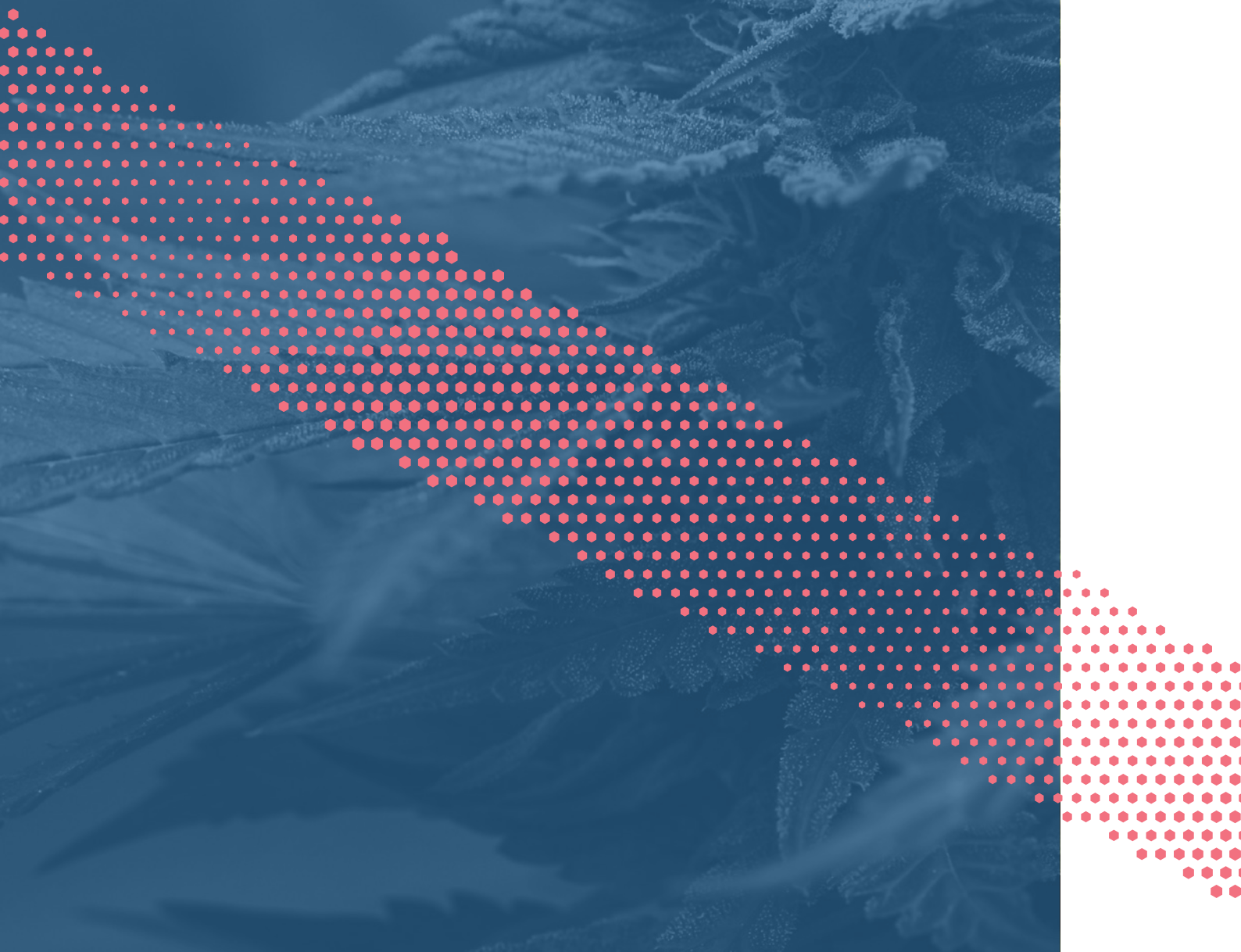




The Global Cannabis ReportTM

NOVEMBER 2019

About Prohibition Partners



Advancing the global cannabis industry.

Data, analytics and business intelligence on the international cannabis industry.

ABOUT US

Prohibition Partners was founded in 2017 with a mission to open up the international cannabis industry through reliable data and intelligence. Within two years, we have become the world's leading provider of market insights and strategic consultancy for this emerging frontier. We firmly believe that data, insights and education will unlock the societal and commercial potential of cannabis. Our research and content teams routinely share the latest legislative developments and key trends in the industry – information that is regularly cited by political leaders, investment banks and Fortune 500 companies. Our consultancy team works with investors, operators and regulators to identify and execute opportunities across multiple jurisdictions. We advise our private clients on licensing, regulatory and business opportunities.

SERVICES

Data

Bespoke Research, Polling, Consumer Insight, Pricing, Market Forecasting.

Intelligence

Policy & Compliance, Market Analysis, Supply / Demand.

Strategy

Market Entry / Expansion, Regulatory Guidance, Licensing, Partnerships, Business Development.

Marketing

Advertising, Promotion, Media Partnerships, Content Marketing.

PROHIBITION PARTNERS TEAM:

Our consultancy team works with investors, operators and regulators to identify and execute opportunities across multiple jurisdictions. We advise our private clients on licensing, regulatory and business opportunities.



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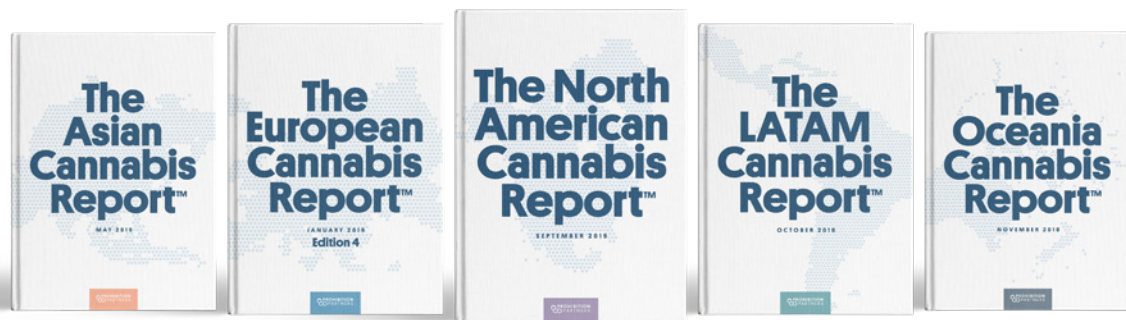
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Prohibition Partners is the number one source for data and information on established and burgeoning cannabis markets. Read by over 150,000 global cannabis investors and entrepreneurs, and creating more than 6 million social impressions annually, Prohibition Partners produces thought-leading industry reports. If you would like to partner with us and support independent data and research please contact our sponsorship team on info@prohibitionpartners.com

Advertising with Prohibition Partners is a unique opportunity to promote your business and brand to the most influential figures in the international cannabis market. Our research, data and content reaches key stakeholders in the industry; from politics to pharma and cannabis to consumer-packaged goods. As companies and investors scramble to get a foothold in the market, this is an invaluable opportunity to put your brand front and centre in one of the industry's most influential reports.



Cannabis remains illegal in some countries so please reference your local laws in relation to medical or recreational use. This report has been compiled for informational purposes only. It should not be construed as a research report for investment, legal, medical, health or tax advice. © 2019 PP Intelligence LTD.

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INTRODUCTION



Cameron Hughes
*Managing Director,
 Prohibition Partners*

Cannabis, both medical and recreational, is currently at the centre of a flurry of legalisation worldwide. The Prohibition Partners' The Global Cannabis Report, an industry first of its kind, provides a snapshot of current developments in the cannabis sector as well as industry forecasts across the continental markets: Africa, Asia, Europe, Latin America, North America and Oceania. As the only consultancy to offer global coverage and analysis of the international cannabis market, this report represents the most reliable and up to date resource for investors, operators and regulators in the emerging cannabis industry.

The Global Cannabis Report gathers and analyses data from across the globe, collating patient numbers, pricing trends, product availability and growth trends to determine the value of the international cannabis market, an industry we expect to be worth up to US\$103.9 billion by 2024.

The potential for growth in the medicinal cannabis market will be heavily influenced by the breadth and scope of the qualifying conditions that it will treat. As the list grows, so too will the potential patient base. As patients with treatment-resistant conditions become increasingly frustrated with traditional medications, pressure is mounted on regulators to legalise medical cannabis. Access could be aided further by healthcare schemes to support patients with prescription costs. For example, in October 2019 the government of the Czech Republic declared its intention to

subsidise 90% of the cost of medical cannabis for patients living in the country. With cannabis-based medicines legal in 40 countries already, and with a number of other countries expected to come online in the next five years, Prohibition Partners expects the value of the medical market to be worth up to US\$62.7 billion by 2024.

While only a handful of countries have legalised recreational cannabis on a federal scale - most notably in Uruguay and Canada - there is a general sentiment that, country by country, regulators are beginning to open up to the possibility of legalising cannabis for adult-use. Luxembourg is set to legalise by 2021, New Zealand will hold a referendum in 2020 and, this year, Australia's Capital Territory (ACT) voted to legalise recreational cannabis.

Investment in research and development (R&D) heralds a new wave of innovation in cannabis, while the normalisation of the CBD consumer goods market has resulted from celebrity endorsements and has led to partnerships between startups and well-established brands looking to dip their toe in the market while attempting to navigate murky legal territory.

Our latest report is designed to give you, the reader, a bird's-eye view of changes and developments in the global cannabis industry to date. We hope you enjoy reading it.

Cameron Hughes
Managing Director
Prohibition Partners

KEY INSIGHTS

- 1 In legal markets, next-generation cannabis products such as edibles, topicals and extracts are becoming mainstream, thanks in large part to celebrity-endorsement, which in turn normalises the wider cannabis market.
- 2 The global legal cannabis market is forecast to be valued at US\$103.9 billion by 2024. This is based on the Q4 2019 major update to Prohibition Partners' proprietary market sizing model.
- 3 Europe is forecast to have the largest legal cannabis market by 2024. The total value of the European market is forecast to be US\$39.1 billion in 2024 (driven strongly by its medicinal market, which accounts for 57% of the total value). With the expansion of the European legal recreational cannabis market post-2024, the market is predicted to further outgrow North America.
- 4 By 2024, the medical cannabis market (US\$62.7 billion) will be worth more than the recreational market (US\$41.2 billion), with medical cannabis legislation being enacted at a much faster pace. As the market matures post-2024, recreational cannabis' share is predicted to increase.
- 5 With a market expected to be worth US\$17.7 billion North America will dominate the legal recreational cannabis market until 2024, followed closely by Europe (US\$16.8 billion). The key driver behind North America's dominance here is the pace at which recreational cannabis is being legalised. We forecast the entire North American region to have legalised recreational cannabis by 2024, whereas this will be the case for only a minority of European countries by this time.
- 6 The early-stage investment community has shifted its focus away from up-stream, plant-touching producers towards cannabis infrastructure as the international market develops, focusing on ancillary sectors, technological innovations, regulatory aids and the intersection of biopharma and cannabis.
- 7 There has been an explosion in ancillary markets that support the cannabis infrastructure as it matures, from product testing, insurance and risk management to marketing intelligence that tracks sales and consumer habits.
- 8 Large consumer goods companies have been slow to enter the cannabis space, but are taking tentative steps through acquisitions. Instead, independent startups are leading the charge in consumer products, capitalising on the hazy legal status that abounds on a global scale and which served to frustrate larger-brand participation early on.

- 9 There are signs that the North American market is maturing with share prices of some Canadian leaders in the field taking a hit in 2019. The hype surrounding the industry is subsiding, giving way to a more considered and mature approach to the market. This is reflected in the recognition by leading financial institutions such as Barclays and Black Rock of the value of the international cannabis market, bolstered by outcomes such as The SAFE Banking Act in North America.
- 10 Approval of Epidiolex in both the US and EU represents a turning point in pharmaceutical-based cannabis. Previously, cannabis pharmaceuticals were considered relatively low revenue, but Epidiolex/Epidyolex has succeeded in securing access to the two key markets of Europe and North America and looks set to generate sales that have not yet been achieved in the cannabis pharmaceuticals sector. As scientific research informs the list of qualifying conditions for which medical cannabis may be prescribed, the patient base will expand.

LEAD SPONSOR FOREWORD



Dr Boštjan Jančar
CTO,
PHARMAHEMP

The story of PharmaHemp started in 1995, when hemp products were perceived somewhere between criminal activity and a business opportunity. With courage and perseverance, we transformed our organisation from a risky business practice to a globally recognised producer and supplier of hemp products. Today we are present in over 60 countries with annual growth of over 50%. Our main goal is to deliver organic CBD products with recognised premium qualities and to be the best supplier on the market.

An established hemp solution provider must be able to independently gather and manage knowledge regarding both pharmacodynamics and pharmacokinetics of cannabinoids. Therefore, we are launching a clinical study to compare bioavailability of cannabidiol from oil-based solutions to that from oil-in-water micellar emulsions. The findings are expected to contribute to a better understanding of pharmacokinetics of cannabidiol, its future use as a therapeutic compound and for evaluating the importance of proper dosing and routes of administration.

Equally important to understanding pharmacokinetic parameters is our ability to accurately analyse cannabinoid content in different matrices. Tests from a variety of laboratories reveal significant differences in reported results, which point to further research and analysis. PharmaHemp has developed an analytical method, which apart from

serving as an internal quality control system, also performs quantitative determination of cannabinoids for our customers. This method is in compliance with good laboratory practices and is in the final stage of obtaining ISO accreditation (17025:2017).

The market for hemp-based pharmaceuticals is shaped by a turbulent mixture of rapidly changing technologies, shifting regulatory frameworks and explosion of mainstream awareness. In this environment, PharmaHemp brings in standardised quality in the form of thoroughly researched and independently approved solutions. We successfully manage our business in today's dynamic environment with a highly qualified team and with our purpose of improving customer lives for the better drop by drop.

Dr Boštjan Jančar
CTO
PharmaHemp



IMPROVING LIVES DROP BY DROP.

PHARMAHEMP is becoming one of the few companies that are globally shaping the market for innovative hemp solutions. Our continuous innovation, R&D, dedicated customer support and strategic investments into new technologies are key drivers behind our story. Such a combination with a highly qualified cohesive team enables us to successfully manage our business in today's turbulent environment with the purpose of improving customer lives for the better drop by drop.



YOUR PREMIUM CBD PARTNER



LEAD SPONSOR INTERVIEW



Andrej Sušnik
Chief Executive Officer,
PHARMAHEMP

How did you begin in the cannabis industry? What were the catalysts for founding PharmaHemp?

Our hemp story started in the 1990's, when a small group of entrepreneurs wanted to change the quality of life for people with different ailments. We decided to launch a line of personal care products enriched with essential oils extracted by steam distillation of the cannabis plant. The result? Skyrocketing quality-of-life improvement based on positive anecdotal feedback from individuals using our products. Bottom line, we were helping people of all ages drop by drop. This priceless achievement coupled with our pioneering spirit drove us further in our mission to improve lives. About eight years ago, we became one of the first companies in Europe to produce and commercialise products based on hemp extracts rich in CBD and other phytocannabinoids. Today, PharmaHemp is an established business with a superior brand providing a wide range of premium products based on phytocannabinoid oils.

The cannabis market is becoming increasingly competitive. What advantages does PharmaHemp have over the rest of the market?

The first advantage is two-fold: strong R&D and our rigorous quality processes. First and foremost, we are committed to transparency and full traceability. PharmaHemp's experts monitor every step of the production process with quality assurance of the highest standards. We start by choosing appropriate seeds to carefully balance the varieties from the list

of certified hemp. Our licensed subcontractors currently have 500 hectares (ha) of ECO or certified organic fields in the Pannonian plains throughout Slovenia and Croatia, and are still growing. The careful choice of fields and organic farming methods ensure that our hemp is free of pesticides, herbicides, fungicides, heavy metals and other environmental pollutants. After every stage of the process we perform diligent quality control to quantitatively determine the major cannabinoids. All of our final products are subjected to continuous and rigorous quality-assurance checks as well as short- and long-term stability tests.

Our second advantage is the geographical location. Slovenia's climate is very suitable for hemp growth. In addition, it provides excellent infrastructure and connections for easy access to the global market.

Last but not least, we are a B2C and B2B company. The largest portion of our business are 'bulk' products or 'a la carte' products with customised formulations for customers/businesses from varying industries. We also offer parallel support to those venturing into the expanding CBD market. We are a reliable and strong supplier for our clients, and have built a network of business partners in more than 60 countries around the world.

The regulatory and commercial landscape within the cannabis industry is continuously changing. What has been the biggest challenge in the cannabis industry and what have you learned?

In a fast-changing environment, one must adapt quickly, innovate accordingly and maintain its purpose or belief of 'why'. Although the global market has already recognised the advantages and benefits of hemp use, we still come across a prohibition-like mentality in Eastern Central Europe. We are trying to break the stigma by encouraging effective regulation of hemp as an alternative to prohibition. We must of course stay in tune with the highly regulated industry and continuously maintain a deep level of understanding local, state and federal laws. Our key takeaway here is to partner with legislation and authorities to overcome challenging relationships and potential setbacks.

How do you see the cannabis industry developing in the future? Is there still an opportunity to grow in today's saturated market?

Saturation breeds challenge. In other words, the more saturated the market, the more challenging the business and all of its operational components get. There are new producers, custom labellers, etc. entering the market as we speak. However, we believe that there is immense opportunity to grow as we maintain our purpose and mission. Our perspective as a pioneer has evolved into our focus as a leader. We strive for customer satisfaction, trust and loyalty.

Despite regulatory pressures, we continue to expand. Currently, we have 50 employees working in 8 departments – technology, production and logistics, regulatory, quality control, marketing & design, sales, finance and, most importantly, research & development. Due to our exponential growth, we expect to recruit more highly qualified personnel in the future and continuously upgrade our robust organisational structure.

PharmaHemp collaborates with a number of universities and research institutions; what do you hope to achieve from these collaborations?

We are constantly striving to improve our research capabilities and are aware of the importance of collaboration with research institutions and universities. For example, we developed and validated a method for accurate determination of cannabinoids at ppm levels with the Jožef Stefan Institute, the leading Slovenian scientific research institute. We continuously develop and test new methods for production with the Faculty of Pharmacy of the University of Ljubljana. We perform analyses of the extracts with respect to minor unknown cannabinoids and other bioactive compounds with the University of Chemistry and Technology in Prague.

In addition, we are setting up a project aimed at studying the selective degradation of phytocannabinoids under controlled light, temperature and atmosphere with ETH Zurich. We are also collaborating with the Pediatric Neurology Department at the University

Medical Center of Ljubljana, which performs clinical studies for the treatment of childhood epilepsy and mitigating spasticity in children with cerebral palsy using extracts with the full spectrum of cannabinoids.

PharmaHemp also plays an active part in applying for European funding and is currently leading a project titled 'New generation of hemp extracts for natural cosmetics', with the aim of launching new phytocannabinoid oil for use in the cosmetics industry.

International cultivators are continuously looking for accreditation. You recently gained GMP certification; how will it affect your business?

One of the most important drivers of successful business is trust. We are very proud to become a GMP-certified company for cosmetics production under the global ISO 22716 standard. With a certified GMP system, PharmaHemp ensures that our products are consistently produced and controlled according to the highest quality standards. In fact, our current PharmaHemp GMP system exceeds the basic GMP requirements for cosmetic production and is set up to complete far more demanding requirements, such as pharmaceutical GMP.

In terms of our business, we will continuously work to improve our quality compliance and ensure that our products will continue to meet and exceed regulatory requirements as the industry matures. Through the qualification process we established that all our premises (warehouse, production facilities) and technical equipment meet the highest GMP pharmaceutical standards.

What is your vision for the future? Where do you see your business in five years' time?

We see PharmaHemp at the forefront of innovative solutions in the rapidly expanding cannabis-related industry. We never lose sight of our mission to improve quality of life and why we drive our business further. To ensure a competitive advantage on the market and to deliver unique products, we will be active in recruiting highly qualified personnel

and expanding our production and business facilities.

By the end of 2019, we will double the capacity of our R&D department and strengthen our collaboration with leading research institutions and universities through bilateral projects and by applying for EU funding. We plan to finish building a new facility that will house a processing line from hemp to final products, analytical laboratories and research capabilities, all in compliance with the regulations defining good manufacturing practices.

What do you consider your biggest achievement to date?

Our biggest achievement is our continuous passion and perseverance. Today's volatile environment requires clear strategic planning, transparency and the ability to transform along with the fast-changing demands of the cannabis industry. We aim to become a global leader in innovative hemp solutions. Apple sells lifestyle, Google sells information, Uber sells mobility and PharmaHemp improves people's lives.



EXECUTIVE SUMMARY

The landscape of the global cannabis industry is shifting as quickly as the legislation that underpins it. A major shift in attitudes towards cannabis is being realised in political and regulatory changes.

For example, The World Health Organization's (WHO) recent proposal to reschedule cannabis within international law marks a significant U-turn on a doctrine that has been codified in international and local laws for the past 60 years. This is emblematic of a broader sea change in attitudes to cannabis around the globe. However, as the market develops, there is a clear need for clarity across a number of key sectors.

A NEED FOR LEGISLATIVE CLARITY

Africa's cannabis industry is contradictory in terms of production vs legality and offers an opportunity to formalise cannabis legalisation and regulation. Some of the region's countries, such as Zambia and Uganda, exemplify how the industry survives in something of a grey area, where legislation lacks clarity, or cultivation is permitted without requiring the granting of any licences.

In Europe, there is also a need for multinational regulation. Demand is growing for medical cannabis legalisation across the region; the WHO is reviewing the legal status of canna-

bis, and the European Parliament Committee on the Environment, Public Health and Food Safety is proposing a region-wide regulatory framework on medical cannabis.

Although, medical cannabis is illegal at the federal level in the United States, North America is also seeing political and regulatory developments, which are bringing wider and more permissive legislation to states as politically diverse as New York and Utah and as geographically separate as New Mexico and New Jersey, offering the cannabis industry more potential for growth, particularly in the CBD sub-sector.

In Oceania, Australia has improved accessibility to medical cannabis through a new streamlined process and recreational cannabis is now legal in the Australian Capital Territory (ACT); New Zealand will be holding a cannabis referendum by November 2020, and in September 2018, the Commonwealth of the Northern Mariana Islands legalised recreational cannabis.

DOMESTIC CANNABIS CULTIVATION

Until now, European medical cannabis programmes have been dependent on Canadian imports and joint ventures to supply the burgeoning demand for cannabis medicines. Industry-leading EU nations Germany, Italy and

the Netherlands are developing tenders for domestic cultivation licences and seeking to build a domestic industry with localised supply of medical cannabis. Southern European nations are beginning to develop domestic cultivation programmes that will offer a low-cost product available via intra-EU trade networks. In September 2019, the Congress of Ecuador approved major reforms to laws governing cannabis, paving the way for production, cultivation and use of medicinal cannabis if approved by the executive branch of government. Self-cultivation is already popular in Latin America, with many countries, such as Chile and Uruguay, home to a variety of cannabis clubs and communities. The abundance of homegrown cannabis has helped to keep cannabis prices low. Many Latin American countries boast cheap land and favourable climates for cultivators, offering at least two harvests a year. In addition, outdoor grows will become popular, offering considerable savings on costly heating and lighting infrastructures.

Similarly, Oceania could become very attractive to investors in the near future as Australia boasts an optimum climate for growing some strains of cannabis that are expensive to produce in more established markets such as Canada. Furthermore, recent and anticipated changes to the law will enable the region to capitalise on strong growth within the industry.

MARKET PENETRATION

Cannabis is slowly but surely entering new consumer markets. Health, beauty and wellness were the first to capitalise, but food, beverages and financial markets are catching up. Announcements such as Altrias's US\$1.8 billion investment in Cronos group are evidence that cannabis stocks are becoming mainstream; however, it is the indie startups that are truly capitalising on early momentum in the cannabis consumer-goods market.

The market potential of cannabis as a consumer product is gathering pace in North America, where the tobacco, pharmaceutical, and beauty and personal care (BPC) giants have started to enter the marketplace. Within food and drink, brand activity has been largely dominated by beer giants as they seek to offset the potential impact of recreational cannabis legalisation on their core audience. However, big brand activity has been noticeably absent in the food and drinks categories as the inconsistent legality of cannabis and hemp-based CBD within food and drinks products means we have seen the mainstream brands err on the side of caution before committing. Although indie startups have initially filled the void, they will need to establish strong brand credentials to compete against the inevitable entry of the larger brands once greater legal clarity is achieved, since these conglomerates have the advantage of production and distribution networks that are able to bring new products and brands to market at scale.

Asia remains somewhat out of kilter with this

development. This region has been heavily influenced by the international community. Cannabis was largely legal and used in traditional medicines until the 1930s. The US was a key player in the prohibition of cannabis in the region in the 1960s and 1970s, but, as attitudes in the US have now changed, Asia needs to keep up, or risk being out of step with the international community.

OPPORTUNITY TO IMPROVE INFRASTRUCTURE AND KNOWLEDGE

Africa is lacking the infrastructure and facilities necessary for cannabis production, and investing in new production centres may prove costly and time-consuming. Countries such as Malawi, Lesotho and eSwatini are stricken by poverty and have limited funds to invest in any new facilities for the production and manufacture of cannabis products. As such, corporate social responsibility (such as providing much-needed infrastructure, or supporting local workers) is likely to be of paramount importance for foreign investors and producers looking to set up in the region.

Similarly, many Latin American and Oceanic nations continue to rely on medical cannabis exports from Canadian companies due to their lack of official infrastructure for domestic cultivation industries. A number of companies (including Cann Group, Althea, Auscann, Little Green Pharma, and MGC Pharma) in Oceania are ramping up efforts to reduce reliance on imports, and are making great strides towards securing the region's position as a future major producer in the global export market.

Europe is suffering from a lack of formal educational programmes for medical cannabis professionals, with physicians often playing catch-up in the wake of regulatory changes to national cannabis policy. The need for extensive and credible education for licensed health professionals is quickly becoming a priority, and has paved the way for sever-

al independent learning platforms to fill the space. Working in collaboration with Canada and Aurora Cannabis, Luxembourg's health authorities have devised a strategy to ensure supply, by giving 150 GPs specialist training in prescribing medical cannabis for conditions such as cancer, multiple sclerosis (MS), neurodegenerative diseases and chronic pain. A similar programme has recently been rolled out by the Public Health Ministry in Thailand, which launched a two-day training course on the use of medical cannabis for physicians, dentists, pharmacists and Thai traditional medical practitioners. Attendees who pass the exams become eligible for a two-year licence to prescribe medical cannabis. In the UK, NHS doctors have had little training in relation to prescribing medical cannabis and this has contributed to only a handful of patients gaining access to medical cannabis since doctors were given permission to prescribe it in November 2018.

STRONG GROWTH IN CANNABIS PATENTS AND TRADEMARKS INDICATE VIBRANT MARKET

China holds 309 of the current 606 international cannabis-related patents that have been filed, including methods of administering the drug, according to data from the United Nations' World Intellectual Property Organization (WIPO). In addition, WIPO also shows that North America held the vast majority of cannabis-related trademarks between 2018 and 2019. This is also evident from strong activity witnessed in the region's beauty market, for instance the growing number of high-end retailers adding cannabis products to their stock.



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INDUSTRY EXPERT INTERVIEW:

CUTTING-EDGE RESEARCH AND INNOVATION AT MGC

MGC is one of the most innovative cannabis organisations in the world, can you tell us about the business?

MGC has based its operations in Slovenia, where it currently has its own GMP Class D non-sterile manufacturing & packaging facilities as well as white-label formulation services.

MGC Pharma has an EU licence to produce pharmaceutical-grade phytocannabinoid medicinal formulations and any API/research products, which are delivered to pharmacies and patients utilising its global network of distributors and wholesalers.

MGC Pharma's Slovenian EU-GMP certified facility, one of the few of its kind in the world, is certified for the purposes of manufacturing and formulating phytocannabinoid derived medicines, tetrahydrocannabinol (THC) and cannabidiol (CBD) API, while also giving the company direct access to the entire EU and, via its distribution relationships, a global reach for providing the company's first-in-class products to patients.

MGC is based in Slovenia, can you tell us a little more about your operations there?

Slovenian operations are at the core of MGC Pharma's clinical and research activities. It is the location of the company's GMP Class

D non-sterile manufacturing facility, which is licensed to produce IMPs for human use and clinical trials, and does both of those actively. The company also uses this site to develop new and improved methods for the production of phytocannabinoid derived medicines.

Tell us about your work with The Slovenian Institute of Hop Research and Brewing (IHPS)

MGC and IHPS have been granted a first-of-its-kind approval from the Slovenian Ministry of Health to conduct a comprehensive, large-scale research project on the cultivation of cannabis for medical purposes, and the standardisation of post-cultivation production processes, from genetics through to API production. This research enables MGC Pharma to create industry-first standardisations for cultivation, extraction and production of phytocannabinoid and to ensure the company stays at the forefront of research and development.

You have also worked with the University Medical Centre (UMC) Ljubljana, what kind of research are you conducting with the institution?

The Institution for Children's Neurology Paediatric Clinic, together with Prof. David Neubauer, member of the MGC Pharma Group's Scientific Advisory Board, is executing a Phase IIb double-blind placebo-controlled crossover study with CannEpiL on patients with drug-refractory epilepsy. The trial will assess whether CannEpiL can provide a meaningful reduction in seizure frequency.

The National Institute of Biology (NIB) is another partner of yours, tell us about the research their team has completed and the data MGC has shared.

MGC recently published data following successful preclinical research assessing the efficacy of phytocannabinoid derived medicines on glioblastoma. Experiments were performed in-vitro on human brain cancer cells, immediately post-mortem, and showed that phytocannabinoids, particularly THC, reduce the viability of cancer cells.

The Biotechnical Faculty at the University of Ljubljana is working on cutting edge genetic research into cannabinoids, how will MGC use their findings?

MGC Pharma, with the Biotechnical faculty led by Prof. Borut Bohanec and Dr Jana Muravec, who is in the process of registering four new cannabis strains with the EU registry for a new variety of medical uses. This is alongside studying the cannabis plant genome and the development of cannabinoids within the plant in response to environmental effects, in order to optimise cultivation, e.g. improving cannabinoid yield per square metre of cultivation. MGC Pharma is implementing the results of these studies into its operational pipeline contributing to its goal of creating cost-effective phytomedicines.

Further afield, MGC is also working in Australia...

In Australia, MGC Pharma is actively collaborating with academia, creating global networks to

ensure a strong foothold in Australia and Asia.

What projects are you working on with the Royal Melbourne Institute of Technology (RMIT)?

MGC Pharma holds an exclusive research agreement with the RMIT. Through the agreement, MGC Pharma and RMIT established a research facility with cultivation and processing abilities to run botanical and in-vitro (cell lines) studies, further to the A\$2 million state-of-the-art co-funded facility, dedicated to the research of cannabis.

Additionally, the collaboration has established the International Library of Cannabinoids (ILC), an open-source, large data aggregator built around global cannabis research, which is being collected and analysed through machine learning tools to provide up-to-date prescribing information to doctors around the world.

MGC also has a working relationship with the Hebrew University of Jerusalem (HUJI), why is this important?

RMIT, HUJI and MGC Pharma have established a research hub to facilitate research in the medicinal cannabis sector. This hub marks the first example of two leading universities sharing IP with an industry partner, which acts as an independent research institute under the agreement.

The hub will encourage and facilitate the progress of the medicinal cannabis industry globally and will, at the same time, provide MGC Pharma Group with first rights to review

and commercialise any innovative developments generated from the hub.

Finally, MGC Pharma is expanding its operations into Malta, tell us why this decision has been made and what makes the island the perfect place to conduct research and expand further around the world.

With its colourful history of regimes, languages and cultures, Malta has forever been a place known for maintaining its own identity and focus within the changing European sphere. Since the island's independence in 1964, it has done more and more to distinguish itself as a significant global presence, with the ability to influence global markets. The decision to lead the charge on working with, encouraging and facilitating the cannabis industry since 2016, has shown that Malta has taken a step closer to creating an industrial global hub.

MGC Pharma first became aware of these interests and efforts in 2017, and quickly began to recognise what the residents of the island have known for a very long time: this is a very special place, and there are plenty of reasons to base yourself here.

MGC Pharma (ASX: MXC) (OTC: MGCLF) is a biopharma company with a 'Seed to Pharmacy' strategy at the forefront of global phytocannabinoid derived medicines. With operations in Australia and the European Union (EU), MGC Pharma has developed pipelines for phytocannabinoid derived medicines and unique formulations (phytomedicines), both proprietary and for third parties, all under Good Manufacturing Practice (GMP) certified regulations at GMP certified facilities.

MGC Pharma's mission is to provide 'cost-effective, standardised medicines'. This mission is cemented by MGC having established a full EU-GMP certified facility in Slovenia, allowing the company to create a standardised Active Pharmaceutical Ingredient (API), and to have formulated that into effective, consistent, EU-GMP compliant phytocannabinoid derived medicines following the EU Pharmacopeia.

The MGC Pharma's two flagship products, CannEpi[™] and CogniCann[™], are in development for central nervous system (CNS) disorders and are the first in MGC's pipeline, with further products following close behind.

MGC's Founder, Nativ Segev, was CEO of one of Israel's eight official medical cannabis companies, for four years, and saw first hand the limitations of the local market, while recognising the global impact the industry was going to have. He brought in MGC's Co-Founder, Roby Zomer, whose experience in energy and biofuel projects, large scale agricultural projects, and global commerce, contributed to the founding of a company focused on leveraging the Israeli knowledge and experience, with a globally emerging industry.

MGC Pharma's focus has allowed the company to uniquely position itself as a developer and producer of pharmaceutical products from a phytocannabinoid based pipeline, supported by an R&D team with over 30 years' experience, and backed by a management team with extensive industry experience. Management's experience in the global phytocannabinoid industry has continuously allowed MGC to be positioned at the forefront of industry standards, products and vertical integration.

After a long period of due diligence, filling out paperwork and visiting the island, MGC Pharma was the only cannabis producer to be issued a letter of intent (LOI) by the Government of Malta to establish operations on the island and expand its manufacturing capabilities.

The facility under construction in Malta (which is expected to be operational in mid-2021) will be significantly larger than MGC's existing facility in Slovenia and will be the primary hub for the MGC's manufacturing operations. Once complete, the Maltese facility is expected to be the largest GMP phytocannabinoid focused manufacturing facility in the world, with the capacity to produce fully compliant medicines at a rate of thousands of units an hour.

MGC has used the company's experience in Slovenia as a template for creating this kind

of high standard facility, so that all SOPs and Protocols are already in place for transferring operations seamlessly into the Maltese facility. The 15,000m² EU-GMP certified manufacturing facility will make the company a global leader in the supply of phytocannabinoid derived medicines.

As the first company to be given a letter of intent (LOI) and approval to build a full facility in Malta, MGC Pharma is ensuring Malta operations are at the centre of its EU manufacturing and distribution activities, including implementing Pharma level CRO and analytics on the island, in collaboration with the Government and Malta Enterprise.

Aside from an ideal climate, Malta has only 5% corporation tax, making it a suitable market-release site for MGC Pharma products to Europe and MENA countries. Malta also holds one of the main sea-ports in the Mediterranean and land access to Italy, making it an ideal central operation and logistics site to the mainland of Europe. The GMP production site in Malta will quickly become the main production site for MGC's phytomedicines as well as a cultivation hub, a side benefit of Malta's wonderful climate.

MGC Pharma is involved in the development of a Phytocannabinoid Research Centre in partnership with the Prime Minister's office and Malta Enterprise. The Maltese Government and MGC Pharma have signed an agreement to open a joint research centre for cannabis and cannabinoids, which will work in collaboration with MGC's RMIT's Australian activities. To demonstrate MGC Pharma's commitment to Malta and the company's operations there, one of MGC Pharma's leading scientific advisors, Dr Jonathan Grunfeld, will apply his clinical experience treating patients in Israel to steering the CRO project, and will also act as a leading doctor in Malta for the cannabis sector, both as an instructor and prescriber of cannabis for medicinal use.

The mission of MGC Pharma, wherever the company operates, is to encourage the growth and development of a responsible, recognised

and regulated medical cannabis industry, with all of the effort and responsibility this entails. In most of the places where MGC has operated to this date, this has demanded dealing with regulators and legislators who have approached the cannabis issue as a political or health issue, rather than an industrial one.

There are only a few countries in the world that have taken the view that the emergence of medical cannabis can be leveraged and taken advantage of, to the benefit of the country. Malta is one of those countries. By facilitating, encouraging and closely monitoring how the medical cannabis industry on the island grows, the country has taken significant steps to become a major player in a fast-growing vertical with massive potential for revenues. Malta is continuing its agenda of identifying arenas of high worth that will bring investment and tax revenue to the country, and MGC is very happy about being a partner in that vision, and in cementing that reality.

MGC's goal is to improve the wellbeing of patients, globally. This must be done in a comprehensive, research-backed manner, ensuring patients receive the positive results they deserve. To that end, MGC is investing much of the company's energy and resources to an agenda of clinical trials, research and development which are designed to ensure the company's position as a thought leader and trailblazer in the emerging medical cannabis field as well as in the world of pharmaceuticals. From the company's new centre of operations in Malta, the company can access a global patient base which will expand MGC's footprint even further.

METHODOLOGY

The market sizing contained within this report has been based on a variety of official sources, including United Nations (UN) population projections by country, World Bank forecasts of inflation, UN price change data, and the United Nations Office for Drugs and Crime (UNODC)'s figures on prevalence of annual cannabis use by country. Calculations have then been made using quantitative analysis of socio-economic data, consumption trends, cannabis requirements and pricing, informed by a wide range of reputable datasets including, but not limited to, the World Bank, the Organisation for Economic Co-operation and Development (OECD), the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) and the International Narcotics Control Board (INCB). To generate these regional estimations, Prohibition Partners' proprietary market-sizing model accounts for every country within the region as an individual entity and aggregates country-level estimations at the final stage. For situations where data have not been available for a particular country, reputable data from the most comparable geography have been utilised (with appropriate statistical adjustments applied as necessary).

MEDICINAL

The medicinal market-size estimates and forecasts contained within this report include both medical and pharmaceutical products. They represent a calculation of average price per gram of cannabis multiplied by the expected usage, multiplied by the estimated potential patient population. Price per gram of medicinal cannabis differs to street value prices, and the price per gram has been modelled based on post-legalisation pricing trends from a number of markets. This has been factored into the market-size calculations with price modelling incorporated into the year-on-year forecasts.

Patient numbers have been modelled on existing markets where medicinal cannabis has already been legalised and regulated. It is not calculated as the sum of patients who suffer from qualifying conditions, primarily because patients may suffer from multiple qualifying conditions for which cannabis can be prescribed. Value forecasts can include pharmaceutical and CBD medical products.

RECREATIONAL

Our recreational cannabis market sizes do not include the black market. If a country has yet to legalise recreational cannabis, the value of the market is 0. If legalised, appropriate growth curves are applied to the legal market thereafter, while capping the legal market at maximum 60% of the value of the entire recreational market (including the black market). Taking the UNODC prevalence figures as a starting point, this has been multiplied by average annual consumption and average prices for cannabis (herb). The growth rate has been modelled on trends seen around the world, and pricing trends have been informed by research published in more mature markets on the impact of legalisation and regulation on the average cost per gram on the black market. We have assumed that the price per gram of cannabis will either be the same or lower than the most recently available pricing data.

MARKET VALUE

For the purposes of this report, medicinal market sizes include pharmaceutical cannabis and medical cannabis that are sold as flower, oils, topicals, etc.

LEGALITY

Industry tracking has proven to us that a simple legal vs illegal classification of cannabis is inadequate, and at times misleading. For this reason, we have introduced a scale of legality for each country profiled, which is defined as follows:

ILLEGAL	LEGAL
Illegal	Technically legal, but not legally available
Illegal, but decriminalised	Legal, but no formal access programme
Illegal to consume, but legal to cultivate (with licence)	Legal, with an established formal access programme

EXPERT ANALYSIS



Brady Cobb
CEO,
Bluma Wellness

Buoyed by wide-scale public support, legislation to legalize and properly regulate cannabis in the US on the state and federal level continues to gain steam. So why are commercial and investment banks moving in the opposite direction? And what are the risks to US companies and workers who are trying to build out this high-growth CPG (consumer packaged goods) sector? As a result, the US retail investor has become collateral damage.

The passage of the *2018 Farm Bill*, which legalised the cultivation and sale of hemp and hemp-derived CBD, signaled federal acceptance and expansion of the cannabis marketplace in the United States. Republican Majority Leader Mitch McConnell's endorsement of the legislation and continued support are further testament to Washington's growing embrace of the cannabis industry. And recently, the House of Representatives passed its version of The SAFE Banking Act, which would give cannabis companies access to the US banking system including retail banking, credit card processing and access to institutional lending (as opposed to dilutive convertible debt financings).

So it comes as a surprise that an influential US commercial bank would take a step to thwart the efforts of Americans to invest in legal cannabis companies with US operations.

Bank of New York Mellon Corp., one of the largest custody and clearing banks in the world, announced earlier this month it would

stop accepting positions (custody) or trading with US cannabis-related businesses, a decision which would restrict trading of popular cannabis companies that are listed on Canadian exchanges, but have US operations. Canadian-listed firms without US operations would still be able to be traded.

BNY Mellon's head-scratching decision has moved in the opposite direction of the thrust of US public opinion. A Gallup poll conducted in 2018 found that two out of every three Americans support legalising cannabis, while key 2020 swing states, including Nevada and Michigan, have adapted to voters' concerns by legalising recreational cannabis use.

The only way to provide lasting relief for US investors in cannabis is with legislation from Washington.

Currently, if you're a US company that employs Americans and provides legal cannabis products to Americans, you have to publicly list your shares on the Canadian Securities Exchange, without the benefit of US Securities and Exchange Commission oversight.

Currently, if you are a US retail investor you must do cross-border trades in order to invest in cannabis stocks with all of the capital and fees flowing right out of Wall Street to Bay Street in Toronto. But more importantly, the protection of US exchanges and securities laws are also missing.

It also means that America's homegrown multi-state operators have to raise capital in Canada where there are major constraints on capital and prohibitive costs to the companies and to investors. Almost every deal/listing in Canada carries dilutive warrants that are ultimately cashed in once professional stock short-sellers drive share prices down. The result is that shares of almost every US multi-state operator are down over 60% from their yearly highs, mostly at the expense of the retail investor who is the primary investor in these deals because large institutions are still restricted from investing in the sector.

Moreover, professional investors operating actively managed or fixed portfolios of cannabis stocks are unable to invest in some of the highest growth cannabis companies — even though they are operating in states where what they do is totally within the law.

At a time where we are hearing chatter about restricting Chinese companies from listing their shares in the United States, this BONY Mellon decision serves to actually restrict US-based operators and investors in the cannabis industry at home.

The US cannabis marketplace is one of the largest and most heralded emerging industries. And unlike other nascent sectors, it's a 100% American-made story. Because traditional credit and/or lending has not been made available to the marketplace due to marijuana's antiquated and misguided classifica-

tion as a Schedule 1 drug — along with heroin — the only meaningful way to access capital has been via a reverse merger go-public strategy in Canada.

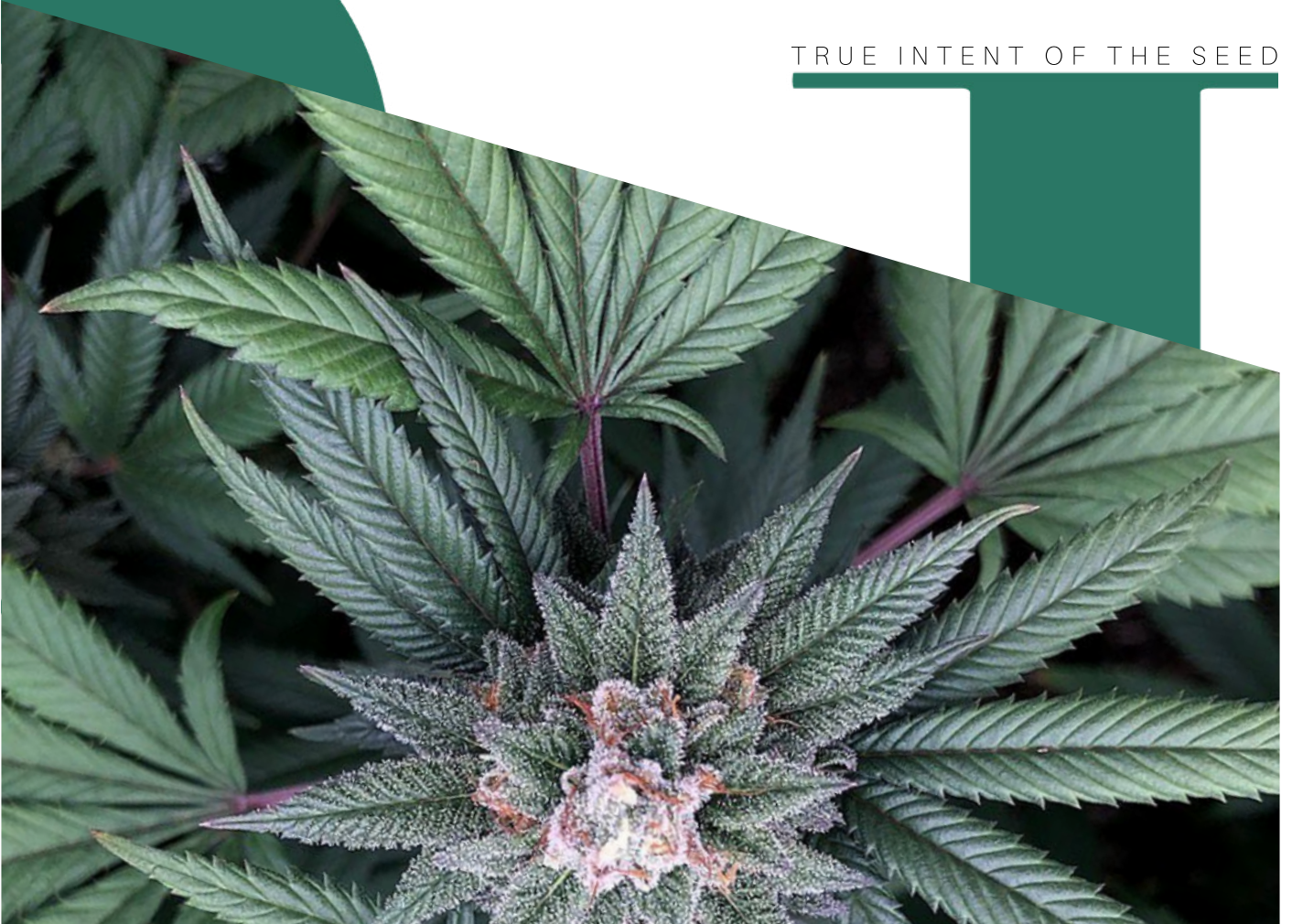
The SAFE Banking Act has now passed in the US Senate. But it's currently missing a key component that would allow for the movement of American multi-state operators to the US capital markets, with oversight by US regulatory agencies. Such a provision would provide safe harbour to US exchanges while allowing investment banks and pension funds to invest in US cannabis operators compliant with state and federal laws.

Capital in an exciting, profitable and socially beneficial industry shouldn't just be flowing north to Canada. It should stay in the US so that when Americans invest in this space, they can do so with confidence.

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DEFINITION AND SCOPE

MEDICINAL CANNABIS

Medicinal cannabis refers to both medical and pharmaceutical cannabis products. Please see definitions below for more detail.

MEDICAL CANNABIS

Medical cannabis refers to plant-based or plant-derived cannabis products prescribed by a medical practitioner for the treatment of a specific condition or disease (e.g. epilepsy, pain, multiple sclerosis (MS)). Medical cannabis uses the whole unprocessed plant, the processed plant or the chemicals contained within it. It can include high-CBD and low-THC products, though CBD products may also appear as consumer goods. Medical cannabis products are currently prepared as plant materials, oils, tinctures, edibles or capsules.

PHARMACEUTICAL CANNABIS

For the purposes of this report, pharmaceutical cannabis refers to products formulated using pure cannabinoids (either plant-extracted or synthetic) that have been through full clinical trials and licensed as a medicine. Examples of products include Sativex, Epidiolex, Cesamet, Marinol and Syndros.

RECREATIONAL CANNABIS

Recreational cannabis refers to any cannabis used for non-medical purposes, and this category includes black-market products. It ordinarily has a higher concentration of THC,

the psychoactive and intoxicating compound of the cannabis plant, and is illegal in many countries and states. People tend to smoke (or consume via edibles) recreational cannabis, or use oils and vaporised products. For the purposes of this report, usage is assumed to be by people aged 15+.

CBD

Cannabidiol (CBD) is one of the most important of at least 113 cannabinoids identified in the cannabis plant. CBD is indicated for use in treating conditions such as chronic pain, insomnia and anxiety as well as seizures and spasticity. While there is an emergent market for CBD-infused consumer goods, capsules and oils, these have been excluded from the market-size calculations due to a lack of sales data. Although these products may be used for wellness purposes such as aiding sleep, or for pain or anxiety management, they do not require a prescription and have therefore been excluded from the medical market sizing.

THC

Tetrahydrocannabinol (THC) is another of the most important cannabinoids for human use. THC has been shown to play an effective role in the treatment of many conditions, especially chronic pain, MS-spasticity and severe nausea among others. THC is also known for its psychoactive effects and for this reason, it is more heavily controlled than CBD in many regions.


MARKET OVERVIEW

- 1 Canada and the US are driving the market through a growing array of cannabis-infused consumer goods, most notably in beauty and food.**
- 2 The majority of the world's largest cannabis producers by market cap are based in Canada.**
- 3 Front-running companies are those with first-mover advantage, large equity investment and those actively acquiring smaller firms.**

Top ten largest cannabis firms by market cap, October 2019

COMPANY	MARKET CAP (USD)	HEADQUARTERS
Canopy Growth Corporation	7.3b	Canada
GW Pharmaceuticals plc	3.7b	UK
Aurora Cannabis Inc.	3.6b	Canada
Cronos Group Inc.	2.8b	Canada
Curaleaf Holdings	2.7b	US
Green Thumb Industries Inc	2.3b	US
Tilray, Inc.	2.2b	Canada
Aphria	1.2b	Canada
Innovative Industrial Properties	815.3m	USA
Organigram Holdings	552.4m	Canada

Source: Prohibition Partners/Yahoo Finance



At the time of writing some 410 cannabis companies were listed on stock exchanges around the world, and include firms involved in cannabis horticulture, pharmaceutical research and ancillary businesses. Those companies with the greatest market value are largely concentrated in the most mature region for the industry, North America. Despite the fact that the United Kingdom (UK) legalised medicinal cannabis only at the end of 2018, UK company GW Pharma takes its place amongst the top ten companies.

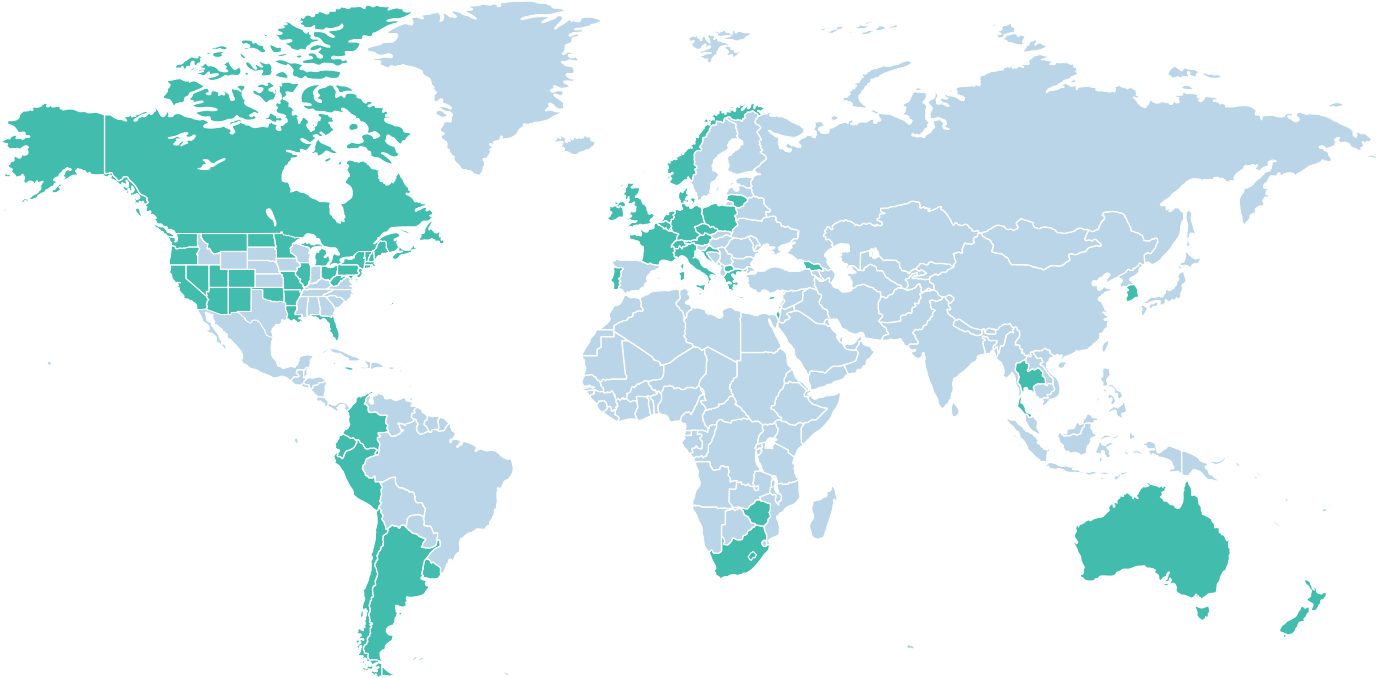
These companies are the leaders of the industry for three main reasons:

- 1 They have first-mover advantage; GW Pharmaceuticals is the only company to have an approved treatment for Dravet syndrome – Epidiolex (US)/Epidyolex (EU) – giving it a monopoly on the market. Regarding the other companies, North America is home to the most mature markets with a large customer base. This has enabled companies to scale up.
- 2 Some companies have received huge equity investments; the most notable ones being the beer, wine and spirits company Constellation Brands' US\$4 billion investment in Canopy Growth and tobacco company Altria's US\$1.8 billion investment in Cronos Group.
- 3 Acquisitions have been a primary means of growth, most notably:
 - Acreage Holdings acquisition by Canopy Growth;
 - MedReleaf acquisition by Aurora Cannabis;
 - Grassroots acquisition by Curaleaf Holdings.

LEGISLATION AND REGULATION

Medical cannabis legality*

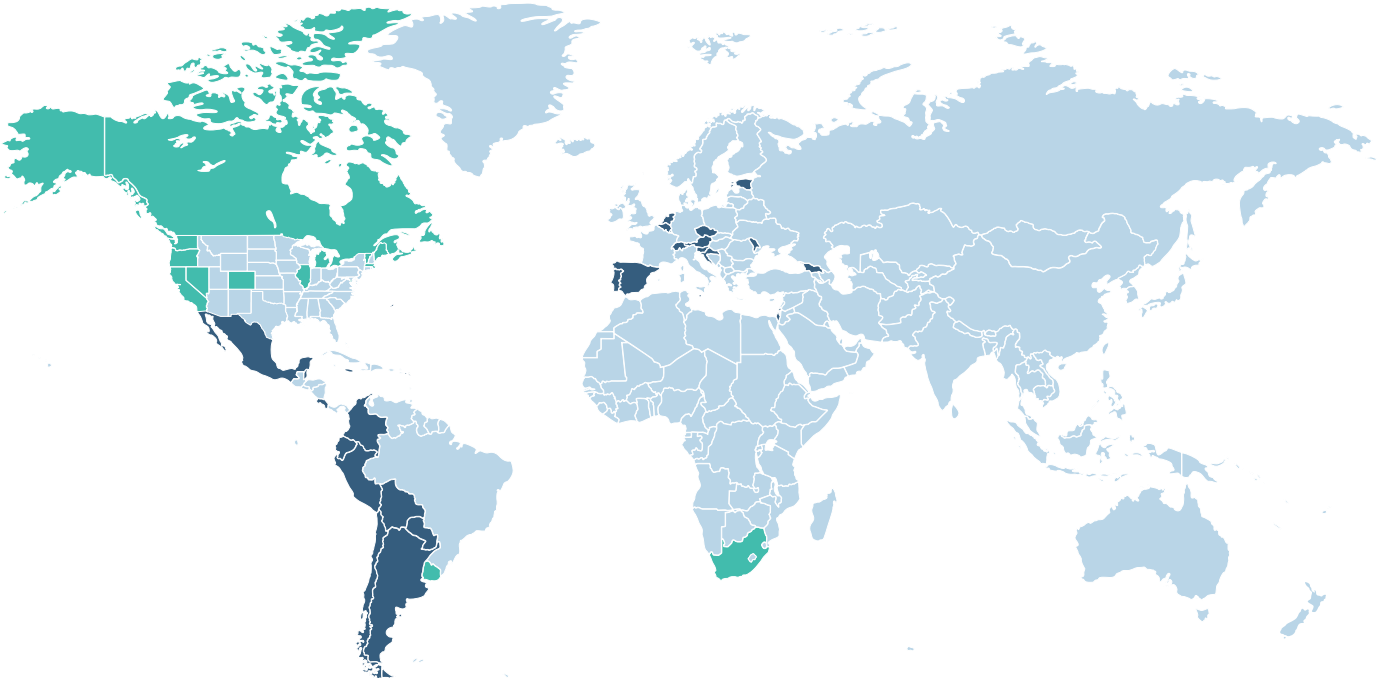
LEGAL



*US remains illegal at the federal level

Recreational cannabis legality*

LEGAL
DECriminalISED



*US remains illegal at the federal level

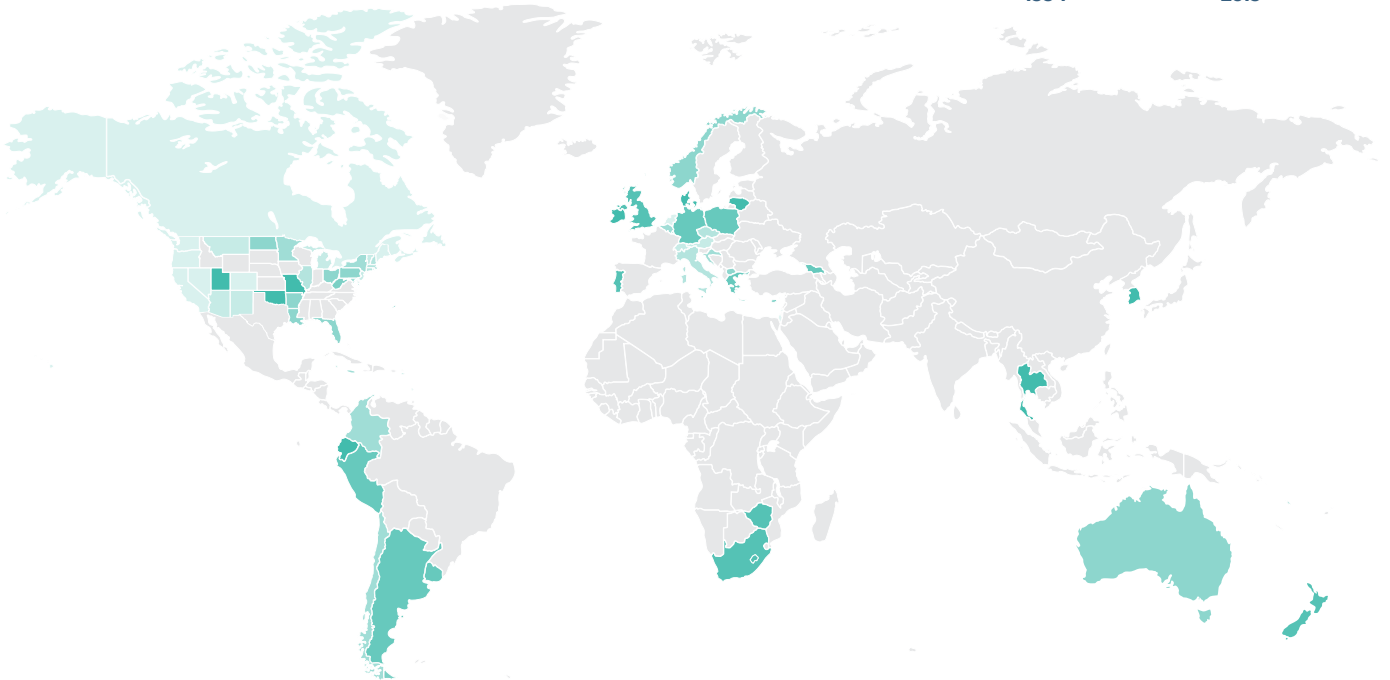
LEGAL ADVANCES

Legalisation of Medical Cannabis

DATE OF LEGALISATION

1994

2019

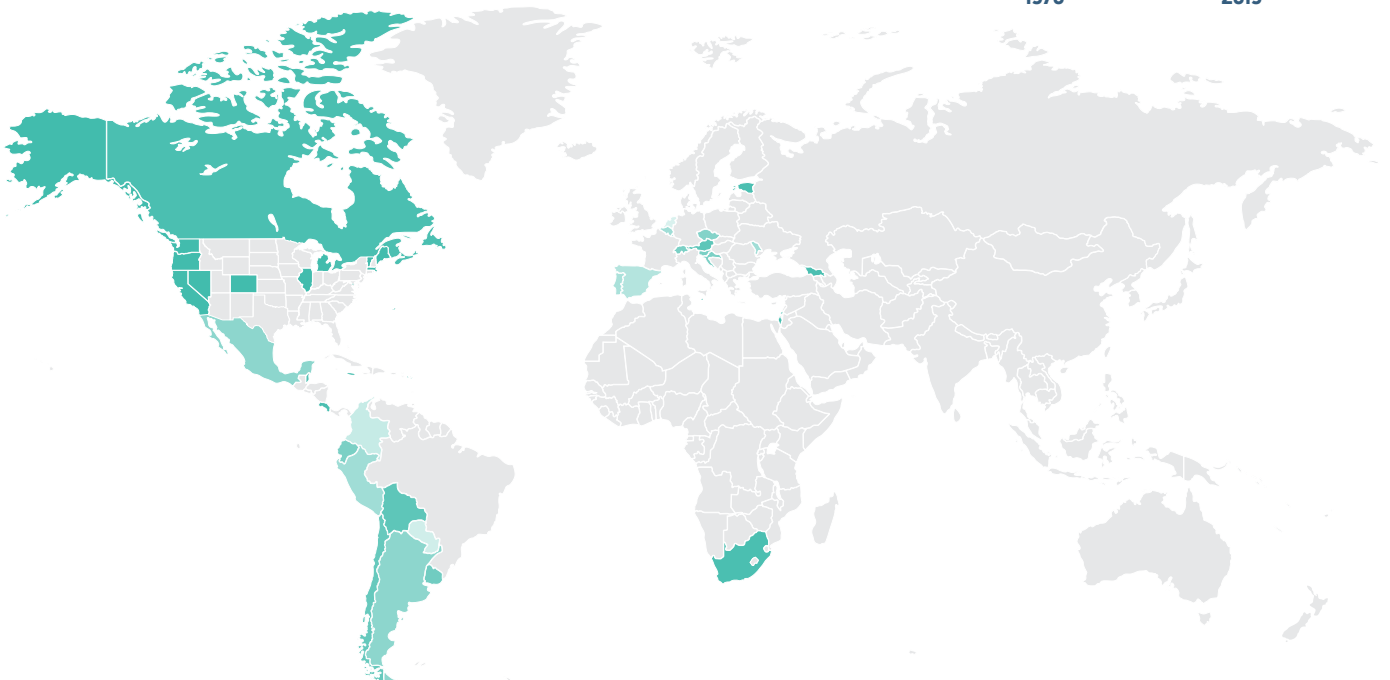


Decriminalisation of Recreational Cannabis

YEAR STATUS CHANGED

1976

2019



International drug treaties

Cannabis remains prohibited under three international treaties.

- 1 The ***Single Convention on Narcotic Drugs of 1961*** is the first of such treaties and is a non-self-executing international agreement signed between 186 States that encourages the prohibition of certain specific drugs as well as ceasing the production and supply of said drugs.

As previous treaties, such as the *Paris Convention of 1931*, were limited in the types of drugs they specified – for example they didn't include cannabis – the *Single Convention on Narcotic Drugs of 1961* was agreed upon in order to broaden and consolidate the scope of illicit narcotics.

The treaty recognises the medical benefits of some drugs under certain conditions, and therefore the document specifies that exceptions can be made regarding a drugs prohibition if it is for a particular use, for example medical or therapeutic purposes. Motivation for the document was moral panic around drugs, which was prevalent at the time. The *Single Convention on Narcotic Drugs of 1961* was amended in 1972, primarily to allow for the rescheduling of drugs without the need to hold further conventions.

- 2 By the late 1960s, cracks began to appear in the 1961 treaty. ***The Convention on Psychotropic Substances of 1971***, which is approved by 184 States, was again driven by an apparent moral outrage and was primarily aimed at diversifying and expanding the spectrum of illicit drugs to be included. It also recommended introducing new controls. The primary focus of these efforts is tackling drug trafficking by introducing tighter restrictions on imports and exports of Schedule 1 drugs such as cannabis. Other rules aimed at limiting the type and volume of drugs that could be used in medical research were implemented in 1976.

- 3 The 1980s heralded a worldwide surge in the use of narcotics. In order to respond to this epidemic, new international agreements were drafted and proposed in the ***United Nations Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances of 1988***. This treaty has 34 signatories and 184 parties. Its main objective was to promote cooperation among all parties in efforts to combat the various aspects of illicit drug trafficking. The signatories to these treaties are not legally bound by them and each Member State is responsible for creating the necessary laws and regulations in order to adhere to the terms of the treaty.

The gatekeeper of these treaties is the INCB, an independent and quasi-judicial monitoring body for the implementation of the UN international drug control conventions. Although the INCB does not have the power to enforce sanctions on countries that break the treaties, it can apply pressure by encouraging countries to lobby one another.

The UN's legal and institutional mechanisms have proven sluggish when faced with the possibility of delisting cannabis as a Schedule 1 drug. The UN Commission on Narcotic Drugs (UNCND) postponed its vote on the possible rescheduling in both December 2018 and earlier in 2019, in order to provide its Member States with more time for consideration. During the commission's intersessional meetings on 24 June and on 23 September 2019, Member States were given the opportunity to address questions to WHO. Present during these meetings were the INCB and UNODC, who were tasked with providing responses within their respective mandate. A transcript of this Q&A session was compiled and released on 5 October 2019, but thus far a rescheduling decision has not yet been reached.

The INCB has previously criticised Canada and the United States, for 'skirting' international drug laws by developing domestic recreational cannabis markets, action that 'represents a challenge to the universal

implementation of the Treaties, a challenge to public health and well-being, particularly among young people, and a challenge to the parties to the treaties'. The report also stated that medical cannabis programmes in Canada and the US are 'poorly regulated' and do not meet UN standards.

The INCB was dismissed by the global cannabis sector for being in need of internal reform, whilst the contents of the report were criticised for running counter to the claims of other recently published UN reports on cannabis.

Asia's domino effect

Cannabis and hemp have traditionally played an important role in many Asian cultures. However, these countries have been influenced by the attitudes of other nations and by the treaties referenced earlier. Certain countries, such as Malaysia, the Philippines, Indonesia, Singapore and China, have consistently applied harsh penalties for drug-related crimes. However, 2019 has been a significant year for cannabis reform in Asia, as evidenced by changes to their medical cannabis laws and programmes. The attractive economic benefits associated with legalising the cultivation of hemp and cannabis for medical or industrial purposes are likely to contribute to the scale of reform.

The domino effect in the cannabis industry has been a gradual process, where one country's opposition to cannabis is neutralised with a certain level of inevitability as both the medical and financial benefits of legalisation and decriminalisation gain recognition. In December of 2018, Thailand became the first Southeast Asian country to approve the use of medical cannabis. This then came into effect mid-February. Thailand has since completed several projects aimed at facilitating patient access. All such projects are regulated through the State, and some of the most notable achievements include patient registration for the medical cannabis programme, which was introduced in February of this year; the loosening of regulations back in August so as to allow traditional and folk practitioners to prescribe and distribute, and the removal

of hemp from Thailand's list of controlled substances in early September.

Thailand's cannabis policy has been an example for neighbouring nations looking for reforms. In 2019, the *Compassionate Cannabis Act* in the Philippines was approved on the third and final reading; South Korea legalised pharmaceutical cannabis; Japan approved clinical trials for Epidiolex; Guam legalised recreational cannabis, and clinical trials into the efficacy of medical cannabis were approved by the government of Malaysia. In June 2019, Malaysia also announced its intention to decriminalise possession of small amounts of cannabis for personal use. In India, lawmakers are being lobbied to reconsider their stance on medical cannabis, including in the province of Manipur, where in September 2019, the Chief Minister voiced his intention to legalise medical and industrial cannabis practices. If this bid is successful, Manipur will become the fourth province in India to legalise cannabis for medical purposes. In the same month, Myanmar's Home Secretary agreed to amend the country's hemp farming law to allow for commercial cultivation of the plant. Jilin is expected to become the third province in China to legalise the cultivation of industrial hemp.

Reform and referendum in Oceania

In Oceania there have been several exciting advancements in 2019, which will open the door to grand-scale cannabis reform in the future. By far the most notable of these has been the Australian Capital Territory (ACT) reforming its laws in September 2019, which will see it legalise the recreational use of cannabis in 2020. State officials have announced that the intentions behind the move do not relate to developing a recreational market, which will inevitably happen if the law isn't overturned by the federal government, but, instead, the focus is primarily to combat the illicit market. Furthermore, as this legislation is primarily concerned with home cultivation rather than grand-scale production, reform in the ACT can be viewed as a significant societal milestone rather than an economic one, which will likely

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contribute to the normalisation of cannabis in this region and may even serve to boost the country's involvement in the industry.

In New Zealand in December 2018 a law was passed that greatly increased patient access to medical cannabis and paved the way to allow companies to produce their own cannabis for both domestic and international markets. The 2020 general election in New Zealand will coincide with a cannabis referendum. Advocates of cannabis legalisation include the Helen Clark Think Tank. Members of the think tank have urged the public to vote yes in the referendum so that the country may properly regulate the cannabis market already present on the island.

In stark contrast to its neighbours, Indonesia continues to oppose cannabis reform.

North America – innovate to facilitate

Canada legalised medical cannabis in 2001, and in October 2017 the federal Cannabis Act came into effect making Canada the first G7 nation to legalise recreational cannabis. Unlike its North American counterpart, which has a patchwork of States that have legalised medical or recreational cannabis, Canada's legalisation of recreational cannabis occurred unilaterally. However, one of the most prevalent and pressing issues in both these countries is the illicit cannabis market. North America serves as a salient reminder of some of the challenges associated with regulating an emerging industry.

Illicit markets pose a threat

The black market continues to pose a serious threat to the legal market throughout Canada and several US states. Statistics Canada which tracks prices and sales of cannabis and reported that the average price of a legal gram of medical cannabis in Q3 of 2019 was almost double that of the black-market price. In order to produce a consistently high-quality product, industrial-grade equipment and pristine growing conditions are required. With other costs such as distribution, quality control, inventory tracking, regional taxes and

employee salaries, the legal market has more overheads to cover.

Supply shortages are a major factor attributed to the higher legal product costs. In April 2019, Health Canada announced they were working to streamline licence application processes as well as expanding cultivator numbers. According to Canada's government website, 60 licences for cultivators, processors and sellers of medical and non-medical cannabis under the *Cannabis Act* were registered in 2018 while 95 new ones have been registered so far in 2019. In 2019 a number of North American companies turned to Latin America to cultivate cannabis in order to help reduce retail prices.

Veteran Affairs Canada normally reimburses a military patient for up to 3 grams of dried flower per day at a maximum rate per gram set at CA\$8.50. Military veterans in theory save around 83% when they purchase cannabis through regulated providers. As cannabis is classified as a Schedule 1 drug in the US, insurance companies will not reimburse medical cannabis purchases, although some states, such as New Mexico, are looking to address this; it still remains more cost effective for US patients to source their medicinal cannabis through black-market channels.

The passing of *The SAFE Banking Act* in September 2019 was a legislative landmark event in the US. Currently, financial institutions are not protected if they conduct business with a state-licensed cannabis business. This bipartisan bill permits legal cannabis businesses to process payroll, pay taxes and maintain general-use current accounts (known as 'checking accounts' in the US). The bill is set to be discussed by the US Senate at an as-yet unspecified date in 2020.

Europe's Trojan Horse

Although North America is currently the largest medical cannabis market in the world and projected to reach US\$37.9 billion in 2024, Europe is forecast to surpass it by reaching US\$39.1 billion in the same year. However, if this potential is to be unlocked it is crucial that

CANNABIS EUROPA

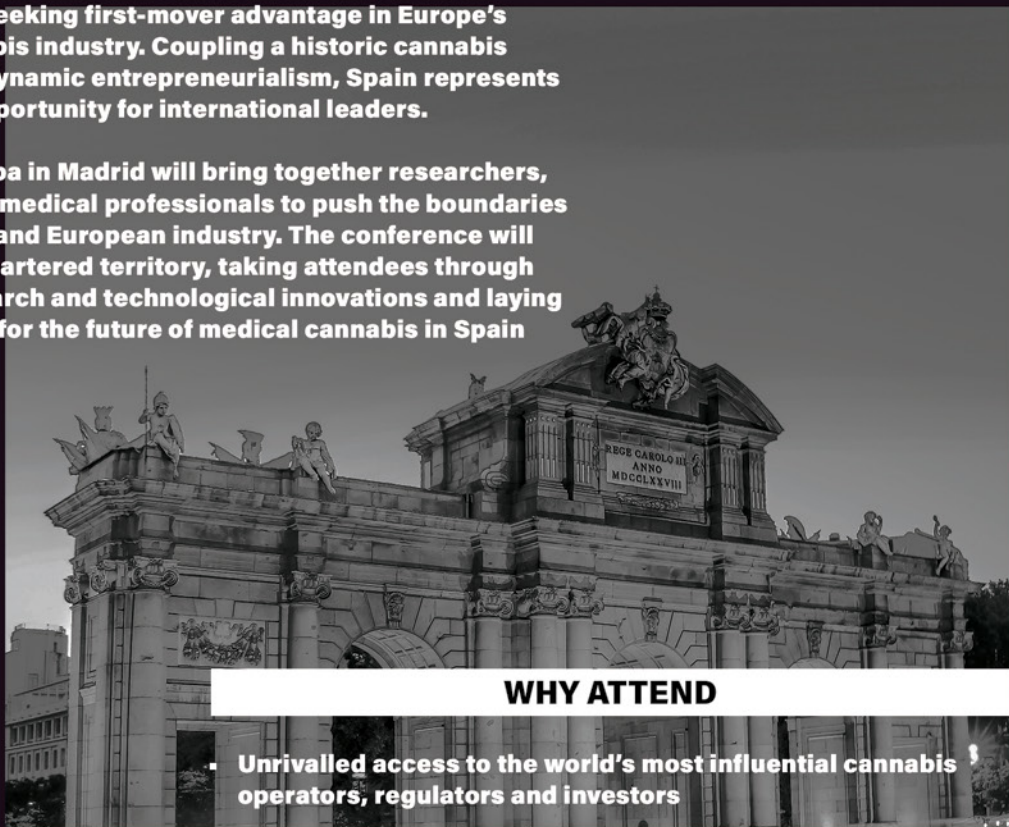
5 FEBRUARY

2020

MADRID, MUSEO SOFÍA REINA

Spain is becoming one of the most interesting markets for operators seeking first-mover advantage in Europe's nascent cannabis industry. Coupling a historic cannabis culture and a dynamic entrepreneurialism, Spain represents the next big opportunity for international leaders.

Cannabis Europa in Madrid will bring together researchers, regulators and medical professionals to push the boundaries of the Spanish and European industry. The conference will delve into uncharted territory, taking attendees through the latest research and technological innovations and laying the framework for the future of medical cannabis in Spain and beyond.



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Europe's patchwork of inconsistent regulations is addressed. In Europe the overarching trend is that medical advancement and patient wellness are the driving forces behind cannabis reform and market entry for foreign and domestic players.

Germany's legislative amendments over the past 35 years have paved the way for it to become one of Europe's most forward-thinking countries regarding cannabis reform. It wasn't until March 2017 that the legalisation of medical cannabis began in earnest. The market for medical cannabis in Germany has since grown exponentially. 2019 has brought Germany's medical cannabis industry to record heights with a total of 2.5 tonnes of medical cannabis flower being imported in the first half of the year, insured medical cannabis sales reaching €4.47 million in the second quarter and 13 domestic cultivation licences awarded.

In August 2019 Luxembourg announced its intention to legalise the recreational use of cannabis by 2021. This reform, which does not include self-cultivation or the sale of cannabis to non-residents, may influence other European countries to follow suit or at least reconsider their stance on cannabis. From 1 December 2019 Luxembourg will begin to tax CBD products in the same vein as tobacco products. It is understood the Government in Luxembourg also intends to establish State-owned cannabis cultivation sites in an effort to meet the anticipated demand for recreational medical cannabis.

NURTURING AN EMERGING MARKET

Governments employ varying policies to ensure growth of legal cannabis industry

As the legalisation of medical and recreational cannabis gathers momentum across the globe, so too does the demand for consistent, medical grade and high-quality cannabis. Accompanying this surge of global legalisa-

tion, two different approaches in the policies adopted by the various governmental bodies are becoming more distinct. The first of these favours actively pursuing foreign investment whilst the latter promotes domestic development and involvement by indigenous communities. Here we explore the varying attitudes in the legal global cannabis industry that are giving rise to such strategies.

Foreign investors zoom in on Latin America

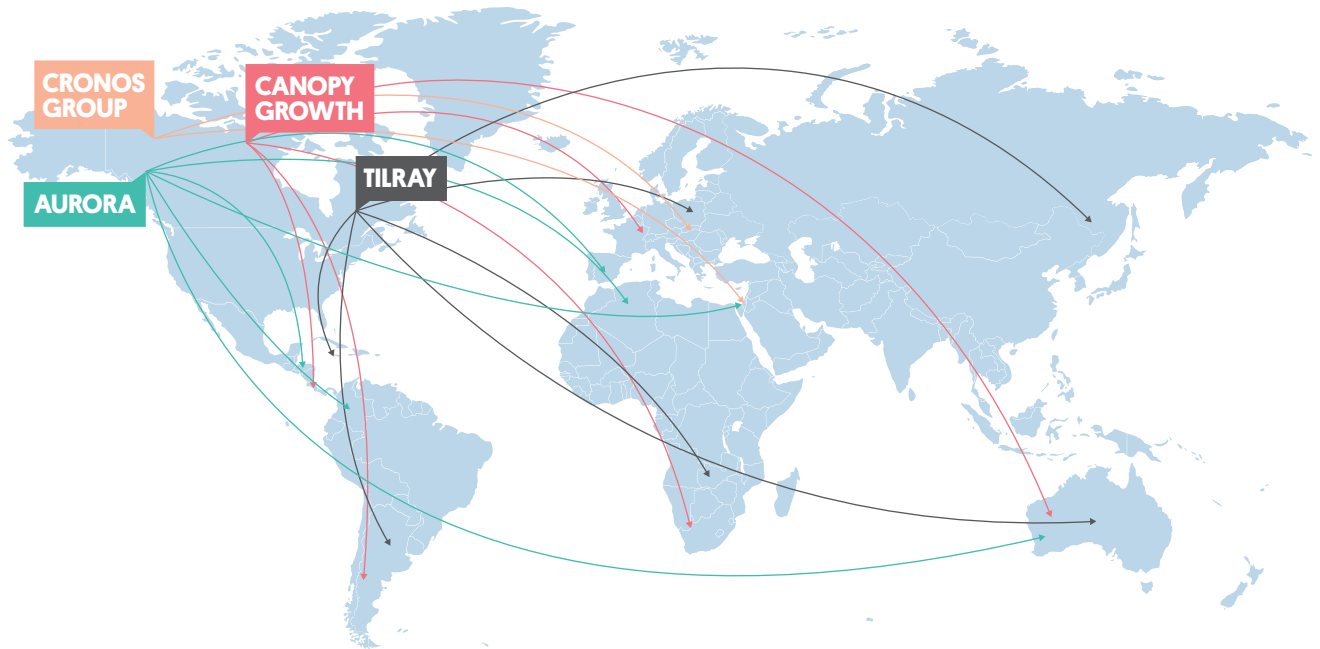
Latin America and Africa are becoming hubs of activity for North American cannabis companies. Governments in these regions have developed policies to attract foreign companies. Colombia's Ministry of Justice and Law responds to all licence applications within 30 working days. Colombia's National Council of Narcotic Drugs authorised a cultivation limit of 40.5 tonnes of cannabis for 2019 in order to accommodate as many companies as possible.

In 2019, publicly listed North American players, such as Charlotte's Web Holdings Inc., Canopy Growth Corp., and Khiron Life Sciences Corp., have significantly increased their presence in Latin America through numerous acquisitions and partnerships. This activity is mirrored, to a lesser extent, in Africa with companies such as HaloLabs and Supreme Cannabis establishing bases in Lesotho. Africa has received increasing attention from UK and Chinese investors.

Foreign investment has made it possible to set up large cultivation and processing facilities in a relatively short amount of time. For their part, countries such as Lesotho and Colombia offer foreign companies close to optimal outdoor growing conditions, reduced labour costs and access to foreign markets. This has enabled some companies such as Northern Swan Holdings to reduce the price of their products by 90% and still remain profitable.

One of the main factors contributing to a lack of indigenous involvement in these

Map of Foreign Investment by a sample of Canadian Companies



regions appears to be the high start-up costs. Lower than average industrial wages and a lack of access to credit from bank loans or sponsorship can make it very difficult for domestic companies to meet all the requirements necessary to establish a legal medical cannabis cultivation or production site. In Lesotho, a cultivation licence alone costs US\$37,000, while in South Africa setting up a fully functioning facility could cost an investor between US\$200,000 and US\$460,000 depending on the scale of the operation, and before factoring in fixed costs such as storage. These expenses are simply out of the reach of the average indigenous farmer in Africa or Latin America. As a result, traditional cannabis farmers are limited in their options and many feel compelled to continue with illegal cultivation.

Although there may be fewer risks associated with inviting foreign companies to set up industry infrastructure, it also causes the local economy to become dependent on foreign investors and reduces the likelihood of developing a new domestic industry independent of external players.

A Budding Domestic Market

Another approach is to limit foreign involvement and accommodate domestic innovation. Ever since cannabis was legalised in Thailand in December 2018, numerous policies have been introduced to ensure that indigenous communities are the driving force behind this sector. Arguably one of the most creative and efficient policies is the 'Two-Thirds Rule'. This dictates that companies established under Thai law, with a local office, can receive the necessary cultivation or trade licences to conduct business, only if at least two thirds of the investors and board of directors are Thai. As foreign investors and companies account for the remaining third, this approach was designed to encourage the sharing of cultivation practices, production techniques and the latest technology from abroad. Thai law also protects future cannabis earnings by restricting investors with early patent claims. Under Thai law it is illegal to copyright a raw extract of cannabis or indeed any micro-organism, either whole or in part, that is found in nature, animals, plants and plant extracts. This law was upheld earlier this year when GW Pharmaceuticals and Otsuka filed patents in Thailand

for medicines, including Sativex. However, several of their applications attempted to patent phytocannabinoids, active ingredients found naturally, and so the application was denied. This case represented a very public rebuttal of foreign control over intellectual property development and potential future earnings, and is a law that is likely to be adopted further afield (for example, both India and the US have similar laws in place) as the cannabis industry unfolds around the world.

Thailand is also initiating and implementing public educational programmes, such as free self-cultivation classes, and is developing a cannabis curriculum for schools. Thailand will therefore reap not only the immediate economic and medical benefits associated with cannabis legalisation, but its long-term vision for the future will also secure future prosperity. With the global cannabis industry set to be worth US\$103.9 billion by 2024, Thailand is well-positioned to capitalise on this emerging domestic market.

Although North American companies such as Aphria Inc. and Canopy Growth Corp have begun to expand their operations in the Caribbean, the governments of Antigua and Barbuda, Jamaica, and The Bahamas, are among those adopting policies that restrict foreign involvement. In Barbados, in August 2019, the government set aside 60 hectares of land for the Rastafarian community to cultivate cannabis legally. The government further stated that it would also play a major role in the establishment of the domestic medical cannabis industry. Jamaica is also spearheading efforts to involve local farmers. In September 2019, the Jamaican company Zimmer & Co announced that it has invited 200 local farmers to attend its CanEx Jamaica 2019 conference.

Centralised models that are independent of foreign investment (for example, Italy) may also be problematic. In September 2014, in order to reduce dependence on imports and to make medical cannabis more affordable to Italian patients, the Italian military began growing medical cannabis. Initially successful (patient

costs were reduced by an estimated 30%), the military was unable to keep pace with increasing demand. In 2018, this resulted in a patient waiting list of approximately 20,000 individuals. Italy has continued to rely on imports from the Netherlands and, most notably, Aurora, which won the tender earlier in 2019.

LEGISLATIVE CASE STUDIES

Asia

2019 has marked a turning point for Asia, most notably in relation to medicinal cannabis. Throughout 2018, a number of countries took steps to either legalise medicinal cannabis, fund research into the benefits of cannabis or begin cultivating cannabis for scientific and research purposes. Thailand, South Korea, Malaysia and Singapore are leading the way, although other countries, such as Myanmar, have also softened their approach to drug crime.

In January 2019, 153 members of the Philippines' House of Representatives cast votes for the *Compassionate Medical Cannabis Bill*. If enacted, physicians licensed by the Philippines Drug Enforcement Agency would be allowed to prescribe cannabis. However, since these votes were cast, concerns have since been raised about whether the *Compassionate Medical Cannabis Bill* will actually pass.

Cannabis-based medicines that have been approved in Western markets such as the US, UK and Australia are gaining a foothold in the region. Medical cannabis was legalised in Thailand in December 2018, followed by clinical research trials. By May 2019, 175 medical practitioners had successfully completed medical cannabis training and could prescribe medicinal cannabis. Between May and October, the number of patients in receipt of medical cannabis oil grew to 4,000, and 30,000 patients have applied.

Malaysia is set to decriminalise the possession and use of drugs held in small quantities.

South Korea legalised medical cannabis in March 2019, a move that paves the way for the first import of certain THC-based and CBD-based medications for conditions such as epilepsy. Approved products will remain tightly restricted. Qualifying patients will be required to apply to the Korea Orphan and Essential Drug Center (KODC), a government body that facilitates patient access to rare medicines, after receiving a prescription from their doctor. Applications will be assessed on a case-by-case basis, according to the country's Ministry of Food and Drug Safety. However, the new law marks a significant milestone in the global industry and a turning point in how cannabis is perceived in traditionally conservative societies.

In August 2019, the Department of Thai Traditional and Alternative Medicine and the Department of Medical Sciences announced that it would process seized cannabis from illicit growers into oil for medical cannabis patients.

Israel decriminalised recreational cannabis in April 2019.

Africa

Recreational cannabis is illegal across Africa, apart from in Lesotho and Zimbabwe, where the cultivation of cannabis for medical purposes and for personal use has been made legal. In September 2018, the South African Supreme Court ruled that adult possession of cannabis for private, personal use would be made legal. However, the order has been suspended for 24 months until parliament can amend the constitution. South Africa's cannabis market remains unregulated. Cannabis is widely cultivated and consumed across the region, despite its illegal status in most countries in the region. Kenya could follow suit in the near future; there have been several petitions in the Kenyan Parliament requesting that cannabis be legalised. Campaigns to change the legal status of cannabis in Malawi, Morocco, Ghana and eSwatini are currently in train. In Egypt, the Deputy Governor of Cairo, John Talaat, M.P., proposed a draft law, in October 2018, that sought to decriminalise all drugs, including cannabis,

allowing users to access treatment instead of incarceration. However, the draft failed to gain traction among legislators.

Europe

Throughout 2018 and 2019, a swathe of European countries introduced, reviewed or announced future legislation to advance the legal cannabis agenda.

- The UK, Portugal and Malta have legalised medical cannabis products.
- Ireland has introduced a medical access programme for a restricted number of qualifying conditions.
- France has granted approval for a two-year trial for legalising medical cannabis on prescription.
- Slovakia has introduced a draft law that removes CBD from the country's list of psychotropic substances.
- The Netherlands, Denmark and Germany have either issued cultivation licences or plan to introduce a tender for global cannabis producers.
- North Macedonia introduced a new draft law for the control of drugs and psychotropic substances in October 2019, which stipulates that medical cannabis can only be cultivated by companies, which must contribute 10% of their profits to the local government, which in turn allocates these assets. The content of the draft law will be subject to a public debate. North Macedonia has issued 28 licences for growth and production of cannabis oil since 2017, with a further 15 companies awaiting permits. The country has yet to export any cannabis.

Looking forward, Luxembourg is set to legalise recreational cannabis by 2021. In the coming months, San Marino's Council of Ministers will evaluate the Arengo Petition for the legalisation of recreational cannabis. The petition requests include permission to possess up to 30 grams of cannabis deriva-

tives; permission to grow up to four cannabis plants at home; the establishment of collective cultivation groups (similar to Spanish Cannabis Social Clubs); and preparation of commercial premises for cannabis sale and consumption.

Latin America

Both medical cannabis and recreational cannabis are expected to become universally legal in this region when cannabis is rescheduled by the UN or soon after cannabis becomes legal at the federal level in the US. The economies of Latin America and the Caribbean remain dependent on the US systems. There is sufficient local support to make cannabis fully legal, and evidence suggests that political opposition to cannabis is weakening. The economic and medical potential of the industry cannot be ignored by any forward-thinking government, and Prohibition Partners expects both medical and recreational cannabis to become legal in the next five to ten years. For the purpose of estimating market sizes, we have forecast medical cannabis to be legal in approximately 65% of countries in the region by the end of 2024, with recreational cannabis legal in approximately 31% of countries. There is a trend towards the widespread and complete legalisation of medicinal cannabis in the near future.

In September 2019, the Ecuadorian National Assembly approved the production, commercialisation, use and consumption of cannabis for medicinal or therapeutic treatment. This reform is now being passed to the executive branch of government for final approval.

North America

New York State Governor Andrew Cuomo signed a new decriminalisation law, which came into effect on 28 August 2019. The law reduces the penalty for minor cannabis possession. Anyone, regardless of criminal record, caught with less than an ounce of cannabis will be fined US\$50, while a maximum fine of US\$200 will be issued to anyone in possession of one to two ounces. Section 221.05 of the *Penal Law* has also been amended to enable the many thou-

sands of New Yorkers with low-level cannabis related criminal convictions to have these automatically expunged (if it involves possession of 25 grams (just under one ounce), or less). These measures in New York State point to a gradual easing of legislation relating to cannabis use. Should the US join its Canadian neighbour in legalising all forms of cannabis, Prohibition Partners estimates that the legal recreational market in this region will be worth some US\$17.7 billion by 2024.

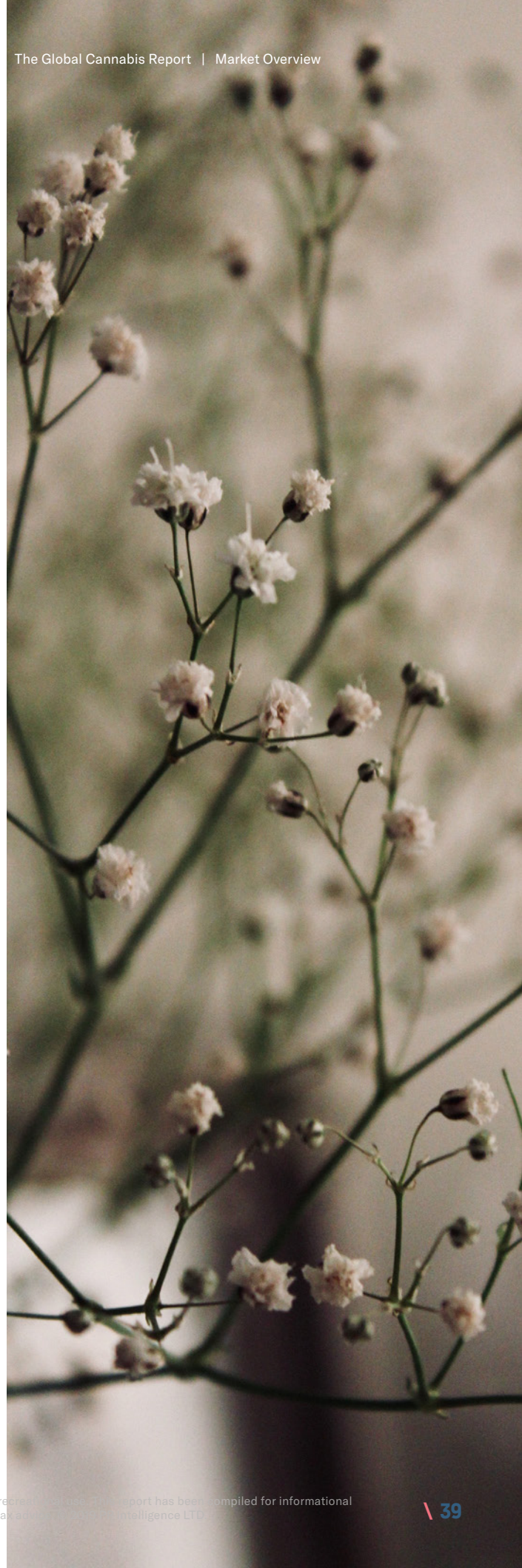
Oceania

The legal status of cannabis varies significantly across this region and even between territories within Australia.

In 2018, the Australian Minister for Health, Gregory Hunt, commissioned a review of the operation of the *Narcotic Drugs Act 1967*. In September 2019, the findings of the review were tabled for debate in the Australian Parliament. The report contained 26 recommendations to improve the regulatory framework for the cultivation, production and manufacture of medicinal cannabis in Australia. All 26 recommendations were accepted by the Minister for Health. The aims of these recommendations are to reduce the regulatory burden on industry, and promote and allow greater flexibility in the administration of the legislation to support industry innovation and development.

Access to medical cannabis has been legal in Australia since 2017. However, the region as a whole is highly conservative, and cannabis is illegal for medical and recreational use across most of the territories and islands. In July 2018, it was reported that a state crackdown on recreational cannabis possession in South Australia would result in the drug being elevated to the status of 'other controlled drugs', such as ecstasy and heroin. There are, however, moves elsewhere in Parliament to legalise recreational cannabis for personal use. The *Drugs of Dependence (Personal Cannabis Use) Amendment Bill 2018* was passed on 25 September 2019. It will legalise the personal possession and use of cannabis in the Australian Capital Territory (ACT) when it comes into effect on 31 January 2020.

Under New Zealand's *Misuse of Drugs Act (1975)*, cannabis oil is listed as Class B, and seeds or plants are listed as Class C on the controlled substances list, making it a criminal offence to consume, possess, cultivate or traffic products from either class. The country is due to hold a (non-binding) referendum on the legalisation of cannabis for personal use in 2020, with polls suggesting that 65% of New Zealanders support legalising recreational use. The latest possible date for the referendum is 21 November 2020.



MARKET SIZE AND FORECAST

Estimates here are based on Prohibition Partners' proprietary market sizing model, which received a major update in Q4 2019. This represents the first iteration of our most complex market sizing model to date. The model methodology has been refined and standardised across regions to maximise the accuracy and comparability of forecasts. In addition, all input data has been revised to align with most currently available market data. Due to the rapidly changing nature of the sector and the increasing amount of historical data coming onstream, it should be noted that these market sizing estimates will be further optimised with subsequent iterations.

These estimates have been built with fully integrated statistical models for both recreational and medical cannabis, forecasted on a monthly basis for the next five years. Every country in each region has been modelled individually to include best available data on variables such as population growth, recreational cannabis usage rates, patient numbers, pricing and dosage, among others. Probabilistic estimations of legalisation likelihood and timing are inputs to the model, as are macroeconomic indicators such as inflation. Appropriate statistical adjustments have been applied to smooth temporal and geographical variance, data heterogeneity and error rates. In many instances, model variables have been cross-validated with external sources to further maximise accuracy. A document outlining the methodology with full transparency – as well as more detailed figures for individual variables – is planned for release in 2020.

We estimate the global legal cannabis market to be worth US\$103.9 billion by 2024. Europe will dominate the market, accounting for US\$39.1 billion here. Although having a significantly lesser population, the North America/Canada region will follow closely with a total market value of US\$37.9 billion, owing to the fact that the markets are more mature there in two key respects:

- Overall patient numbers and medical cannabis access programmes are more advanced in North America and Canada. Our modelling accounts for the historical trend for patient numbers to increase over a period of 24 months post-legalisation. Most European countries are at an earlier point on the growth curve.
- The path towards legalisation of recreational cannabis is also more advanced in states within the US. The EU has yet to fully legalise recreational cannabis in any country.

To a lesser extent, the economic underdevelopment of some countries of Europe also contributed to this difference. As patient numbers grow, and the pace towards legalisation increases in Europe, the market will further outgrow the US.

With market values of US\$2.7 billion and US\$2.6 billion respectively, Oceania and Africa are the two regions with the lowest overall market size. Although it has significantly higher than average usage rates of recreational cannabis, Oceania's small population

TOTAL GLOBAL FORECAST

LEGAL CANNABIS MARKET SIZE, 2024 (US\$ Billion)

REGION	MARKET VALUE 2024 (US\$ BILLION)
Africa	» 2.6
Asia	» 12.5
Europe	» 39.1
Latam	» 9.1
North America	» 37.9
Oceania	» 2.7
Total	» 103.9

Source: Prohibition Partners

is the primary cause behind this comparably low figure, whereas in the case of Africa, this is primarily due to the weaker economy and limited access to healthcare in the region (which has been adjusted for). Although market size is relatively small in Africa, the pace of market growth there is the highest of all regions, owing partly to rising inflation and improving macroeconomic conditions.

Relative to the size of the Asian population, the corresponding market size of US\$12.5 billion is comparatively low. The pace towards legalisation of cannabis in Asia is the lowest of all regions and there are indications that the legalisation of medical cannabis could be more limited in Asia, the latter being adjusted for in the final stages of modelling.

MEDICINAL MARKET FORECAST

MEDICAL CANNABIS MARKET SIZE, 2024 (US\$ Billion)

REGION	MARKET VALUE 2024 (US\$ BILLION)
Africa	» 1.3
Asia	» 10.7
Europe	» 22.3
Latam	» 6.6
North America	» 20.2
Oceania	» 1.5
Total	» 62.6

Source: Prohibition Partners

We estimate the value of the medical market to be US\$62.7 billion by 2024. This comprises 60% of the overall legal market. In countries where both medical and recreational cannabis are legal, the size of the recreational market is typically significantly larger than the medical one. This is not the case here due to countries being reported in aggregate and the pace towards medical cannabis legalisation being faster than that of recreational. Again, Europe dominates the market here (US\$22.3 billion), followed closely by North America/Canada (US\$20.2 billion), with Oceania and Africa having similarly low market sizes (US\$1.5 billion and US\$1.3 billion respectively). It should be noted that ~86% of Asia's total market size is accounted for by medical cannabis, owing to the fact that the predicted likelihood and pace of legalisation of recreational cannabis is less in many Asian countries.

RECREATIONAL MARKET FORECAST

LEGAL RECREATIONAL CANNABIS MARKET SIZE, 2024 (US\$ Billion)

REGION	MARKET VALUE 2024 (US\$ BILLION)
Africa	» 1.3
Asia	» 1.8
Europe	» 16.8
Latam	» 2.5
North America	» 17.7
Oceania	» 1.2
Total	» 41.3

Source: Prohibition Partners

The total estimated value of the legal recreational cannabis market in 2024 is US\$41.2 billion. Regional patterns here are similar to the medical market, with some key differences:

- In 2024, the size of the legal recreational market in the US and Canada will be greater than in Europe (US\$17.7 billion versus US\$16.8 billion). This is attributable to the fact that 100% of states in the US are predicted to have legalised by the end of the forecast period, whereas in Europe this is predicted to be the case for 43% of countries.
- Asia is similar to Oceania and Africa in having a low market size, due to the lower probability of many Asian countries legalising recreational cannabis during the forecast period.

Shaping the Future of Cannabis



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NOBL is a global leader in cannabis data, media and conferences. We deliver the knowledge, network and insight that has become fundamental to what is now one of the fastest growing industries in the world. We are bringing together a portfolio that already includes some of the leading brands in the industry, underpinned by unrivalled leadership and an aggressive growth strategy. We are unlocking the societal, economic and medical opportunities of cannabis.

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MARKET SEGMENTATION

- 1 **Canada is the main nation behind cannabis products in terms of market value and sales. In the top ten largest firms, Canadian companies account for approximately two thirds of the total market value.**
- 2 **The US conducts the majority of cannabis trials (343) with Europe as a runner-up (106).**
- 3 **Many producers in Canada, South America and elsewhere seek to create EU-GMP compliant production lines to supply the nascent European market.**
- 4 **Morocco remains the most industrious illicit cannabis producer globally with the highest recorded cultivation area.**

CULTIVATION

Europe's legal cannabis market is estimated to be worth up to US\$39.1 billion by 2028 and will likely become the world's largest legal market over the next five years.

Germany, Italy, the Netherlands, Denmark, Portugal and Greece are becoming the forerunners in medical production. Smaller markets, such as Macedonia, despite its lack of an official medical cannabis access programme, and Malta, are also offering extensive cultivation licences and export opportunities. Southern Europe has a climate more suitable for cannabis cultivation, whilst Northern and Western European nations (particularly Germany, the Czech Republic and the Netherlands) have created rigid pharmaceutical-grade standards for their production facilities. There are major developments within the Netherlands, Greece, Denmark and Czech Republic towards the creation of domestic cannabis cultivation and export capabilities. The Netherlands has a distinct advantage as it can build on its knowledgeable and experienced cultivators and well-established cannabis trade channels. Cannabis cultivation, supply and possession remain illegal in the Netherlands but are decriminalised for personal use.

Shortages in Europe are made up elsewhere

Outside Europe, Israel, USA, Canada and Latin American nations are set to become major hubs for research and innovation, leading to a rapid expansion in cannabis cultivation

volumes and associated techniques. Presently, the government tenders in Germany and Italy are inadequate to cater for growing demand. In 2017, the German government set up an administrative body overseen by the Federal Institute for Drugs and Medical Devices (BfArM), which aimed to have the country's new medical cannabis cultivation programme ready for roll-out by 2019. In just one year, Germany has raised its required domestic cultivation and import limit from 6,600 kilograms to 10,400 kilograms. It has also issued new production tenders to invite more companies to invest in its domestic cannabis cultivation programme. Italian cannabis cultivation was being handled by the military, but demand has outstripped government supply. Hence, the government issued a cannabis cultivation and import tender to bridge the gap.

Further south, the Colombian Cannabis Industry Association (Asocolocanna) has invested more than US\$600 million building medical cannabis facilities in Colombia. Colombia has a competitive price advantage due to affordable land, low wages and an abundance of skilled farm-hands. In February 2019, Clever Leaves became the first Colombian cannabis company authorised to export cannabis to Canada and is the first Colombian company certified by a leading regulatory agency to produce medical cannabis at a pharmaceutical level. Clever Leaves plans to produce 32 tonnes of dried cannabis flowers in 2019 and increase that to 85 tonnes by 2020. In April 2019, Clever Leaves and Uruguayan company Fotmer Life Sciences announced they will become the first Latin American companies to export legal medical cannabis products to Europe when they start exporting cannabis extract and dried cannabis flowers to Germany. No date has been announced yet.

MANUFACTURING AND PRODUCTION

Canadian producers dominate the industry. However, following the 2018 *Farm Bill* in the

US, and cannabis legislation around the rest of the world rapidly changing, the landscape is poised to change.

- GW Pharmaceuticals is behind the hugely successful medical cannabis product Epidiolex (US)/Epidyolex (EU), which saw sales more than double in the first half of 2019.
- Aurora is the market leader by production capacity and was deemed the most popular stock on NASDAQ so far in 2019, and most widely held cannabis stock on the investing app Robinhood.
- Canopy Growth is at the forefront of medical cannabis research, product development and innovative production capabilities. The company's US\$253 million acquisition of German C3 Cannabinoid Compound Company was one of the world's largest cannabis business deals to date and is set to further advance Canopy's standing in the market.

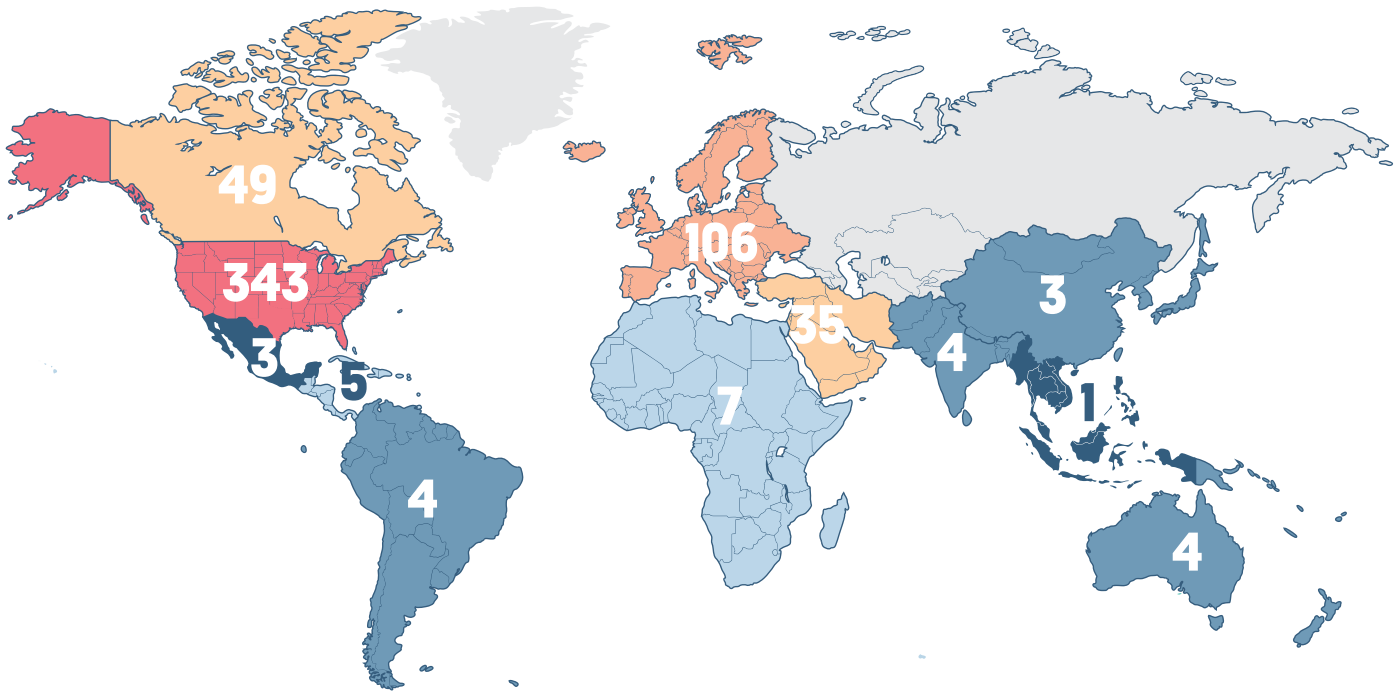
RESEARCH

- US leads the way in cannabis clinical trials
- Innovation in Asia creating novel medicines
- Progress is made on synthetic cannabinoids

Development of pharmaceuticals steams ahead

Novel cannabis products are constantly being produced including cosmetics, dietary supplements and novel foods. However, the pharmaceutical sector, which makes up a large part of the cannabis market depends on the development of rigorously tested drugs. This is best illustrated by the success of GW Pharmaceuticals, which today is the second largest cannabis company in the world. America is currently leading the way in developing new cannabis-derived therapeutics as well as new uses for existing medicines.

Clinical trials involving cannabis, 2019



Source: US National Library of Medicine/ Prohibition Partners

Government institutes row in behind cannabis research

Institutes and governments the world over are investing in cannabis research in an effort to develop new products as well as strengthening the foundations of our understanding of these medicines. For example, in August 2019, Canadian cannabis company Tilray began shipping CBD to researchers at New York University (NYU) to study alcohol and post-traumatic stress disorders. The NYU researchers will test CBD in clinical trials aimed at treating alcohol use disorder and PTSD. In Australia in July 2019, New South Wales Government committed AU\$9 million towards clinical trials to evaluate the safety and effectiveness of cannabis medicines. The trials will cover palliative care, paediatric epilepsy and chemotherapy-induced nausea and vomiting (CINV).

Similarly, nations in Europe and Asia are opening up to funding of cannabis research. In July 2019, the French Agency for Drug Safety (ANSM) approved the country's

first clinical trial featuring French patients suffering from treatment resistant pain, those in palliative care, epilepsy patients and anyone suffering from the side effects of chemotherapy, while patients experiencing muscle spasms related to MS are also invited to take part in the trial. India does not allow for the cultivation of cannabis; however, in September 2019, the Indian government announced that it will allow cannabis research for the first time. The government's narcotics department has sanctioned a research and development project to examine substances found in cannabis. The sanction means that cannabis will be grown in a monitored way, at the Central Institute of Medicinal and Aromatic Plants (CIMAP) in Uttar Pradesh and Uttarakhand.

Innovation in Asia could open new markets for investors

Many countries in Asia such as China, Philippines and Thailand have a history of restrictive drug laws. However, they also have histories of traditional cannabis use including for medical purposes. There is a resurgence in interest in these traditional uses in the region. For example, Thailand's Rangsit University has produced novel medical cannabis products based on traditional cannabis formulations. Thailand has also approved several traditional cannabis formulations as regulated medicine as well as approving traditional medical practitioners as cannabis prescribers. China, the world's second largest economy, may soon follow suit. The Academy for Traditional Chinese Medicine is rumoured to be developing its own anti-epileptic cannabis medicine in place of the West's Epidiolex. Furthermore, the largest CBD producer in the country, Hemp Investment Group, is currently developing a cannabis-based treatment for PTSD in collaboration with the Chinese Army. The development of these products may indicate that China may legalise medical cannabis products soon, opening up a massive new market for producers, retailers and investors alike.

Synthetic cannabinoid breakthroughs

Cannabis produces over 100 cannabinoids as well as 150 terpenes, many of which are biologically active and few of which have been studied thoroughly. Our understanding of the mechanism of cannabis' effect centres on the actions of THC and CBD. The most effective cannabis medicines are based on this understanding. In recent decades and particularly in recent years, the development of synthetic cannabinoids makes it possible to produce the chemicals without mass cultivation and processing of cannabis plants. There are several advantages to this: standardisation of product, reduction of risks from agricultural variables and modification of cannabinoid structure for different biological effects. In 2019, Ralph Echoulam, discoverer of the endocannabinoid system, has presented new work on synthetic cannabinoids including new methods of stabilising the compounds for research as well as presenting a newly discovered cannabinoid:

HU-580. Mr Echoulam believes this could lead to more effective cannabis medicines with less side effects. If the production of synthetic cannabinoids proves to be cost-effective in treating patients, and if the story of GW Pharmaceuticals is anything to go by, future giants of the cannabis industry could include companies producing synthetic, highly effective, standardised pharmaceutical medicines.

INDUSTRY EXPERT INTERVIEW

GREG ENGEL, CEO, ORGANIGRAM

What are the key considerations for cannabis producers in Canada at present?

Key considerations for cannabis producers in Canada are varied. Chief among considerations include:

Driving efficiencies – Continually working to improve productivity and focusing on automation and technology to reduce production costs.

Sustainability – Ensuring environmental considerations are a part of decision-making around consumer products, operations and facility infrastructure. Organigram has taken significant steps around water recapturing and using fully recyclable packaging to this end.

Good corporate governance – Establishing and engaging an independent board and chair to ensure stakeholders from outside the business can provide perspective and help guide decision-making.

Education – Ensuring consumers have the right information on new product formats and are provided with sufficient educational resources at touchpoints to make informed decisions around purchases and consumption.

Looking ahead – Choosing strategic partners

carefully and focusing on developing a strong strategic plan for next-phase products and the evolving retail and medical markets.

Growing wisely – Because cannabis companies evolve so rapidly, ensuring growth is well managed. The most successful cannabis companies in Canada have begun to change their self-concept from simply ‘cultivator’ to ‘consumer packaged goods company’, which is what the regulated cannabis industry will become in Canada over time.

How will the legalisation of cannabis edibles (suggested timing is mid-December 2019) affect and drive the market?

‘Cannabis 2.0’ will bring entirely new demographics to the market through convenient, discreet and approachable forms. This new area will also allow the legal market to compete more aggressively; strategic partnerships around proven technologies and the introduction of innovative methods for cannabinoid delivery will help elevate and set standards for this class of products in Canada. Restrictions on marketing and branding in the regulated space considered, next-phase products will provide an avenue for licensed producers to create product differentiation and enhance branding.

Where do you think the biggest growth in the Canadian cannabis industry will come from?

A few areas present significant growth potential. New product development that leans on

advancements in technology and innovation; Organigram has an R&D team that is working to create a range of cannabis products that offer consumers rapid onset and offset of effects. It's product advancements like these that will really change the cannabis experience for consumers and make products more appealing. Another big opportunity lays in CBD and the ability for companies to take proven tech, like cannabis beverage or vaporisers, and use them as a vehicle for CBD. There's huge potential for Canadian companies to work in both the European and US markets, so expect to see growth there as well.

What will be the key drivers?

As Canadian companies have been able to access capital through our capital markets and, more recently, through traditional debt financing, they're afforded the opportunity to take advantage of strategic opportunities and apply that capital as opportunities arise.

Strong partnerships, increased distribution, policy work and more flexibility in branding and packaging will all help drive growth in the industry.

What else needs to change in order to unlock potential in the industry?

Exploring avenues never charted, including research and development in areas like biosynthesis. From a consumer perspective, an adoption and understanding of the value of buying a product that's been produced using exemplary quality control measures and put through rigorous testing; that understanding will help legal producers further differentiate their products.

How do you see North America's involvement in the global cannabis industry at present, and how do you think this might change as more countries legalise?

While North America has become the global leader from a commercial perspective, Canadian companies run the risk of being outpaced by American companies; we need to be more aggressive in advancing technology and innovation to stay on the leading edge of the curve to ensure the Canadian programme is the

most robust in the world. That said, Canadian companies remain the global leaders in terms of industrial-scale production and processing and can translate that expertise into other markets. Expect to see more innovation come from Canadian companies that will influence global product trends.

What is your twelve-month and five-year outlook for the industry?

Twelve months: Expect to see more strategic partners enter the space, including major consumer packaged goods, tobacco and alcohol. We can also expect to see companies that perform continue to do well, and those who underperform to struggle.

Five years: Expect to see some levels of consolidation among key players by way of mergers and acquisitions.

What is the biggest challenge for the cannabis industry to overcome in the next 12 months and who/what do you think is needed to overcome it?

Reaching consumers is one of the biggest challenges this industry needs to overcome; marketing and branding restrictions considered, building and finding effective delivery platforms for fulsome education programmes will help us get there. Educating consumers on the differentiation of products and the value of purchasing a tested, quality-controlled product will contribute to Canadians' adoption of and confidence in the legal market.



DISTRIBUTION

The Netherlands will launch cannabis distribution trials in 2021, when cafes in ten cities will receive a legal supply of ‘quality’ cannabis as part of a four-year experiment. These trials are aimed at providing a controlled and legalised supply of cannabis, making the industry more transparent as well assessing the potential impact on crime levels. The cities chosen, and still to be approved, are Arnhem, Almere, Breda, Groningen, Heerlen, Helvoetsluis, Maastricht, Nijmegen, Tilburg and Zaanstad. The Hague, Amsterdam, Utrecht and Rotterdam will not take part, primarily over the demand that all coffee shops in the test locations must immediately abandon their illegal suppliers. Amsterdam has almost 170 cannabis cafes, and its mayor, Femke Halsema, warned in 2018 that it would be dangerous if all those buyers abandoned their suppliers simultaneously.

In January 2019, Tilray entered into a long-term revenue-sharing agreement with Authentic Brands Group to market and distribute a range of consumer cannabis products within ABG’s brand portfolio. The initial focus will be on CBD in Canada and the US. Tilray will supply CBD for the products.

Austrian online CBD retailer Hanfgarten was founded in 2015 and is one of the biggest distributors of hemp products in Europe.

The company ships across Europe, to countries where CBD products are legal.

Farmako GmbH is a research-focused pharmaceutical company based in Germany that distributes medical cannabis products, including capsules, oils and inhalers. The company aims to obtain a licence to distribute pharmaceutical cannabis across the EU. Farmako has branches in Germany and the UK. The company prioritises research to develop new pharmaceutical products for the medicinal cannabis market.

CONSUMER PRODUCTS

To date, the US has lodged 8,859 cannabis related trademark applications according to WIPO (World International Property Organization), whilst Canada made 6,640 applications, marking a chasm between North America and the rest of the world when it comes to cannabis product patenting activity. The closest countries in terms of activity levels are Mexico on 549 and Australia on 453 applications.

All cannabis-related trademark applications to October 2019

USA	» 8,859
Canada	» 6,640
Mexico	» 549
Australia	» 453
New Zealand	» 213
Germany	» 157

Source: WIPO

Top five cannabis related trademark applications lodged between 23 October 2018 and 22 October 2019 by country

USA	» 711
Canada	» 292
Mexico	» 52
Australia	» 20
Germany	» 7

Source: WIPO

North America is the main hub of activity for cannabis products, with the US applying for 711 cannabis-related product trademarks between 23 October 2018 and the 22 October 2019, followed by Canada with 292 applications.

Despite being illegal under federal law, cannabis-related inventions have been receiving patents from the US Patent and Trademark Office (USPTO) since 1942. Recent examples of issued cannabis utility patents include: US patent 10,028,987, issued on 24 July 2018, titled 'Cannabis-infused milk', and USPN 10,206,888, issued on 19 February 2019, titled 'A cannabis-based therapeutic product for the treatment of chronic pain, produced by separating hash resin from plant material of the cannabis plant'.

Cannabis-related patents have been permitted by the USPTO even though the legality of cannabis varies between the state and federal level. It is also reported that the US government holds a 2003-issued patent for certain uses of cannabinoids as antioxidants and neuroprotectants.

There has been a significant increase in the number of cannabis-related US patents that have been filed and issued. It is estimated that more than half of all cannabis patent applications have been filed in the past 25 years. Innovation has been largely spurred by legislative

change and increasing research and development expenditure by major cannabis producers. In the US, disparities in the legal status of cannabis between states has had little impact on the patentability or the ability to enforce cannabis-related patents in the federal court.

The Q2 earnings report for the 2019 fiscal year indicated that Canadian cannabis firm Canopy Growth spent CA\$1.94 million on research and development (R&D), representing close to a 300% rise in spend compared with the firm's CA\$494,000 spent in Q2 2018.

Aurora Cannabis spent CA\$3.43 million on R&D during the first quarter of 2019, up over 3000% from CA\$107,000 during Q1 2018. Also, Aurora identified CA\$2.35 million in patent-related acquisitions since July 2017.

Unlike other regions, in North America cannabis patents can be issued based on the chemical composition of a specifically bred cannabis plant. This enables cross-breeders to create new strains of cannabis. However, in Canada, unlike the US, a patent cannot be issued for a unique natural strain of the cannabis plant; instead, the creator would need to apply for a Plant Breeders' Right (which offers intellectual property protection and breeder exclusivity rights on the variety for between 20 and 25 years).

ANCILLARY SERVICES

The continued growth of the cannabis market impacts on an increasing number of industries, including legal, marketing and branding. In October 2018, Duane Morris LLP and the American Trade Association for Cannabis & Hemp (ATACH) announced the country's first partnership agreement between a US Law 100 firm and a cannabis trade association.

Data from WIPO found that the top ten cannabis marketing and branding trademarks were lodged by the nations listed in the following table. Unsurprisingly, Canada and the US are by far the main trademark holders. This is evident in the rapidly growing cannabis product market in North America.

Total cannabis marketing and branding trademarks, October 2019

COUNTRY	TOTAL TRADEMARKS
Canada	» 3,939
US	» 2,138
Australia	» 163
Germany	» 101
New Zealand	» 81
Mexico	» 63
Switzerland	» 59
Italy	» 47
Spain	» 45
Israel	» 33

Source: WIPO/Prohibition Partners

In March 2018, Malta officially legalised the production and use of medicinal cannabis. The Maltese Parliament approved *The Production of Cannabis for Medicinal and Research Purposes Act*, an all-encompassing Act regulating the entities that are eligible to produce and distribute cannabis under strict supervision. The nation has also created Malta Enterprise, the country's economic development agency, tasked with attracting new foreign direct investment as well as facilitating the growth of existing operations.

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CONSUMER GOODS MARKETS

- 1 **CBD products are impacting mainstream markets on a significant scale, particularly in North America and in the area of beauty and personal care (BPC), largely due to the relatively widespread availability and legality of hemp (and hemp derived CBD), in contrast with the restrictions in place for other cannabis products.**
- 2 **Investment in the consumer goods market has been characterised by partnerships or M&A of indie start-up companies with well-established brands looking to dip their toe in the market while attempting to successfully negotiate legal grey areas;**
- 3 **Prohibition Partners estimates that the global market for cannabis-based beverages will reach**

US\$1.4 billion by 2024. Less restrictive regulation, investment by major brewers, and innovation from start-ups are all responsible for facilitating this growth.

The legalisation of cannabis and hemp-derived CBD has given the global consumer marketplace access to a brand-new product that has a wide range of uses and benefits. And while prohibition may be hindering the progress of development within the medical world, the kudos attached to cannabis and its illicit past is driving interest, buzz and momentum in the consumer marketplace. The emergence of cannabis- and CBD-based products, brands and innovations is significantly disrupting the food, drink, beauty and personal care (BPC), tobacco, and pharmaceuticals markets.

CBD SPREADS INTO MAINSTREAM MARKETS

The spread of cannabis into mainstream consumer markets has largely been dominated by independent start-ups, who have moved quickly in order to seize upon the opportunity of the first-mover advantage. Many of the large brand players are constrained by the varying legalities of operating across state lines and

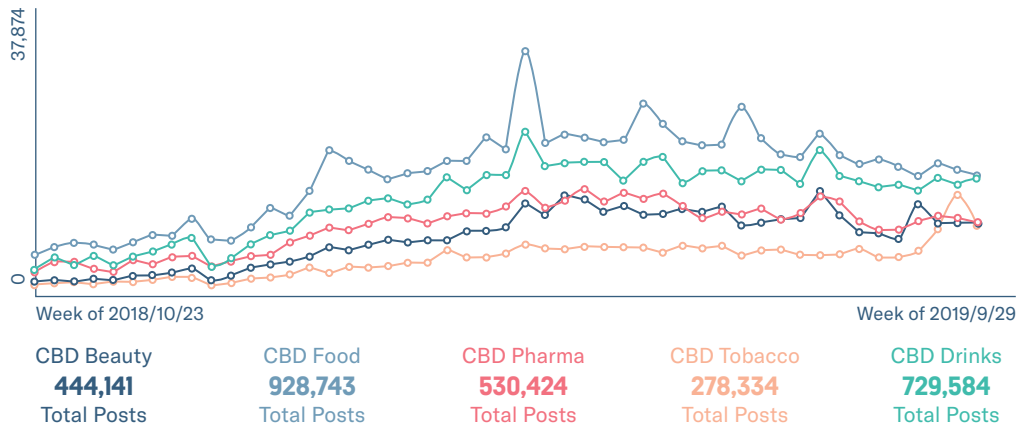


borders (in the case of food and drink), while small independents are able to work within the guidelines of their respective regions. Big established brands also have to manage their brand reputation and brand following when negotiating the public impact of the many grey legal areas of this emerging and highly unregulated market. Where there have been big brand forays into the market it has largely been restricted to BPC, owing to the widespread legality of hemp and the fact that BPC products are not ingested. Large fast-moving consumer goods (FMCG) brands are watching and waiting for greater consistency in legality and operating conditions before they embrace expansion through innovation with cannabis-derived ingredients.

FMCG cannabis brands are of increasing interest to the cannabis-growing giants. Keen to ensure that they are maximising their reach within this rapidly evolving market, companies such as Aurora and Canopy Growth have embarked on M&A and vertical integration strategies. Consequently, partnerships are forged between many of the newly emerging cannabis and CBD FMCG brands and the cannabis-growing giants. This has given the smaller craft and indie brands the long-term marketing muscle needed to rival the subsequent entry of big-name brands following global legalisation.

CBD FOOD AND DRINK MOST POPULAR CATEGORIES

Online mentions of CBD in the context of consumer-goods markets, year to October 2019



Source: Infegy Atlas/Prohibition Partners

The 12 months to October 2019 show a rising interest in CBD consumer goods, with online mentions of key categories displaying a general upward trend. Interest is concentrated in the food and drink segments with beauty and pet care also increasing in popularity.

The way in which cannabis is discussed online has changed in the last five years, shaking off negative connotations; and the language has shifted from discussions around pot, weed and smoking towards different forms of consumption and application.

The involvement of celebrities such as Martha Stewart, Mike Tyson and Seth Rogen has also helped to normalise consumer attitudes towards products, with high-profile individuals like Rob Gronkowski helping to generate significant spikes in conversation around CBD within the sports industry.

Food

Having reviewed consumption and consumer trends in the world's markets, Prohibition Partners estimates the value of the global market for solid cannabis edibles at around US\$1.2 billion in 2019 and forecasts sales to reach around US\$4.7 billion by 2024.

The US is the runaway leader for cannabis edibles. Its value is underpinned by the comparatively early legalisation of recreational cannabis in key states such as California and Colorado. However, the legalisation of edibles in Canada on 17 October 2019 has created a flurry of activity in the region to the point where Canada held 164 applications for cannabis related food products between 23 October 2018 and 22 October 2019, according to information from WIPO. The US holds the highest number of applications for cannabis related food products, however, at 203 applications.

A 'limited' selection of next-generation cannabis products including edibles will gradually hit retail shelves from mid-December 2019. Canada has set a cap for cannabis-infused food or drinks of 10 milligrams of THC, whereas in California, Colorado and Washington State, recreational cannabis customers can buy packages of edibles with up to 100 milligrams of THC. The regulations put in place by Health Canada will be burdensome for manufacturers and could impact on their ability to compete with the illicit market.

Total cannabis-infused food trademarks, October 2019

COUNTRY	TOTAL TRADEMARKS
Canada	» 4,124
US	» 1,034
Australia	» 172
Mexico	» 112
Germany	» 96
Switzerland	» 95
New Zealand	» 86
Italy	» 65
Spain	» 39
Israel	» 37

Source: WIPO/Prohibition Partners


Hemp-based CBD edibles in the US and Europe continue to operate within something of a 'grey market'.

The FDA has ruled that it is unlawful under the *Federal Food, Drug & Cosmetic (FD&C) Act* to introduce food containing added CBD or THC into interstate commerce, or to market CBD or THC products as, or in, dietary supplements, regardless of whether the substances are hemp-derived.

Although many manufacturers in the US have created businesses in spite of these rulings, Washington State officials enforced the FDA ruling in August 2019 and announced that all food and drink products containing CBD should be removed from retailers' shelves. While the FDA continues to investigate the viability of an amendment to its current position, there are fears that other states will forcibly uphold the ruling. A similar 'grey zone' exists in Europe, since CBD is categorised as a 'Novel Food' and therefore any

food products containing CBD need to be evaluated and authorised (at great cost and time) before they are permitted to be placed on the market.

Cannabis edibles typically straddle the indulgence and health platforms, with much of the NPD focusing on confectionery (predominantly gummies), biscuits and cakes. CBD edibles are, in contrast, increasingly defined by health and wellness having become closely aligned with all-natural trends in the food industry. This is more pronounced within the food service industry, with several restaurants positioning themselves as 'all-natural', creating CBD-based menus and offerings. On the indulgence side, on 20 April 2019, fast-food chain Carl's Jr. launched a one-day limited edition CBD cheeseburger to celebrate 420 Day. The so-called Rocky Mountain High burger featured a sauce that contained around five milligrams of CBD extract. The burger was available for one day only at its 4050 Colorado Blvd outlet.



An emerging trend within this market is the growing number of edibles that are embracing the proposition of consistent and reliable low-dose or micro-dose edibles. Industry estimates put growth in the US market at 90 to 100% for such products in 2018 compared with the previous year. This increase gives credibility to the suggestion that edibles products are also bought and consumed by patients with medical needs.

Drinks

The nascent cannabis-infused drinks market has attracted several big alcohol companies that are seeking to offset declining beer consumption with the next big thing. Examples of such partnerships include

- Constellation Brands' 38% in Canopy Growth Corp.;
- Budweiser brewer Anheuser-Busch's research partnership with Tilray, with each company investing up to US\$50 million in the venture; and
- Molson Coors Brewing Co. collaboration with Quebec-based Hexo Corp. The latter collaboration is called Truss and is set to launch a non-alcoholic, cannabis-infused drinks range on the Canadian market on 16 December 2019. Truss also plans to sell CBD-infused beverages in eight US states by 2020.

Much like the cannabis/CBD beauty and food markets, the most interesting product development in the cannabis-based beverage industry is coming from start-ups, which, unlike the established brands in the market, are able to focus exclusively on cannabis-based drinks. Innovation has been concentrated in cannabis-infused flavoured water and tonics. However, no other category has seen as much activity as the soft-drink segment, with cannabis-infused teas being a key segment for innovation.

Prohibition Partners estimates that the global market for cannabis-based beverages will rise from around US\$185 million in 2018 to in the

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region of US\$225 million in 2019. US sales of cannabis-based drinks grew to US\$88 million in 2018, rising to US\$110 million in 2019. Sales are forecast to grow rapidly over the next five years, reaching US\$1.4 billion by 2024. The key

factors driving this growth include loosening regulation, investment by major brewers, and innovation from start-ups. The US market saw 88 cannabis drinks brands on the market in Q2 2019 – 19 more brands than in Q2 2018.

Cannabis-infused drinks trademarks, October 2019

COUNTRY	TRADEMARKS
Canada	» 2,594
US	» 581
Australia	» 78
Germany	» 53
Italy	» 42
Switzerland	» 38
New Zealand	» 32
Mexico	» 17

Source: WIPO/Prohibition Partners

In August 2019, British high-street retailer WH Smith started to sell Ignite International Brands' CBD products in 276 of its retail travel stores in the UK. Drinks brand Rozoy & Picot introduced two Chardonnay varietals containing cannabis: OG Kush and Amnesia Core Cut in February 2019.

Zenabis Global Inc. announced in August 2019 its plans to produce a wide range of THC- and CBD-infused beverages. CEO Andrew Grieve has been quoted as saying: 'This Agreement puts Zenabis in a strong position to compete in the cannabis-infused beverage market once these products are legalised in Canada later in 2019.' Grieve added: 'The Canadian market for these beverages is estimated to be worth US\$529 million, so the ability to infuse cannabis in beverages without affecting their taste, smell or appearance strengthens Zenabis'

position relative to the many other companies planning to commercialise similar products.'

In August 2019, Arizona Iced Tea entered into a US\$10 million deal with edibles company Dixie Brands Inc. to sell cannabis-infused products, including vape pens and gummies. It is also set to move into beverages such as tea, lemonade, seltzer (carbonated water), soft drinks, and coffee. Sales will begin in the US, and then expand to Canada and Latin America.

Beauty and Personal Care

Canada has lodged the highest number of trademarks for BPC products containing cannabis, followed by the US and Australia.

Cannabis-infused beauty trademarks, October 2019

COUNTRY	BEAUTY-RELATED TRADEMARKS
Canada	» 2,198
US	» 1,234
Australia	» 84
Germany	» 80
Switzerland	» 68
Italy	» 47
New Zealand	» 43
Israel	» 28
Mexico	» 26
Spain	» 10

Source: WIPO/Prohibition Partners

The US market is driven by high-end names, such as Estée Lauder, and big brand retailers, including Sephora, which are helping cement cannabis-infused beauty products. In Spring 2019, Unilever launched a CBD-infused product under the Schmidt's Naturals brand, which it acquired in December 2017. Although not major launches, they represent a cautious step into an, as yet, unregulated category.

In the past couple of years, the beauty market has been flooded with indie brand offerings, mainly focused on treating the skin. There is a plethora of BPC product categories infused with cannabis or CBD; from make-up to skincare. In 2018, Kush Mascara by Milk

Makeup was one of the first mainstream make-up products to be launched into a mass retailer in the US. The product uses a cannabis-oil binding component instead of the usual beeswax. Other brands making waves with their CBD-based lines include Disciple, which markets a single CBD product that can be consumed sublingually or applied direct to the skin, and Perricone CBx, which taps into the burgeoning demand for men's performance grooming products.

The big cannabis production companies are also ensuring they have a place in this newly emerging market segment. Canopy Growth, the world's largest cannabis company, bought

British beauty brand This Works for £43 million in April 2019, with a view to launching a range of products containing CBD to help users sleep and improve their skin.

Cannabis-infused beauty products have very much entered the mainstream and are increasingly backed by famous faces, such as Kim Kardashian and Miley Cyrus. Canopy Growth has been working with Martha Stewart on its line of CBD-based cosmetics and body care products. This combination is helping to change consumers' attitudes to, and perceptions about, the plant and its uses.

Tobacco

The declining consumption of tobacco products globally has prompted many multinational tobacco producers to venture into the cannabis arena.

- In July 2019, Imperial Brands invested US\$123 million in a research and development partnership with Auxly Cannabis Group, a move that will assist in rolling out next-generation cannabis products (e.g. edibles, topicals and extracts) following the October 2019 legalisation in Canada.
- Altria Group, makers of Marlboro, announced a US\$1.95 billion deal with Toronto-based cannabis company Cronos in 2018. In 2016, the Altria subsidiary Philip Morris International invested US\$20 million into Syqe Medical, an Israeli-based firm that makes 3D-printed cannabis inhalers.
- In early 2018, another US tobacco company, Alliance One International, purchased a 75% share in Canadian cannabis company Island Garden.

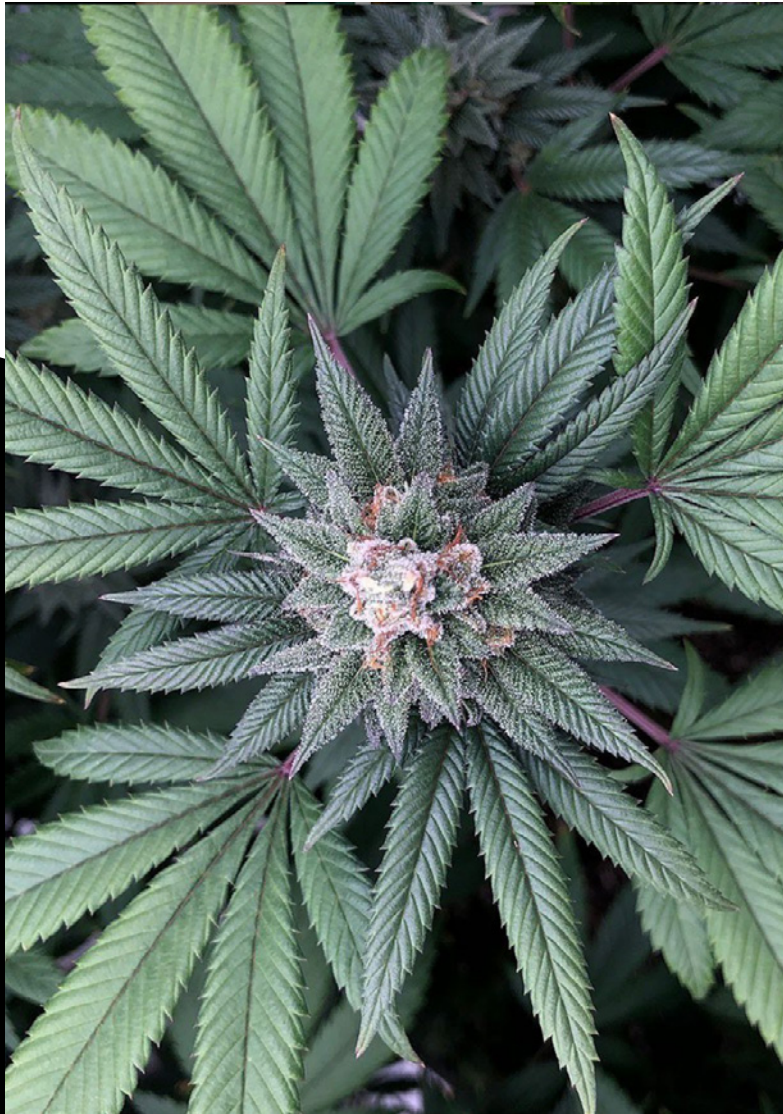
Cannabis-infused tobacco trademarks, October 2019

COUNTRY	TRADEMARKS
Canada	» 5,307
US	» 3,396
Australia	» 341
Mexico	» 203
New Zealand	» 179
Germany	» 137
Switzerland	» 126
Israel	» 94
Italy	» 66
Spain	» 65

Source: WIPO/Prohibition Partners



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In July 2019, THC BioMed Intl Ltd announced that it is to sell pre-rolled 100% pure cannabis cigarettes through its website. No date is set for launch. The Pure Cannabis Cigarettes will be packaged in lots of 3 and 20, with each cigarette featuring a commercial-grade cigarette filter.

In September 2019, the use of e-cigarettes and cannabis vaporisers were linked to several deaths and hundreds of illnesses. Recreational cannabis vape product sales have suffered as consumers shift their spending into other merchandise such as cannabis flower and pre-rolled cigarettes.

Pharmaceuticals

The pharmaceutical cannabis medicines currently approved for use around the world are as follows:

The pharmaceutical industry is gradually investing more time and money in cannabis research as legislation issues begin to ease, and revenue potential increases. The recent approval of GW Pharmaceuticals' prescription drug Epidiolex/Epidyolex within the US and the approval by the EU's EMA have massively increased the earning potential of this medication and this is likely to step up activity in the pharmaceutical-led research and development of medical cannabis. It is estimated that the pharmaceutical industry has sponsored over 120 federal clinical trials involving CBD,

Traditional pharmaceuticals are exploring an arena traditionally dominated by the cannabis-growing companies.

- Novartis is partnering with Tilray to distribute medical cannabis internationally, while Teva Pharmaceuticals has signed a deal with medical cannabis company Canndoc to distribute its GMP products to pharma customers.
- As the full potential of cannabis and its many compounds becomes clearer, the race to invest in cannabinoid patents has begun in earnest, with US biotech companies, such as Emerald Bioscience, trying to make

their own patented formulations in order to secure their share of the income that will be generated from medical cannabis.

There has been an influx of patents in the US and Canada. However, these trademarks are overly broad and this will ultimately restrict innovation in the market. As a result, legal challenges are disputing some of these patents and not just on a national level. The issue of national protectionism and the threat to potential income earned from cannabis is causing countries such as Thailand and India to reject trademarks filed by foreign companies on medical cannabis patents.

Canada and the US dominate the pharmaceutical cannabis trademark landscape. Notable recent product innovation includes:

- Aphria Inc. has launched a smoke-free alternative in the form of proprietary QuickStrip technology, an oral fast-dissolving drug delivery system. In the spring of 2019, the company won exclusive rights to license, manufacture, distribute and sell QuickStrip delivery technology on the German cannabis market.
- Zynerba Pharmaceuticals, Inc. has a product development programme that includes clinical trials for the ZYNO02 transdermal gel for children and adolescents with developmental and epileptic encephalopathies (DEE).
- Pressure BioSciences (PBI) has come to the market with ground-breaking technology that has the ability to create extremely small, nanometre-scale oil droplets that effectively dissolve in water to provide optimised bioavailability for absorption into the bloodstream and stability.

Product development opportunities for medicinal cannabis are also being explored through joint venture activity.

- Early in 2019, pharmaceutical company Sandoz Ltd, a division of Swiss drug-giant Novartis, linked up with Tilray to research medical-grade cannabis products. Tilray

Pharmaceutical cannabis trademarks lodged, October 2019

COUNTRY	PHARMACEUTICAL TRADEMARKS
Canada	» 4,255
US	» 2,684
Australia	» 329
New Zealand	» 172
Germany	» 131
Mexico	» 122
Switzerland	» 99
Israel	» 81
Italy	» 59
Spain	» 58

Source: WIPO/Prohibition Partners

also stands to benefit from Sandoz's extensive Canadian distribution network.

- In October 2018, Cronos Group Inc. announced that it had entered into a sponsored research agreement with the Technion Research and Development Foundation of the Israeli Institute of Technology to explore the use of cannabinoids in regulating skin health and skin disorders, specifically three skin conditions: acne, psoriasis and skin repair.

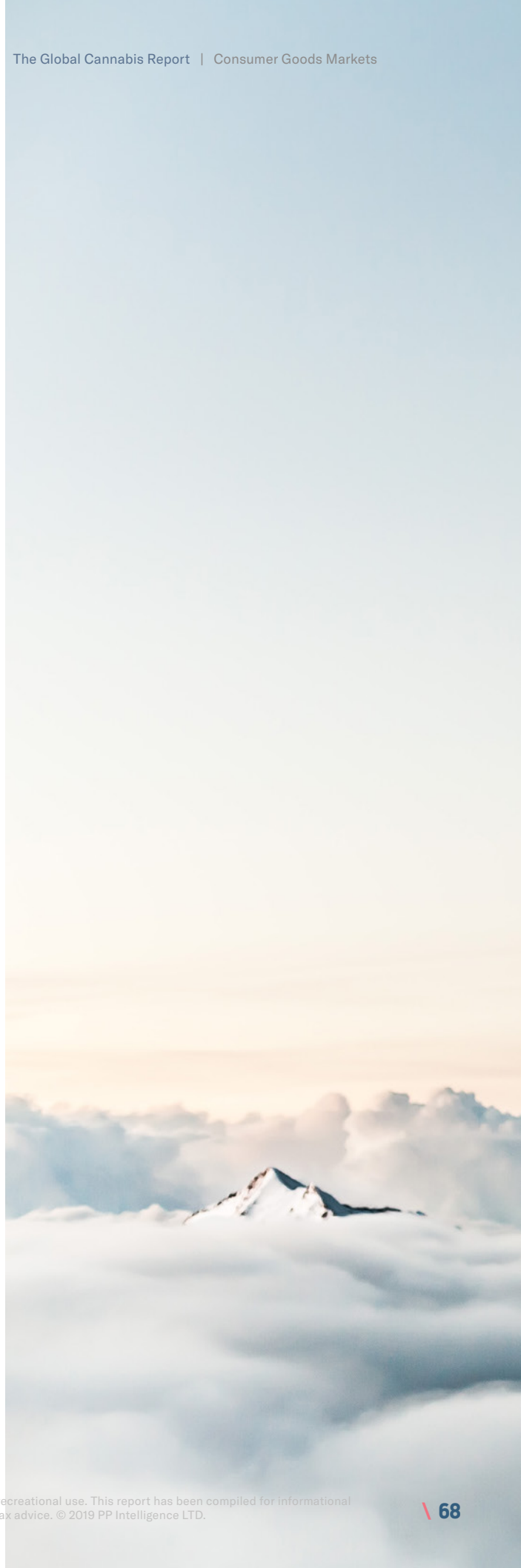
In Thailand, in July 2019, state-sanctioned clinical trials began to test cannabis oil in sublingual-drop format on selected patients suffering from CINV. The Department of Thai Traditional and Alternative Medicine has developed two traditional medicines and three ready-to-mix recipes that contain cannabis. 'Sanan Traipop Oil' helps in the treatment of liver cancer and ascites, while one of the rec-

ipes is a haemorrhoid treatment. The other three ready-to-mix recipes contain cannabis as well as other herbs, such as dried flower, chopped pepper and moonseed in different proportions. Although medical cannabis remains illegal in Japan, the country has approved Epidiolex for clinical trials in epileptic patients with Dravet and Lennox-Gastaut syndromes, marking a departure from the country's strict policy on cannabis.

By 2019, many EU countries had introduced some legal provision for access to pharmaceutical cannabis products, on a trial or permanent basis and with various provisions ensuring supply of product and patient access. These include the UK, France and Ireland. However, Germany, Sweden, Italy and the Netherlands' medical programmes are increasingly based around cannabis flower, such as those produced by Bedrocan®.

In the UK, medical cannabis can be prescribed only by specialist physicians and cannot be imported until a prescription has been issued. These rules, coupled with disagreement among doctors about how effective it is, means fewer than 100 UK patients are thought to have been prescribed it.

At present, the only cannabis product registered as a medicine and marketed in Australia is nabiximols oromucosal spray (Sativex). However, two routes of access to medicinal cannabis products exist in Australia, via the Special Access Scheme and the Authorised Prescribers scheme. In the SAS scheme alone, over 17,300 applications to access have been approved by the Therapeutic Goods Administration, many of these may have been for Epidiolex as over a quarter were for CBD-only medicines. Furthermore, New South Wales has a compassionate access scheme dedicated to Epidiolex.





LICENSING

- 1 **Countries' licensing practices shape markets into producers and consumers.**
- 2 **There are bottlenecks on patient access in some countries produced by tight border regulations and a lack of licensed and specialised medical prescribers.**
- 3 **Established giants extend their reach to Africa, South America and Europe.**

As governments shape their cannabis markets through licensing, this is now a central influence in the development of the global cannabis market.

MARKET PARALLELS

Over the past five years cannabis markets have developed in line with demand and supply as moderated by the regulations of each state. Observable global trends are now emerging. One such trend sees high consumption rates in developed countries with low production, and, on the other hand, the development of large production potential in developing countries that have access to cheap labour and land with ideal climatic conditions.

Germany is fast becoming the biggest European market for medical cannabis and is predicted to rival the goliath markets of Canada and California. Despite this, only three companies have been granted a total of 13 licences to produce medical cannabis within the country as announced in April 2019.

- Aurora
- Aphria, and
- Demecan (in a joint venture with Wayland Group).

A total of 23.2 tonnes of cannabis may be grown domestically each year for the roughly 60,000 patients currently registered in Germany. A similar situation has arisen in Japan, which has a massive CBD market with no legislation or licensing for production. Contrast this with Colombia, which has

granted more than 40 licences for production of cannabis with a production capacity of hundreds of tonnes. Just three of the largest cultivators, Colombian companies Clever Leaves and Pharmacielo as well as Canadian Khiron, have a combined production capacity of 962 tonnes.

Other regions are also gearing up to supply the growing markets in Europe and North America. In Africa, several countries are leading the way in terms of licensing for the new global cannabis market. Lesotho has granted around 60 licences for production of medical cannabis. Lesotho-based Medi Kingdom became the first company to export medical cannabis from Africa to Canada in March 2019. Though the shipment was non-commercial, the event paves the way for future flow of product between the regions. In Southeast Asia, Thailand and Malaysia are looking to other southern hemisphere nations as examples of the potential for cannabis-related revenue generation. Though not yet legal, the opportunities represented by cannabis exportation have been discussed in both parliaments.

ESTABLISHED FIRMS POWER THE INDUSTRY ACROSS THE GLOBE

Established industry giants, often Canadian, are increasingly setting up in countries with newly emerging cannabis markets.

- Canadian company HEXO, through its affiliate HEXO Med, is one of a number of firms to secure a medical cannabis licence in Greece. The licence, issued by the Greek government, allows the company to establish cultivation, processing and manufacturing facilities in the Thessaly region of the country with HEXO hoping to boost its presence in the European Union.
- Malta is expected to become an exporter in 2020, having licensed production facilities for companies such as Canadian-based MPX.

Some countries plan to develop domestic markets that are locally owned yet cooperate with larger global players.

- South Africa has begun licensing production of medical cannabis, approving three licences for cultivation, processing and export. Two of the licences have gone to South African companies House of Hemp and Leaf Botanicals, the latter signing a deal to export to Canadian company Agrotiva Ltd for further processing.

- Thailand has set the bar for protecting their local markets by only allowing companies which are 2/3rds Thai owned to acquire licences for any part of the supply chain.
- As of January 2019, New Zealand has granted licences to private companies for production of medical cannabis for research, three of which were granted to local start-ups Hikurangi Cannabis, Cannasouth and Helius Therapeutics.
- In Australia, a shortage of prescriptions has impeded patient access. A 2018 survey of doctors in Australia indicated that only 29% felt adequately trained to discuss medical cannabis with patients.
- In Texas and other American states, grey legal areas exist between state and federal law, which deter some practitioners from prescribing medical cannabis.

BOTTLENECKS OF CANNABIS DISTRIBUTION

Mobility of cannabis exports is hampered by strict regulations and licensing, causing regional shortages and oversupply of cannabis, as well as impasses between supply of products and patient bases. Countries aiming to maximise revenue streams will need to relax regulations to unlock previously untapped revenue and medicines. Countries such as Australia, Thailand, Germany and even Canada have experienced shortages of cannabis at various times, in part due to restrictive border policies. In contrast, Oregon, which granted cultivation licences freely as its market expanded, experienced massive over-production with little option to export and subsequent steep price drops. This may serve as a cautionary lesson for other emerging markets on the risks of under-regulated cultivation markets. In the US, one large legal obstacle is that federal policy currently prohibits the transfer of cannabis across state lines, even between states with legal medical cannabis policies.

Another bottleneck faced by the industry in some countries is the shortage of licensed medical practitioners who can provide medical cannabis to patients.

- In the UK, patient access is restricted by a lack of licensed doctors. Calls for relaxation of licensing regulations are currently coming from the mainstream medical community.

Governments face the challenge of relaxing legislation around transport of cannabis while maintaining quality assurance of the product. Another solution to the issue of patient access in countries such as Australia and the UK is increased access to educational programmes and extensive online resources for cannabis-based treatment as seen in more established medicinal markets such as Canada and Israel and also the emerging market of Thailand. As licensing opportunities and legislation evolve, new opportunities will arise.



LICENSING BY GEOGRAPHY

Cannabis is one of the fastest growing nascent markets in the world. However, at present, cannabis licences are currently concentrated in country markets that are more established.

Sample of reported cannabis licences by country, October 2019

COUNTRY	TOTAL NO. OF LICENCES	LICENCE TYPE (SELF-DEFINED)
US	17,350	Cultivation, processing, distribution, testing and retail
CANADA	796	Cultivation, processing, testing, sale, research and drug licence
THAILAND	200	Sales
AUSTRALIA	81	Medicinal cannabis and research
LESOTHO	60	Cultivating, processing and selling

NB: Table is indicative and not exhaustive

Source: Prohibition Partners/trade interviews/governmental and media sources

In October 2019, Canada was home to 243 licence holders across cultivation, processing and distribution. 145 licences were also awarded for research. The initial medical cannabis sales licence was awarded to CanniMed in September 2013, whilst Prairie Plant Systems Inc. received a cannabis processing and cultivation licence in the same month. In July 2019, more licences were awarded to Candre Cannabis Inc., Cannogroup Development Corp. and Crystal Cure Inc. for medical cannabis sales, processing and cultivation.

Prohibition Partners estimates that as of October 2019, Canada is home to just over 400 retail locations. Alberta is the state with the highest number of retail licences at 254, giving it a density of about 5.7 stores per 100,000 inhabitants. This contrasts with Ontario, a region that decided to phase in

private cannabis retail stores and initially issue only 25 licences in April 2019. The reasoning behind this was influenced by supply shortages in the industry and the wish to protect the interests of private retailers. The Alcohol and Gaming Commission of Ontario (AGCO) implemented a lottery system to determine eligibility for the initial licences to legally operate a store in Ontario. As of October, 47 more licences have been granted of the total 75 which will be allowed. As such Ontario will eventually have 0.52 stores per 100,000 inhabitants. This is already causing disruption in the state, with many patients travelling hours to obtain medication. Since June 2019, the Food and Drug Administration (FDA) has awarded more than 200 cannabis sales licences to government and private hospitals and clinics in Thailand. However, due to a shortage of supply of CBD oil and THC oil produced by the GPO, only a handful of

licensees have commenced treating patients. Cannabis medication must be approved by the FDA before being allowed to go on sale. Only hospitals and clinics are eligible to apply and these must be staffed by doctors, dentists or pharmacists specially trained in dispensing cannabis by the Department of Medical Services (DMS). Thus far, the DMS has held six rounds of cannabis training, which have turned out 1,000-plus cannabis-trained medical professionals, who received issued training certificates and are required to be registered as authorised dispensers with the FDA. In a testament to the growing interest in medical cannabis in Thailand, the courses filled up several months in advance.

Australia's Office of Drug Control (ODC) received 246 licence applications, and granted 63 licences (24 medicinal cannabis licences, 16 cannabis research licences and 23 manufacture licences) by 30 June 2019. According to the ODC's website, this was much higher than anticipated. Under one of the patient access pathways (Special Access Scheme Category B), the number of monthly approvals for the supply of a medicinal cannabis product grew from 132 approvals in May 2018 to 1,374 in May 2019.

Medifarm holds three cultivation licences in Australia, issued by the federal government to grow cannabis for medicinal purposes. The company's cannabis farm in South East Queensland opened in August 2019.



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Other countries of note

AUGUST 2019

In August 2019, Jersey became the first region in the UK to grant a licence for farmers to harvest hemp flowers for cannabis oil.

JULY 2019

In July 2019, the Medicinal Cannabis Authority (MCA) in St Vincent and the Grenadines awarded the first-ever licences to cultivate commercial medical cannabis. 24 cultivation licences were given to local individual farmers or farming cooperatives with an aggregate membership of over 100 cultivators. As of September 2019, the MCA granted approval to 173 traditional cultivators who are now eligible to legally cultivate medicinal cannabis. In addition, two local cultivation companies and five individuals have also been granted licences with a further seven investor companies receiving licences. This points to the strong growth that the medical cannabis industry is seeing in the country.

JULY 2019

XPhyto's wholly owned German subsidiary Bunker Pflanzenextrakte GmbH was awarded a cannabis cultivation and extraction licence for scientific purposes. The licence authorises the company to cultivate and extract up to 70 different cannabis strains for scientific purposes at Bunker's high-security facility in southern Germany.

APRIL 2019

In April 2019, BfArM awarded cultivation licences to three companies with each company permitted to grow a combined total of 10,400 kilograms of medical cannabis over the next four years. There were 13 lots available – Aphria and Aurora received five each, and Demecan received the remaining three lots (the equivalent of 200 kilograms per year per lot).

APRIL 2019

In April 2019, the South African Health Products Regulatory Authority (SAHPRA) awarded four local companies production licences to supply medicinal cannabis to the export market. Afriplex partnered with the House of Hemp to produce medical cannabis in a purpose-built facility. The first Cannabis Cultivation Licence was also awarded to Paarl-based company Aphriplex (Pty) Ltd.

FEBRUARY 2019

In February 2019, the government of Zimbabwe had plans to license 37 companies. The first company to receive approval was Precision Cannabis Therapeutics Zimbabwe, which was awarded a medical cannabis licence in March 2019, pending the US\$46,000 fee. Since then, London-based Eco Equity has obtained a cultivation licence with plans to export GMP-certified cannabis to North America and Europe.



COMPANY AND MARKET ACTIVITY

- 1 Investor interest in the global cannabis industry is growing as cannabis legalisation continues to spread, especially across the US and Canada.**
- 2 Tilray was the best performing cannabis stock of 2018, but has seen a major dip in its share in 2019 due to distribution constraints in Canada.**
- 3 The cannabis industry is increasingly evolving into everyday consumerism, which is leading to struggling beer and tobacco companies looking for fresh avenues for new business ventures.**
- 4 Three of the fastest growing cannabis company shares for 2019 are GW Pharmaceuticals, Aphria and Hexo.**

Top 20 companies in the cannabis industry by market cap (US\$), October 2019



Source: Prohibition Partners

THE PIONEER SHARE

Tilray was the first cannabis company to be listed on a US stock exchange and the initial company to legally export medical cannabis to the US for a clinical trial. In 2019, it struck further deals to stock hemp CBD products into more US retail outlets. In September 2018, Tilray's stocks rose to US\$214 per share, but, by August 2019, crashed to US\$29 per share owing to distribution issues. Tilray currently trails its medicinal cannabis rivals, although recreational sales jumped during the second quarter of 2019. Tilray shipped less than 5% of Canada's recreational cannabis to the provinces during the fourth quarter and first quarter. However, the company signed a CA\$3.3 million deal in August 2019 with CanaMedical Pharma GmbH to supply Germany with medical cannabis from its new Portuguese operation. The deal has given Tilray an important first foothold in the EU in a country with a population and GDP figure twice the size of Canada's.

FAST-CLIMBING CANNABIS SHARES

Three of the fastest-growing cannabis company shares for 2019 are GW Pharmaceuticals, Aphria and HEXO.

- Since GW Pharmaceuticals launched Epidiolex in late 2018, its revenue has skyrocketed by 758% over the twelve months. Epidiolex continues to pick up momentum, generating twice the amount of sales in the second quarter than it did in the first and this will continue apace now that the EMA has approved its use (as Epidyolex) within the EU.
- Aphria saw revenue growth of 417% from August 2018 to August 2019, following a disappointing 2018. The company reported disappointing sales results for its third quarter of fiscal 2019 in April due to the company's limited production capacity. However, by the fourth quarter, sales had grown by 158%

per quarter in the recreational market. In the fourth quarter, its acquisition CC Pharma contributed more than three quarters of Aphria's total revenue.

- Throughout 2019, HEXO delivered trailing-12-month revenue growth of 245%, largely fuelled by the Canadian adult-use recreational cannabis market. However, production capacity had stymied growth. This is likely to have been resolved with the opening of a 1m sqft facility in April 2019.

LATIN AMERICA IS POSITIONING ITSELF IN THE CANNABIS MARKETPLACE

Uruguay was the first country in the world to legalise recreational cannabis, but has been slow to develop the market. This is set to change with one of the country's largest cannabis companies, Silverpeak Life Sciences Uruguay Inc, in talks with investors to raise US\$35 million during 2019 in a bid to quadruple production and build a larger extraction lab in 2020.

Latin America is further positioning itself in the cannabis market with three Colombian cannabis companies entering the global cannabis supply chain. Medical cannabis producer Clever Leaves is set to become the first Colombian company authorised to export cannabis to Canada. Khiron Life Sciences Corp., a Canadian integrated cannabis company with branded emergency-care-like clinics, is partnering with US cannabis company Dixie. Canadian-owned Colombia-based cannabis company PharmaCielo has an export licence for medical cannabis oil.

CROSS-BORDER VENTURES

A growing presence of Canadian cannabis producers, including Tilray, Inc. and Canopy Growth Corp., are listed on US stock exchange-



es in a bid to raise capital to fund expansion. US-based investment fund Northern Swan Holdings issued plans to expand its existing Latin American operations, including Clever Leaves, in August 2019. Clever Leaves is a vertically integrated licensed producer of medical cannabis in Colombia. The company plans to invest in new low-cost, large-scale cannabis cultivation and processing centres and to build out distribution channels and brands in Europe, Latin America and North America, for example Cansativa GmbH, a German cannabis distributor.

Medicinal cannabis business Althea Group has seen its share price rise fivefold since the start of 2019, and in July this year announced its first foray into Canada. The company has entered into a US\$35 million agreement to buy Canadian recreational cannabis business Peak Processing Solutions, provided the company attains US\$27 million in revenue within two years.

In December 2018, LA-based MedMen acquired Chicago-based PharmaCann, resulting in combined company New MedMen, which comprises a portfolio of cannabis licences in 12 states, permitting the new venture to operate 79 cannabis facilities.

VERTICAL FOCUS IS KEY FOR GROWTH

Growing numbers of companies display a seed-to-sale focus. Vertical integration has been a key focus for companies looking to grow both in North America as well as overseas to capitalise on the wave of legalisation. Cronos Group is an example of a company seeking to access an entire supply chain to operate on a global scale through its international production and distribution across five continents.

TOBACCO AND ALCOHOL GIANTS ENTER THE CANNABIS ARENA

Globally, there has been a long-term decline in alcohol consumption and smoking, and growing alliance activity; this is culminating in a string of deals by global alcohol and tobacco giants seeking to exploit what the North American cannabis sector has to offer:

- In November 2018, beverage giant Constellation Brands invested US\$4 billion for a stake in Canopy Growth.
- In 2018, Anheuser-Busch InBev, the world's largest brewer (owner of the Labatt Blue and Budweiser brands), and Canadian cannabis producer Tilray, Inc. announced that they would be partnering in a US\$100 million joint venture to research cannabis-infused non-alcoholic drinks for the Canadian market.
- Tobacco-market leader Altria acquired a 45% stake in Cronos Group in December 2018 valued at US\$1.8 billion.
- Molson Coors, the second largest beer maker in North America, struck a Canadian joint venture with cannabis producer Hexo Corp. to make cannabis drinks.
- Adopting a multi-disciplinary approach to treating conditions like chronic pain, small players, which have historically focused on medical cannabis, are considering entering the cannabis edibles market. Organigram is looking to collaborate with one of Canada's leading food product development companies, Smartest Kitchen. This reflects a desire among users of cannabis to move away from smoking and vaping, with discretion being a key demand for both medical patients and those consumers who have never before considered cannabis (or indeed smoking in some cases) and who now need to engage or who are simply 'curious'.



Abbreviations



ABBREVIATIONS

ACT	Australian Capital Territory
AU (\$)	Australian Dollar
BfArM	Federal Institute for Drugs and Medical Products (Germany)
BPC	Beauty and personal care
CA (\$ or D)	Canadian Dollar
CBD	Cannabidiol
CEO	Chief Executive Officer
CINV	Chemotherapy-induced nausea and vomiting
DMS	Department of Medical Services
EMA	European Medicines Agency
EU	European Union
FDA	Food and Drug Administration
FMCG	Fast-moving consumer goods
GDP	Gross Domestic Product
GMP	Good Manufacturing Practice
GP	General Practitioner
GPO	Government Pharmaceutical Organization (Thailand)
INC	Incorporated
INCB	International Narcotics Control Board
KODC	Korea Orphan & Essential Drug Center

LSE	London Stock Exchange
M&A	Mergers and Acquisitions
MCA	Medicinal Cannabis Authority
MEP	Member of the European Parliament
MS	Multiple sclerosis
NGO	Non-governmental organisation
NHS	National Health Service
NPD	New product development
NYU	New York University
ODC	Office of Drug Control (Australia)
PMS	Premenstrual syndrome
PTSD	Post-traumatic stress disorder
R&D	Research & Development
SAHPRA	South African Health Products Authority
TCM	Traditional Chinese Medicine
THC	Tetrahydrocannabinol
UAE	United Arab Emirates
UN	United Nations
UNODC	United Nations Office for Drugs and Crime
UK	United Kingdom
US(A)	United States (of America)
USPN	US Patent Number
USPTO	US Patent and Trademark Office
WHO	World Health Organization
WIPO	World Intellectual Property Organization



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