THC), and nabilone, a synthetic cannabinoid that is similar to THC.



Potential medicinal benefits of cannabis

Endocannabinoid receptors are found throughout the body: in the brain, nervous system and organs, and regulate virtually every process in the human body. The feedback loop to maintain homeostasis may not always work correctly or efficiently. And that is where cannabis can help. Because cannabis is able to help all the different processes of the endocannabinoid system, it has many potential therapeutic properties. It is not always understood exactly how cannabis helps the endocannabinoid system but the medicinal benefits are not only anecdotal. The direct and indirect activation of endocannabinoid receptors by cannabis may be able to treat a wide range of conditions.

FIG. 2: CANNABIS: POTENTIAL MEDICINAL APPLICATIONS

Epilepsy	Anxiety	Depression and other mood disorders
Pain	Connective tissue diseases	Chronic inflammation
Improving lung capacity	Arthritis	Overweight
Diabetes	Cancer	Osteoporosis
ADHD/ADD	Glaucoma	Alzheimer's disease
Side-effects of hepatitis C treatment	Inflammatory bowel disease	Motion sickness
Nausea caused by chemotherapy	Multiple sclerosis	Huntington's disease
Parkinson's disease	Schizophrenia	PTSD
Autism	Alcoholism and opioid addiction	



2. Growing consumer acceptance

The continuing emergence of evidence for the therapeutic value of cannabis in treating a variety of disease-related problems has been important in developing support for medical cannabis legalization. This has also influenced acceptance of recreational cannabis use, which has been further supported by indications that the recreational use of cannabis

carries less risk than alcohol and other drugs, including prescription medicines.

American and European public opinion has been shifting towards supporting some degree of cannabis legalization. Polls in the US show that 93% of adults agree there should be some form of legal cannabis.

In the UK, support for some form of legalization is hitting a high of 77%. But support is also growing in continental Europe. In Germany, 29% of the population wants cannabis to be legalized and about half consider medical cannabis to be a good alternative to traditional medicines.

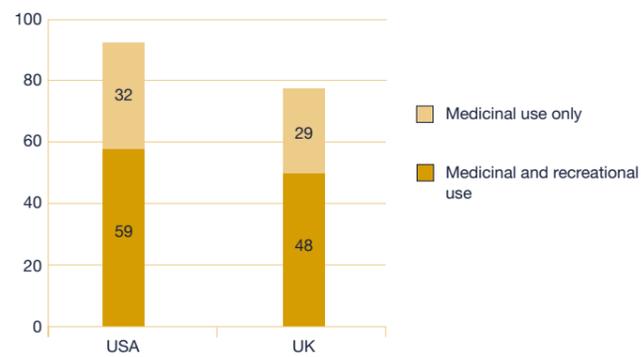
It has never been clearer than during the current COVID-19 pandemic that cannabis has become mainstream in American society. In state after state, governors and public health officials are deeming cannabis businesses “essential” operations that can stay open amid coronavirus-related forced closures and stay-at-home mandates. People might not be able to go bowling or see a movie in theatres, but they can still stock up on cannabis.

Not long ago, growers and sellers of cannabis risked arrest, prosecution and jail. But now, in an era of expanding legalization, cannabis providers in many states are held up as vital members of the community, providing a valuable service on a par with picking up prescription drugs at a pharmacy, food shopping, or filling up your car at a petrol station.

As cannabis becomes mainstream, it impacts different consumer

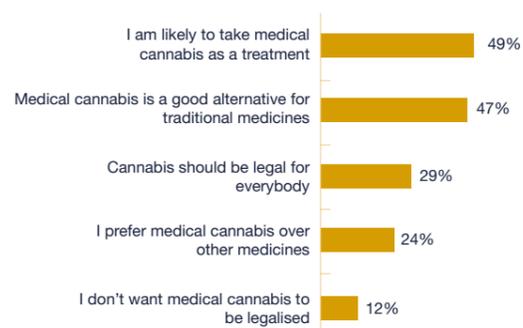
industries. For example, according to BDS Analytics, around 20% of consumers who consume both alcohol and cannabis reduced their alcohol consumption, by around 50% on average. The additional risk for distillers and brewers is that the percentage of alcohol consumers who consume cannabis continues to increase, while the percent of cannabis consumers consuming alcohol is decreasing.

FIG. 3: NEW HIGH IN SUPPORT FOR LEGALIZING CANNABIS



Source: Pew Research Center, Survey of U.S. adults conducted Sept. 3-5, 2019. YouGov quoted in The Independent

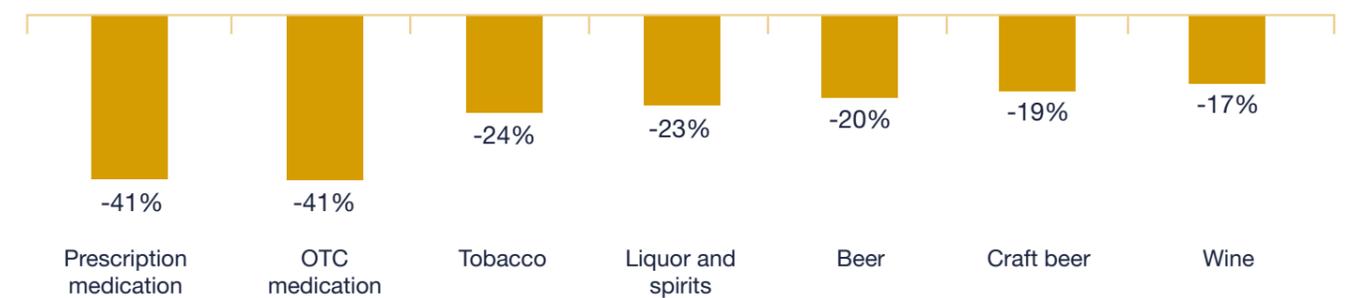
FIG. 4: STRONG SUPPORT FOR CANNABIS IN GERMANY



Source: Statista Global Consumer Survey September 2019



FIG. 5: PERCENTAGE OF CANNABIS CONSUMERS WHO DECREASED CONSUMPTION OF THE FOLLOWING CATEGORIES DUE TO THEIR CANNABIS CONSUMPTION



Source: BDS Analytics, “Cannabis is exploding in CPG: is your organization ready?” Larry Levin, Jessica Lukas August 27, 2019

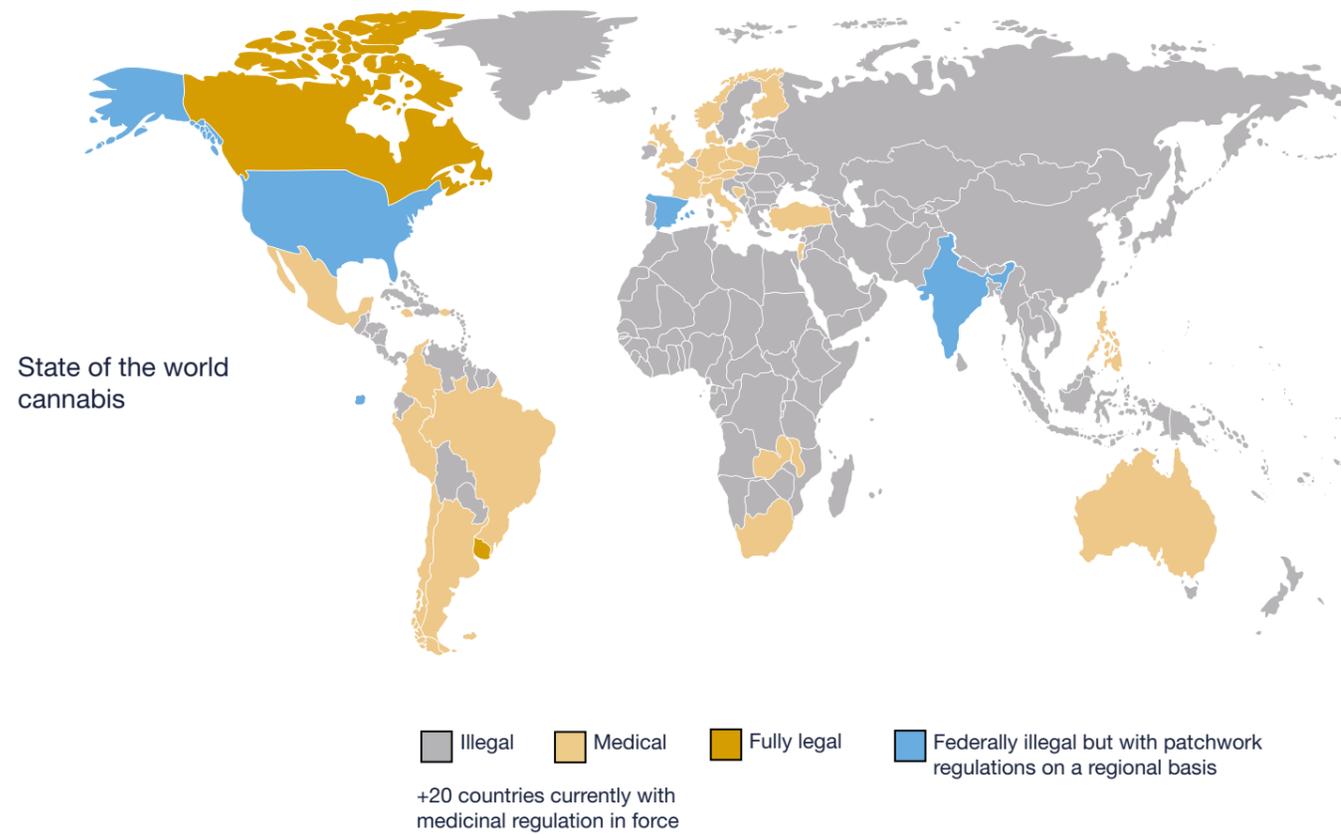
3. The progress of legalization

The growing belief in the medicinal benefits of cannabis has increased public support for medical cannabis legalization and policymakers are gradually responding. Medical use is now legal in 33 US states and in over 30 countries including Brazil, Mexico, South Korea, Thailand, Australia,

Canada. Most key Western European countries already have legal medical cannabis systems in place, including the UK, Italy, the Netherlands, France (with an ongoing pilot project), Spain and Germany. Currently, 11 US states, Canada, Uruguay, Georgia, the Netherlands, Luxembourg,

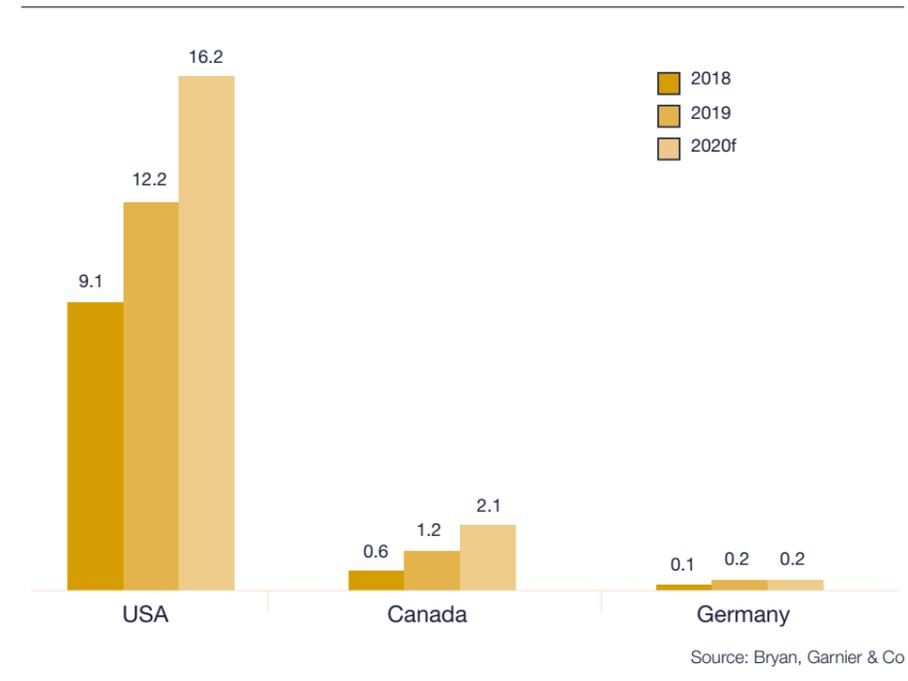
Spain and South Africa have been developing rules and legislation to allow cannabis for recreational use. At present the German legal cannabis market is the third largest, behind the US and Canada, but is only in its infancy.

FIG. 6: STATE OF THE LEGAL CANNABIS MARKET – PROHIBITION IS ENDING



Source: BDS Analytics, State of the Industry: A Look at the Numbers, Roy Bingham and Tom Adams, 2019

FIG. 7: KEY LEGAL CANNABIS MARKETS (IN USD BN)



Despite the increased support in individual countries, cannabis is still classified in Schedule IV of the 1971 United Nations Single Convention on Narcotic Drugs, meaning it is considered “particularly harmful and of extremely limited medical or therapeutic value”. As long as this remains the case, research on it is severely restricted.

Nevertheless, there is an emerging scientific consensus on its therapeutic value based on a growing body of successful preclinical and clinical trials. The World Health Organization (WHO) is recommending the following:

- Remove cannabis flower and resin from Schedule IV of the 1961 convention, the most restrictive category—for drugs deemed to

be most liable for problematic use and to have no therapeutic effects. Cannabis would be transferred to the slightly less restrictive Schedule I and would still be strictly controlled. But it would then become easier for governments to allow medical and scientific research on cannabis, which the WHO says shows good evidence for having therapeutic applications. Schedule I drugs can be made available for patients on prescription.

- Remove THC in all its forms from the 1971 Convention on Psychotropic Substances and place it with cannabis in Schedule I of the 1961 convention. In effect, the WHO thinks that classifying THC and cannabis together would be more consistent and less confusing.

- Remove extracts and tinctures of cannabis from Schedule I of the 1961 convention, declassifying them entirely, because such preparations may have varying levels of THC, have no psychoactivity and be therapeutic.
- Place pharmaceutical preparations of 9-THC (such as Marinol, Syndros, or Sativex) in Schedule III of the 1961 convention, which includes drugs with no deemed likelihood of problematic use or ill effects.
- Completely remove pure CBD and low-THC CBD products from all drug conventions.



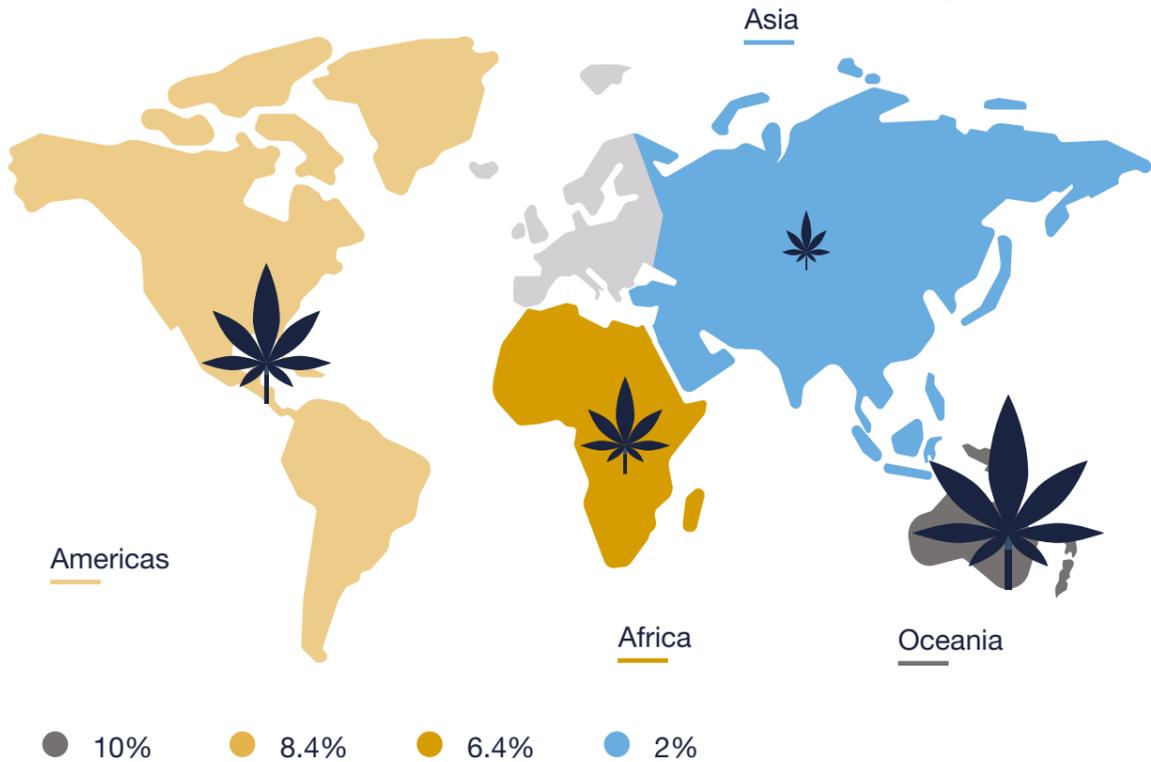
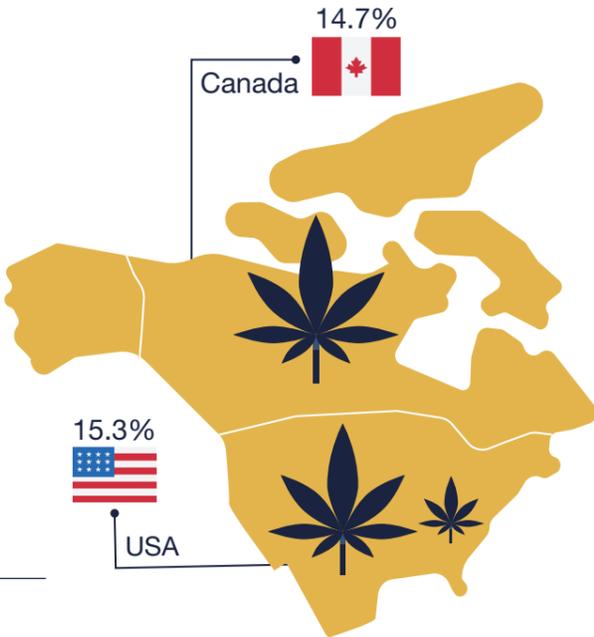
However, at its meeting in Vienna from 2-6 March 2020, the United Nations Commission on Narcotic Drugs (CND) postponed a decision on the WHO proposal for the rescheduling of cannabis until December 2020. This is the second time the CND has refused to vote on the recommendations, which the WHO first presented in January 2019. The CND is the UN’s central drug policy-making body, comprising 53 member states representing each continent and region. Like the Drug Enforcement Agency in the US, the CND classifies or schedules drugs according to the UN’s 1961, 1971 and 1988 global drug control conventions. Following review, it can de-schedule or reclassify drugs, thereby influencing how countries around the world control them.

4. Buoyant outlook for the global and European cannabis markets

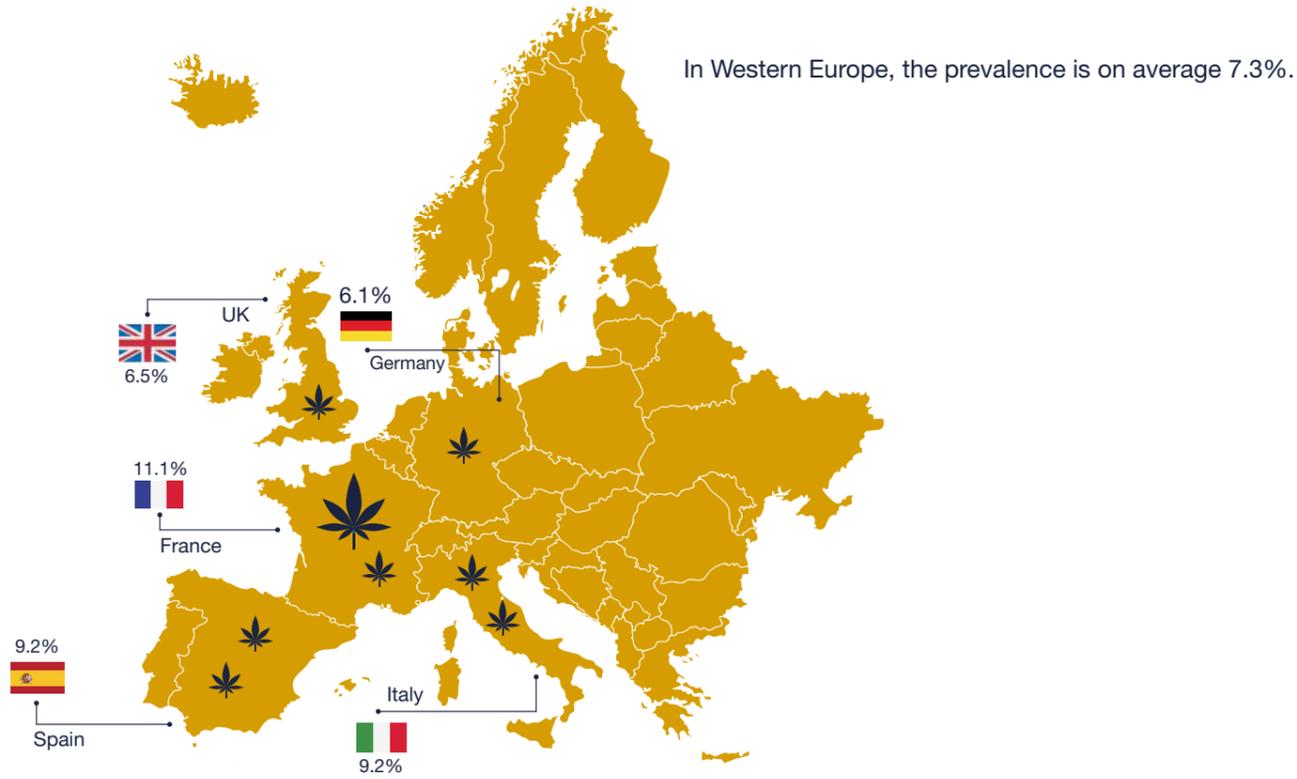
Cannabis use worldwide

The United Nations Office on Drugs and Crime estimated the number of drug users at 339m in 2017 and 55% of those are cannabis users (188m). The 188m legal and illegal cannabis users are about 3.8% of the global population.

FIG. 8: ANNUAL PREVALENCE OF CANNABIS USE



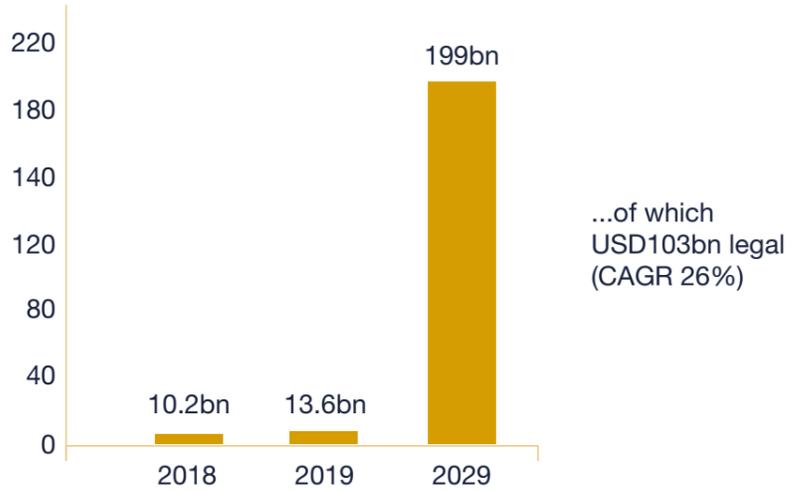
Source: UNODC World Drug Report 2019



Value of the global cannabis trade

Based on data from the United Nations and black-market intelligence provider Havocscope we estimate the global drugs market to be worth USD511bn, of which the cannabis trade (both legal and illegal) accounts for USD177bn (35%).

FIG. 9: ESTIMATES OF THE LEGAL CANNABIS MARKET (IN USD BN)



European market growth

For Europe we estimate the cannabis market to grow to USD62.6bn by 2029, up from USD52.1bn in 2019 (CAGR of 2%).

FIG. 10: EXPECTATIONS FOR THE EUROPEAN LEGAL MARKET (IN USD)

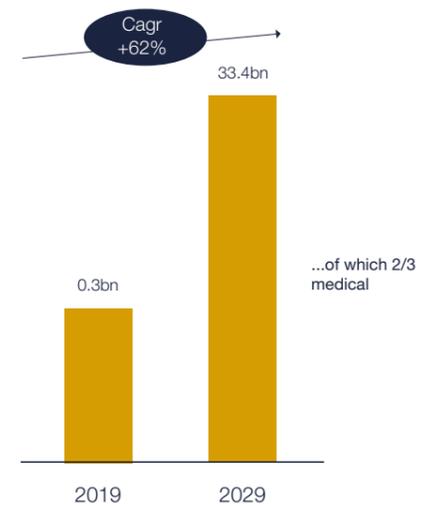
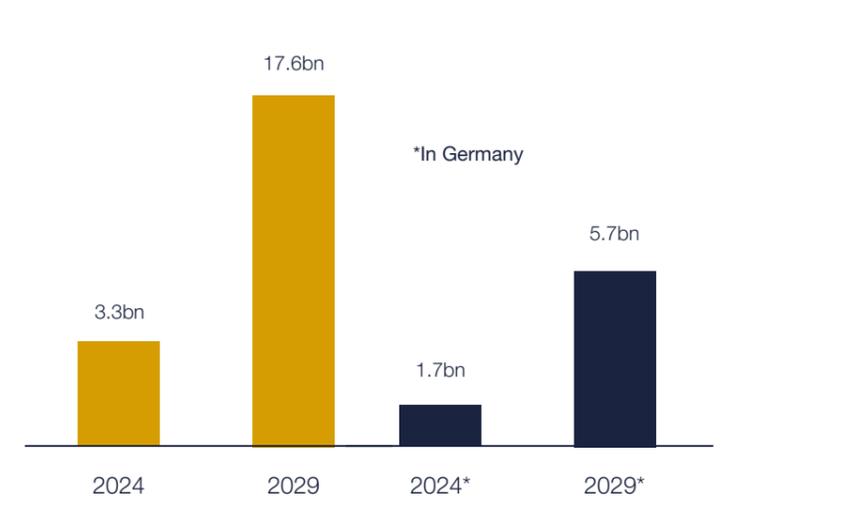


FIG. 11: THE SIZE OF THE WESTERN EUROPEAN LEGAL MEDICAL CANNABIS MARKET (IN USD)



COUNTRY FOCUS:



Italy

We expect Italy to remain the second largest European medical cannabis market, reaching USD3.1bn in 2029. Italy legalized medical cannabis in 2013 and last year, Italians purchased 861 kilos vs. 578 kilos in 2018). In Italy, most legal cannabis sold is exported by the Dutch Office of Medical Cannabis and grown by that country's only commercial cultivator, Bedrocan. A small amount of Italian cannabis (130 kg in 2018) is grown domestically by an arm of the Ministry of Defense. Canadian producer Aurora won a July 2019 tender to provide 400 kilos to Italy over a two-year period. And at the end of 2019, Italy's supreme court ruled that cultivating cannabis on a small scale for personal use is legal. Furthermore, since 2020, medical cannabis for patients suffering from chronic pain, cerebral palsy and multiple sclerosis will be paid for by the Sicilian regional government.



UK

We expect the UK to become the third largest European medical cannabis market by 2029, with total revenues of USD2.2bn. Doctors have been able to prescribe cannabis products to patients since 1 November 2018, but initial prescription numbers were small and the product was also difficult to get. However, since 2 March 2020, licensed wholesalers will now be able to import larger quantities of cannabis-based products and hold supplies for future use by patients with prescriptions. Previous restrictions meant that patients had to wait for weeks or months to obtain the still highly expensive drugs: for example, an import license from Canada can take eight weeks. In November 2019, drugs charity Drug Science Project Twenty21, a large-scale national medical cannabis registry, aiming to enrol 20,000 patients by the end of 2021 and create the largest body of evidence for the effectiveness and tolerability of medical cannabis. Suppliers for the Twenty21 project include Khiron, Emmac and Canopy Growth.





France

By 2029, we expect the French medical cannabis market, currently in its infancy, to reach USD1.5bn. As part of its 2020 social security proposals, the French Assemblée Nationale authorized a two-year trial for medical cannabis treatment to 3,000 patients for whom no other options remain. Doctors may prescribe the drug for patients suffering from certain forms of treatment-resistant epilepsy, neuropathic pain that does not respond to other treatment, involuntary muscle spasms, and/or other nervous system conditions. Medical cannabis can also be prescribed for people suffering from side effects of chemotherapy, or who are at a stage where they require palliative care only.



FIG. 12: GROWTH OF THE GLOBAL LEGAL CANNABIS MARKET (USD BN)

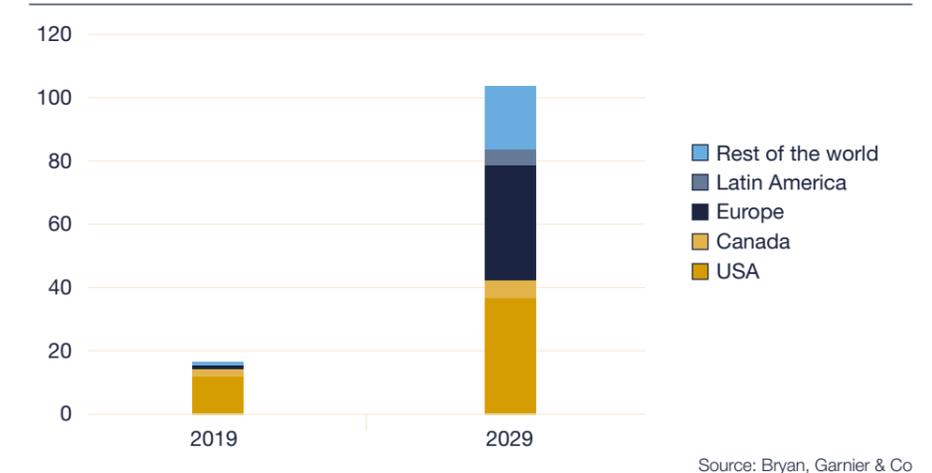
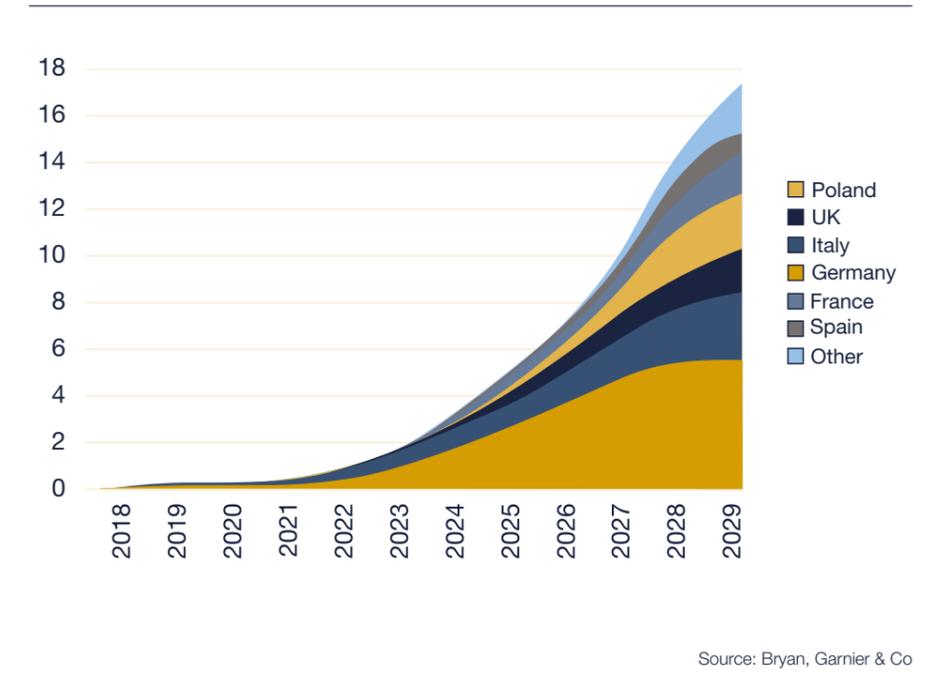


FIG. 13: GROWTH IN THE WEST EUROPEAN MEDICAL CANNABIS MARKET (USD BN)



5. Germany, Europe's leading cannabis market

Germany is expected to lead the European cannabis market, with growth to EUR4.9bn by 2029 from an estimated EUR210m in 2019. In Germany, cannabis flower may be sold unprocessed or the doctor may prescribe it ground or packaged for use as tea. Doctors who can prescribe narcotics can also prescribe medical cannabis. If the patient has exhausted all other avenues of treatment, the physician may prescribe cannabis. When prescribing flower, doctors need to specify in the prescription that the cannabis brand that has the desired cannabinoid ranges sought (high THC, balanced THC/CBD, low THC/high CBD, etc.).

Prescription are for specific brands and if the brand is not available, the patient must return to the doctor for another prescription. This underlines the importance of security of supply and also the importance for medical cannabis brands of targeting doctors in their sales strategy. Flower for sale must specify THC and CBD content, with a variation of 10% allowed according to good manufacturing practice (GMP) principles. A maximum 30-day supply of up to 100 grams of flower per patient may be prescribed. Patients can have their prescriptions filled at any of the roughly 20,000 pharmacies in Germany but in practice, there are only around 2,500 pharmacies that deal with cannabis.

For the six months to September 2019, a government-sponsored survey of 6,538 patients found that pain was the most important indication for which medical cannabis was prescribed (71%)². This was followed by spasticity, at almost 11%. Another survey found that 68.4% of medical cannabis product applications have been approved in Germany since the introduction of cannabis legislation³. When cannabis is not covered by insurance, however, patients must pay out-of-pocket for the cannabis medicine, which is more expensive than buying cannabis on the black market.

At least 3.3m of 15-64 year-old Germans, 6.1% of this group, had used legal and illegal cannabis at least once in 2015, which is about one fifth of all 14.8m lifetime users in the general population aged 15-64 yrs. Usage is higher among young people and falls in older age groups as a result of the social stigma of cannabis use and the availability of alcohol as a more socially accepted intoxicant. That same trend is observed across the EU, the US, Canada and Australia. But once cannabis is legalized, the highest growth is among older and female consumers (while there is a slight decline among young adults). Since, 2015 when the last survey on prevalence in Germany was conducted, medical cannabis use

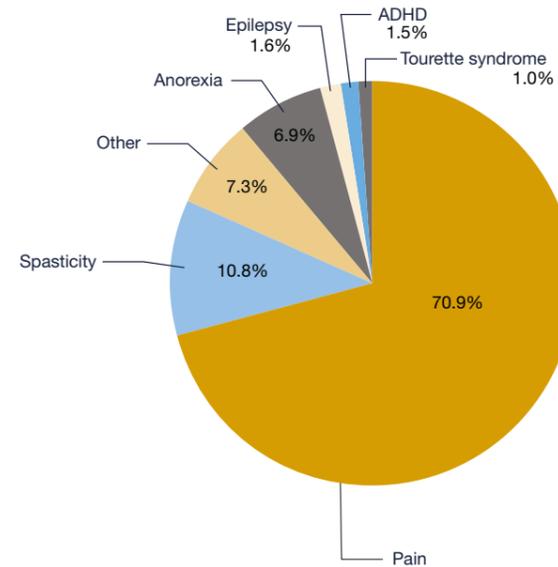
has been legalized (March 2017), so we would expect that the next survey will show an uptick in cannabis prevalence.

² [Cannabisreportworld.com/new-data-reveals-top-medical-conditions-for-which-cannabis-is-reimbursed-in-germany](https://cannabisreportworld.com/new-data-reveals-top-medical-conditions-for-which-cannabis-is-reimbursed-in-germany)

³ healtheuropa.eu/medical-cannabis-prescriptions-three-years-of-cannabis-law-in-germany/97628



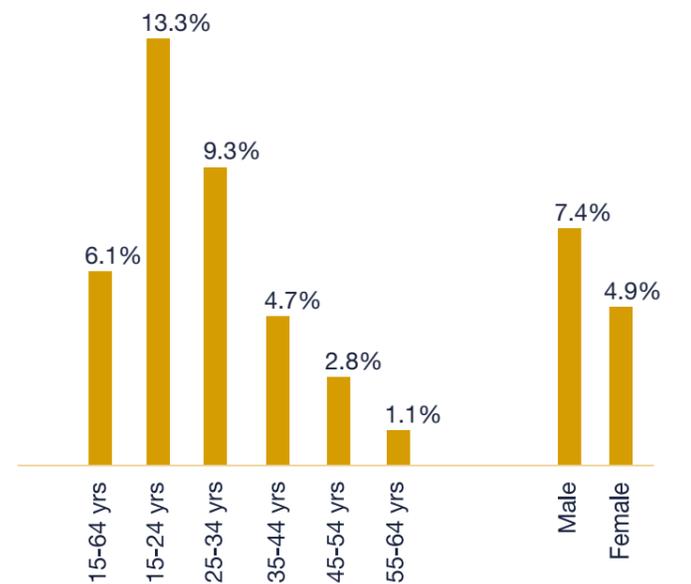
FIG. 14: CONDITIONS TREATED WITH CANNABIS RECEIVING REIMBURSEMENT IN GERMANY



Source: BfArm in "Marijuana Business Daily", April 2019.



FIG. 15: LAST YEAR PREVALENCE RATE IN GERMANY (2015)



Source: European Monitoring Centre for Drugs and Drug Addiction

The two-thirds of patients that received reimbursement for medical cannabis cost public healthcare insurance companies EUR123m in 2019, (267,348 prescriptions) an increase of 75% compared to 2018. Public healthcare insurance companies cover 90% of Germans while the other 10% - mostly the self-employed, foreigners and high earners - have more expensive private coverage. Extrapolating public health insurance figures to private insurers brings the total legal insured

cannabis market in Germany at an estimated EUR137m in 2019 (7.5 tonnes) and the total legal cannabis market at an estimated EUR210m (11.5 tonnes flower equivalent).

As patients and doctors become more comfortable with medical cannabis and insurance companies find ways to reduce the cost of the medicine by encouraging doctors to prescribe authorized cannabis medicines that are more likely to be reimbursed), we expect the German

market to grow to EUR4.9bn in 2029 (444 tonnes) putting it on track to become one of the largest legal medical cannabis markets in the world.

Currently we estimate that only 60,000 patients received cannabis in 2019, 0.07% of the population. In US states and in Canada, the number of medical cannabis patients is 1.5-2% of the population, suggesting a potential for 2m patients in Germany.

FIG. 16: THE RISE OF THE GERMAN CANNABIS MARKET

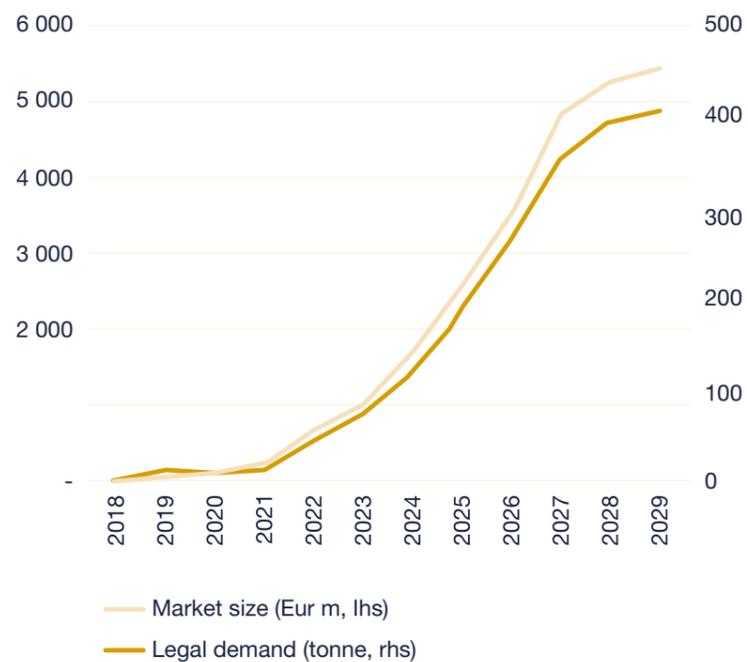
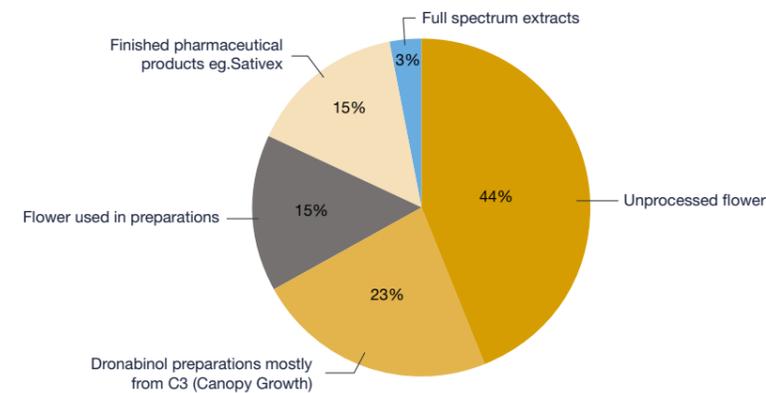


FIG. 17: INSURANCE COVERED CANNABIS PRODUCTS IN GERMANY 2019



Source: GKV in GKVgamsi, March 2020

Cannabis flower represented 59% of cannabis reimbursements in 2019. Until March 2020, flower was sold with a compulsory mark-up of 100% from the pharmacies on their purchase price. This led to an average retail price of circa EUR20/gram. Since 1 March 2020 a new price regulation with a fixed reimbursed price of EUR9.25/gram was introduced. Under the new regulations, pharmacies' mark-up will depend on the size of the prescription. The bigger the prescription, the less surcharge will be applied for reimbursement. This new regulation is effectively reducing the margins of pharmacies which could try to pass through part of this loss to distributors and cultivators, putting pressure on their selling prices of medical cannabis flower.

Last year a total of 6.7 tonnes was imported: 2.5 tonnes from the Netherlands and 4.2 tonnes from Canada, with Bedrocan, Aurora, Tilray and Canopy Growth the main producers. All but Bedrocan have their own importer/distributor. From 2020, additional imports are expected from Australia (Little Green Pharma), Portugal (Tilray and Flowr), Colombia (Clever Leaves), Uruguay (Fotmer Life Sciences), Greece and Malta, alongside increases from Canada and the Netherlands. Cannabis imports have to be EU-GMP certified. The German market currently suffers from a supply shortage as only a limited number of producers have the necessary GMP certifications.

In April 2019, Germany granted its first licenses for domestic cannabis

cultivation, awarding 13 contract lots of 200kg per year each to three companies: Aphria (1,000 kg p.a.); Aurora (1,000 kg p.a.) and Demecan (600 kg p.a.). The three companies are authorized to cultivate pharmaceutical-grade cannabis in Germany, and the first harvest is expected in the fourth quarter of 2020. The Federal Institute for Drugs and Medical Devices (BfArM) will pay on average a wholesale price of EUR2.3/gram. A total of 10,400 kilograms of cannabis is expected to be produced over a period of 4 years from the 13 lots. This is not enough for the German market to be self-sufficient and it will continue to rely on imports from the Netherlands, Canada, Portugal and other countries.

There are currently more than 40 companies allowed to distribute medical cannabis products to pharmacies in Germany. Distributors must hold a narcotics license and a specific license is required for each product reference distributed. Of the companies that hold the required licenses, only a dozen are active. One group of distributors are subsidiaries of Canadian licensed producers (Tilray, Aurora, Canopy Growth, Aphria, TerrAscend), and another are independent European distributors (such as CanPharma, Demecan, Sanity Group) distributing flowers from Bedrocan and other EU-GMP cultivators.



Spotlight on Germany

European companies with a focus on Germany that are involved in funding rounds include:

CANPHARMA:



Pan-European operations with an integrated sales organization led by pharma industry veterans; leverages the sales team of its strategic minority shareholder Ever Pharma. Have been distributing since 2019; supply deal in place for own brand product to launch in July 2020. Follows patient-centric approach and is focussed on the next generation of medical cannabis through digital innovation combined with its medical cannabis consultancy Kalapa Clinic (already serving patients and doctors in 6 languages).

EMMAC LIFE SCIENCES GROUP:



Vertically integrated pan-European medical cannabis and wellness group with operations across the value chain. In Germany, Emmac holds a license to distribute medical cannabis and has a partnership with pharmaceutical and medical cannabis distributor CC Pharma. In July 2019, Emmac acquired Terra Verde, a Portuguese cultivator, and operates two EU-GMP pharmaceutical laboratories: Medalchemy in Spain and Rokshaw in the UK.

WUNDR:



EU GMP importer and distributor of medical cannabis with operations in the UK, Germany and Malta.

DEMECAN:



German medical cannabis distributor that is licensed to cultivate in Germany, alongside the Canadian groups Aurora and Aphria.

FOLIUMED:



Vertically integrated Columbian producer of cannabis extracts and non-smokable products for medicinal and wellness use. The company has a partnership with Fidelio Healthcare, a narcotics-licensed German pharmaceutical contract manufacturer.

At the moment, distributing medical cannabis flowers in Germany is relatively easy, as demand exceeds supply. The main challenge for distributors is to secure good-quality medical cannabis. But as the market grows, the key success factor will be the ability to reach all key stakeholders. Distributors will need to develop large dedicated sales team

to target country's c.70,000 doctors and 20,000 pharmacies. Currently only 2,000-3,000 doctors prescribe medical cannabis and 80% of pharmacies do not sell it.

As the market matures, it will converge towards more traditional pharmaceutical standards. Winners will be the companies with experience

from the pharma world, capable to secure deals with insurance companies, to have a flawless supply chain and logistics set-up and offer a portfolio of products tailored to patients' needs. We expect to see improvement in the galenical consistency, stability and efficiency of medical cannabis products.

Fundraising and M&A

All three segments of the European medical cannabis market: medical cannabis, the cannabidiol (CBD) wellness industry and pharmaceutical cannabis, are capturing investor attention and the number of fundraising and M&A transactions are rising. Most transactions are concentrated in Germany (8 out of the 12 deals in 2019) where the medical cannabis regulations and market is furthest developed.



FIG. 18: SELECTED TRANSACTIONS IN THE EUROPEAN MARKET



Sources: Company Information, Bryan, Garnier & Co Research.

Conclusion

The European investment opportunity

As medical benefits from cannabis use are becoming better documented and public support is growing, politicians are developing medical cannabis frameworks differently from country to country. But the trend towards legalization of medical cannabis is unstoppable. Currently, the biggest opportunities are in Germany, where lawmakers have been establishing a simple footprint consisting of doctors prescribing, pharmacies dispensing and insurance companies covering most prescriptions.

As the European cannabis regulatory framework takes shape, homegrown cannabis companies are developing around three themes:

- **Medical cannabis** that looks to offer solutions for a whole range of conditions, from pain management to insomnia and anxiety. Several European and non-European companies are in the process of positioning themselves in this market. We expect the total European medical cannabis market to grow to EUR15.3bn

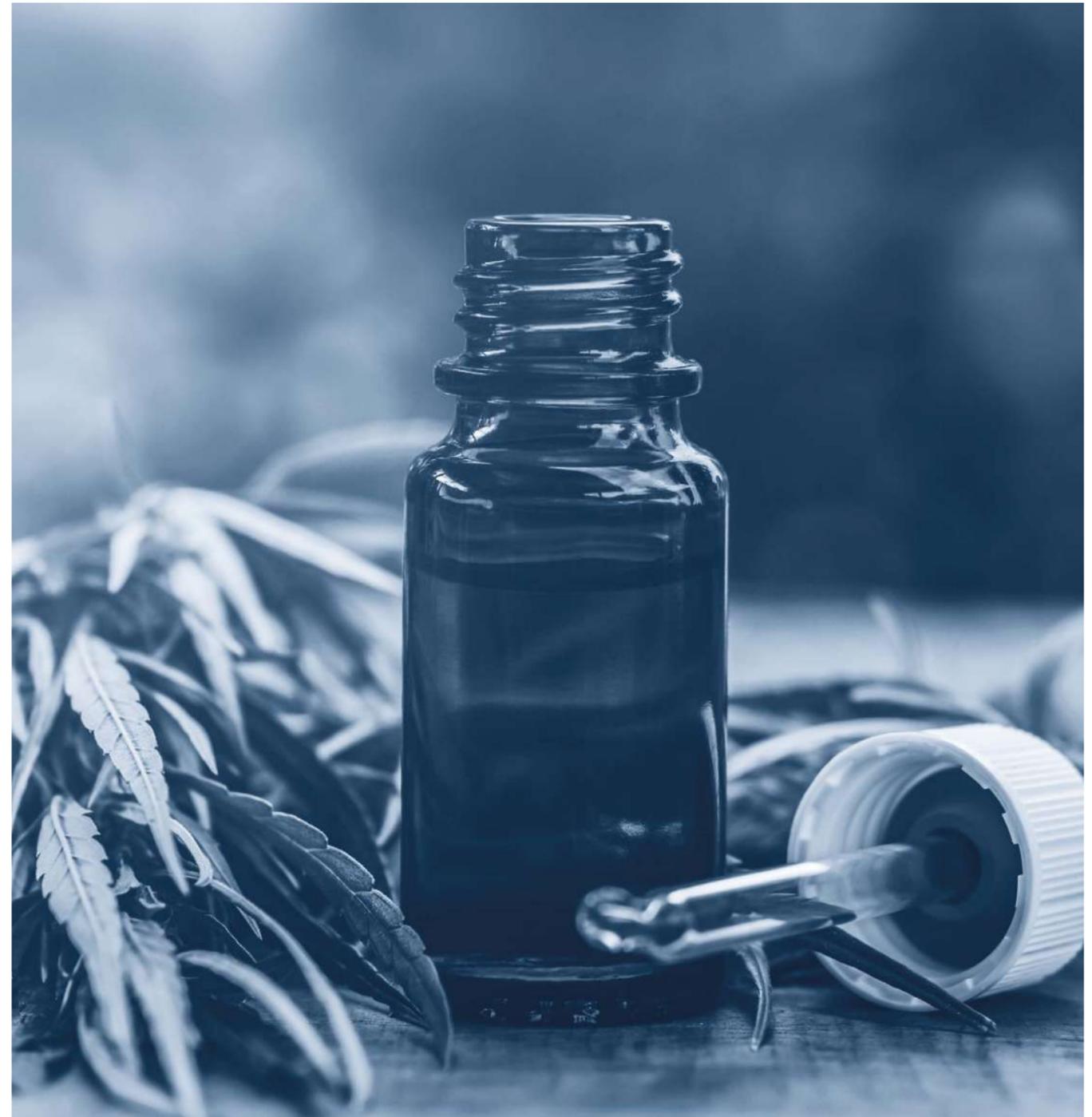
in 2029 from EUR250m in 2019 and the German medical market to grow to EUR4.9bn in 2029 from EUR210m in 2019.

- **The cannabidiol (CBD) wellness industry**, where brand development will be key. Here, as of now, there are as yet no strong European or global brands. It is an area that is likely to see interest from global wellness operators acquiring existing brands and adding CBD as an active ingredient. According to GlobalData, the global skincare market is valued at USD127bn, of which USD22.7bn in Western Europe and USD5.4bn in Germany. Assuming that over time, 10% of the skincare market could include cannabinoids, the potential revenues for CBD brands would be USD2.3bn. However, the value of essential oils in skincare is about USD1.8bn (20% of the USD9bn essential oils market)⁴, which is about 1.5% of the retail value of the skincare market and probably a good indication of the potential size of CBD's share in the wellness industry.

- **Pharmaceutical cannabis**, where scientific research and clinical trials lead to the development of cannabis medicines. This is likely to be supported by biotech and pharma companies. Market size will depend on the drugs that are developed. For example, GW Pharma's prescription cannabidiol drug Epidiolex is approved for the treatment of paediatric epilepsy associated with Dravet syndrome and the Lennox-Gastaut syndrome, which affects 20,000 and 40,000 patients respectively worldwide.

The drug is also in P3 clinical trials for epilepsy associated with Tuberous Sclerosis Complex, which could add another 40,000 patients. On top of that, the drug could potentially be used off script for treatment-resistant paediatric epilepsy (160,000 patients) or even for all treatment-resistant epilepsy (1m patients). Analysts forecast revenues from Epidiolex at close to USD1bn in 2021 in a global anti-epilepsy market of USD4.3bn. So, the size of the pharmaceutical cannabis market could be even more significant in the future depending on scientific developments.

⁴ GlobalData



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