CURALEAF REPORT

The Hidden Dangers of Illicit Cannabis

curaleafclinic.com

Contents

FOREWORD FROM

Juan Martinez

Head of Curaleaf International

Medical cannabis is steadily gaining acceptance, now legal in 75 countries, including the UK since 2018. However, due to the barriers people face in accessing medical cannabis, many continue to access cannabis via the illicit market. In the UK alone, an estimated 1.8 million people use illicit cannabis for health reasons, often unaware of the potential health risks or the availability of regulated alternatives. As the legal market continues to expand, it's essential to raise awareness and remove the obstacles that drive patients to illicit sources.

At Curaleaf International, Europe's largest medical cannabis company, we are committed to patient safety and product quality. Our extensive supply chain network delivers cutting-edge cannabis products based on rigorous research and development. Curaleaf's experience in the United States, where we witnessed the dangers of illicit cannabis and the vital role of regulated alternatives, has driven us to partner with Manchester Metropolitan University to study the risks of unregulated cannabis in the UK.

This report, "The Hidden Dangers of Illicit Cannabis," uncovers the potential harm caused by unregulated cannabis, including contamination from mould, yeasts, bacteria, heavy metals, and chemical residues. These contaminants may pose significant health risks, particularly to vulnerable populations using cannabis for medical reasons.

Cannabis prohibition is gradually being replaced with responsible legal regulation, reflecting a shift in public opinion and evidence. The continued criminalisation of cannabis users has proven to be ineffective and may even worsen existing challenges. I hope regulators will consider the findings of this report when making necessary changes to medical cannabis programs, not only in the UK, but globally, to reduce the barriers patients face. Reform of the current regulations would help address some of the problems associated with the illicit market. This includes assurances that products meet acceptable standards, disruption of criminal and gang activity, and generation of tax revenue and jobs. Finally, it would allow organisations to implement public health initiatives and education programs.

By exposing these hidden dangers, we aim to empower patients, encourage informed choices, and advocate for legal, regulated cannabis. As the cannabis industry evolves, safety, transparency, and education must remain top priorities. Therefore, I urge all readers – consumers, patients, healthcare professionals, and policymakers alike – to carefully consider this report's findings.

FOREWORD FROM

Dr Simon Erridge

Research Director at Curaleaf Clinic

Curaleaf Clinic provides patients with the highest standard of medical cannabis care, backed by science. With illicit cannabis becoming more accessible, especially online, highlighting the risks of unregulated products is crucial. The unchecked growth of the illicit cannabis market poses significant threats to public health, and it is our responsibility to shed light on the hidden dangers associated with these products.

Our partnership with Manchester Metropolitan University has revealed alarming contamination levels in illicit cannabis, including mould, yeasts, bacteria, heavy metals, and chemical residues, highlighting the potential health risks associated with these products.

We have previously published research that estimated 1.8 million patients in the UK self-treat diagnosed health conditions with illicit cannabis. This report serves as a crucial resource, informing the public, healthcare professionals, and policymakers about the dangers of unregulated cannabis. We aim to empower consumers with knowledge, enabling them to make informed choices about their health.

By advocating for the use of regulated cannabis products by suitable patients and supporting the growth of a responsible medical cannabis industry, we strive to protect individuals from the harmful effects of contaminated illicit cannabis.

Through this report, we hope to spark a dialogue about the importance of cannabis safety and encourage a shift towards responsible consumption. By promoting accountability in the cannabis industry, we can collectively work towards safeguarding public health and ensuring that suitable patients have access to medical cannabis that abides by the necessary standards.

Introduction

Cannabis, a plant cultivated for over 5000 years, has seen a recent rise in global legal consumption due to changing laws and regulations. This is particularly true in North America, where a significant portion of the population has used cannabis for non-medical purposes in the past year, and in Europe, where cannabis use is increasingly prevalent. Most importantly, many countries are improving access to medical cannabis, including Germany, which recently removed it from the narcotics list. In the UK, medical cannabis has been legal to prescribe since 2018.

Despite the introduction of regulated sources of cannabis, which need to conform to regulations to protect the safety of consumers, many still continue to consume illicit cannabis.

> The Office of National Statistics estimates 7.8% of UK adults aged 16 to 59 years (around 2.6 million people) consumed cannabis in the past year.

Our own research published in JMIR Public Health and Surveillance estimated that in 2022 3.3% of UK adults (approximately 1.8 million people) consumed illicit cannabis for the purpose of self-treating a diagnosed health condition.

Whilst the legal risks will be well known, illicit cannabis consumers may also be subject to hidden risks to their health from potentially harmful contaminants. These may include bacteria, fungi, heavy metals, pesticides, chemical residues, synthetic cannabinoids, and glass among others. This is in comparison to medical cannabis which is governed by strict quality control measures across the supply chain from seed to patient. This is to ensure compliance with standards set for the safety of medicines by regulators in the UK and other jurisdictions.

Like any crop, cannabis can become contaminated with bacteria and fungi, posing a potential risk to human health. It is particularly susceptible to fungal growth, especially when stored improperly.

Image owned by Curaleaf International

Some microbes are harmless, even beneficial, to the plant, but others can cause infections in humans if inhaled or ingested. Several bacterial and fungal species have been identified on cannabis, some of which are known to cause serious infections, particularly in individuals with weakened immune systems. This has in some cases led to reported cases of respiratory complications and other infections linked to illicit cannabis.

Another key concern is the presence of heavy metals. Cannabis can absorb and concentrate heavy metals from the environment. These metals, including lead, cadmium, arsenic, and mercury, can accumulate in different parts of the plant, particularly in the leaves and flowers. When consumed, these heavy metals can lead to a range of adverse health effects, from acute poisoning to chronic conditions such as kidney damage, neurological disorders, and cancer. The risk is higher in areas with industrial activity or pollution, where soil contamination may be more prevalent.

Synthetic cannabinoids may also be found in illicit cannabis samples, which poses a significant threat to consumers. These man-made chemicals mimic natural cannabinoids, like Δ9-tetrahydrocannabinol (THC), but often with much higher potency and unpredictable side effects. Synthetic cannabinoids are sometimes added to cannabis products to enhance their psychoactive effects or to circumvent legal restrictions. However, these substances can cause severe health issues, including arrhythmias, vomiting, behaviour changes, and even death. The lack of regulation and standardisation in illicit cannabis makes it challenging for consumers to detect and prevent the addition of these dangerous synthetic compounds.

Pesticide contamination is another potential concern. As with any agricultural crop, cannabis is susceptible to pests and diseases, leading some growers to use pesticides to protect their yields. However, many pesticides that are considered safe for use on food crops have not been evaluated for safety when combusted and inhaled when consuming cannabis. Some pesticides can break down into harmful compounds when heated, potentially causing respiratory issues, headaches, nausea, and long-term health problems. Medical cannabis patients, meanwhile, can be assured that their medications are produced in compliance with good agricultural and collecting practices and are tested for the presence of common pesticides.

Across Europe, including the UK, countries have adopted criteria set out by medicines regulators to ensure the consistency of medical cannabis products and ensure patients are protected from potentially harmful contaminants. Medical cannabis products must be grown in conditions which meet European guidelines for Good Agircultural and Collection Practice (GACP) and manufactured into finished products in accordance with Good Manufacturing Practice (GMP).

Finally, each batch must be tested to ensure compliance with internationally recognised standards of microbials, heavy metals, pesticides, and other potential harmful contaminants. This process adds additional costs and time to manufacture medicines from cannabis. Those involved in producing and selling illicit market cannabis have no duty of care to protect patients in the same manner and therefore do not go to the same lengths.

> An estimated 1.8 million people in the UK are self-treating diagnosed health conditions with illicit cannabis.

This highlights the risks of just a few potential contaminants in illicit cannabis. This is likely to be alarming to any illicit cannabis consumer, but this may be of particular concern to the estimated 1.8 million people in the UK who are self-treating diagnosed health conditions with illicit cannabis, particularly if their health condition makes them more vulnerable to the potential adverse health effects. This white paper examines the potential health risks of consuming illicit cannabis in the UK. This is also relevant internationally due to interconnected illicit markets. We aim to raise awareness that medical cannabis, conforming to pharmaceutical safety standards, offers a safer, legal alternative for patients with chronic health conditions compared to illicit cannabis.

Methodology

This report combines numerous data sources to provide a comprehensive picture of the illicit cannabis market in the UK. This includes:

- A collaborative effort between Curaleaf and Manchester Metropolitan University analysed the chemical and microbial composition of 60 illegal cannabis samples seized by law enforcement in Greater Manchester and Northumbria, UK.
- A search of the Welsh Emerging Drugs & Identification of Novel Substances (WEDINOS) website on 29 July 2024 assessed the contamination of samples that were purchased with the intent of consuming cannabis or a derived product since 2013.
- A survey amongst 720 Curaleaf Clinic patients in the UK, who are currently prescribed medical cannabis for diagnosed medical conditions who previously used illicit cannabis.
- A survey of 500 cannabis consumers in the UK, conducted in August 2024, to ascertain current views on the illicit market.

Cannabis Testing with Manchester Metropolitan University

Curaleaf and Manchester Metropolitan University collaborated to analyse the chemical and microbial composition of illegal cannabis seized by law enforcement in Greater Manchester and Northumbria, UK. Over six months, 60 samples were tested using techniques such as gas chromatography-mass spectrometry (GC-MS), liquid chromatography, and microbial assessments. The aim was to identify contaminants, including fungi, bacteria, heavy metals, pesticides, and synthetic cannabinoids.

Thirty samples each were analysed from Greater Manchester and Northumbria respectively. Each sample came from a separate seizure.The cannabis samples were collected from police operations across each region. All samples were anonymised to protect ongoing investigations.

Commenting on the study, Dr Oliver Sutcliffe, Reader at Manchester Metropolitan University and Director of the MANchester DRug Analysis and Knowledge Exchange (MANDRAKE) partnership, said:

"Our collaboration with Curaleaf has allowed us to conduct detailed analyses of cannabis samples seized by police forces, uncovering a range of hazardous substances. By working together, we hope to provide valuable insights that will help consumers make safer choices and encourage the development of policies aimed at reducing the prevalence of harmful, unregulated cannabis in the market. Our findings serve as a stark reminder of the importance of vigilance and education in protecting public health."

Microbial Analysis

Each sample was tested for Escherichia coli (E. coli), Salmonella and fungi.

Plates were incubated for 48 hours at 29°C to determine bacterial counts. Fungal plates, meanwhile, were incubated at 29°C and counted at 48 and 120 hours.

E. coli and Salmonella: No E. coli or Salmonella were found in Greater Manchester samples. One (3%) Northumbria sample showed growth of both.

Fungi: Twenty-seven (90%) samples from both Greater Manchester and Northumbria showed fungal growth. The growth consisted of both mould and yeasts but was predominantly mould. A wide variety of different moulds were observed.

The widespread fungal contamination is suggestive of a systemic issue of fungal contamination of illicit cannabis considering it was present in 90% of samples across two different police forces. Whilst these fungi were not directly characterised as to whether they were harmful or not harmful, it is indicative that the cultivation and handling of illicit cannabis is not sufficient to protect against contamination from mould. Consequently, patients may be at risk of developing fungal infections if they consume illicit cannabis. This risk will be higher in people with a weakened immune system and/or lung damage.

Chemical Analysis

Samples were analysed utilising GC-MS and liquid chromatography as appropriate to assess for contamination by pesticides, heavy metals, and controlled substances. The relative composition of THC, cannabidiol (CBD), and cannabinol (CBN) was also assessed.

Pesticides and Controlled Substances

None of the surveyed samples were determined to contain any other organic (e.g. pesticides) or controlled substances (e.g. synthetic cannabinoids receptor agonists).

This particular outcome from the analysis is promising in isolation for illicit cannabis consumers, but will be revisited in an additional analysis, which assesses the prevalence of controlled substances in illicit cannabis samples from a wider sample.

Heavy Metals

Heavy metals shown above the detection limit of the Manchester Metropolitan University analytical method underwent further analysis to quantify their levels.

Most heavy metals were below detection limits or at low levels. The exception to this was lead, as one sample (3%) in Northumbria and four samples (13%) in Greater Manchester were found to contain the heavy metal.

The limits for permitted exposure of lead from cannabis-based medicinal products is set out by the International Council for Harmonisation guideline for elemental impurities. In this guideline the permitted daily exposure of lead is 5 micrograms per day via inhalation. Assuming a typical daily dose of 1 gram in illicit cannabis users, 3 (10.00%) of the samples from Greater Manchester would exceed this limit. No (0%) samples from Northumbria would exceed this limit.

Overall, metals associated with plant material were at typical levels. Iron, manganese, and zinc were present but not at harmful levels.

Lead is the primary concern. Lead is not widespread in these samples, and therefore lead poisoning is unlikely for most consumers. However, this risk is not eliminated compared to medical cannabis products which must conform with internationally recognised standards. Lead poisoning's effects are often irreversible and particularly harmful to the nervous and cardiovascular systems.

Cannabinoid Levels

In Greater Manchester, THC, CBD, and CBN were detected in the samples. All samples contained THC, with 11 samples (37%) THC and CBD, 27 samples (90%) containing THC and CBN, and 9 samples (30%) containing THC, CBD and CBN.

The average concentration of THC by weight in the samples surveyed from Greater Manchester was 3.46 ± 0.06 %.

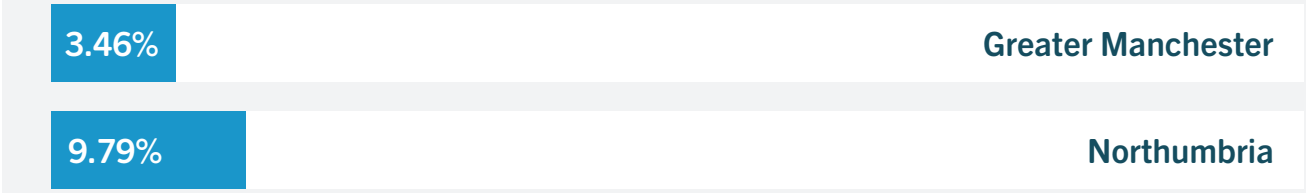
The average content of CBD and CBN in samples containing either cannabinoid were 0.19 ± 0.02 % and 0.56 ± 0.03 % respectively.

In the samples from Northumbria, only THC and CBN were detected in the samples. No CBD was detected.

All samples contained both THC and CBN. The average concentration of THC in the samples surveyed was 9.79 ±0.09 %. The average content of CBN was 3.43 ± 0.12 %.

This highlights discrepancies between regions as to the potential concentration of cannabinoids found within illicit cannabis products and the lack of standardisation one may expect when sourcing cannabis via these means.

Average concentration of THC by weight



WEDINOS Analysis

A search of the **WEDINOS website** on July 29, 2024 supplemented the lab analysis with geographically diverse data. WEDINOS provides an anonymous service to people across the UK for collecting and testing drug samples to assess concordance between intended purchase and content.

WEDINOS was first set up in 2009 to assess local drug samples, but now provides a robust mechanism for the collection and testing of substances. Individuals can submit a sample themselves, or be supported to do so through substance misuse services, housing and hostels, youth clubs and young people's services, education, night clubs and bars, mental health community teams, local authorities, ambulance service and the police.

The data derived from the website was analysed to identify any products that were purchased with the assumption that they were cannabis or natural cannabis-derived products. The search criteria were broad and extended to all terms that could be used to describe cannabis or a derived product to ensure complete capture.

Of 38,820 data entries, 1,635 (5%) had been analysed as samples that were purchased under the assumption they were cannabis or natural cannabis-derived products.

Samples were analysed between September 27, 2013 to July 9, 2024 and the most common samples were vape cartridges (n = 636; 39%), dried flower (n = 387; 24%), and edibles (n = 219; 13%).

Unsurprisingly, given WEDINOS' location in Wales one in five samples (n = 339; 21%) were from the region. The next most common locations were the South East (n = 283; 17%) and London (n = 203; 12%).

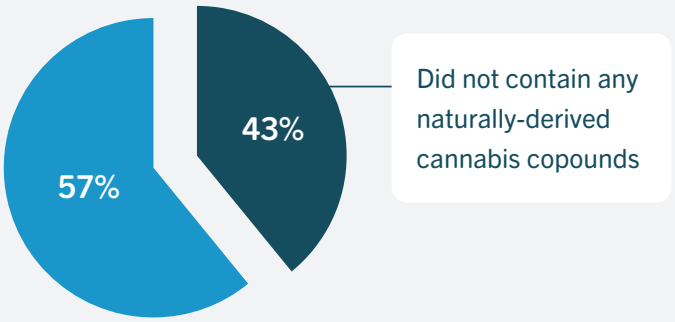
Key Findings

Absence of Active Compounds

Notably, 10% of samples contained no active compounds at all. This indicates that a significant portion of the illicit cannabis market may be selling ineffective or inert products, deceiving consumers. This is also supported by the analysis with Manchester Metropolitan University of seized samples from Greater Manchester which show the THC, CBD, and CBN content of each sample was low.

Cannabis Content

Over half of the samples analysed by WEDINOS (57%) were reported as being cannabis or containing a major natural component of cannabis, such as THC, CBD, or CBN. However, 43% of the samples tested did not contain any naturally-derived cannabis compounds, highlighting the prevalence of misrepresented products in the illicit market.



Stability of Cannabis Content

The proportion of samples containing cannabis has remained relatively stable over the years, with no clear trend indicating whether the situation is improving or deteriorating. This suggests that the presence of genuine cannabis in the illicit market is inconsistent and unpredictable.

Contamination

Alarmingly, 38% of all samples contained a compound not naturally found in the cannabis plant.

The most common contaminants were synthetic cannabinoid receptor agonists, such as Spice or K2, which were present in 27% of the samples. These synthetic compounds are known to have severe potential health effects, including acute toxicity and unpredictable psychoactive responses. Seventeen (1%) samples contained cocaine, and nine (1%) contained opiates and ketamine respectively.

27%	**Synthetic cannabinoids (e.g. Spice or K2) present**
1%	**Cocaine present**
1%	**Opiates & ketamine present**

Vape Cartridges and Contaminants

Vape cartridges were found to be the least likely to contain derivatives from the cannabis plant, with the highest likelihood of containing contaminants. 57% of vape cartridge samples contained a contaminant, making them the most adulterated form of cannabis product. Oils and flower also showed high levels of contamination, at 38% and 29% respectively.

Consumer Survey

In August 2024, Curaleaf and Opinium Research conducted a survey to understand consumer behaviour and awareness regarding illicit cannabis use in the UK. We polled 500 cannabis consumers via telephone using a standardised set of questions developed in collaboration with Opinium and researchers based at Imperial College London. The sampling methods used and answers were weighted to produce a national representative sample of UK cannabis consumers based on age, gender and region.

The survey aimed to illuminate why individuals opt to consume illicit cannabis, their awareness of associated risks, and consumption patterns. These findings provide valuable insights into consumer preferences and concerns, helping to inform strategies for public health and safety, as well as guiding future policy and education efforts.

Key Findings

Prevalence of Illicit Cannabis Use

The survey revealed that a significant 75% of cannabis consumers in the UK have sourced cannabis illegally in the past three years.

Purpose of Cannabis Use

Two-thirds (66%) of respondents consume illicit cannabis for recreational purposes, while a significant proportion consume it for managing symptoms of diagnosed (35%) or undiagnosed (23%) medical conditions, such as anxiety, depression, chronic pain, insomnia, and ADHD.

Frequency of Purchases

Among those buying cannabis illegally, 35% do so weekly, 21% purchase monthly, and 17% buy less frequently than every six months. Age differences were notable, with 41% of 35-to-54-year-olds purchasing illicit cannabis weekly, compared to only 24% of those aged 55 and above.

Perceived Effectiveness

One-third (31%) of those using illicit cannabis for symptom management report significant relief, compared to 36% of those using legally sourced cannabis.

Comparing to medical cannabis

Over half (56%) of respondents perceive medical cannabis as safer than illicit cannabis, of whom 30% said it was much safer.

Awareness and Concerns

While 81% of respondents are aware that illicit cannabis may contain contaminants, only 34% fully understand the associated health risks. The primary concerns around cannabis use include legal risks (34%), health risks (28%), and inconsistent potency (24%).

Sources of Illicit Cannabis

Street dealers remain the most common source of illicit cannabis, with 45% of users currently purchasing from them. Friends and family are the next most common sources (44%), followed by instant messaging apps (19%), social media (15%), and online sources (including websites and the dark web) (15%). 7% report that they engage with ‘QR codes’ provided by illicit dealers.

45%	Street Dealers
44%	Family & friends
19%	Instant messaging apps
15%	Social media
7%	QR codes

Websites offering illegal cannabis products (often called the grey market) have experienced significant growth, with the percentage of consumers purchasing from these sources nearly doubling from 6% to 11%. This is a notable shift, as it indicates that one in ten cannabis consumers now turn to these platforms for their supply. Among younger adults, this trend is even more pronounced, with 15% of 18-24 year olds buying cannabis online. The rise in digital purchasing highlights the evolving landscape of cannabis distribution, particularly as more consumers, especially younger ones, embrace online options.

Consumers spend an average of £188 per month on illicit cannabis purchased online, with a median expenditure of £150.

Convenience (51%), product quality (49%), price (37%), promotions and discounts (32%), and variety (31%) were cited as the primary reasons for purchasing cannabis online illegally.

This survey highlights that despite the introduction of legal medical cannabis in the UK, a large proportion of people who choose to self-medicate with cannabis continue to do so via illicit channels. Whilst these individuals are aware of the potential for contamination, these results suggest they are not fully informed of the extent of contamination or the harms these may present.

Patient Survey

Between 13th August and 6th September 2024, Curaleaf Clinic administered an anonymous survey to its patients to provide greater insights from current legal cannabis patients who have previously self-medicated on the illicit market. The survey was only distributed to individuals who had previously reported that had accessed cannabis prior to starting treatment at the clinic by either legal prescription, illicit means, or in countries where cannabis can be accessed legally without a prescription.

The survey received 720 responses, with 561 (78%) reporting consuming illicit cannabis. It provides valuable insights into patients' reasons for initially using illicit cannabis, their experiences with unregulated products, and the impact of switching to legally prescribed cannabis. By exploring these dynamics, the survey aims to highlight the importance of regulated access to medical cannabis.

Key Findings

Prior Sources of Illicit Cannabis

The primary sources of illicit cannabis were friends and family (43%) and street dealers (39%), with 6% sourcing online (in line with the trends from two years ago highlighted in the consumer survey conducted with Opinium Research).

Spending on Illicit Cannabis

33% of patients spent £0-99 per month, 25% spent £100-199 monthly on illicit cannabis and 20% spent over £200 per month on cannabis. Notably, 45% believed that illicit cannabis was more expensive than medical cannabis. 29% of respondents believed that medical cannabis is more expensive, whilst 25% were unsure or thought the costs were similar.

Health Effects and Side Effects

21% reported negative health effects from using illicit cannabis, with anxiety being the most commonly reported side effect (18%). Other common side effects included brain fog, paranoia, and cough. 32% also reported they are anxious of potential legal repercussions of illicit cannabis. 31% reported the product was of variable quality and 29% found it was difficult to obtain consistency.

Only 5% reported no negative experiences in sourcing their cannabis illicitly.

Health Effects Post-Switch

64% noticed a change in symptoms after switching from illicit to medical cannabis, with 48% and 19% finding medical cannabis significantly and slightly more effective in helping the symptoms of their condition than illicit cannabis, respectively.

Reasons for Switching to Medical Cannabis

The primary reasons for switching included the illegality of illicit cannabis (61%), known sourcing (50%) ,better regulation (49%), improved consistency (47%), and the availability of guidance from a clinician (44%).

61%	Illegality
50%	Known sourcing
49%	Better regulation
47%	Improved consistency
44%	Clinician guidance

Implications for Public Health and Consumer Safety

Our research reveals significant health risks from illicit cannabis. Contaminants range from biological agents to heavy metals and synthetic compounds. This has critical implications:

1. **Health Risks from Microbial Contaminants**

The most clear and present risk to individuals highlighted in this analysis is the contamination of cannabis with fungi, including moulds and yeast. With 90% of tested samples showing fungal growth, this presents a systemic issue across different illicit sources. This suggests that there is a risk that individuals may unwittingly be consuming potentially harmful microbes. This is exacerbated by the presence of E.coli and Salmonella on a limited selection of samples. Individuals who are self-medicating for health conditions and have a reduced ability to fight infections or lung damage may be at the highest risk of the adverse health effects of these contaminants.

2. **Unregulated Market Risks**

The results highlight that people are also at risk of consuming other potentially harmful substances, such as lead and synthetic cannabinoid receptor agonists. As highlighted in the survey studies, most people are unaware of the extent of potential contaminants and the harms that may result from this. Whilst these individual substances are associated with specific harms,these are just a small selection of potential risks that were able to be assessed within this research project. The variability and lack of consistency in illicit cannabis, also highlighted by the variability in THC, CBD, and CBN found between samples in Greater Manchester and Northumbria serves as a further reminder of this.

3. **Consumer Awareness and Behaviour**

Survey data indicates that while a majority of cannabis consumers are aware that illicit cannabis may contain contaminants, there is still a significant gap in understanding the full extent of the associated health risks. The fact that many consumers continue to purchase cannabis from illicit sources due to perceived convenience, quality, and price highlights the need for better education on the dangers of unregulated products and awareness of legal medical cannabis for those who may be eligible.

Implications for Policymakers

The report and associated data suggest several actions for policymakers to mitigate the risks associated with illicit cannabis:

1. **Stricter Enforcement and Regulation**

There is a pressing need for enhanced enforcement against the distribution and sale of illicit cannabis, particularly when so many are still sourcing illicit cannabis for health reasons when a legal alternative exists. Policymakers should consider expanding efforts to target illegal online sales channels and other illicit markets, including urging search engines to enforce stricter rules.

2. **Public Awareness Campaigns**

Increasing public awareness about the dangers of illicit cannabis is crucial. Educational campaigns should focus on the health risks associated with contaminants compared to regulated, tested cannabis products. Informing the public about the potential harms of synthetic cannabinoids and other contaminants found in illicit cannabis could significantly reduce demand for these products.

3. **Create a more sensible regulatory framework**

The existing classification is preventing the safe and legal import/export of medical cannabis, making it difficult to conduct research and to supply medical cannabis to those that need it. Reclassifying cannabis intended to be manufactured or sold as a medicine to Schedule 2 and investing in the right type of clinical trials to help determine if it should be more widely available on the NHS will help enable cannabis to be accessed safely and legally for medical purposes where appropriate and reduce dependency on illegal cannabis products.

4. **Electronic prescribing**

Enabling electronic prescribing of cannabis medicines would reduce the bureaucracy imposed on doctors and improve the efficiency of medicine dispensing. Currently, the NHS Business Services Authority has poor oversight over the number of medical cannabis prescriptions in the UK. By implementing electronic prescribing this would improve oversight and lead to more robust national data available for researchers to examine the effectiveness of cannabis medicines.

Implications for the Cannabis Industry

The findings from this study also carry significant implications for the cannabis industry, particularly in terms of promoting safer practices and ensuring product quality. Key considerations include:

1. **Reduce Barriers for Eligible Patients**

Cost, was highlighted by the consumer survey as a key factor that would help eligible patients move away from illicit to legal medical cannabis. Curaleaf Clinic works hard to provide care at the most accessible price without compromising quality. All private appointments for patients are £50, with patients on the Curaleaf Access Scheme receiving their first follow up for free. In addition, UK military veterans receive five free appointments per year with Curaleaf Clinic. To find out more click here.

2. **Continued Research and Development**

Ongoing research into the safety and efficacy of cannabis products is critical. The industry should invest in studies that explore the long-term effects of cannabis use, the impact of various contaminants, and the development of safer consumption methods to help provide the evidence required to consider future randomised controlled trials. Curaleaf has a reputation as not only a UK leader in medical cannabis research, but internationally. Through development of the UK Medical Cannabis Registry and a range of both pre-clinical and clinical research activities Curaleaf International published over 40 peer-reviewed studies. This is already crucial in guiding current clinical practice through the clinic, but will also help determine the future role of medical cannabis in healthcare more broadly.

Implications for Future Research

In addition to repeated calls for further research on medical cannabis to help identify where it should be used more broadly, the findings of this white paper specifically point to several areas where further research is needed:

1. **Expanded Contaminant Studies**

More comprehensive studies on the range of contaminants found in illicit cannabis and their specific health effects are necessary. Research should focus on understanding the prevalence and impact of synthetic cannabinoids and other novel adulterants.

2. **Behavioural Research**

Understanding consumer behaviour and motivations for choosing illicit cannabis can help shape more effective public health interventions. Researchers should explore how awareness campaigns and education influence consumer choices and assess the impact of different regulatory environments on consumer behaviour.

3. **Cross-Disciplinary Collaboration**

The complexities of the cannabis market and its regulation require a multidisciplinary approach. Collaborating across fields such as toxicology, public health, pharmacology, and law enforcement can provide a more holistic understanding of the challenges and inform better policy decisions.

Conclusion

The Curaleaf report underscores the significant dangers associated with illicit cannabis. Through detailed analysis and collaboration with Manchester Metropolitan University and others, we have uncovered the prevalence of harmful contaminants in illegal cannabis samples. These findings highlight the importance of understanding the potential health harms associated when choosing to consume cannabis sourced from the illicit market.

Where individuals are seeking to self-treat health conditions with illicit cannabis it is specifically important that they are aware of the availability of legal medical cannabis and whether they may be suitable candidates. We urge consumers to be aware of the risks, policymakers to take action to address this public health concern, and researchers to continue exploring the complexities of cannabis safety and regulation.

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