

Victoria Cannabis Buyer Club's Federal Exemption Application

Submitted to: The Honourable Patty Hajdu

Minister of Health

House of Commons

Ottawa, Canada K1A 0A6

Submitted on behalf of the Victoria Cannabis Buyer Club by:

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Dated: April 9, 2021

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Overview

1. The Victoria Cannabis Buyers Club (the “VCBC” or the “Club”) is a medical cannabis compassion club that has operated since 1996 in Victoria, BC. It has approximately 8,000 members.¹
2. The VCBC applies to the Honourable The Honourable Patty Hajdu, Minister of Health and the minister responsible for cannabis regulation, for an exemption pursuant to sections 140(1) and (2) of the *Cannabis Act*, SC 2018, c 16 (the “Act”) in order to allow the Club to continue providing its members with vital services that relieve the symptoms of their medical conditions and improve their quality of life.
3. Section 140(1) of the Act provides the following:

The Minister may, on any terms and conditions that the Minister considers necessary, by order, exempt any person, or any cannabis or any class of cannabis in relation to a person, from the application of all or any of the provisions of this Act or of the regulations if, in the opinion of the Minister, the exemption is necessary for a medical or scientific purpose or is otherwise in the public interest.²
4. Section 140(2) similarly provides that the Minister may exempt any class of persons from the Act or Regulations.³
5. The VCBC, its members, and its growers seek an exemption from the Act and Regulations on the following grounds:
 - a. **Medical:** the VCBC’s work serves the urgent medical needs of its members, all of whom live with chronic conditions, by providing low-barrier access to high-quality medical cannabis.
 - b. **Public Interest:** the VCBC serves the public interest by providing affordable medical cannabis from reputable suppliers as an alternative to

¹ Affidavit #1 of Ted Smith, affirmed March 26, 2021 at para 33 [Smith Affidavit].

² *Cannabis Act*, [SC 2018, c 16](#), s 140.

³ *Cannabis Act*, s 140(2).

pharmaceutical and street drugs, reducing the harms of opioid use and the opioid overdose epidemic, upholding safety and security policies, controlling access to its products through member screening, and fostering positive relationships with the local community, its neighbours, and the City of Victoria.

6. The VCBC is committed to transitioning its operations as much as possible to a licensed model in compliance with Health Canada's requirements. The VCBC therefore asks to be exempted from some parts of the Act and Regulations on a temporary basis, to ensure its members do not experience any interruption in their medical treatments while the VCBC and its suppliers are in the process of obtaining licenses. The VCBC seeks an exemption from other parts of the Act and Regulations on a permanent basis in order to preserve the aspects of its operations that assist its members with specific medical needs that are not met by the regulated medical cannabis regime.

Facts About the VCBC

The VCBC has a long history of dedicated and compassionate service to its members

7. The VCBC is a non-profit society with a 25-year history of supporting individuals with chronic medical conditions, including chronic pain and opioid dependency.⁴ Founded by Ted Smith in 1996, the VCBC initially worked to alleviate the suffering of people living with HIV/AIDS.⁵ Mr. Smith witnessed the agonizing pain and debilitating illness caused by this disease and the drug cocktails then used to treat it, and he was deeply affected by the intolerable suffering these patients experienced.⁶ Mr. Smith came to understand that cannabis can help alleviate that suffering, and he felt compelled to use medical cannabis to help those in need.⁷

⁴ Smith Affidavit at paras 1-2.

⁵ Smith Affidavit at paras 5-8.

⁶ Smith Affidavit at paras 6-8.

⁷ Smith Affidavit at para 7.

Nothing is more important to him than “providing relief to those suffering towards the end of their lives.”⁸

8. When the VCBC was founded, little was known about the medical uses of cannabis.⁹ However, Mr. Smith and the early members of the VCBC observed and experienced firsthand that patients suffering from AIDS, hepatitis C, cancer, chronic pain and other serious medical conditions were able to find relief from their symptoms by smoking, eating, and topically applying cannabis products.¹⁰ These observations led Mr. Smith, VCBC members, and the Club’s supporters to begin advocating on behalf of individuals whose lives had been positively transformed through the use of cannabis as medicine.¹¹
9. ██████████, a VCBC member from 2003 until her death in 2016, also profoundly influenced the VCBC’s work.¹² ██████████ was a tireless advocate for medical cannabis, which she used for many years to help her manage numerous chronic medical conditions, including the terminal cancer that ultimately ended her life.¹³ ██████████ personal fortitude, sustained advocacy, and positive experiences using medical cannabis continue to inspire the VCBC’s work and its members, and have left a moving legacy for Mr. Smith, her partner of ten years.¹⁴

The VCBC has tirelessly advocated on behalf of their members

10. Over more than two decades, the VCBC’s staff, board, and supporters have persistently advocated on behalf of their members and have put themselves at considerable risk to protect their members’ access to medical cannabis. The VCBC’s facilities have been raided by police numerous times, and its staff have been arrested, criminally charged, and acquitted on constitutional grounds.¹⁵

⁸ *Ibid.*

⁹ Smith Affidavit at para 8 and Ex L at 486.

¹⁰ *Ibid.*

¹¹ *Ibid.*

¹² Smith Affidavit at para 10.

¹³ *Ibid.*

¹⁴ *Ibid.*

¹⁵ Smith Affidavit at paras 15-16 and Ex L at 486.

11. In 2015, the Supreme Court of Canada upheld the acquittal of Owen Edward Smith, who worked for the VCBC producing edible and topical cannabis products and had been charged with possession of THC and possession for the purpose of trafficking.¹⁶ The Court found that the prohibition on forms of medical cannabis other than dried marijuana violated s. 7 of the *Charter* and that the infringement was not justified under s. 1.¹⁷ The Court upheld the trial judge's findings that different methods of administering medical cannabis had different medical benefits and were appropriate to meet individual medical needs, and that prohibiting cannabis edibles, gel capsules, and topical products deprived medical users of the liberty to choose how to take their medication.¹⁸
12. The *Smith* case, which was led by the VCBC, was an important step forward in the long project of securing access to cannabis for medical uses, and yet many aspects of the VCBC's work for its members remain criminalized.

The VCBC serves only screened and approved members with medical conditions

13. The VCBC serves only medical cannabis users, and has done so since its founding.¹⁹ Individuals who wish to become members must provide medical proof of a chronic condition and meet age requirements.²⁰ VCBC members come from diverse backgrounds, and many of them suffer from debilitating physical conditions that affect their quality of life in multiple ways.²¹ The average age of VCBC's members is 55-60 years; and members range in age from their early 20s to 90s.²²
14. VCBC members live with a variety of chronic conditions, including cancer, AIDS, epilepsy, multiple sclerosis, osteoarthritis, rheumatoid arthritis, neuropathy, anxiety, chronic pain, bronchitis, irritable bowel syndrome, and multiple

¹⁶ *R v Smith*, [2015 SCC 34](#) at paras [5-6](#), [8](#), [34](#) [*Smith*].

¹⁷ *Smith* at paras [28-29](#).

¹⁸ *Smith* at paras [7-8](#).

¹⁹ *Smith* Affidavit at para 18 and Ex L at 486.

²⁰ *Smith* Affidavit at paras 24-26 and Exs E, F at 376-451.

²¹ *Smith* Affidavit at paras 27-32 and Ex E at 377.

²² *Smith* Affidavit at para 28.

myeloma.²³ Many of them use cannabis-based medicines to replace or supplement other treatments.²⁴ VCBC members also report using medical cannabis as a replacement for other drugs, including narcotics, steroids, anti-seizure medication, sleeping medication, anti-inflammatories, and migraine medication.²⁵ Members report that VCBC's high-quality cannabis products provide them with excellent symptom relief.²⁶ For instance, several of them report that they use VCBC's topical cannabis products to treat the pain and inflammation caused by severe arthritis.²⁷ This treatment has been so successful that these members have been able to completely stop using prescription opioids.²⁸

15. Many members who formerly used opioids report that cannabis helped them manage drug withdrawal symptoms, and research on the efficacy of cannabis substitution programs supports these accounts.²⁹

The needs of VCBC members are not met by the regulated medical cannabis regime

16. Many VCBC members are on low fixed incomes, rely on disability payments, live in supportive or subsidized housing, or face other economic and social barriers to accessing cannabis products.³⁰ These members rely on the cash economy, and many lack access to computers, internet, phones, and credit cards.³¹
17. VCBC members have struggled to have their needs met in the regulated medical cannabis system because of multiple barriers to accessing healthcare.³² In many

²³ Smith Affidavit, Ex D at 121, 128, 157, 365-373; [REDACTED], sworn March 30, 2021 at para 78 [REDACTED] Affidavit].

²⁴ Smith Affidavit, Ex D at 121, 330, 353-359; [REDACTED], sworn March 29, 2021 at paras 10-12 [REDACTED] Affidavit].

²⁵ Smith Affidavit, Ex D at 106, 121, 174, 244; [REDACTED] Affidavit at paras 10-12.

²⁶ Smith Affidavit, Ex D at 121, 128, 157, 283, 365-373.

²⁷ [REDACTED] Affidavit at paras 21-23.

²⁸ [REDACTED] Affidavit at paras 4-6; [REDACTED] Affidavit at paras 31, 37-42, 80.

²⁹ Smith Affidavit, Ex D at 315, 355-356; [REDACTED], affirmed March 26, 2021 [REDACTED] Affidavit].

³⁰ Smith Affidavit, Ex. D at 313, 315; [REDACTED] Affidavit at paras 2-3, 44-45, 66-67, 72-73; [REDACTED] Affidavit at paras 3, 28-33, 36.

³¹ Smith Affidavit Ex D at 157, 227, 268, 293-294, 313, 374; [REDACTED] Affidavit at paras 3, 72.

³² Smith Affidavit, Ex D at 121, 124, 270, 313.

cases, lack of access to family doctors and clinics means that members are unable to obtain prescriptions for medical cannabis.³³ Many members' doctors are unwilling to write prescriptions for medical cannabis.³⁴ For some members who rely on the VCBC's products to treat the symptoms of opioid withdrawal, the severity of their symptoms and the stigma associated with drug use create considerable barriers to obtaining a cannabis prescription for medication that is urgently needed.³⁵

18. Because the VCBC produces and provides cannabis and cannabis products with higher THC levels, its products offer superior pain relief than those available in the regulated market.³⁶ Members whose complex medical needs require higher THC dosages are better served by VCBC's high-potency products.³⁷ High-potency products are vital for the treatment of many of the VCBC's members, particularly those who use cannabis to treat opioid withdrawal and as a substitute for opioid painkillers.³⁸ The VCBC's highly concentrated THC extracts and oils also offer relief to members with severe and terminal illnesses, including cancer and AIDS.³⁹
19. Members report having to use much more government-regulated cannabis to obtain the same symptom relief at much higher prices.⁴⁰ This causes financial stress, as members must spend more than they can afford to achieve the same relief provided by higher potency, lower cost products.⁴¹ For members who live with nausea and loss of appetite, it is very difficult or impossible for them to

³³ Smith Affidavit at para 43, Ex D at 315.

³⁴ Smith Affidavit at para 44, Ex D at 157; ██████████ Affidavit at para 53; ██████████ Affidavit at paras 7-9; H. ██████████ Affidavit at para 32.

³⁵ ██████████ Affidavit at paras 26, 30-32.

³⁶ Smith Affidavit at paras 60-61, Ex D at 365-373; ██████████ Affidavit at paras 64-65; ██████████ Affidavit at paras 14-16.

³⁷ Smith Affidavit at paras 60-61, Ex D at 365-373; ██████████ Affidavit at paras 64-65; ██████████ Affidavit at paras 14-16.

³⁸ Smith Affidavit at paras 64-69; ██████████ Affidavit; ██████████ Affidavit at paras 22-23.

³⁹ Smith Affidavit at paras 83.

⁴⁰ Smith Affidavit at para 52, Ex D at 153, 270; ██████████ Affidavit at para 64-65; ██████████ Affidavit at paras 14, 16-17.

⁴¹ Smith Affidavit, Ex D at 153.

consume the large amounts of low-potency regulated cannabis needed to treat their symptoms.⁴²

20. The products available in the regulated system are not comparable to the steady supply of high quality, inexpensive cannabis that members can obtain from the VCBC.⁴³ Many of the products relied upon by VCBC members are not available in the regulated market, where THC levels are capped and the types of products are limited.⁴⁴ For instance, at the end of her life, ██████████ relied on products such as cannabis suppositories and high-potency cannabis capsules, which are still not available in the regulated medical or non-medical cannabis markets.⁴⁵ Mr. Smith estimates that products with the levels of THC that ██████████ needed to manage end-of-life cancer pain and other symptoms would likely have cost \$1,000 a day or more if they had been purchased in today's regulated cannabis market.⁴⁶

The VCBC provides low-barrier cannabis and cannabis products to its members in a supportive environment

21. The VCBC currently operates a retail location where it sells cannabis and cannabis products to its members.⁴⁷ The VCBC sells a variety of products, many of which would not meet federal licencing requirements because they exceed federal limitations on potency.⁴⁸ The VCBC's products are generally much less expensive than cannabis products sold through licensed vendors, and the VCBC sells a variety of products that provide a wide range of therapeutic effects, including edibles, capsules, suppositories, topicals, bath products, concentrates, and oils, as well as numerous strains of dried cannabis – some that are unique to

⁴² Smith Affidavit at paras 60, 98; ██████████ Affidavit at para 65; ██████████ Affidavit at para 24.

⁴³ Smith Affidavit, Ex D at 106, 121, 128, 143, 153, 244, 270, 322; ██████████ Affidavit at paras 28-29; ██████████ Affidavit at paras 64, 66, 69; ██████████ Affidavit at paras 14-16.

⁴⁴ Smith Affidavit at paras 51-52, 88; ██████████ Affidavit at paras 28-29; ██████████ Affidavit at paras 64, 66, 69; ██████████ Affidavit at paras 14-16.

⁴⁵ Smith Affidavit at paras 45, 52, 62, 63, 66, 72, 92, Ex L at 486.

⁴⁶ Smith Affidavit at para 52.

⁴⁷ Smith Affidavit at para 70.

⁴⁸ Smith Affidavit at paras 51-52, 88; ██████████ Affidavit at paras 28-29; ██████████ Affidavit at paras 64, 66, 69; ██████████ Affidavit at paras 14-16.

the VCBC.⁴⁹ Members who rely on the cannabis strains found only at the VCBC report that if the VCBC ceased to operate, lack of access to these strains would have a profoundly negative impact on their well-being.⁵⁰

22. Harm reduction is a key component of the VCBC's operations, and is one of the reasons it provides a safe indoor smoking lounge and access to vaporizing equipment that reduces the harms of smoking dried cannabis.⁵¹ The smoking lounge also provides a supportive community space for members to share their experiences and knowledge about which cannabis products have been effective at treating their symptoms.⁵²
23. The VCBC offers products that allow members to consume cannabis using different routes of administration, including ingestion and topical applications, and the organization encourages its members to pursue routes of administration that cause fewer side effects, for instance by recommending edibles over smoking dried cannabis.⁵³ The VCBC's products have decreased the amount of inhaled medical cannabis that some members use to manage their medical conditions, which reduces the harms associated with smoking or vaporizing cannabis.⁵⁴ The VCBC produces their own high-dose products in a variety of different formats at affordable prices.⁵⁵ The VCBC allows for cash purchases of medical cannabis and provides its members with small grants.⁵⁶ The small grant program is vital for members who live on fixed incomes and who would otherwise struggle to afford their medications.⁵⁷
24. The VCBC ensures its products are accessible to its members by allowing for in-person pick-up, pick-up by designated caregivers, local delivery by staff, and mail

⁴⁹ Smith Affidavit at paras 70-98; ██████████ Affidavit at paras 68-70.

⁵⁰ ██████████ Affidavit at para 69.

⁵¹ Smith Affidavit at paras 38-41.

⁵² ██████████ Affidavit at para 38; Smith Affidavit at paras 38-42.

⁵³ Smith Affidavit at para 38, Ex D at 153, 270 and Ex E at 395-396.

⁵⁴ Smith Affidavit at para 73, Ex D at 153.

⁵⁵ Smith Affidavit at paras 70-98.

⁵⁶ Smith Affidavit at para 31, Ex D at 227, Ex E at 397; ██████████ Affidavit, at para 67.

⁵⁷ ██████████ Affidavit at para 67.

delivery.⁵⁸ VCBC member and former employee [REDACTED] who lives with [REDACTED], says that the VCBC has helped her by providing immediate access to medicines when they are needed to treat flare-ups, including when she is unable to attend at the storefront in person.⁵⁹ [REDACTED] explains this as follows:

One of the main reasons that the VCBC is so accessible is because there is a physical location. When I lived in Victoria and had symptom flare-ups that required more medicine, I could either immediately go to their storefront, send a caregiver, or have my medicine delivered to my home the same day. This was extremely important for me, as my medical conditions cause recurrent symptom flare-ups that are very difficult to predict or plan for. The only way for me to access legal medicinal cannabis is to order online and pay with a credit card. This system is unmanageable for me, as I don't have a credit card. If this were my only option, I would be unable to access my medicine.⁶⁰

25. In addition to providing its members with medical cannabis, the VCBC offers a supportive environment with knowledgeable staff.⁶¹ One member reports that the VCBC is “more than just a club, it’s where I go so I can live”.⁶² Other members report that the VCBC provides better education and guidance than non-medical dispensaries, where clerks are often unaware of the medical uses of cannabis and offer poor or no information.⁶³ The VCBC has a longstanding reputation for providing outstanding education and support to its members in Victoria and beyond.⁶⁴

⁵⁸ Smith Affidavit at para 71, Ex E at 402-404.

⁵⁹ [REDACTED] Affidavit at para 71.

⁶⁰ [REDACTED] Affidavit at paras 71-72.

⁶¹ Smith Affidavit, Ex D at 153, 157, 174, 227; [REDACTED] Affidavit at para 32; [REDACTED] Affidavit at paras 22-24.

⁶² Smith Affidavit, Ex D at 293.

⁶³ Smith Affidavit at paras 35, Ex D at 143; [REDACTED] Affidavit at para 13.

⁶⁴ Smith Affidavit, Ex D, at 121, 350.

VCBC ensures its cannabis is produced by reputable growers and meets or exceeds Health Canada standards

26. The VCBC sources its cannabis from small-scale growers who meet its quality standards, which are equivalent to or exceed those set out by Health Canada.⁶⁵ For instance, every batch of cannabis sold by the VCBC is examined bud-by-bud with a microscope to ensure it is free of mold, rot, and mildew.⁶⁶ The VCBC's growers do not use any pesticides and they take steps to ensure their cannabis does not contain any chemical residues.⁶⁷ These standards are more rigorous than those laid out in the Cannabis Regulations, SOR/2018-144 (the "Regulations"), which allow a degree of pesticide residues and microbial and chemical contaminants to be present in cannabis within "generally accepted tolerance limits".⁶⁸
27. Producers must follow the VCBC's Grower's Guidelines to ensure that the cannabis they provide to the VCBC is of consistently high quality.⁶⁹

The VCBC's cannabis products meet quality control standards and are clearly labelled

28. The VCBC ensures its cannabis products meet rigorous quality control standards before they are sold to its members.⁷⁰ All the VCBC's products are freshly made with high-quality, all-natural ingredients, many of which are organic, and are produced under sanitary conditions.⁷¹ All cannabis products, including edibles and topical preparations, are tested for potency and clearly labelled before they are sold to members.⁷²

⁶⁵ Smith Affidavit at paras 109-119; ██████████ Affidavit at paras 26-38.

⁶⁶ Smith Affidavit at para 115; ██████████ Affidavit at para 36.

⁶⁷ Smith Affidavit at paras 112, 119, Ex D at 51-55; ██████████ Affidavit at para 31.

⁶⁸ *Cannabis Regulations*, [SOR/2018-144](#) at ss 93(2)-(3), 94(1)-(2).

⁶⁹ Smith Affidavit at para 119, Ex E at 432-434.

⁷⁰ Smith Affidavit at paras 120-124, Ex E at 427-431; ██████████ Affidavit, at paras 43-48.

⁷¹ Smith Affidavit at paras 86-91; ██████████ Affidavit at paras 43-48.

⁷² Smith Affidavit at para 118; ██████████ Affidavit at para 45.

The VCBC is supported by Victoria's City Council, Members of Parliament, and the community

29. The VCBC's mandate is supported by Victoria's City Council and the Mayor of Victoria, Lisa Helps.⁷³ When this exemption application was brought to the Victoria City Council agenda in January 2020, City Council members unanimously voiced their support for the Club and the need for an exemption.⁷⁴
30. Mayor Lisa Helps has written letters both to Premier John Horgan to advocate for an exemption from the provincial cannabis restrictions, and to federal Health Minister Patty Hajdu to state the City's support for a temporary exemption from federal restrictions and eventual licenses under the federal regime. In both letters Mayor Helps urges, on behalf of City Council, that the VCBC be allowed "to continue to provide responsible access and a safe, welcoming space for medical cannabis users in the City of Victoria and Capital Region."⁷⁵
31. Mayor Helps states on behalf of City Council that an exemption for the VCBC would be appropriate and would benefit the Club's members.⁷⁶ She also states the following:
- The VCBC has provided a compassionate, not-for-profit, safe, inclusive and welcoming space for medical users of cannabis in the City of Victoria for more than two decades. Over the past months Council has heard from concerned medical cannabis users that they might lose access to the type of services provided by the VCBC. This could negatively impact consumer's health, quality of life and their sense of connection and community.⁷⁷
32. Local Members of Parliament also support the VCBC and its mandate of providing low-barrier access to cannabis for seriously ill individuals. In a letter of support for the VCBC addressed to Minister Hajdu, Laurel Collins, MP for

⁷³ Smith Affidavit at para 12.

⁷⁴ *Ibid.*

⁷⁵ Smith Affidavit, Ex A at 1-5.

⁷⁶ Smith Affidavit, Ex A at 1-5.

⁷⁷ *Ibid.*

Victoria, urges the government to allow the VCBC to continue providing “a not-for-profit and accessible space for medical users of cannabis.”⁷⁸ She states that:

the current legal model for medical cannabis is expensive and inaccessible. Barriers that exist include a general inaccessibility of family physicians and General Practitioners in my home province of British Columbia. As well, users of medical cannabis who face financial hardship already struggle to pay for medications as well as struggle to qualify accessing credit in order to purchase cannabis online. Barriers such as these are unjust.⁷⁹

33. Paul Manly, MP for Nanaimo-Ladysmith, has also written to Minister Hajdu to encourage the government to grant an exemption to the VCBC. In his letter, he states that “[u]ntil legal medical and/or recreational distribution systems are able to offer comparable products at comparable prices with the same level of accessibility, VCBC should be allowed to continue to provide high quality medicines to patients.”⁸⁰

Background to this Application

Provincial Exemption Application

34. The VCBC has taken steps to apply for an exemption from BC’s cannabis regime. On February 28, 2020, Ted Smith wrote to Mary Shaw, Executive Lead at the Cannabis Legalization and Regulation Secretariat, requesting a provincial exemption under under s. 130 of the *Cannabis Control and Licensing Act*, SBC 2018, c 29.⁸¹ In a reply dated May 6, 2020, Ms. Shaw indicated that such an exemption could not be granted because the provincial regime does not regulate cannabis for medical purposes.⁸² In addition, Ms. Shaw advised that retail sales and sales of cannabis not produced by a Health Canada licensed producer are not permitted under federal law, and that the federal regime is responsible for

⁷⁸ Smith Affidavit, Ex B at 7.

⁷⁹ *Ibid.*

⁸⁰ *Ibid.*

⁸¹ Smith Affidavit, Ex L at 486.

⁸² Smith Affidavit, Ex M at 491-492.

determining the potency and types of cannabis products that can be legally sold in Canada.⁸³ She concluded that “the the Province will not authorize sales of cannabis that are illegal under federal criminal law.”⁸⁴

35. The VCBC’s correspondence with Ms. Shaw indicated that a federal exemption will be required before the province will consider exempting the VCBC from any aspects of BC’s cannabis regime.

Submissions as to why an exemption should be granted

Exemption Sought

36. Until it has obtained the necessary licenses to authorize its operations under the federal cannabis regime, the VCBC seeks a temporary exemption from the following prohibitions in the Act:

- possession of cannabis by organizations and by individuals 18 years of age or older;⁸⁵
- distribution of cannabis by organizations and individuals 18 years old or older;⁸⁶
- possession for the purpose of distribution;⁸⁷
- selling cannabis to individuals 18 years old or older;⁸⁸
- possession of cannabis for the purpose of selling it to individuals 18 years old or older;⁸⁹
- obtaining cannabis;⁹⁰
- cultivating, propagating, and harvesting more than four cannabis plants at any one time in a dwelling house by a person 18 years of age or older;⁹¹

⁸³ *Ibid.*

⁸⁴ *Ibid.*

⁸⁵ *Cannabis Act*, s 8(1)(a)-(b), (d)-(f).

⁸⁶ *Cannabis Act*, s 9(1)(a), (c)-(d).

⁸⁷ *Cannabis Act*, s 9(2).

⁸⁸ *Cannabis Act*, s 10(1)(a).

⁸⁹ *Cannabis Act*, s 10(2).

⁹⁰ *Cannabis Act*, s 12(1)(a).

⁹¹ *Cannabis Act*, s 12(4).

- cultivating cannabis by a person aged 18 years or older at a place that is not that person's dwelling house;⁹²
- cultivating, harvesting, or propagating cannabis by organizations;⁹³
- possessing anything with the intention that it will be used to produce, sell or distribute illicit cannabis;⁹⁴ and
- producing cannabis.⁹⁵

37. The VCBC also seeks a temporary exemption from the following requirements in the Regulations:

- authorization for adults to possess medical cannabis in a public place;⁹⁶
- authorization to deliver medical cannabis;⁹⁷
- authorization to sell medical cannabis;⁹⁸
- authorization to distribute cannabis;⁹⁹ and
- packaging requirements for cannabis products.¹⁰⁰

38. The VCBC seeks a permanent exemption from the following provisions of the Act and Regulations:

- providing cannabis without monetary consideration;¹⁰¹
- dispensing limits for cannabis extracts;¹⁰²
- maximum THC levels for cannabis products;¹⁰³ and

⁹² *Cannabis Act*, s 12(6)(a).

⁹³ *Cannabis Act*, s 12(7).

⁹⁴ *Cannabis Act*, s 13(1).

⁹⁵ *Cannabis Act*, s 12(1)(a).

⁹⁶ *Cannabis Regulations*, s 266.

⁹⁷ *Cannabis Regulations*, s 291.

⁹⁸ *Cannabis Regulations*, s 289.

⁹⁹ *Cannabis Regulations*, s 269.

¹⁰⁰ *Cannabis Regulations*, ss 108-136.

¹⁰¹ *Cannabis Act*, s 24(1)(a).

¹⁰² *Cannabis Regulations*, ss 103.2, 122.5(1)(b).

¹⁰³ *Cannabis Regulations*, ss 96, 101.2, 102.7, 122.3.

- restriction on obtaining cannabis products from more than one source at a time on the basis of the same medical document.¹⁰⁴
39. The VCBC seeks a permanent exemption from the following provisions of the Cannabis Fees Order, SOR/2018-198:
- application screening fee requirements for one or more licenses; and¹⁰⁵
 - application fees for security clearances.¹⁰⁶
40. The VCBC anticipates that the licensing application and transition process will take a considerable amount of time. The VCBC would welcome a discussion with Health Canada regarding the timeline for such applications. The VCBC's current understanding is that the licensing process may take up to two years, and possibly longer. As such, the VCBC requests temporary exemptions for a period of 2-3 years, with the option of extending the exemption period should this be required during the licensing application process. This would allow the VCBC sufficient time to transition its operations into the licensed regime while continuing to serve its members in the interim.
41. Attached as Schedule "A" to this application is a table listing the various provisions of the Act and Regulations for which the VCBC seeks exemptions, and a brief summary of the rationale for each exemption. The need for the exemptions, taken together, are discussed in more detail in the submissions that follow.

An exemption is necessary to meet the medical needs of VCBC's members

The medical cannabis licensing regime creates barriers for VCBC's members

42. The federal system for regulating medical cannabis, as laid out in the Act and Regulations, has facilitated access to cannabis for some medical patients in

¹⁰⁴ *Cannabis Regulations*, s 276.

¹⁰⁵ Cannabis Fees Order, [SOR/2018-198](#), s 3.

¹⁰⁶ Cannabis Fees Order, s 4.

certain circumstances, but considerable barriers remain. Below, we have set out the provisions that make it difficult or impossible for the VCBC's members to treat their medical conditions with federally regulated cannabis. We then explain how the VCBC's system removes these barriers and provides its members with reasonable access to the cannabis and cannabis products they need in a safe and supportive community setting.

43. The Act prohibits the possession, distribution, sale, obtaining, cultivation, and production of cannabis and cannabis products, unless such activities are authorized by the Act.¹⁰⁷ The Regulations require that the following activities relating to medical cannabis be authorized under the Act: possession in a public place, delivery, sale, and distribution.¹⁰⁸ The Regulations also set out detailed packaging requirements for cannabis products.¹⁰⁹
44. The federal licensing regime has created a system that is only accessible to medical patients with doctors that are willing to write cannabis prescriptions and file them with Health Canada; who have credit cards, internet access, computers, and phones; who can wait for items to be shipped to them; who can treat their conditions with a limited selection of products; who can tolerate cannabis that may contain pesticide residues and microbial contaminants; and who are able to navigate a complex online marketplace without any information or assistance. The internet mail-order system presents a particularly difficult barrier for many individuals who require timely access to medical cannabis.¹¹⁰ It is therefore essential to provide these products in a storefront in the communities where the VCBC's members live.

¹⁰⁷ *Cannabis Act*, ss 8(1)(a)-(b), (d)-(f), 9(1)(a) (c)-(d), 9(2), 10(1)(a), 10(2), 12(1)(a), 12(4), (6)(a), 12(7), 13(1), 12(1)(a).

¹⁰⁸ *Cannabis Regulations*, ss 266, 291, 289, 269.

¹⁰⁹ *Cannabis Regulations*, ss 108-136.

¹¹⁰ Smith Affidavit, Ex D at 157, 293-294, 322, [REDACTED] Affidavit at paras 33, 36; [REDACTED] Affidavit at paras 3, 72.

VCBC removes these barriers and facilitates access

45. The VCBC removes these barriers for its members by evaluating their medical documents in-house; allowing for in-person cash purchases, pick-up by designated caregivers, and same-day local delivery; providing a wide variety of products in one location; producing and selling high-potency products and products not sold anywhere else; maintaining zero tolerance for product contamination; and offering decades of knowledge and experience in the medical cannabis industry in a supportive, community-oriented environment.

A temporary exemption will ensure continued access

46. The federal provisions criminalize many core aspects of the VCBC's operations, and leave the organization vulnerable to enforcement actions undertaken by the province. A temporary exemption from these provisions is needed to ensure that the VCBC's members can continue to have their urgent medical needs met while the VCBC and its growers are engaged in the licensing application process. Ensuring access to medical cannabis during this interim period will benefit the health of VCBC's members by ensuring that the supply of medicine they rely on is not interrupted. For many members, particularly those who rely on the VCBC to supply cannabis products as opioid substitutes, uninterrupted access to their medicines may save their lives.
47. Without the VCBC, chronically ill people who have no access to family doctors or whose doctors are unwilling to write prescriptions for medical cannabis are left at serious risk of having their symptoms left untreated, struggling with the side effects and potential dangers of pharmaceutical and street drugs, and losing the freedom to choose their own treatment path – a freedom available to many Canadians who pursue alternative forms of medicine that are not criminalized. The VCBC is working towards having a medical practitioner on staff to fulfill

Health Canada's requirements; however, it is vital that its members not experience any disruption in their access to medication in the interim.¹¹¹

48. The VCBC is committed to taking all possible steps to come into compliance with the federal licensing scheme; however, it anticipates that the application process will be lengthy, expensive, and complex. For instance, the licensing process undertaken by the medical cannabis storefront Completely Cannabis in Brockville, Ontario took nearly two years and required a 278-page application, which had to be revised six times before it was accepted by Health Canada.¹¹² The owners of Completely Cannabis were also required to make financial investments to comply with the licensing regime, such as renovating their building to fit Health Canada's specifications and add a vault.¹¹³

A permanent exemption is needed from some aspects of the federal regime to meet the medical needs of VCBC's members

49. The federal medical cannabis legislation and regulations also criminalize providing cannabis without monetary consideration; set out dispensing requirements for cannabis extracts; prescribe maximum THC levels for cannabis products; and restrict medical patients from obtaining cannabis products from more than one source at a time on the basis of the same medical document.¹¹⁴ In addition, the Cannabis Fees Order requires that applicants pay screening fees for one or more licenses, as well as application fees for security clearances.¹¹⁵
50. These provisions create insurmountable barriers for the VCBC's members, and a permanent exemption is needed to meet their medical needs. The VCBC provides small grants to ensure that its members can continue to receive their medication even during times of financial insecurity – this is a vital service. In addition, many of VCBC's members rely on its high-potency products, including

¹¹¹ Smith Affidavit at para 133.

¹¹² Smith Affidavit at para 130, Ex N at 494-497.

¹¹³ Smith Affidavit, Ex N at 494-497.

¹¹⁴ *Cannabis Act*, s 24(1)(a); *Cannabis Regulations*, ss 103.2, 122.5(1)(b), 96, 101.2, 102.7, 122.3, 276.

¹¹⁵ Cannabis Fees Order, ss 3-4.

highly concentrated cannabis oils that can be dispensed in larger dosages needed to treat serious pain, life-threatening illness, and other chronic ailments.

51. In particular, the VCBC's high-potency products are a lifesaving medicine for members withdrawing from opioids, who would otherwise remain reliant on drugs that put them at serious risk of addiction, overdose, and death. Many of the VCBC's members require multiple products available from several sources at the same time – the requirement to obtain a new medical document for each supplier is impractical and creates serious access problems. Lastly, as a non-profit society, the VCBC requires exemptions from application and security clearance fees in order to continue to operate and serve its members.

An exemption serves the public interest

52. If granted an exemption from the federal Act and Regulations, the VCBC will continue to operate as a non-profit society serving the interests of its members, the community, and society more generally. An exemption would serve the public interest by reducing the healthcare, financial, and societal burdens associated with substance addictions and the opioid epidemic, untreated or inadequately treated medical conditions, and expensive pharmaceutical drugs and their side effects. An exemption would also allow the VCBC to continue to operate safely in a manner that protects its members and the community.
53. Twenty-five years after the VCBC was founded during the AIDS crisis, BC and Canada are now experiencing an unprecedented epidemic of opioid overdoses, which has only worsened during the COVID-19 pandemic.¹¹⁶ Tragically, some VCBC members have died from opioid overdoses.¹¹⁷ Medical evidence indicates that cannabis-based medicines can be highly effective in reducing opioid and benzodiazepine dependence.¹¹⁸ Access to low-cost cannabis products provides

¹¹⁶ Smith Affidavit at para 68.

¹¹⁷ Smith Affidavit at para 68.

¹¹⁸ Smith Affidavit, Ex D at 355-356.

a life-saving alternative to opioids and other more dangerous substances, particularly for people living on low incomes.¹¹⁹

54. Providing affordable cannabis to people who use illicit drugs, particularly opioids, improves public health and reduces the burden on our healthcare system.¹²⁰ Academics who have written letters in support of VCBC's application report that "medical cannabis provides an inexpensive alternative to a number of pharmaceutical products that heavily tax our healthcare system through drug costs and the undesired side-effects of their use."¹²¹
55. Many VCBC members live with complex chronic medical conditions that are difficult and expensive to treat using pharmaceutical drugs, some which have debilitating side effects and can impair quality of life.¹²² Even with the assistance of pharmaceutical drugs, many VCBC members report that without VCBC's services, they would turn to the underground market, alcohol, or narcotics for pain relief.¹²³ VCBC's products allow these members to improve their quality of life, relieve their symptoms, and in many cases continue contributing to society in meaningful and productive ways despite their illness.¹²⁴
56. The VCBC operates pursuant to rigorous quality standards, and it requires that all cannabis be inspected to mitigate harms to human health.¹²⁵ The VCBC also maintains strict vigilance to protect against criminal behaviour, including illicit redistribution of medical cannabis, and it has operated for decades without significant problems.¹²⁶

¹¹⁹ Smith Affidavit at para 69, Ex D at 355-356.

¹²⁰ Smith Affidavit, Ex D at 355-356.

¹²¹ Smith Affidavit, Ex D at 354.

¹²² ██████████ Affidavit at paras 15-16, 21, 78.

¹²³ Smith Affidavit, Ex D at 121, 143, 153, 244.

¹²⁴ ██████████ Affidavit at paras 33, 35, 77-80; ██████████ Affidavit at paras 21, 37.

¹²⁵ Smith Affidavit at paras 115, 119, 86-91, 120-124, Ex E at 427, 432-434; ██████████ Affidavit at paras 36, 43-48.

¹²⁶ Smith Affidavit at paras 106-107, Ex E at 385-387.

57. As outlined above, elected officials at both the municipal and provincial level are in agreement that granting the VCBC an exemption is in the public interest.

Health Canada must proportionately balance the s. 7 interests of the VCBC's members with other public interests

58. As set out above, the VCBC's mandate is to provide high-quality medical cannabis to the seriously ill, who would otherwise struggle to access the medical cannabis they require. As demonstrated by the evidence supporting this application, the VCBC provides high-quality cannabis at a lower cost than other medical cannabis suppliers. It also provides cannabis at the high potency levels some of its members require, and in forms that better address their illnesses and are not available elsewhere. The VCBC also enables access to their medical cannabis products through a supportive storefront, where members can benefit from the advice of VCBC staff.
59. The affidavits and letters of support from VCBC members show that the VCBC's products and services are important aspects of their health care, and that they are not practically able to obtain comparable products and services through other means. That is, the health of many VCBC members would suffer if the VCBC were to cease operations.
60. It is therefore clear that this application engages the VCBC's members' liberty and security of the person interests, which are protected under s. 7 of the *Charter of Rights and Freedoms*. Indeed, courts have repeatedly found that the s. 7 liberty and security of the person interests of individuals who use cannabis for medical purposes are impacted by laws that put them at risk of criminal sanctions and affect access, potency levels, and the types of cannabis they may use.¹²⁷
61. The VCBC respectfully submits that denying the exemptions sought would be inconsistent with principles of fundamental justice – including the principles

¹²⁷ *R v Howell*, [2020 ABQB 385](#) at paras [290-293](#), [360](#) [*Howell*]; *Allard v Canada*, [2016 FC 236](#) at paras [187-189](#), [212](#) [*Allard*]; *Smith* at paras [8](#), [17-18](#), [20-21](#), [28](#).

against arbitrariness, overbreadth and gross disproportionality – such that a denial would breach s. 7.

62. The principle against arbitrariness examines whether there is a rational connection between the object of the law and the limit it imposes on life, liberty, or security of the person.¹²⁸ The VCBC respectfully submits that not granting the exemptions would not be rationally connected to the objectives of the Act. Those objectives are to protect health and public safety while improving access to a quality-controlled supply of cannabis.¹²⁹ Those are similar to the objectives the court in *Allard* found to underlie the *Marihuana for Medical Purposes Regulations*, SOR/2013-119.¹³⁰ In *Allard*, the court found those regulations insufficiently facilitated access to medical cannabis and found them to unjustifiably breach s. 7 for that reason.¹³¹
63. The VCBC's operations are consistent with the objectives of the statutory regime. As discussed above, the VCBC facilitates access to medical cannabis for its members, many of whom need that access most and would not otherwise be able to obtain the medical cannabis they require. The VCBC also provides access safely by screening membership applicants for medical need; working with a limited number of small growers and rigorously inspecting for quality and absence of molds and mildew; and providing tailored advice to its members on which products to use for which conditions, and how to do so safely. The VCBC has a track record of over two decades – longer than any medical cannabis licence holder – of providing safe access to medical cannabis. It has demonstrated over many years that its operations are safe and responsible and provide an essential public service. Indeed, that is why it has garnered the full support of Victoria City Council and local Members of Parliament.

¹²⁸ *Carter v Canada (Attorney General)*, 2015 SCC 5 at para 83 [Carter].

¹²⁹ Some of the objectives of the Act are set out in s. 7: to protect public health and public safety, deter illicit activities in relation to cannabis through appropriate sanctions and enforcement mechanisms, provide access to a quality-controlled supply of cannabis, and enhance public awareness of health risks associated with cannabis use.

¹³⁰ *Allard* at para 220.

¹³¹ *Allard* at paras 234-237, 253, 285.

64. Denying the exemptions sought would also be overbroad. The overbreadth inquiry considers whether the limitations on the s. 7 interests generally support the objectives of the law but go too far by denying the rights of some individuals in a manner that bears no relation to those objectives.¹³² That is the case with the VCBC. It may be that some compassion clubs do not provide access to medical cannabis in a safe, responsible manner. But the VCBC clearly does, and the VCBC respectfully asks the Minister to consider its particular circumstances on their own merit.
65. Last, denying the exemptions would, in the VCBC's respectful submission, violate the principle against gross disproportionality. The inquiry under that principle is whether the negative impacts on the VCBC's members that would arise from denying the exemptions are completely out of sync with the objectives of the statutory regime.¹³³ As seen from the facts outlined above and the affidavits and support letters filed with the application, the impacts on the VCBC's members of shutting down the VCBC would be very severe. The VCBC's members require high-quality medical cannabis, many require it in the particular forms and potency levels the VCBC offers, and most of them depend on the low-barrier access the VCBC provides. Forcing the closure of the VCBC would effectively deny the VCBC's members necessary access to medical cannabis and would threaten their health and personal security. Given the demonstrated safety of the VCBC's operations, such impacts would be grossly disproportionate to the public safety aspect of the Act's objectives.
66. The VCBC respectfully asks the Minister to consider the limitations on its members' s. 7 rights that would arise from a denial of this application and to carefully balance them against the other public interests the statutory regime is intended to advance. Parliament delegated the exemption power to the Minister for a reason: so that exceptions to the broader scheme can be made to

¹³² *Carter* at para [85](#).

¹³³ *Carter* at para [89](#).

allow for safe and effective access to medical cannabis through unique means that would otherwise be prohibited by the Act or the Regulations.

67. In considering whether to use that exemption power, the Minister is obliged – both by statute and by the Constitution – to decide this application based on the VCBC’s particular circumstances, not on the basis of broad policy.¹³⁴ Granting the exemptions sought by the VCBC would not imply that similar exemptions need to be granted for all compassion clubs.¹³⁵ It would simply mean that an exemption is appropriate in the VCBC’s case.
68. The VCBC respectfully submits that the only decision that reasonably balances the s. 7 interests of the VCBC’s members with the objectives of the statutory regime is to grant the VCBC the exemptions it needs to continue to fulfill its mandate.

Conclusion

69. Granting an exemption to the VCBC will allow it to continue meeting the urgent medical needs of its members and serving the public interest. It will also promote the purposes of the Act.¹³⁶ The VCBC has a history of improving public health and safety by using medical cannabis to support its members’ health and reduce their reliance on illicit drugs and pharmaceutical medications. The Victoria community and City Council has recognized the importance of this work. The VCBC has a demonstrated track record of ensuring public safety by screening its members and ensuring its medicines are not diverted to the illegal market. It has consistently offered high-quality products in a supportive atmosphere with dedicated staff that educate its members and support them in reducing the health risks associated with cannabis use. For these reasons, it is reasonable and

¹³⁴ *Canada (Attorney General) v PHS Community Services Society*, [2011 SCC 44](#) [PHS].

¹³⁵ *Ibid* at paras [139-140](#).

¹³⁶ *Cannabis Act*, s. 7.

appropriate for the Minister to exercise his discretion to grant the VCBC an exemption from the Act and Regulations.

70. The VCBC would welcome the opportunity to engage with Health Canada and work collaboratively in this process. The VCBC would like to begin a productive dialogue with Health Canada to ensure that the VCBC can transition into an operation that meets as many of the federal requirements as possible, while continuing to meet its members' needs. Should this application require revisions or additions, or if you have questions regarding anything outlined within, the VCBC would be pleased to discuss these issues at any time. The VCBC and its staff would be pleased to offer Health Canada a tour of the storefront, to facilitate any inspection that may assist Health Canada in considering this application, and to answer any questions regarding the VCBC and its operations.

RESPECTFULLY SUBMITTED this 9th day of April, 2021

Naomi
Moses

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Date: 2021.04.09
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Tim Dickson and Naomi Moses
Counsel for the VCBC
JFK Law Corporation
340 – 1122 Mainland Street
Vancouver, BC V6B 5L1

Schedule A

Provisions/Regulations	Description	Type of Exemption Sought	Rationale
<i>Cannabis Act</i> , s 8(1)(a)-(b), (d)-(f).	possession of cannabis by organizations and by individuals 18 years of age or older	temporary	To ensure that the VCBC, its staff, its growers, and its members who possess medical cannabis are not criminalized while the VCBC transitions to a licensed operation.
<i>Cannabis Act</i> , s 9(1)(a), (c)-(d)	distribution of cannabis by organizations and individuals 18 years old or older	temporary	To ensure that the VCBC, its staff, and its growers are not criminalized for distributing medical cannabis to VCBC members while the VCBC transitions to a licensed operation.
<i>Cannabis Act</i> , s 9(2)	possession of cannabis for the purpose of distribution	temporary	To ensure that the VCBC, its staff, and its growers are not criminalized for possessing medical cannabis to be distributed to VCBC members while the VCBC transitions to a licensed operation.
<i>Cannabis Act</i> , s 10(1)(a)	selling cannabis to individuals 18 years old or older	temporary	To ensure that the VCBC, its staff, and its growers are not criminalized for selling medical cannabis to VCBC members while the VCBC transitions to a licensed operation.
<i>Cannabis Act</i> , s 10(2)	possession of cannabis for the purpose of	temporary	To ensure that the VCBC, its staff, and its growers are not criminalized for possessing medical cannabis for the purpose of selling

Provisions/Regulations	Description	Type of Exemption Sought	Rationale
	selling it to individuals 18 years old or older		to VCBC members while the VCBC transitions to a licensed operation.
<i>Cannabis Act</i> , s 12(1)(a)	obtaining cannabis	temporary	To ensure that the VCBC, its staff, and its members are not criminalized for obtaining medical cannabis while the VCBC transitions to a licensed operation.
<i>Cannabis Act</i> , s 12(4)	cultivating, propagating, and harvesting more than four cannabis plants at any one time in a dwelling house by a person 18 years of age or older	temporary	To ensure that the VCBC's growers are not criminalized for growing medical cannabis in their homes while the VCBC transitions to a licensed operation.
<i>Cannabis Act</i> , s 12(6)(a)	cultivating cannabis by a person aged 18 years or older at a place that is not that person's dwelling house	temporary	To ensure that the VCBC's growers are not criminalized for growing medical cannabis in locations other than their own homes while the VCBC transitions to a licensed operation.
<i>Cannabis Act</i> , s 12(7)	cultivating, harvesting, or propagating	temporary	To ensure that the VCBC is not criminalized due to its working relationships with its growers while the VCBC transitions to a licensed operation.

Provisions/Regulations	Description	Type of Exemption Sought	Rationale
	cannabis by organizations		
<i>Cannabis Act</i> , s 13(1)	possessing anything with the intention that it will be used to produce, sell or distribute illicit cannabis	temporary	To ensure that the VCBC and its growers are not criminalized for possessing any materials related to the production, sale, or distribution of medical cannabis to VCBC members while the VCBC transitions to a licensed operation.
<i>Cannabis Act</i> , s 12(1)(a)	producing cannabis	temporary	To ensure that the VCBC, its bakers, its growers, and its members are not criminalized for producing cannabis or cannabis products to be sold to VCBC members while the VCBC transitions to a licensed operation.
Cannabis Regulations, s 266	authorization for adults to possess medical cannabis in a public place	temporary	To ensure that the VCBC, its staff, its growers, and its members can continue to possess medical cannabis without authorization while the VCBC transitions to a licensed operation.
Cannabis Regulations, s 291	authorization to deliver medical cannabis	temporary	To ensure that the VCBC, its staff, and its growers can continue to deliver medical cannabis for VCBC members without authorization while the VCBC transitions to a licensed operation.

Provisions/Regulations	Description	Type of Exemption Sought	Rationale
Cannabis Regulations, s 289	authorization to sell medical cannabis	temporary	To ensure that the VCBC, its staff, and its growers can continue to sell medical cannabis to VCBC members without authorization while the VCBC transitions to a licensed operation.
Cannabis Regulations, s 269	authorization to distribute cannabis	temporary	To ensure that the VCBC, its staff, and its growers can continue to distribute medical cannabis to VCBC members without authorization while the VCBC transitions to a licensed operation.
Cannabis Regulations, ss 108-136	packaging requirements for cannabis products	temporary	To ensure that the VCBC, its staff, and its bakers can continue to package the VCBC's cannabis products following their current labelling and packaging practices while the VCBC transitions to a licensed operation.
<i>Cannabis Act</i> , s 24(1)(a)	providing cannabis without monetary consideration	permanent	To ensure that the VCBC and its staff can continue to provide low-barrier access to its members on low incomes through the Gayle Quin small grant program.
Cannabis Regulations, ss 103.2, 122.5(1)(b)	dispensing limits for cannabis extracts	permanent	To ensure that the VCBC can continue to provide high-potency products to its members that can be dispensed in doses appropriate to meet their medical needs.

Provisions/Regulations	Description	Type of Exemption Sought	Rationale
Cannabis Regulations, ss 96, 101.2, 102.7, 122.3	maximum THC levels for cannabis products	permanent	To ensure that the VCBC, its staff, and its bakers can continue to produce and provide high-potency products to its members to meet their medical needs.
Cannabis Regulations, s 276	restriction on obtaining cannabis products from more than one source at a time on the basis of the same medical document	permanent	To ensure that the VCBC's members can continue to obtain cannabis products that meet their medical needs from a number of the VCBC's growers, as well as other producers, at any given time, without the need to obtain multiple medical documents.
Cannabis Fees Order, s 3	application screening fee requirements for one or more licenses	permanent	To ensure that the VCBC's status as a non-profit does not prevent it and its growers from obtaining licenses due to inability to pay application screening fees.
Cannabis Fees Order, s 4	application fees for security clearances	permanent	To ensure that the VCBC's status as a non-profit does not prevent it and its growers from obtaining licenses due to inability to pay application fees for security clearances.

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Support Letters

Exhibit D	11
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VCBC Members

Member: [REDACTED]	12
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AFFIDAVIT OF TED SMITH

I, Ted Smith, Executive Director of the Victoria Cannabis Buyers Club, Victoria, British Columbia, AFFIRM AND SAY THAT:

1. I founded the Victoria Cannabis Buyers Club (the “VCBC” or the “Club”) in 1996 and serve as the Executive Director of the VCBC and the President of the VCBC’s Board of Directors. As such, I have personal knowledge of the facts and matters hereinafter deposed to except where stated to be made on information and belief, and where so stated I believe the same to be true.
2. The VCBC is a cannabis compassion club with a 25-year history of supporting individuals with chronic medical conditions, including chronic pain and opioid dependency. It is a society registered under the *Societies Act*, SBC 2015, c 18. To my knowledge, the VCBC is the longest-running cannabis compassion club operating in Canada today.
3. I affirm this affidavit in support of an application for certain temporary and permanent exemptions from the *Cannabis Act* and associated regulations. Below, I summarize some of the history of the VCBC and then set out in detail the VCBC’s mission and operations and how we serve the needs of our members.

The History of the VCBC

4. In the early 1990s, I was living in Victoria after having graduated with a bachelor’s degree in philosophy from Wilfrid Laurier University.
5. During this time, I met a number of people living with AIDS, as well as people suffering from debilitating pain and other chronic illnesses, including illnesses that were terminal. Meeting these people and seeing how their lives were improved through the medical use of cannabis changed the course of my life. I witnessed the agonizing pain and devastating illness caused by AIDS and the drug cocktails then used to treat it, and I found this suffering intolerable, knowing how much cannabis could help these patients.

6. I will never forget a few patients from those early days in the 1990s. One was a man in his 40s who had contracted HIV, and AIDS hit him hard. I saw him often and he would tell me that cannabis was very helpful in treating his symptoms. I remember that he was admitted to the hospital with pneumonia and was then sent home to die. None of the medications prescribed at the hospital were working. The only thing that relieved his symptoms and helped him breathe better was cannabis.
7. I decided to start the Club to assist people who were sick and dying by providing a safe and reliable source of cannabis. Nothing is more important to me than providing relief to those suffering towards the end of their lives.
8. When the VCBC was founded, little was known about the medical uses of cannabis. However, I observed that patients suffering from AIDS, hepatitis C, cancer, chronic pain, and other serious medical conditions were able to find relief from their symptoms by smoking, eating, and topically applying cannabis products. These observations led me, the early VCBC members, and our supporters to begin advocating on behalf of patients whose lives had been positively transformed through the use of cannabis as medicine.
9. I worked out of an apartment for about five years, until March of 2000 when the VCBC began renting a storefront.
10. One of the biggest influences on the work of the VCBC over the years was [REDACTED], [REDACTED] and a VCBC member from 2003 until her death in 2016. [REDACTED] was a tireless advocate for medical cannabis, which she used to help manage her numerous chronic medical conditions, including the cancer that ultimately took her life. [REDACTED] legacy continues to inspire the VCBC's work to this day.
11. Given our 25-year history of providing effective, low-barrier access to the seriously ill, the VCBC has garnered wide support in the southern Vancouver Island community.
12. Victoria City Council has unanimously expressed its support for the VCBC. In this regard, Mayor Lisa Helps has written letters both to Premier John Horgan to advocate for an exemption from the provincial cannabis restrictions, and to federal Health Minister Patty Hajdu to state the City's support for a temporary exemption from federal

restrictions and eventual licenses under the federal regime. In both letters, Mayor Helps urges, on behalf of City Council, that the VCBC be allowed “to continue to provide responsible access and a safe, welcoming space for medical cannabis users in the City of Victoria and Capital Region.” Attached as **Exhibit “A”** to this affidavit are true copies of both letters.

13. Local Members of Parliament also support the VCBC and its mandate of providing low-barrier access to cannabis to the seriously ill. In that regard, a true copy of a letter in support of the VCBC from Laurel Collins, MP for Victoria, is attached as **Exhibit “B”**. A true copy of a support letter from Paul Manly, MP for Nanaimo-Ladysmith, is attached as **Exhibit “C”**.
14. Hundreds of VCBC members, as well as VCBC’s neighbours, community members, medical professionals, academic researchers, and other supporters, have written letters in support of VCBC’s application for an exemption from the federal cannabis regime. More than 250 of these support letters are attached to this affidavit as **Exhibit “D”**.
15. Despite the trust that has been built between the Club, local politicians, and the greater Victoria community, the VCBC has been raided by the police and the province’s Community Safety Unit (the “CSU”) seven times. Our staff have been arrested, criminally charged, and acquitted of every charge on constitutional grounds.
16. For instance, our former baker, Owen Smith, was arrested in 2009 and charged with drug possession and trafficking charges while he was working for the VCBC producing cannabis edibles. The VCBC led his defence, which was brought on constitutional grounds, and his acquittal was upheld by the Supreme Court of Canada in *R. v. Smith*, 2015 SCC 34 [*Smith*]. I am very proud of how the VCBC’s work on this case secured the right of medical patients to access edible cannabis products.
17. My entire life has been dedicated to the VCBC. It is a labour of love, which has often come at a financial cost to me. I make around \$30,000 a year as Executive Director of the VCBC. I could not qualify for a credit card until five years ago because I had no credit

history. Now I have a credit card but the credit limit is only \$500 and I had to deposit \$500 in order to qualify.

The VCBC's Mandate

18. The VCBC's mandate is to help the seriously ill access a range of cannabis products at the lowest cost possible. The VCBC exists exclusively to help members with a proven medical need for cannabis. Nearly all of our members use cannabis as a substitute for pharmaceutical drugs or street drugs. Many members treat their medical conditions with both cannabis and prescription drugs.
19. A further aspect of our mandate is to provide access to affordable high-quality medical cannabis for those who would otherwise face serious – sometimes insurmountable – barriers to obtaining it.

20. When we started the Club, there was no jurisprudence to look to except the Supreme Court of Canada's decision in *R v. Morgentaler* on life, liberty, and security of the person. We saw that decision as establishing that people with serious medical issues have the right to determine how to treat them. We based our mandate around this concept.

Member Screening Process at the VCBC

21. We have always required prospective members to provide proof of a chronic medical condition. It is not enough for someone to come in and tell us that they are sick. They must also provide credible documentation of their illness.
22. We accept diagnoses from doctors and other health practitioners, such as chiropractors and naturopaths. We also accept members with only mental health diagnoses (with the exception of schizophrenia or personality disorders, unless they have a doctor's recommendation). This allows us to help members who live with depression, anxiety, and post-traumatic stress disorder, among other conditions.
23. We also allow people with opioid prescriptions to access the club without documentation of their diagnoses. This ensures that people who use opioids for any reason can access cannabis products as a safe substitute or supplement for opioids.

24. We look for a few key pieces of information in the documentation that the prospective member provides: the document must be from a doctor or medical clinic, it must include and match the member's information and photo identification, and it must state what medical issue they are dealing with. If a person has multiple diagnoses, we review each diagnosis to consider whether they qualify. Our membership criteria are outlined in the VCBC's Operations Manual, which is attached to this affidavit as **Exhibit "E"**.
25. In terms of age requirements, we require that every new member show photo identification when they join the club. While we have had a few pediatric cases in which the parents and doctors have consented to the use of cannabis, we are currently only admitting members aged 19 and older. Going forward, our policy will be that young people who wish to become VCBC members must meet the medical registration and documentation requirements outlined in s. 267 of the *Cannabis Regulations*.
26. We require our members to abide by a set of VCBC rules and policies that protect the safety of all our members and staff. All prospective members must initial and sign a form indicating they have read and understood these rules and policies and agree to abide by them. A copy of the VCBC's Application for Membership is attached to this affidavit as **Exhibit "F"**.

The VCBC's Members

27. VCBC members live with a variety of chronic conditions, including cancer, AIDS, epilepsy, multiple sclerosis, osteoarthritis, rheumatoid arthritis, neuropathy, anxiety, chronic pain, bronchitis, irritable bowel syndrome, and multiple myeloma.
28. The average age of our members is around 55-60. Our members range in age from early 20s to mid-90s.
29. When I started the Club, the majority of our members lived on low incomes. After the *Smith* decision in 2015, we started serving more middle and working class members. After *Smith*, edibles could be legally used by medical patients, but there was still no regulated supply, so more people relied on the VCBC for these products. It took some

time before licensed producers began providing access to cannabis edibles, and in the interim many more members relied on the VCBC to meet this need.

30. Around 60% of our members are on fixed incomes, and many live on disability, old-age pensions, or insurance plan payments. Many of our members live in precarious housing situations or subsidized social housing.
31. Because of the economic circumstances of some of our members, the VCBC allows for cash purchases and provides members who need it with small grants. We named the small grant program after Gayle Quin, in recognition of her generosity to members who needed medicine in times of financial need. The Gayle Quin grants help ensure that members do not have their supply of medication interrupted due to inability to pay.
32. It is very difficult for many of our members who live on disability payments to get a credit card or access any type of credit or loans. Many of our members have poor or nonexistent credit history or other factors that make it difficult or impossible for them to qualify for credit cards.

The VCBC Community

33. We have registered over 8,000 members since the Club's founding, and we have approximately 3,000-3,500 currently active members. We generally employ about a dozen people at the Club at any given time. Many of our employees are also members, and some are individuals who struggle to find other employment due to the physical and psychological impacts of their medical conditions.
34. The VCBC is very community-oriented. Our staff take the time to personally welcome each member when they join. When a member first comes in, one of the staff members will sit down with them to discuss various aspects of the Club and the person's needs. We ensure the new member is informed about all the products the Club offers and how they work. This personal introduction to the VCBC is a critical component of the Club's work.
35. Because the VCBC has been operating for so long, we have developed considerable experience and a body of knowledge that we are always expanding. While our staff are

not medical professionals or healthcare workers, we know a great deal about medical cannabis. Providing information and personalized service to our members is very important to us. Attached to this affidavit as **Exhibit “G”** is a selection of informational brochures that we provide to our members.

36. Before the COVID-19 pandemic, we regularly held monthly games nights and events such as picnics, potlucks, and 4/20 celebrations. For some of our members, the Club is the only place they can go to relax and feel welcome. The staff learn their names and treat them as valued community members rather than just customers.
37. The VCBC’s status as a non-profit is very important to me. It allows the Club to prioritize members’ health and well-being over profits, to ensure we don’t cut corners to make money, and to value our members and suppliers as a community of people working together to improve the lives and relieve the pain of people who are very ill.

38. Harm reduction is an important value at the VCBC. Wherever possible, we encourage our members to eat cannabis, apply it topically, or use capsules and suppositories to reduce the health impacts of smoking cannabis and achieve more consistent symptom relief.
39. The smoking lounge is a safe place for our members that serves both our harm reduction and community building goals. It is a warm and cozy indoor space where members feel protected from the elements and other people. We do not allow any discussion of politics or religion or any drug and alcohol stories in the lounge. Our aim is not just to provide a physically safe space but also an emotionally safe space for our members to gather, consume their medication, and connect with each other.
40. In the smoking lounge, we also provide tools and equipment that reduce the harms of smoking dried cannabis. For instance, we have a Volcano vaporizer for our members to use, which does not burn the plant but heats it and produces vapour. This reduces harm to the lungs and improves the effects of the medicine by preserving the plant’s essential oils.
41. The COVID-19 pandemic has negatively affected the social aspect of the club. We hear daily how much our members miss the smoking lounge and the community we have created in our space on Johnson Street.

VCBC's Members' Experiences with the Healthcare System

42. We often hear our members discuss their issues with the medical system. One of the many positive aspects of the smoking lounge is that it is a space where members can discuss their experiences and help each other navigate the medical system.
43. It has become increasingly difficult for our members to find a family doctor. More and more of our members have to rely on walk-in clinics, where they often struggle to build a relationship with a doctor who knows their history.
44. Many of our members come to the VCBC in part because their doctors are reluctant to prescribe cannabis or simply refuse to do so. Some doctors suggest that our members buy cannabis from non-medical cannabis stores. These stores do not meet most of our members' needs because they are set up for recreational rather than medical purposes.

45. In my experience, the non-medical cannabis stores have fewer or no products that are suitable for medical use, such as high-dose edibles, topicals, capsules, and suppositories.
46. Further, the price differences between products sold at non-medical cannabis stores and products sold at the Club is substantial. Most non-medical cannabis products are simply out of reach for our members.
47. For instance, a non-medical cannabis store in Victoria called the Cloud Nine Collective sells two cookies, each containing 5 mg of THC, for \$12.60. In comparison, the VCBC sells two cookies each containing a total of 75 mg of THC for \$5.00.
48. The price of THC capsules is also much higher in non-medical cannabis stores. For instance, the Original Farm cannabis store in Victoria sells 30 capsules, each containing 5 mg of THC and 5 mg of CBD, for \$44.99. The VCBC sells 30 super capsules, each containing 18 mg of THC, for \$30.
49. Attached to this affidavit as **Exhibit "H"** are screenshots describing these products from the websites of the Cloud Nine Collective and the Original Farm. The VCBC's menu, with pricing and product descriptions, is attached to this affidavit as **Exhibit "I"**.

Barriers to Accessing the Regulated Medical Cannabis System

50. There are three main differences between the products that the Club provides to our members and federally-regulated medical cannabis: price, potency, and routes of administration.
51. The Club provides cannabis medicine at a fraction of the prices offered by licensed producers. We also supply high-potency products our members rely on that are not permitted in the licensed medical market. We offer cannabis products that deliver medicine through multiple routes of administration, including suppositories, topicals, oils, drops, capsules, edibles, and dried cannabis.
52. Most of these products are not available in the regulated market or exceed the maximum THC levels provided for in the regulations. Similar products are very expensive and of low potency, which makes them inaccessible to our members. For example, towards the end of her life, ██████ relied on products such as cannabis suppositories and capsules that are still not available in the regulated market, or that are prohibited due to potency. Products with the levels of THC that ██████ needed to manage her cancer pain and other symptoms would have cost about \$1,000 per day or more if they had been purchased in today's regulated cannabis market.
53. I understand that under the current federally regulated system, a medical cannabis patient can only purchase products from one licensed producer at a time. Once you have chosen a company and purchased from them, it takes some effort to remove your license and choose another one. Our members struggle with this requirement, especially those who rely on products that may not be available when they need them from the company they are registered with.
54. Many of our members tell us that they find the regulated system overwhelming to navigate. They are given a long list of companies to purchase from and they must compare the options online, then choose one company to buy from at a time. This does not work for our members who rely on multiple cannabis products that are available at some companies but not others.

55. Many of these companies do not have any customer service available. This impersonal approach is not helpful for our members who need to discuss the products and their uses as they do with staff at the Club.
56. There is a lack of information on these websites and further details are only available by email. This is not efficient or accessible for our members, particularly those who lack reliable access to computers, smartphones, and the internet.
57. The delay between ordering a product, shipping, and receiving it is unacceptable for our members, many of whom are managing a lot of pain. Even if the wait time is only a few days, this is a few days of being in unmanageable pain.
58. It takes much longer for cannabis from licensed producers to be grown, packaged, and shipped than it does for the Club to provide cannabis to our members. The delay negatively affects the quality of the cannabis and our members' health.
59. The presence of mold and other contaminants in the regulated cannabis supply is also a major concern for our members. Because Health Canada will approve an entire batch as mold-free after testing only a small percentage of it, moldy cannabis may be sold by licensed producers because inspections were not thorough enough.

Our Members' Need for Higher Potency Products

60. The potency limit is a big barrier for our members. There is a 10 mg limit for THC content on most regulated products. The products offered at the Club are much stronger. For instance, we have capsules that contain 130 mg of THC. For members who are in a lot of pain, it is much more efficient and much more cost-effective to take one strong capsule rather than 13 10-mg capsules. For many of our members, symptoms like nausea also make it very difficult or impossible to swallow 13 capsules at a time.
61. Cookies and other edible cannabis products from licensed producers contain a maximum of 10 mg of THC. Some of our cookies are 7.5 times stronger than that. For many of our members, one of our cookies provides the minimum dosage needed to manage their pain. If a member were to purchase 7 cookies to obtain the same dose of THC, this would be

inefficient and expensive. Many of our members also deal with loss of appetite, and eating 7 cookies to manage their pain and other symptoms is simply not possible.

62. Many of our members' stories speak to the need for higher potency products to manage their pain. I personally saw the need for this when I cared for my [REDACTED], who dealt with high levels of pain for the last few years of her life. The opioid painkillers prescribed to her caused nausea and vomiting and made it difficult for her to function. She was better able to relieve her pain using cannabis capsules, which allowed her to finally keep food down. She also relied on high-potency cannabis suppositories when eating and swallowing was difficult.
63. In the fall of 2014, [REDACTED] was discharged from the hospital for the last time and sent home to die. With the help of high-potency cannabis products, however, [REDACTED] pain was controlled well enough for her to regain some function and quality of life. She lived for two more years after her last hospitalization. I believe the cannabis products the VCBC provided to [REDACTED] towards the end of her life gave her great relief and helped keep her alive much longer.

Cannabis as Opioid Substitution Therapy

64. Many of the Club's members have been prescribed opioids to manage pain. However, I have observed that once they start using cannabis alongside their opioid painkillers, their quality of life dramatically improves.
65. Opioids may be effective for pain management, but they are addictive, they lose effectiveness over time, and they can cause other physical issues to develop.
66. When I was caring for [REDACTED] she was prescribed fentanyl to manage her severe pain. The fentanyl managed her pain, but at the same time it made her nauseous, constipated, and incapacitated. It was also highly addictive. For these reasons, we supplemented her opioid painkillers with cannabis products. For a two-month period, she was able to stop taking fentanyl and only rely on cannabis. This dramatically improved her quality of life and allowed her to get out of bed, shower, and even take a car ride to the hospital so she could thank the doctors and nurses who had cared for her.

67. Many of our members use cannabis to cut down on their use of street drugs or to cut them out entirely. Cannabis helps them with anxiety and helps manage their pain levels. If the VCBC disappears, I am concerned that many of them may turn to street drugs again.
68. I have known members who died of opioid overdoses. It is always devastating to me and to the entire VCBC community when a member dies from an overdose. By providing alternatives to prescription and street opioids, the Club plays a key role in saving lives from the opioid epidemic that BC and Canada is now experiencing and which has only worsened during the COVID-19 pandemic.
69. I have seen how many members have been affected by the opioid crisis because their doctors are now more concerned about overprescribing and have responded by trying to quickly wean them off opioids or cut them off altogether. As a result, some members have turned to street drugs to address their need for opioids and pain management. Our high-potency products play an important role for these members in reducing their risk of opioid addiction, overdose, and death.

VCBC's Products

70. VCBC currently operates a retail location where we sell cannabis and cannabis products to our members. These products have a wide range of therapeutic effects. Many of these products are described in our product menu, attached as Exhibit "I".
 71. We ensure that our products are always immediately available to all our members, even if they cannot make it to the store. We allow pick-up by designated caregivers, arrange for local delivery by staff, and provide mail delivery.
 72. We offer our products at compassionate prices that are far less expensive than cannabis products sold through licensed producers and non-medical cannabis stores. Many of these products also exceed federal potency levels and/or are not available in the regulated system, including our salves, creams, and suppositories.
 73. We encourage our members to try a variety of products to see which ones relieve their symptoms with the fewest side effects, such as ingesting edibles rather than smoking
-

dried cannabis. Access to VCBC's products has decreased the amount of inhaled medical cannabis that some members use to manage their medical conditions, which reduces the harms associated with smoking or vaporizing cannabis.

74. With the exception of cannabis flowers, kief (also known as hash), and high-potency oils, most of the products we sell are produced by the VCBC's bakers. We offer products in the following categories: cannabis flower and kief, tinctures and capsules, edibles, suppositories, concentrates, and topicals and infused products.

Cannabis Flowers and Kief

75. The VCBC has cannabis buds and pre-rolled joints for sale. The buds are available by weight starting at 0.3 g. We allow our members to purchase very small quantities to ensure consistent access for those without much cash on hand. The VCBC's joints are all rolled from cannabis made from plants grown specifically for the Club.
76. Many of the growers we work with have provided the Club with the same strains they have been growing for many years. This ensures that our members have consistent access to the strains they rely on.
77. The kief that the Club sells is made entirely without solvents, using screens to ensure purity and prevent chemical contamination. This is the same hash we also use in our brownies and capsules. Unlike other cannabis producers, we do not use any water in our extraction process because it can cause mold.

Tinctures, Oils, and Capsules

78. The VCBC offers a wide array of tinctures, oils, and capsules to meet members' individual needs. Our recipes have been fine-tuned over more than 25 years to create consistent and reliable products.
79. Capsules are one of the most popular products for our members. They are an efficient way to ingest a large amount of cannabis, which is helpful for members in a lot of pain.

80. We use rosin in our capsules, which is a solvent-free extract produced by using heat and pressure to extract a sticky, flavourful cannabis concentrate from dried cannabis flower. We take this rosin and mix it with MCT oil and lecithin so it is more easily digested. Our rosin capsules are our most potent capsules. We offer them in two strengths: 65 mg (\$3 per capsule) and 130 mg (\$5 per capsule).
81. We offer CBD tinctures, which are alcohol-free and made from organic hemp oil.
82. We also offer Cannoil capsules. Each capsule contains olive oil that has been infused with the active ingredients from a selection of cannabis strains. Some capsules are high in CBD and are made from CBD-dominant cannabis strains, and others are high in THC. Our members can choose the capsules that best meet their medical needs. Most of our capsules have about a 1:1 CBD to THC ratio. Most of our members report that this treats their symptoms effectively and produces fewer psychoactive effects.
83. One of the Club's top-selling products is a high-potency edible cannabis oil made by a Vancouver company called Viridesco. We recommend this product to patients with advanced cancer and AIDS. The oil contains 73% THC. One 5ml vial contains 3,180 mgs of THC, and we sell them for \$80. Viridesco's flyer describing this line of products is attached to this affidavit as **Exhibit "J"**.
84. The same amount of THC purchased in the regulated market would cost around \$700. More than 300 10-mg gel capsules would be required to obtain the same amount of THC.
85. I am not aware of any similar products that are currently available through licensed producers. Even if such products were available, I understand that the regulations require that the dispensing mechanism release no more than 10 mg of THC at a time. Dispensing a high-potency extract in 10 mg doses would be inefficient and ineffective for people in severe pain, who require much higher THC levels for pain management.

Edibles

86. Edibles are some of our most popular products. We are proud to supply many healthy and diverse edible alternatives to inhaled cannabis, including vegan and gluten free options, and we are continually developing new products.
87. We offer products such as gummies, cookies, brownies, chocolate bars, and meal replacement products we call Budda balls.
88. The regulated market and local dispensaries have fewer edible options. Their edibles are usually commercially produced and often sit on the shelf for a long time before they are sold and consumed. We offer our members more selection and fresher products with healthy ingredients, many of which are organic.
89. Providing a wide variety of edible products is important to us because it provides comfort and freedom of choice to members who are in pain and may be nauseous from their illness and from the side effects of their medications. Our edible cannabis products do more than simply deliver a dose of medicine. They provide the comfort of homemade and healthy food to very sick people.
90. I am especially proud of the VCBC's Budda balls, which we designed as a meal replacement that delivers medicine at the same time. A single Budda ball provides enough nutrition for a person struggling with nausea and lack of appetite to get through the day. We named this product after one of the bakers who helped design it.
91. Because the VCBC is a non-profit dedicated entirely to helping improve our members' well-being, we are able to focus our attention on edible products like those described above that are tailored for specific medical needs. We can also charge less for these products and use higher quality, more expensive ingredients than a company expecting to turn a profit. This is very important to me and to our members.

Suppositories

92. Cannabis suppositories are very helpful when members are so sick that they cannot keep food down. As far as I know, they are not an option that is available for purchase in the legal market.
93. We offer low-cost suppositories in in two strengths, \$2 for 50 mg and \$4 for 100 mg.

Topical Cannabis and Extracts

94. We have combined some of our cannabis oils with ingredients derived from other medicinal plants, to provide our members with traditional treatments for a variety of chronic illnesses.
95. Cannabis infused oils have analgesic, antifungal, antimicrobial, antibiotic, and antiseptic properties when applied to the skin. Because these products target the area where they are applied, they require significantly lower blood levels of the active ingredients to achieve symptom relief. Our topical products are generally non-psychoactive. Topical applications are quick acting, usually taking effect within the first five minutes of use.
96. These topicals are helpful for members who do not want to ingest cannabis. They are not widely available in the regulated market and when they are available, they tend to be very expensive and are mass-produced with a lot of chemicals and additives that can make our members sick.
97. Members who deal with severe arthritis, skin cancers, and bone issues find our topical products very helpful.
98. I understand that the regulations cap THC levels for cannabis extracts and topicals at 1000 mg per container. This restriction is a major barrier for our seriously ill members who rely on high-potency products. To achieve the same level of pain relief as they would with a high-potency product, they would need to consume or apply much more of a low-potency product. This is both prohibitively expensive and impractical, particularly for members who struggle with nausea and joint pain.

Product Labeling

99. The labels on our products include the following information:
- a. Keep away from children;
 - b. Keep away from pets; and
 - c. The list of ingredients.
100. I have attached two of our product labels to this affidavit as **Exhibit “K”**.
101. One of our goals for the future is to improve the packaging, including by providing childproof features. It is very important to me that we take all possible measures to ensure our products are not accidentally consumed by anyone, particularly children or pets. We are willing and able to adapt our packaging to transition to a licensed operation.
102. In our 25-year history, we have not received any reports of a child having accidentally ingested one of our products.

VCBC’s Safety & Security Policies

103. The VCBC takes a number of steps to maintain safety and security for our members, employees, and the community. We strive to be a good neighbour and to foster positive connections throughout Victoria and Vancouver Island.
104. We maintain the safety of our storefront by training our frontline staff to manage and deescalate difficult situations, including those involving members who are struggling with mental health and addictions.
105. Our safety practices begin when we onboard a new member. VCBC staff are trained to determine whether the photo identification that a new member presents is valid and that their medical documentation is genuine. We have called the doctors and clinics listed on medical documents to verify the information provided in cases where we have had doubts about the veracity of the documentation.

106. After an individual becomes a member, we carefully monitor their behavior and purchasing habits for suspicious activity. We particularly watch out for members who seem to be buying for anyone other than themselves, or who may be buying products to resell them. All purchases are for personal consumption only and we immediately terminate the membership of anyone found to be reselling VCBC products.
107. We have a colour-based flagging system we use for members. Green means they are members in good standing, blue means they are being monitored for suspicious behavior, yellow members must speak with the most senior staff member before they can access services, and red means that member has been cut off from the Club and can no longer purchase any of the VCBC's products.
108. Some of our safety and security policies are outlined in the Operations Manual.

VCBC's Cannabis Growers

109. We currently have between 15-20 growers for the Club. We have longstanding relationships with most of them. One grower has been providing plants to the Club since 1998, and several since 2003. Most of our growers work exclusively with us and do not need to seek other buyers.
 110. We work with small-scale growers because it is easier for them to control the growing environment, pay close attention to the plants, and inspect for quality. Our suppliers grow mainly indoors, though some grow small amounts outdoors or in greenhouses.
 111. The VCBC has tried many different small growers throughout the years, but we only choose the ones with the best quality product. We are very selective because of how important it is for the VCBC to provide the best quality products for our members.
 112. To ensure that the cannabis they grow, process, and provide to the VCBC is of a consistently high quality, we have guidelines for our growers, some of which are outlined in the Operations Manual. We do not source from growers who use any pesticides or herbicides. We work with every grower to ensure they understand that our members are very sick and herbicides and pesticides can make them sicker.
-

The VCBC's Quality Control Measures

113. Because all of our members are seriously ill, we are particularly vigilant about the quality of our products and we maintain strict quality control practices.
114. The VCBC's staff undertake a visual inspection of every bud for mold, mildew or other contaminants before it is sold. Our staff are trained to always be on the lookout for mold, rot, and mildew, even if a bag has already been inspected.
115. The VCBC also ensures that all of the cannabis sold by the Club is free of molds and other microorganisms by conducting thorough qualitative testing with a microscope. Staff members inspect every batch diligently, bud-by-bud. We have found this is the best way to determine whether there are any mold issues in a given batch.
116. I have researched Health Canada's testing requirements in detail, and I understand that Health Canada inspects for mold by testing only a small percentage of lot or batch of cannabis plants. At the Club, we understand that you can have a high-quality crop but one plant or bud can still have mildew or bud rot, so it is not enough to only inspect only a small part of the batch.
117. We recently submitted a batch of dried cannabis plants for testing with a Health Canada lab and it passed the tests, but we knew from our close inspection that there was mold and rot in the batch. As a result, we cannot rely on this type of testing, as it is not thorough enough to protect our members' health.
118. We also test for potency at a Health Canada certified lab that tests our cannabis and cannabis products for THC and CBD levels. We generally do not have problems with inconsistent or insufficient potency at the Club.
119. I have researched Health Canada's standards for growers and concluded that these standards are not rigorous enough for our members. About nine years ago, the VCBC created our own standards for growers to eliminate chemical additives and mold to protect the health of our members. Some of these standards are outlined in our Growers Guidelines in our Operation Manual at Exhibit "E".

VCBC's Bakers

120. We have had a few bakers over the years at VCBC. I have been heavily involved in the baking process and have been making at least some of the products myself for about the last 22 years. I have also designed many of the VCBC's products and I continue to design and improve the recipes to this day.
121. It is very important to the VCBC's work that we produce our edibles and most of our other cannabis products in-house. This allows us to supply products based on the evolving needs of our members. For about four years, we outsourced the production of our edibles and topicals to a private company. This was not a good experience, as we lost control over the products and quality. We found that the company was not supplying the key products our members needed.
122. In 2016, I set up a new bakery with Clea MacLean. We had to build everything from scratch again, including kitchen equipment and ingredients. This was a time of positive rebirth for the Club and our members. During this time, I heard from many members on a daily basis how critical these products were for their well-being and how they could not find products like ours anywhere else.
123. I will always strive to make sure we have a direct connection from the kitchen to our members because I have learned that this is the best way to maintain the highest quality possible and keep costs to an absolute minimum.
124. We are able to keep the price of our edibles very low because the prices are subsidized by sales of our other products. As stated above, part of the core of our mission is to provide high-quality cannabis products at the lowest cost possible. That objective applies to all of our cannabis products, but we are particularly concerned with providing low-cost edibles, as we know how helpful they are to our members and how important it is that they be able to access them.

Provincial Exemption Application

125. The VCBC has taken steps to apply for an exemption from BC's cannabis regulations.
126. On February 28, 2020, I wrote to Mary Shaw, Executive Lead at the Cannabis Legalization and Regulation Secretariat, requesting a provincial exemption under s. 130 of BC's *Cannabis Control and Licensing Act* (the "CCLA"). Attached and marked as **Exhibit "L"** is a copy of my correspondence to Ms. Shaw.
127. Ms. Shaw wrote back on May 6, 2020 and stated that such an exemption could not be granted because the provincial regime does not regulate cannabis for medical purposes. Rather, the federal regime governs medical cannabis. She told me that "the Province will not authorize sales of cannabis that are illegal under federal criminal law." Attached and marked as **Exhibit "M"** is a copy of Ms. Shaw's correspondence to me.

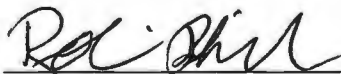
VCBC's Commitment to Transitioning to a Licensed Operation

128. The VCBC is eager to work with Health Canada and our suppliers to obtain licenses and comply with as much of the federal regulations around medical cannabis as possible, while continuing to operate in a manner that meets the needs of our members.
129. We are currently working on preparing our organization to transition into a licensed medical cannabis storefront. We are also in discussions with our growers and are working with them to assist with their applications for production licenses.
130. Based on my research into Health Canada's licensing requirements, I anticipate that the application process will be lengthy, complex, and costly. My understanding, based in part on the experience of the Completely Cannabis medical storefront in Brockville, Ontario, is that this process can take up to two years. A newspaper article describing the application process undertaken by Completely Cannabis is attached to my affidavit as **Exhibit "N"**.
131. It is important to our members that we continue to source cannabis from the same growers, as they provide the strains our members are familiar with and rely upon. We also rely on our established relationships and direct connections with our growers to

ensure consistent quality. Our growers will need to invest considerable capital in their operations to comply with the licensing requirements. I anticipate that transitioning our growers into licensed producers will take a great deal of time.

- 132. As a non-profit society, the VCBC's access to funding and investment is very limited. We keep our costs intentionally very low so that we can keep the cost of our products as low as possible, as that is essential to serving our members' needs.
- 133. We are entirely willing to work with a medical practitioner at the Club and have them register members with Health Canada and review our members' medical documentation a few times a week. We have begun the process of researching how to set up such an arrangement.
- 134. I am very concerned about any interruption in our services as we go through the licensing process. Leaving thousands of people without their medicine for months or years at a time would put their health – and, for some of them, their lives – at serious risk.
- 135. It is very important to the VCBC and our members that we continue to be able to provide accessible, low-cost, high-potency products to our members within a supportive therapeutic community.

AFFIRMED BEFORE ME at Victoria, in the)
Province of British Columbia, this 26 day)
of March, 2021)



(A Commissioner for Oaths in and for the)
Province of British Columbia))



) Ted Smith)

Robin Phillips
Barrister & Solicitor
JFK Law Corporation
816-1175 Douglas Street
Victoria, BC V8W 2E1

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This is Exhibit A referred to in the affidavit of

Ted Smith

affirmed before me at Victoria, BC

this 26 day of March, 2021.

Robin Phil

A Commissioner for taking Affidavits for British
Columbia

THE CITY OF VICTORIA



OFFICE OF THE MAYOR

The Honourable John Horgan
Premier of British Columbia
PO Box 9041 Stn Prov Govt
Victoria, BC V8W 9E1

January 21, 2020

Dear Premier Horgan,

I am writing on behalf of Victoria City Council to advise the Province of the valuable service that the Victoria Cannabis Buyers Club (VCBC) has provided to medicinal users of cannabis for the past two decades, and to request that the Provincial government consider authorizing an exemption to the VCBC under section 130 of the Cannabis Control and Licensing Act, to allow the Club to continue to provide responsible access and a safe, welcoming community space for medical cannabis users in the City of Victoria and Capital Region.

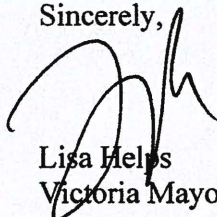
The VCBC has provided a compassionate, not-for-profit, safe, inclusive and welcoming space for medical users of cannabis in the City of Victoria for more than two decades. Over the past days, weeks and months Council has heard from concerned medical cannabis users that they might lose access to the type of services provided by the VCBC. This could negatively impact consumer's health, quality of life and their sense of connection and community.

Legislation adopted by the British Columbia Legislative Assembly, the Cannabis Control and Licensing Act, specifically section 130, allows for an exemption from the provincial regulatory provisions when an exemption is deemed advisable by the Lieutenant Governor in Council, the provincial Cabinet. As such, it is our position that a temporary exemption while the business transitions into the legal system would be appropriate and to the benefit of the Club's patients.

The owners of the VCBC are seeking a fair hearing before the BC Cabinet so that a just decision can be made. The owners of the VCBC have also expressed interest in connecting with a senior representative in the B.C. Liquor and Cannabis Distribution Branch to begin drafting a framework for the logistics of this potential exemption so that the B.C. Cabinet has the information they need to make a decision. An ideal working group could include a panel made up of officials from the Province, Health Canada, Island Health, the City of Victoria and the VCBC to meet as required to discuss the club's progress towards full compliance with the law. During this process, the VCBC would maintain a medical only mandate and would expect to avoid enforcement until an exemption decision is made.

On behalf of Council, I look forward to working together to find a solution that for the sake of medical cannabis users in the City of Victoria. Please do not hesitate to contact me should you have any questions regarding this letter.

Sincerely,

A handwritten signature in black ink, appearing to read 'LH', is written over the typed name.

Lisa Helps
Victoria Mayor

Cc Honourable Mike Farnworth, Minister of Public Safety and Solicitor General
 MLA's representing constituencies in the Capital Region

THE CITY OF VICTORIA



OFFICE OF THE MAYOR

November 4, 2020

The Honourable Patty Hajdu
Minister of Health
Address Locator 0900C2
Ottawa, Ontario
K1A 0K9

Dear Minister Hajdu,

I am writing on behalf of Victoria City Council to indicate the City of Victoria's support for the request from the Solicitor General of British Columbia, that the Federal Government examine issuing a license that would allow the Victoria Cannabis Buyers Club (VCBC) to continue providing important health and wellness services in our local community.

Recently, the City of Victoria advocated to the Solicitor General of British Columbia to advise of the valuable service that the VCBC has provided to medicinal users of cannabis for the past two decades, and to request that the Provincial government consider authorizing an exemption to the VCBC under section 130 of the Cannabis Control and Licensing Act, to allow the VCBC to continue to provide responsible access and a safe, welcoming community space for medical cannabis users in the City of Victoria and Capital Region.

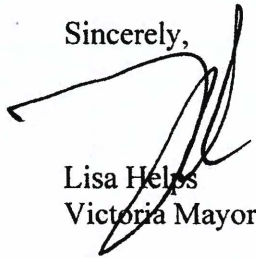
The Solicitor General of British Columbia advised that an exemption of this type would need to come from Health Canada, and that he has raised this issue with his federal ministerial counterpart and encouraged exploration of a license that could allow VCBC to continue providing certain services.

Therefore, on behalf of the City of Victoria, I wish to share our support for the VRBC model with Health Canada through this letter. It is our position that a temporary exemption while the business transitions into the legal system would be appropriate and to the benefit of the Club's patients.

The VCBC has provided a compassionate, not-for-profit, safe, inclusive and welcoming space for medical users of cannabis in the City of Victoria for more than two decades. Over the past months Council has heard from concerned medical cannabis users that they might lose access to the type of services provided by the VCBC. This could negatively impact consumer's health, quality of life and their sense of connection and community.

Thank you in advance for your attention to this matter. I look forward to working together to find a solution that for the sake of medical cannabis users in the City of Victoria. Please do not hesitate to contact me should you have any questions regarding this letter.

Sincerely,

A handwritten signature in black ink, appearing to read 'Lisa Helps', written over the printed name.

Lisa Helps
Victoria Mayor

Cc Honourable David Lametti, Minister of Justice and Attorney General
 Honourable Mike Farnworth, Minister of Public Safety and Solicitor General
 Health Canada, via email: cannabis@canada.ca

This is Exhibit B referred to in the affidavit of

Ted Smith

affirmed before me at Victoria, BC
this 26 day of March, 2021.

Re → Phi

A Commissioner for taking Affidavits for British
Columbia



HOUSE OF COMMONS
CHAMBRE DES COMMUNES
CANADA

Laurel Collins

Member of Parliament | Députée
Victoria

December 1, 2020

The Honourable Patty Hajdu
Minister of Health
House of Commons
Ottawa, ON
K1A 0A6

Dear Minister Hajdu:

I am writing to you on behalf of the constituents of my riding of Victoria to indicate my support for the government to examine issuing a license that would allow the Victoria Cannabis Buyers Club (VCBC) to continue to provide a not-for-profit and accessible space for medical users of cannabis.

It is my understanding that the current legal model for medical cannabis is expensive and inaccessible. Barriers that exist include a general inaccessibility of family physicians and General Practitioners in my home province of British Columbia. As well, users of medical cannabis who face financial hardship already struggle to pay for medications as well as struggle to qualify accessing credit in order to purchase cannabis online. Barriers such as these are unjust.

It has also come to my attention that the leadership of the City of Victoria has written to you advocating similarly on behalf of the VCBC. Please consider allowing for a temporary exemption to the VCBC under section 130 of the Cannabis Control and Licensing Act while the business transitions into the legal system as a compassionate step forward.

Warmly,

Laurel Collins
MP for Victoria

Ottawa	Victoria
House of Commons Chambre des communes	1057 Fort Street, Victoria, British Columbia, V8V 3K5
Ottawa, Ontario, K1A 0A6	Tel.: 250-363-3600
Tel.: 613-996-2358	Fax: 250-363-8422
Laurel.Collins@parl.gc.ca	

This is Exhibit C referred to in the affidavit of
Ted Smith
affirmed before me at Victoria, BC
this 26 day of March, 2021.
Paul Phin
A Commissioner for taking Affidavits for British
Columbia



HOUSE OF COMMONS
CHAMBRE DES COMMUNES
CANADA

Paul Manly

Member of Parliament
Nanaimo-Ladysmith

The Honourable Patty Hajdu, Minister of Health
House of Commons
Ottawa, ON
K1A 0A6

October 16, 2020

Dear Minister Hajdu,

I am writing to you today to encourage Health Canada to grant the Victoria Cannabis Buyers Club (VCBC) a temporary exemption from the Cannabis Act.

The VCBC is one of the oldest compassion clubs in Canada. It operates as a not for profit organization, with the sole purpose of providing affordable, high quality medical cannabis to patients who need it.

Many of the patients who have used their services over the years belong to poor and marginalized communities who have extra challenges in accessing medical or recreational cannabis through the existing channels.

Until legal medical and/or recreational distribution systems are able to offer comparable products at comparable prices with the same level of accessibility, VCBC should be allowed to continue to provide high quality medicines to patients.

My office has been contacted by constituents of Nanaimo-Ladysmith who have not been well served by the medical cannabis system or the for-profit cannabis stores in Nanaimo. These constituents make the trip from Nanaimo to Victoria once every few weeks, in order to purchase

the affordable high quality medical cannabis offered by the VCBC. They are deeply concerned that the VCBC may be forced to shut down.

The Victoria Cannabis Buyers Club is one of the oldest compassion clubs in Canada. VCBC provided Canadian patients with affordable high quality medical cannabis long before Canadian policies caught up and legalized the growing, sale and use of cannabis. VCBC provided relief to patients who had nowhere else to go to fulfill their constitutional rights to have access to the medicine they need.

Over the past 25 years the VCBC has been raided seven times by law enforcement, each time losing tens of thousands of dollars worth of medical cannabis products as well as money.

The current model for access to medical cannabis does not work for everyone. I believe there is a good case to be made for the VCBC to be given an exemption from the regulations, in order for it to continue serving patients in need with a not-for-profit model based on service and compassion.

Throughout its history, the VCBC has been instrumental in the fight against prohibition and for patients rights. It would be a great loss to have it shut down due to legalization.

I would be happy to discuss this with you or someone from your staff.

Regards,



Paul Manly
Member of Parliament
Nanaimo-Ladysmith

Ottawa

Room 313, Confederation Building
Ottawa, Ontario K1A 0A6
Tel.: 613-992-5243
Fax.: 613-992-9112

Paul.Manly@parl.gc.ca

Constituency

Suite 103, 495 Dunsmuir Street
Nanaimo, British Columbia V9R 6B9
Tel.: 250-734-6400
Fax.: 250-734-6404

This is Exhibit E referred to in the affidavit of

Ted Smith
affirmed before me at Victoria, BC
this 26 day of March, 2021.

Rob Phil

A Commissioner for taking Affidavits for British
Columbia

Operations Manual

For the Victoria Cannabis Buyers Club



All material © 2002-2020 Victoria Cannabis Buyers' Club

First Edition Compiled and Edited by Ryan Fink with the help of the staff at the VCBC.

Second Edition Compiled and Edited by Nicholas Fraleigh and staff at the VCBC.

Third Edition Compiled and Edited by Jacqueline Kittel and staff at the VCBC.

Logo by Owen Smith

Foreword

The mandate of the VCBC is to provide cannabis medicines to people suffering from chronic ailments. We are a nonprofit organization. We provide an essential service to the community and offer a safe space for our members to gather and medicate in, as well as engaging in advocacy work. What makes us different from other NPOs is that, because of the illegality of our activities, we don't have access to the types of funding available to other such organizations, so our activities are funded through revenues generated from the sale of products to our membership.

Our organization has been through countless changes since it began operating in 1996 out of the back of an old van. First it moved into a bachelor apartment in an apartment building in the downtown core. It ran there for a few years until 2001, when it moved into its present location at 826 Johnson Street. Through all of these moves, the demographic we serve and their needs have been continually shifting as public attitudes toward cannabis as medicine have changed (in no small part due to the efforts of our group and others like us across the country and around the world).

When Ted Smith created the VCBC, he modeled it after the San Francisco Cannabis Buyers' Club, which was founded by Dennis Peron, "Brownie Mary" Rathbun, and Tod H. Mikuriya, among others. They did much more than sell medicine to the many people who were ill with AIDS in San Francisco at the time - they provided a community for those people to heal themselves in. It could be said that this society was just as medicinal as the medicine they all shared a need for.

As a staff member at the VCBC, you should keep this in the back of your head at all times. Things get very hectic, and business is always growing and changing, and it can become overwhelming at times. This is where this operations manual comes to play. By familiarizing yourself with it and the workflow that it outlines, you should be able to stay on top of all the noise and chaos of business and really get to know your members. This is truly the most rewarding aspect of such work.

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1. Membership Regulations

Members are the core of a successful medical cannabis operation. Regulations around membership are what make these clubs functional by distinguishing them from “pot stores” that would serve the general population cannabis for recreational purposes. By appealing to the various court decisions that have found that sick people have a constitutional right to safe access to this medicine, we are allying ourselves with the justice system and the Canadian Charter of Rights and Freedoms.

1.1 Membership Criteria

1.1.1 We provide membership free of charge to individuals dealing with chronic physical and mental conditions, meaning people dealing with a permanent physical disability or disease, or those with other ailments who have a specific recommendation for medical cannabis use, except for some mental health patients as explained in 1.1.5.

1.1.2 We require evidence of an individual’s chronic condition in the form of a Proof of Condition (POC). This is a document stating the patient’s name and condition or disease, signed by a qualifying medical professional on their official stationery. The POC should contain the doctor’s contact information and signature, or be validated by a lab if the POC is presented in the form of test results. We only accept POC’s from certain medical professionals and medical labs, plus a membership to the Canadian National Institute for the Blind, (CNIB), or an appointment card with the cancer clinic. We also accept proof of condition from Chiropractors, Naturopaths, nurse practitioners, and psychiatrists. Any concern about validity of documentation can be resolved with management.

1.1.3 If a person has MMPR or ACMPR documentation, it can serve as a POC. Membership to a Licensed Producer will suffice so long as the patient’s name, prescription for cannabis and prescribing doctor’s name is on the document.

1.1.4 If a person has an explicit written recommendation from a doctor for the use of cannabis, this will serve as a POC (prescription for cannabis specifically).

1.1.5 Patients with schizophrenia, personality disorders or extraordinary mental health problems require an explicit written recommendation for the use of cannabis by their physician and/or psychologist.

1.1.6 The VCBC requires that individuals have reached the age of majority (19) or have their legal guardians explicit written consent to become members and use medical cannabis.

1.2 Entering a New Member into the System

1.2.1 The following steps are to be taken in signing up a new member. Sign-up Paperwork is completed while the new member is undergoing orientation (see Appendix A). A sign up requires: a valid proof of condition, a copy of government issued ID to confirm the patient’s name, and our completed member application.

1.2.2 Check the POC and government issued photo identification. Have a senior staff double check if you are unclear about their qualifications.

1.2.3 If there is any question about the validity of the POC, ask the prospective member if you can call their doctor to confirm their condition.

1.2.4 If the prospective member agrees, call the doctor's office and verify that the candidate is indeed a patient there.

1.2.5 If the prospective member does not agree, inform them that membership may not be granted. Consult with senior staff.

1.2.6 Request a photocopy of the POC for our records. We use the POC as proof of qualifying medical condition for future reference.

1.2.7 We do not require a photocopy of the candidate's photo ID and we do not keep copies of ID on site for privacy purposes.

1.2.8 Run the name through Biotrack to ensure that the prospective member is not a cut-off member trying to re-apply.

1.2.9 If the patients has all their documents and you are ready to make them a member, make a photocopy of the POC. On the photocopy of the POC, write the member's name, new member number, the date, and your staff initials, all along the bottom corner of the right side of the page so that this information is easily accessible from the filing cabinet.

1.2.10 Have the candidate fill out and sign the membership application.

1.2.11 Consult the master list for the next available member number.

1.2.12 On the top of the completed member application write the member number. In Biotrack complete patient entry into database including name, contact information, and all other pertinent information. For patients with temporary authorizations with term limits, add a note to their Biotrack account with the date of signup and the expiration of their 30 day membership.

1.2.13 After the forms have been filled out they can begin the orientation procedure (see Appendix A). File the completed membership application with the POC in the filing cabinet, alphabetically by last name.

1.2.14 Add number to Master List with following info: legal name and optional preferred name, date, "POC on file", and initials of staff who completed the sign-up paperwork

1.2.15 Enter new member info onto a new index card following example from another card in the index.

1.2.16 Use the member's information to make a member card for them with their name and member number.

1.3 How to Enter a New Employee Into the System

1.3.1 Ensure employees have read the Employee manual, signed worksafe documents, and have a profile made on Quickbooks. Additionally, all staff must read and sign our agreement and policy documents (Appendix F to K)

1.3.2. Walk through of VCBC - orient employee to these spots:

Fire extinguishers, first aid kit, eye wash station, wet floor signs.

Lobby - Front desk, rosin press, line for members to stand behind, display cases.

Office - hours book, cannabis bins, mail order station, employee manuals, member returns.
 Cleaning supplies location - cleaners, mop, broom, gloves, garbages, garbage bags.

Fridges and freezers - special note on distribution location.

Cleaning checklist

1.3.3 How to fill out and taking breaks - break board

1.3.4 Calendar in the back for Days off sheet

1.3.5 Hours book (how to fill out worked shifts)

1.3.6 You are not to be intoxicated at work. Please consume no more than medically required

1.3.7 All employees must obtain their Food Safe and First Aid training

1.3.8 Concept and Mandate (i.e., how we approach member interactions at VCBC

Compassion: The amazing work each employee does and the need for self care to maintain this

Timing: What our members see and what we really do - balancing the team priorities, time management and a personal sense of urgency

Products: Honesty, Our guarantee of integrity

Products - Go through the sign up product introduction (Appendix A)

1.3.9 All VCBC products are broken down into “strain categories” and then specialized from there - sativa, indica, hybrid and CBD. Edibles - cold infusion products (stakenol and kamut), ingredients in edibles and how they help us specialize. Capsules - Specialities and strength

1.3.10 Bio track

Assign a login, password and pin

Youtube videos - biotrack tutorials

Show them how to look up members, and do sales.

1.3.11 Member Sales - How to approach budtending. Recommendations - confidence and honest

1.3. 12 How to help someone figure out what they want (smoke vs ingest? Sativa or indica)

1. 3. 13 Security Risk Assessment - You have the right and responsibility to say no to anything that makes you feel uncomfortable. In case of ANY emergency, do not hesitate to dial 911 - these could include medical emergencies for member

1. 3. 14 Every staff member must have up to date first aid - If there are staff waiting to be certified, a minimum of one person must be First Aid trained and on shift at all time

1. 3. 15 Every staff member must have Serving It Right

1. 3. 16 In the event of a robbery, fully cooperate. Your safety cannot be replaced but everything else can.

1.4 Home Sign-Up

1.4.1 Home sign-ups are for prospective members whose health prevents them from being able to

come to the club in person. They will usually be initiated via the phone, or through an emissary. See the Phone Consultation document pinned in the front office.

1.4.2 Find out if the prospective member plans on making a purchase of smokable cannabis. If so, ask if they know how much and what kind(s) they want. Be sure to mention our edible and topical products so we can bring samples of appropriate products.

1.4.3 If possible, arrange for a caregiver to be at the appointment so they are aware of the club rules and may be listed on the new member's account as being allowed to make purchases on the member's behalf at the club. If a caregiver will be making purchases for the member, make sure to note the caregivers name on the member's Biotrack file.

1.4.4 At the appointment, go over all of Sec. 15 (Member Orientation) but you can exclude the club tour. Also discuss Sec. 6 (Deliveries) so they know we can drop medicine off to them if they can't come to the club.

1.4.5 The staff member who performs the home sign-up is also responsible for: having the member fill out the application form, filing the new member's POC (see sec. 1.2.10), adding the new member to the master list (see sec. 1.2.14-15), making and filing a new member index card (see sec 1.2.16), and creating a new member computer file and card (see sec. 1.2.12).

1.5 Members of Other Clubs

1.5.1 The only other club's we will accept memberships from without a POC are the Vancouver Island Compassion Society (VICS) and the BC Compassion Club Society (BCCCS). We take a picture of their membership card as a POC.

2. Membership Conditions

We deal with a large cross-section of the population, many of whom suffer from debilitating physical conditions that pose multiple barriers to a standard quality of life. All staff and members of the club would do well to appreciate this. Unfortunately, from time to time an incident will occur that warrants the suspension or termination of a membership. This will usually be due to the member redistributing their medicine, though there have been times where violence or other inappropriate behaviour have warranted such action.

2.1 Member Status

2.1.1 Unmarked members are "members in good standing" and are free to enter the club.

2.1.2 Blue members are members currently being monitored for suspicious behavior.

2.1.3 Yellow members are members that must speak directly with the most senior staff member (usually Ted) before they can access services. When a yellow member enters the club, remain calm, read the notes present on their Biotrack and calmly communicate the situation to management. If not present, a phone call should be made to Ted. If no representative is available, the member is to be informed that they must return at a later time. If there is any question on how to proceed or when to schedule the meeting phone a manager.

2.1.5 Red members are members that have been "cut off". Please politely inform and red members

entering the store that they are no longer welcome on the premises. If the member refuses to leave or has questions about their termination ask a manager for their assistance.

2.1.6 If a red member comes into the club with an active member, the active member should be informed that the red member is no longer welcome here, and asked not to have them accompany them into the store, unless they are the active member's partner, in which case the ex-member may still wait in the front lobby.

2.2 Lost Cards

2.2.2 If a lost card has been found, store it in the card catalogue and make a note on the member's Biotrack about finding it.

2.2.3 Members who have lost their cards, who cannot remember their member number, and do not have government issued photo ID cannot purchase cannabis.

2.3 Inappropriate Member Behaviour

2.3.1 Discrimination, sexism, racism, religious persecution, slander, defamation of character, harassment and intimidation are strictly prohibited within the club.

2.3.2 If a member displays any of these actions or behaviors, they should be politely asked to stop immediately. If needed, the member should be politely asked to leave the club.

2.3.3 If the member does not comply with your polite requests, involve a senior staff member immediately.

2.3.4 If there is an occurrence, make a note of the member's actions or behavior on their profile.

2.3.5 If a member is obviously intoxicated, ask a senior staff member to help you escort the member out of the club. If a transaction is allowed by the senior staff member, notify the member that they must make their purchase and leave without using the vapour lounge. If in any doubt about how to proceed, call for a senior staff member.

2.3.6. If a member causes a problem, note the behaviour in the Sketch Files note book in the office and we will discuss all issues with members at our monthly staff meetings.

2.4 Suspicious Behaviour

2.4.1 It is of the utmost importance that any suspicious behavior be monitored and noted for the protection and security of all members and the club.

2.4.2 Staff should be constantly on the lookout for indications that a member intends to sell products to non-members.

2.4.3 We make an exception for the gifting of cannabis between family and close friends. We are primarily concerned with stopping the resale of cash for cannabis products.

2.4.4 If redistribution is witnessed or strongly suspected, the member should be flagged and a note made

on their account immediately and senior staff informed.

2.4.5 Possible indications of the intent to redistribute include: inadvertent verbal affirmations of intent to redistribute, desire to have the same medicine in multiple bags or containers, non-member(s) waiting outside for a member, especially who are trying to stay out of sight, interactions between a member and a non-member(s) outside that visibly could be a transaction or hand-off, a member keeping money in separate piles or in different pockets, and a member who has lots of \$5 or \$10 bills.

2.4.6 Random large purchases or sudden variation in buying pattern. Example: a member consistently buys 1g of cannabis a day, then suddenly buys 1/2 oz or more. This is especially true if they resume their regular buying pattern the next day.

2.4.7 Joint rolling or repackaging in the bathroom as this is a sign of possible redistribution. Be on the lookout for residue on the toilet or in the sink.

2.4.8 Any rude or aggressive behavior. Particularly in the case of aggressive behavior, the member should be immediately yellow flagged and senior staff informed.

2.4.9 A few areas people tend to wait outside the store for members who are redistributing are in front of Central Care Home, the smoking area by the government office, and the bus stop across the street.

2.4.10 A member who commits an incriminating act with sufficient evidence before a transaction has been completed should be immediately flagged on their computer file. If warranted, the transaction should be immediately halted until the reason for the note is resolved by the member and senior management.

2.4.11 A member who commits an incriminating act with sufficient evidence after a transaction has been completed should be immediately flagged on their computer file.

2.4.12 Do not make the member aware of your suspicions. The member may further incriminate themselves prior to speaking with the management. It is in your best interest to avoid letting the member know you are suspicious of them

2.4.13 Members who are flagged are not permitted to enter the club until they have spoken with the management and all issues have been resolved.

2.4.14 Misuse of the club may be cause to flag a member, and/or may result in a member being asked to leave the club for the day, and/or may result in a member being banned from the vapour lounge for a period of time . Misuse of the club includes: extended bathroom use, or IV drug use in the bathroom (more than 10 minutes in the bathroom without a reasonable explanation results in the member losing bathroom privileges), use or preparation of tobacco in the box, panhandling or “mooching” (asking to share other member’s medicine), consistent foul or disrespectful language, excessively loud or inconsiderate conversation in the vapour lounge, or spending too much time in the vapour lounge.

2.5 First Aid and Medical Emergencies

2.5.1 First Aid training is provided to all staff at the expense of the club, and staff will be paid full wages for the time they spend taking the course. All staff are encouraged to take advantage of this.

2.5.2 The First Aid kit is located on the fridge just outside the storage room door (near the bathroom).

2.5.3 In the event that someone requires First-Aid, the employee with the highest level of First Aid training assumes command of the situation and directs others.

2.5.4 Always remember, we deal with a lot of people who have blood-borne illnesses. Use extreme caution whenever a situation involves bodily fluids, and keep members and staff who aren't assisting in treatment or cleaning well away from the area.

2.5.5 If a situation requires an ambulance, call one immediately. This warrants closing distribution and the box temporarily, at the discretion of the manager. Any staff not engaged in treatment should evacuate all members, informing them that we will reopen as soon as the ambulance has left, and then put any medicine away.

2.5.6 Any incident requiring the attention of a qualified first aid attendant must be recorded in detail as an "incident report" to be filed. We are legally required to complete the Worksafe First Aid Record document found in the Staff Communication binder when a first aid incident takes place. Return completed document in Staff Communication binder to be filed by management.

3. Daily Operations

3.1 Member Access

3.1.1 Type in the member's card number into Biotrack and check their profile for their status. Unless a note pops up, give them their card back and tell them to proceed. A member can either memorize their number, show you a card or their photo ID to be able to purchase.

3.1.2 Check them into the Club on their profile by clicking the "check in" button.

3.1.3 In the event of a problem with the computer, use the index card system to check their status, and enter the information as soon as possible in the computer.

3.1.5 If a member does not know their member number or have their photo ID they cannot purchase cannabis.

3.1.6 Suppliers, other professionals, and friends of staff are allowed into the club under the supervision of staff. Non-members who are waiting for members are allowed to use the bathroom.

3.2 Opening Procedure

Before 10 am:

3.2.1 Staff need to arrive for their shift prior to 9:45am on weekdays and 10:45am on Sundays and holidays. Startup the computer, log into Biotrack. Put the float in the til.

3.2.2 Check phone messages and write them down and pass along the information to the necessary parties, they will often be bakery pre-orders, mail orders or general questions about the club.

3.2.3 Move dry used rags and towels from the bathroom and kitchen into the laundry bags and check the vapour lounge to make sure the ashtrays and rolling trays are out. Make sure the dab rig is clean, dab tools are out, and the rig is turned on.

3.2.4 Make sure you have logged your hours in the Staff hours book in the front office. If you don't get your hours written in the book by Monday morning when payroll is done for the week prior, you will

have to wait an extra day to be paid.

3.2.5 Turn on the exhaust system in the kitchen, and ensure the vapour lounge hepa filter unit is turned on max (#6 on the remote control).

After 10 am:

3.2.5 At 10AM (11AM on Sundays, and holidays), yell “Game on!”, tie up the curtains then unlock the front door. Turn on the sign. We are now open.

3.2.6 Open the curtains when the store opens (and close them when the store closes). When closing, make sure that the curtains are completely covering the windows.

3.2.7 Refill all the bud containers. Make sure the menu reflects what is in the shelves and the fridge. Also check the website is up to date.

3.2.8 Check to make sure that pamphlets are stocked.

3.2.9 Check water cooler cups and water level. Wipe down the taps.

3.2.10 The water is provided by Mount Doug Springs Water. They deliver and pick up empty bottles automatically every week. If we get down to two bottles of water, call to request an additional delivery. Cash payment is required on delivery.

3.2.11 Garbage and recycling are picked up by GFL Enviro. No payment is required at the time of pickup.

3.3 Cash Handling

4.17.1 \$20, \$50 and \$100 bills from sales should be added to the distro 1 and distro 2 boxes in the office on a regular basis. Never let too much money build up in the cash drawer.

4.17.2 At approximately 6:30 pm put money from the cash boxes into bundles of \$1000 and note the number of bills for \$20, \$50, \$100 for easy input into Cash Close.

4.17.3 Petty cash should be replenished in \$1000 intervals from the safe cash. Petty cash is used for paying out staff benefits, small office costs, and other business costs under \$400. Mark purchases in the green petty cash book and get someone to double count the balance when money is taken out. Place receipts in the petty cash folder.

3.4 Daily Expectations

3.3.1 Represent the club to our members and engage members of the greater community who enter the club.

3.3.2 Alert all staff immediately of any security concerns and ensure the smooth admittance of members in good standing to the club.

3.3.3 Manage lineups on busy days, especially morning on welfare day. Lineups should never go out the

door.

3.3.4 Coordinate with the team to complete signups, including filling out the paperwork for new member signups (see Sec. 1.2) and presenting the new member orientation (Sec. 15)

3.3.5 Never take your eyes off the front desk for more than 3 seconds. If you need to leave your post for any reason, such as going to the bathroom, another staff member must cover the desk.

3.3.6 You should always be courteous and professional when dealing with people, especially in difficult circumstances.

3.3.7 Unusual or suspicious interactions should be noted in the Staff communication binder, the VCBC Group chat, and the member's profile, including the member's name, member number, and a brief description of the event. Inform all senior staff members immediately of the interaction. If necessary, flag the member's profile and index card with the appropriate colour. Lastly, if the incident requires group discussion mark the incident in the Sketch files binder and we will discuss it at our monthly staff meeting.

3.3.8 You are responsible for answering the phone as well as for checking the voicemail. The phone is answered by saying "VCBC, how may I help you?" Feel free to be discreet, but always answer questions directly and politely.

3.3.9 You are responsible for answering emails. The email address is hellovcbc@gmail.com. On the left hand side of the email webpage there is a folder titled EMAIL TEMPLATES. Use these templates for answering emails concerning new member applications, incomplete member applications, receiving a mail order and sending the tracking number of packages.

3.3.10 You are responsible for the initial screening of potential members. Check to see that they have a valid photo ID and that their POC is genuine. New member orientations happen by staff availability and we need to prioritize signups when possible. Staff members are responsible for communicating the day's orientation(s), appraised of the situation and complete all relevant paperwork (see Sec 1.2).

3.3.11 Never give out a phone number or any personal information about a member, a staff member, a supplier. The only exception is media who are looking to interview a manager in which case his/her phone number may be given at your discretion. Give Ted's number out to anyone who asks for it unless they are obviously trouble.

3.3.12 When a member leaves a preorder for the bakery (see sec. 4.7) immediately write the order on the day sheet and add it to the VCBC Bakery Ordering Sheet on Google Drive. Include the member name, member number, quantity of products desired and the current date.

3.3.13 Bicycles are not allowed in the lobby.

3.3.14 Non-members are welcome to wait for members in the reception area.

3.3.15 If a member is obviously intoxicated they should be refused entry and told not to return until they have sobered up. If the member becomes belligerent, call a manager. If the member becomes violent - see (sec. 3.5.4.)

3.3.16 It is your responsibility to drop the til as large bills accumulate (\$20, \$50, \$100). Throughout the day pay attention to how full your til is getting and make drops into the deposit boxes in the office.

3.5 Closing Procedure

Closing the Shop

3.4.1 At approximately 6:00pm (5pm on Sundays, and stat holidays), the floats for the tills should be counted. Use the blue coin counter to collect a roll of every type of coin, \$100 in \$5 bills and \$100 in \$10 bills. There are two grey treys for each til and they need to be filled with the cash for the float before the end of the day. You can purchase change out of the donations, karma jar, and the safe cash to fill the float.

3.4.2 At 7:00PM (6:00pm on Sundays, and stat holidays), the front desk staff should loudly yell "That's a wrap, smoke 'em if you got 'em!" This signifies to everyone that we are now closed.

3.4.3 Lock the front door and hang the curtains up over the front door and lobby windows, making sure they are entirely covered.

3.4.4 Make sure all deliveries have been addressed and that all messages from the day have been passed to the appropriate person, checking off when tasks are completed.

3.4.5 If a member arrives after 7:00PM but does not call in advance, it is up to the discretion of the staff to serve them.

3.4.6 Turn off the heater and fans (as applies). Turn off the exhaust system in the kitchen. Turn off the dab rigs and leave them to soak in isopropyl alcohol overnight.

3.4.7 Close all files, internet windows and messenger service. Do not turn off computers.

Closing Distribution

3.4.8 Replenish serving containers from 1/2 lb bags so they are full for the next day. Start this 15 minutes before closing.

3.4.9 All members must be out of the store prior to putting away cash, sample jars, serving containers and 1/2 lb bags.

3.4.10 Put away the serving containers, the joints and the hash in the blue rubber maids and leave in the closet. Ensure the distribution fridge is clean and orderly, ensure the edible product list is up to date, carefully wipe off the scales, clean the desk of any leaf, stalk, or bud crumbs, wipe down the desk with medical soap, sweep the floor, log out of the computer database and messenger and leave the computer on. Turn off the distribution fan and display TV.

Cash Close

3.4.11 At this point the cash boxes in the office should have a tally of the number of large bills that have been deposited throughout the day. These bills should be compiled into bundles of \$1000 for easy

counting.

3.4.12 In Biotrack hit Close Cash and fill in the number of coins and bills present in the till. At the bottom of the screen there will be Expected cash which Biotrack generates from sales and also shows the difference in the cash you typed into the system. If the discrepancy is under \$100, carry on with the close. If the discrepancy is over \$100, recount your bills and assess sales and errors throughout the day to account for the discrepancy. If unresolved, make note and communicate with a senior manager in the morning.

3.4.13 Hit "OK" and do not print a z-report. Close the window and from Biotrack go to Reports -> From the Drop down menu select Sales -> Complex Sales Report -> View Report. This will open a new internet browser window.

3.4.14 On the left hand side of the purple web page that comes up, look for Total Tax. From here take the stated tax and round up by \$5. Ex. If the total tax is \$311, round the total to \$315. This total represents the GST we are removing from today's sales and setting aside to pay in the future.

3.4.15 In the GST note book mark down the date, write Deposit and your initials and add today's contribution to the GST. Make note of this as well on the Day sheet and note the running tally of GST.

3.4.16 Back to the complex sales report purple web page, scroll to the bottom of the screen and note the Total Deposit. Here you must make a calculation: Total Deposit - GST = Today's deposit in the safe.

3.4.17. On the day sheet there should be a recounting of all of the day's spending from the safe. Make sure the day sheet and the blue safe book are reconciled and note today's Deposit on both documents. The Total cash represents the total amount of cash in the safe at present which includes the payments made out throughout the day and the deposit added at the end of the night.

3.4.17 File today's Day sheet in the office and fill in a fresh day sheet with tomorrow's date, the current total for GST and the current cash. This document represents the cash on hand for staff without access to the safe.

3.6 Emergencies

3.5.1 The police come into the club from time to time. When this happens, it will generally be for one of two reasons. They are either here to conduct disciplinary action on the club or they are here looking for a member. Rule number one in dealing with the police: be polite and assertive.

3.5.2 If they are here to raid the store, communicate quickly to all staff and distributors should cease the sale of cannabis and exit distribution.

3.5.3 If they are here looking for a member, politely ask them to wait in the front area while you go see if the member is in the club. If the member is here, ask them to accompany you to the front. If the member isn't here, inform the police and ask if there is anything else we can do to help.

3.5.4 In the event of a robbery or other catastrophic circumstance alert others to the situation and avoid putting yourself in harm's way.

4. Distribution

Distributors are responsible for a lot more than just working the scales. They must know about the medicine well enough to make specific recommendations to individual members, and they must ensure in busy times that all members are served in a timely fashion.

4.1 Hygiene

4.1.1 Distributors must wash their hands thoroughly and frequently. Every time a distributor enters distribution or comes in contact with a questionable surface or substance they must wash their hands.

4.1.2 Distributors are to use tongs or gloves when handling cannabis in distribution.

4.1.3 Keep the distribution desk and scales clean throughout the day. Use medical soap to disinfect all distribution surfaces including keyboards, mice, scale tops, and counters.

4.1.4 Distributors must re-wash their hands if they sneeze, handle a large number of coins (including rolling coins), or otherwise risk contaminating a product.

4.1.5 Staff members are not to work in distribution if they feel sick with a cold, the flu or any other potentially contagious disease.

4.1.6 Members who bring their own bag or container should be asked to open it while being filled so the distributor handles it as little as possible, and preferably not at all.

4.2 Setup

4.2.1 Ensure that the distribution area is clean and orderly. Put away edibles and topicals incoming from the bakery and update the online inventory system. Prepare the scales by turning them on, then placing the weighing buckets on them and pressing the 'tare' button. Also make sure there are paper cups and spoons ready for weighing hash.

4.2.2 Retrieve float for both tills. \$584 total, \$292 in each float. This should reflect one roll of every coin and \$100 in \$10 bills and \$100 in \$5 bills.

4.2.3 Retrieve serving containers, joints, and hash from the closet and move into distribution. Confirm there are 1/2 lb bags for each of the serving containers in the boxes above the desktop computer in the office. Replenish as needed.

4.2.4 Familiarize yourself with the cannabis and kief currently being offered. If there are strains you don't know you should reference the burn report them or ask for feedback from the other staff. One should be aware of: effect (sativa - cross - indica), potency, and cleanliness/cure (refer to the Burn Report). Make sure the menu is up to date on the board and the website.

4.2.5 Check the fridge to take note of available edibles and topicals. Ensure the Edible Product List and online inventory is up to date. Make sure the menu is up to date on the board and the website.

4.2.6 Make sure the dried cannabis list on the whiteboard matches the currently offered strains. All cannabis should have a burn report of the current batch updated on the board and the website.

4.2.7 Sativas are written in purple. Indicas are written in green. CBD strains are written in orange. Grades are written in black.

4.2.8 Sample any strains that have not yet been tested. Samples must be marked out of inventory on Biotrack by going to Discounts-> Gram of the Day and Testers 100% off -> OK -> process the transaction.

4.2.9 Make sure you have both types of small bags ready, jars, rolling papers, the credit sheet and coin rollers.

4.2.10 If you are unsure of any storage locations, passwords or have any questions, ask a senior staff member. You can check the product list on Biotrack to see how much of a particular strain or product is in stock at any moment.

4.2.11 The senior staff member on site should be consulted as to what strain to put out next. A serving container, and half-pound bag should be clearly marked and brought to distribution, then the strain should be marked up on the whiteboard and a burn grade should be noted as soon as the strain has been tested. Make sure to check every 1/2 pound being prepared for sale has been inspected and marked when complete on the packaging.

4.3 Computers

4.3.1 Distributors use computers to render transactions into Biotrack, our point of sale system, access and update member account info, and communicate between staff.

4.3.2 Distributors should not download or install any files or programs without express consent of the acting manager.

4.3.3 Computer passwords are communicated in the blue computer binder in the front office.

4.3.4 When creating a document on a computer, it is advised to manually save it every 5-10 minutes to prevent loss in the case of a computer problem, or you can use a cloud-based service like google drive and never worry about this kind of thing again.

4.4 Purchasing and General Operations

4.4.1 Our prices apply to all members equally. See Appendix A for Distribution Pricing Charts.

4.4.2 There must always be at least one staff member in distribution.

4.4.3 If you are the only distributor and a lineup of two or more people is forming, call for a second distributor to expedite the line. Second distributors should stay in distro until all serving jars have been refilled and the 1st distributor has given the OK for them to leave.

4.4.4 If a member makes a purchase of 1g or less (small purchase) that doesn't include bottoms, they may come back no less than an hour later in the day to make a second purchase.

4.4.5 Members may look closely and smell the jars, but only distributors are allowed to handle the jars to ensure minimal contamination. Distributors may fluff the sample jar and hold it for the member to view

and smell.

4.4.6 The weight of stalk, defects, seeds or cannabis with a higher moisture content have been considered when paying our suppliers and are reflected in the price of the cannabis. Additional discounts are not given except for a 10% weight bonus when a member wants to purchase the last of a strain out of a sample jar where the sample has been crumbled. Otherwise, do not over-weigh or under-weigh in any circumstances.

4.4.7 Do your best to ensure that any products you handle (edible, topical, or inhalable) are preserved in good condition. Be gentle with any dried cannabis you handle, treat member's purchases with respect and care, and promptly dispose of any waste products.

4.5 Selling Dried Cannabis and Kief

4.5.1 Sample jars contain 3g of each strain or 1g of kief in the display case when there is one in place.

4.5.2 The final few grams of a strain can be transferred to its sample jar in preparation for releasing the next strain.

4.5.3 If supply allows, there should be 18 strains of cannabis plus 3 varieties of kief available for purchase, covering the spectrum from indica to sativa as evenly as possible.

4.5.4 Sample jars are to be clearly labelled with the strain name and the pricing grade.

4.5.5 Bags that have a check mark in the inspection field with the initials of the inspector are ready to be served.

4.5.6 Bags with an "X" next to the strain name have been inspected and rejected. These bags are not to be served for any reason.

4.5.7 Bags with no mark have not yet been inspected. These bags are not to be served until inspection.

4.5.8 Always be on the lookout for any mold or mildew, even if a bag has already been inspected. If any mold or mildew is found the strain must be immediately pulled from the menu and given to a senior staff member for further inspection and evaluation. Put any buds with mold or mildew into a sealed ziplock bag with the strain name and a large "X" written next to the strain name.

4.5.9 When a 1/2 lb. bag is empty, call for a replacement bag. If a strain is leaving behind large amounts of bag bottoms, alert a senior staff member so that they can talk to the grower about changing their curing technique.

4.5.10 Keep the Burn Report and the website up-to-date as new strains come out.

4.6 Non-Smoke

4.6.1 The fridge contains most of our edible products, except capsules which are above the serving jars

4.6.2 All stock should be rotated as new stock comes in to ensure that the oldest product is placed in front to be sold first. All edible products are dated to ensure first in first out procedures are adhered to.

4.6.3 Members should be encouraged to discuss and try our edible and topical products. We strongly

believe consuming cannabis orally or topically is the preferred method.

4.7 Bakery Pre-Orders

4.7.1 Members may place pre-orders if they require a large number of baked goods.

4.7.2 All pre-orders should be logged in the Bakery Order Sheet with the order and quantity, the members name, the date and your initials,.

4.7.3 Members may have a caregiver pick up an order but the member has to make the call to make the pre order and confirm if a caregiver will be doing the pickup.

4.8 Bottoms

4.8.1 Bottoms are collected when time allows by sifting out the small cannabis particles at the bottom of the serving containers and 1/2 lb. bags and mixing them together. When bottoms are being transferred from their main stock, weight them out and note the amount. Combine the bag bottoms you just weighed with the Inventory item titled Bottoms in Biotrack.

4.8.2 Bottoms are made available to the membership from two weeks before welfare day until CPP cheques have been issued.

4.8.3 Bottoms cost \$5 for 1g.

4.8.4 1g is the only amount of bottoms a member may buy. Do not let anyone convince you they used to be able to buy more. It never has been policy.

4.8.5 When buying bottoms, members may purchase additional cannabis or kief at the same time.

4.9 Credit Ledger

4.9.1 The credit ledger is used to keep a backup record of member's credit, returns (sec. 4.17) and monthly emergency usage (sec. 4.10).

4.9.2 Each row in the ledger containing 4 columns, one for the member's number, next for date, next for staff initials, and last for notes. Each column should be filled for every use of the sheet.

4.9.3 When a new page is started, mark the current date at the left side of the top of the page.

4.9.4 When a sheet is full, mark the current date at the right side of the top of the page.

4.10 Credit

4.10.1 \$20 Credit is available to all members who have made at least one purchase unless otherwise noted on their computer file.

4.10.2 Members may not pay off credit and borrow again on the same day.

4.10.3 Members are not obliged to pay off their credit before making additional purchases.

4.10.4 There is no specified amount of time in which credit must be repaid, and no interest is charged.

4.10.5 All credit transactions are to be recorded as an “Account” transaction on Biotrack and manually filled in on the Credit>Returns Sheet noting “Borrowed” or “Paid” with “owes” and the dollar amount, ie. “Took \$10, owes \$20” or “Paid \$10, owes \$10”.

4.10.6. To pay out someone’s credit go to Accounts-> Receivable->Find their name and click pay out in bottom left corner ->cash and close the transaction.

4.10.7 When a member makes a payment towards a credit, the distributor should also offer the member a written receipt, which consists of the member’s number, the date, the amount paid, and the staff member’s initials.

4.10.8 In the case of a discrepancy, a receipt will be taken as the final authority. In the event of a discrepancy without a receipt, the case should be referred to a senior staff member.

4.11 Gayle Quin Emergency (aka. GQ Grant)

4.11.1 Gayle Quin Grants (formally called emergencies) are available to members with no money who have maxed out their \$20 credit with us.

4.11.2 Allowances are worth \$5 before tax of any product. Members may not add any money to an allowance, except to buy a maximum of up to 2 cookies, 1 budda ball, or 1 bag of cannoil capsules.

4.11.3 Members who use an allowance may not purchase anything else for the remainder of the day.

4.11.4 Allowances renew at the beginning of every month and do not accumulate from month to month.

4.11.6 Members must purchase at least \$20 worth of medicine from the VCBC between receiving an allowance. This is to deter members from accruing debt and only coming back to the shop to receive free cannabis.

4.11.7 Allowances are processed in the member’s computer file by highlighting the product in Biotrack ->Discounts -> GQ Emergency. If the computer does not allow you to make this selection, it is because the emergency has already been used for the month.

4.11.8 Write down the member number, first name, date, your initials and “GQ emergency” in the Credit Ledger.

4.12 Signage

4.12.1 The “product guide” notes the prices and availability of our medical products along with some other basic info. It is divided into 3 sections: the Cannabis Price Chart, the Hash Price Chart, and the Edible/Topical Price Chart.

4.12.2 The Cannabis Price Chart details how much cannabis costs per gram at all price points (\$7/gram, \$7.50, \$8.75 and \$9.55). There are price discounts for larger quantities of cannabis. See the cannabis price chart at the end of this section.

4.12.3 The Hash Price Chart details how much kief members will receive at various price points. See

the Hash Price Chart at the end of this section.

4.12.4 The Edible and Topical Product List shows what is currently in stock. Out of stock items should have their magnet labels pulled off the whiteboard and the product listing removed from the website.

4.13 Containers

4.13.1 Don't divide a single strain into multiple bags, this may indicate reselling.

4.13.2 Members who bring their own bags or containers may have their order separated as they deem appropriate.

4.13.3 Members may buy as many glass jars from us as they want and their order can be separated as they deem appropriate. Jars are sold at cost to assist in avoiding plastic waste.

4.13.4 Rolling papers are for sale to members. Members may also get single papers from the rolling paper board.

4.13.5 Members who purchase cannabis and bring their own container are encouraged and we collect baggies and containers for reuse by members.

4.14 Paraphernalia Sales

4.14.1 Our glass pipes and other merchandise are kept in the case near the entrance to the club. They are listed under Accessories for sale by their listed price, ex. "\$17.50 Glass Pipe"

4.15 Staff Medicine

4.15.1 Staff receive one gram of cannabis or product for free per full day shift worth \$6. This is to be marked out of inventory on Biotrack using the Gram a Day discount button. You may accumulate your gram of the day for the week but they cannot be accumulated over multiple weeks.

4.15.2 Staff may buy additional cannabis and cannabis products at cost + tax. Make sure staff are marked as employees in Biotrack to automate discounting.

4.15.3 Staff may buy kief at \$3 off the member price. There are no bulk discounts.

4.15.4 There may be members or suppliers you are unfamiliar with who ask for staff prices, including those who work off-site and those who worked at the club recently. If you are unsure whether to give staff prices to someone, check to see if they have Friends & Helper status on their profile on Biotrack, or ask a senior staff member.

4.16 Exchange Policy

4.16.1 Members are allowed to exchange cannabis if they are not medically satisfied with it. Only the remaining portion of the cannabis is exchanged for credit in the same price grade.

4.16.2 Refunds are never given.

4.16.3 Record the return as a note in the member's file. Specify the strain, the weight returned and the reason for returning.

4.16.4 To process the return in Biotrack: leave the initial order alone. In a new order, find the price for the amount of returned medicine and make a note of it. Then ring in the member's new order, and discount the balance from the return from the new total using the "coupon" function.

4.16.5 Members are not allowed to return a product because a different or preferred strain has become available since their purchase.

4.17 Member Interactions and Support

4.18.1 Education is just as important to the VCBC as providing a safe space to acquire and use cannabis or providing a safe and standardized selection of products.

4.18.2 To this end, your most important job as distributor is to assist members in selecting ideal products and strains for their particular condition. All distributors must keep themselves aware (at the very least) of all of the information contained within the club's information pamphlets, as well as have a thorough working knowledge of all of the various products the club provides.

4.18.3 Distributors should interact with members as much as the member's willingness and the business of distribution permit. By discussing which strains and products are effective for members (and their associated conditions) a distributor can begin to build an anecdotal understanding of the effects of various strains. This knowledge, along with a solid understanding of what is generally true about the efficacies of various strains will allow a distributor to make well-educated (as much as possible, anyway) recommendations to the various members they interact with. One of the most fulfilling aspects of working at the VCBC is when a member approaches you to tell you just how much your advice has helped them.

4.18.4 Just because information was presented during a member's orientation does not mean the member still remembers it! Be patient with members' questions, and take as much time as is needed to fully answer them. Remember: if you are discussing medical aspects of an individual's condition, there is no line behind them. Take as much time as is needed, and ensure that the member does not feel rushed by the members behind them in line. Many pharmacists take upwards of an hour to help their clients, members can wait 10 minutes to receive cannabis.

4.18.5 If the consultation with the member seems as if it will take longer than 10 minutes, there is a line-up, and there is another staff member available, please allow another staff member to serve the members waiting in line while you give the member your full attention. This reduces the pressure members may feel while in line, while also allowing members with simpler needs to be processed quickly and efficiently.

4.18.6 If a member expresses either that something worked especially well (or especially poorly, including negative side effects), remind them that you can add a note to their account stating such. This allows members to ensure they do not repeat bad experiences, and repeat good ones.

4.18.7 Always check the notes on a member's account before serving them. This helps us avoid making poor recommendations and is our first point of information about the member we are trying to help.

4.18 Waste

4.19.1 When cannabis comes in contact with an unsanitary surface (floor bud) it is to be marked out as waste in Biotrack and placed in the waste jar. In Biotrack go to the “Bulk Inventory” menu and select the strain > adjust inventory > Action = Remove from inventory > Amount to Adjust = Amount of Wastage > UOM = Grams > Adjustment Reason = Product Loss > Apply Adjustment. Then put it in a small jar for Ted to destroy the contaminated bud in small controlled fires.

4.19 Scale Maintenance

4.19.1 Distribution scales are to undergo maintenance each Sunday.

4.19.2 The scales should be thoroughly cleaned, with use of rubbing alcohol to remove any cannabis resin that has accumulated over the course of the week.

4.19.3 The scales should almost never need to be calibrated, but if need be, the process is as follows: with the scale off, hold down the far right button, then turn on the scale using the red power button. Continue to hold the far right button as the scale counts down. It will beep, then ‘Ca 500g’ will appear on the screen. Release the button and place a 500g weight on the scale. The scale will calibrate and show the weight of the object to 2 decimal places (i.e., 500.00g).

4.20 Purchase Orders for Bakery Items

4.20.1 As soon as an order arrives at the club from the bakery, please follow these steps:

1. For every order that comes in, there is a physical PO attached to the order
2. Ensure the PO matches up with what is physically there (I.E. If something is not on the PO but you can see it is there and or if something is on the list but not actually there, first check the “In Transit” on Bakery Orders Sheet, if that does not add up either put a message in the Bakery chat)
3. Make sure you are using the designated PO computer
4. Input the PO into BioTrack (See how-to below)
5. After the PO is successfully input in BioTrack, please immediately remove the list of product under “In Transit” on Bakery Orders Sheet
6. Put away product
7. For products that need to go in a hiding spot, please write on the inventory sheet
8. To help Inventory staff (Nicole & Ryley) please keep track of and communicate if you have taken any product from things that need to go upstairs, this will avoid Inventory staff from having to recount product

4.20.2 To ensure steps are not missed, please have only one person follow the process of receiving an order from start to finish, and please communicate if you are taking care of the order or if it comes too late in the day and it needs to be done the next day.

4.21 How to Enter PO into BioTrack:

4.21.1 This procedure is used for all incoming products. Change the Vendor as needed for incoming inventory.

1. Go to "Inventory" tab
2. Click "New Inventory"
3. Select the vendor
4. Select the product you wish to add, following the PO from top to bottom
5. Enter in the quantity received
6. In "Line Price" put "0" for bakery items, and enter the invoice cost in the line price for all other items.
7. Click "Add"
8. Repeat until all products are entered
9. Under "Wholesale" then "Type" select "Purchase"
10. Under "Method" Select "None" for bakery items or items that have yet to be paid for, and "Cash" for items that are paid for on delivery.
11. Hit "Create"
12. Enter PIN and then hit "Generate PO"
13. Save PO in files under "BioTrack Purchase Orders"

4.21.2. Print a copy of the Purchase Order and write the date for payment. Ted is primarily responsible for assigning dates for payments and will do so on our monthly calendar. If he hasn't given a date yet, print the document and attach it to the Day Sheet horizontally so it is visible. If Ted has given the PO a date, or the items were paid for on delivery, mark the date on the PO and file accordingly under "Unpaid PO's" or "Paid PO's" in the shelving unit in the office.

4.22 How to Update the VCBC Wordpress Website

4.22.1 How to Add Flower, Edibles and Concentrates.

1. Log onto vcbc.live/wp-admin/ (You can find the password in the blue book and it is saved in the bookmarks bar of the Google Chrome browser on most computers).
2. Click -> Dashboard -> WP Dispensary -> From here you can access Flowers, Concentrates and Edibles. All other product categories (bath products, CBD products, edible extracts, etc) are under Dashboard -> Pages -> All Pages.
3. All our flowers are saved as 'cards' with the images, product description and prices. There are categories such as All (to see all the cards we've ever made), Published (the cards currently visible on the website), Draft (unpublished cards) and Trash. To update the menu you can either save a card as a Draft when we sell out or Publish when it hits the menu.
 - a. Always check if the menu item you are about to enter is in the trash as these do not delete right away. If the item is in the trash, click restore.

4. If you can't find a card in Drafts or Published, then you may need to create a new card. If you would like to update the flower menu, go to Dashboard -> WP Dispensary -> Flowers -> Add New in the top left corner.
 - a. Check the google drive in the hellovcbc@gmail.com email for the folder WEBSITE - this will give you strain descriptions and photos.
 - b. If the content isn't in the drive, you may need to take new photos. Do so on your phone on a white piece of paper. Crop the image, rename the file on your phone and email it to the club. Download the file onto the computer you are working on.
 - c. When you are creating the new product you must fill in the following blanks:
 - i. Strain Name - Indica/Sativa/Hybrid
 - ii. Product Description - 3-4 lines on the look, smell and effect of the strain.
 - iii. Prices for 1g, 3.5g, 7g, 14g, and 28.5g
 - iv. On the right under Document -> Fill in Aroma, Flavour and Effect, and select strain category (Indica, sativa, hybrid)
 - v. Set Featured Image -> Media Library ->Upload Files -> Drag and drop the downloaded image from earlier -> Set Featured Image
 - vi. You are now complete. You can click Preview on the top right to view the document and check for errors.
 - vii. When satisfied, click Publish.
5. To remove a cannabis strain from the website when it is sold out, click on the strain -> Switch to Draft -> Update.
6. To edit concentrates, go to WP Dispensary -> Concentrates.
 - a. All Concentrates are listed like the cards described earlier, but it is organized by producer not by product.
 - b. Click on the producer card and list the available strains in text. Edit as items sell out. All producer cards should include an image either of their logo, or of their product.
7. To edit Edibles go to WP Dispensary - Edibles. All edible products are saved as cards and can be edited with Publish or Draft.

4.22.2 How to Add all other products to the website.

1. All other products exist under WP Dispensary -> Pages -> All Pages. These items function like cards with Published and Drafts as well.
2. When adding new items, follow all the steps above. The only addition is adding the links of products to their item Headers. For example, the soaps are listed under the Dope Soap product page. When in the Add New Page menu, go to Document -> Page Attributes -> Template -> Grid Page. The next drop down option is Parent Page -> then select the Heading it belongs under (ex, CBD Products, edible oils, bath products. etc)
3. If you need to make a new Heading. Add New Page menu, go to Document -> Page Attributes -> Template -> Grid Page. The next drop down option is Parent Page -> (no parent).

5. Caregivers and Caregiver Purchasing

Caregivers are individuals who have been designated to make purchases for members who are too unwell to come into the club themselves. There are two types of caregivers: temporary and permanent.

5.1 Temporary Caregivers

5.1.1 If a member is sick with a contagious illness, they may send a temporary caregiver to purchase for them by phoning the club in advance to notify us of their name and membership number, the caregiver's first and last name, and the specifics of the order. Add this information to the member's biotrack.

5.1.2 A temporary caregiver does not have to be a member, but they must be an adult and not be a previously cut off member.

5.1.4 The temporary caregiver must also bring their own photo I.D

5.2 Permanent Caregivers

5.2.1 Members who are permanently unable to come to the club because of severe disability may be designated assigned permanent caregivers.

5.2.2 A permanent caregiver will have their name added to the caregiver field in the member's file on Biotrack.

5.2.3 The caregiver's name will also be included in the "caregiver" field on the member's membership card.

5.2.4 Permanent caregivers must bring their photo ID when they come to purchase.

5.2.5 Permanent caregivers may not purchase for themselves. If it is found out that they are, their caregiver status is to be revoked, and management will decide whether the member will be allowed a new caregiver.

6. Deliveries

The club offers two delivery services to its members. The first is a local delivery service that is offered daily to members who have contagious illnesses or are otherwise temporarily unable to come to the club and who can't find a temporary caregiver. The second is a mail-order service offered to members who live outside the city.

6.1 Local Delivery

6.1.1 We try to provide delivery service for members who are unable to make it to the club. Deliveries within the city can usually be met within 24 hours and are usually done after the club closes (after 7pm). We make no guarantee of being able to deliver.

6.1.2 It is the receiver of the delivery order's responsibility to make sure all deliveries have been allocated by the end of the work day.

6.1.3 The minimum total purchase for a delivery is \$20.

6.1.4 When accepting a delivery, note the member's name, member number, phone number, address (including cross roads), and the order to be delivered.

6.1.5 Inform the member that delivery may not be possible, though in most cases local delivery orders can be met.

6.1.6 Ask all staff if anyone is willing to make the delivery. The staff member who accepts the delivery should call the member back to confirm their address, order and the estimated time of delivery.

6.1.7 In compensation for delivery, the staff member receives remuneration equal to the difference between staff pricing and normal member pricing. The staff member should bring a receipt for the order with them and collect payment at the delivery location, then bring it in with them to work the next day to be deposited in the till, or the staff person could pay for it when they get it and keep the money when they do the delivery.

6.2 Mail Order

6.2.1 Mail orders are processed by designated mail order staff, Monday to Friday. We ship only within Canada and with Canada Post. We charge \$15 for regular shipping, \$25 for express, and free for orders over \$250.

6.2.2 In the mail order binder note the member name, member number, date, and the total of the order including shipping. When the package is shipped, write down the shipping date and tracking number.

6.2.3. Mail orders are done over email. When you receive a mail order, respond with the email template Mail Order Received. Include the invoice of items requested and the cost of shipping. Package the order and place smelly or leaky products in a silver sealable bag. Print receipt from order in the box. Place in boxes with bubble wrap as needed and wrap packages in paper. Print labels with Cobble hill return address and the recipient's address from Dymo software. Separate packages into Incomplete (missing items, not paid for, waiting for more info, etc) or Complete Mail (paid for and packaged)

6.2.4 Payment is done through interac e-transfer. In the Mail Order Received email template there are instructions for the member to complete the etransfer. All passwords should be the member number twice, "67226722" or it will be marked in the members biotrack if the password is different.

6.2.5 Ship the order, expedited for regular shipping, \$100 coverage with no signature unless requested. Write the shipping date and tracking number in the mail order Log. Pay for shipping out of Petty Cash and place the receipt for shipping in the receipt folder for petty cash. Email the tracking number to the member.

7. Cleaning

As the club is a medical facility that is frequented by many people with compromised immune systems, it is very important to keep things as clean as possible at all times. A different staff member is designated as responsible for cleaning every day of the week. Cleaning is generally done in the last two hours of the day except for dishes, special projects, and general catastrophes.

7.1 Kitchen

7.1.1 Dishes should be the first thing done when cleaning. Washing earlier in the day is recommended so there is less to do at the end of the day. Always keep an eye out for forgotten dishes throughout the club.

7.1.2 Put away all clean dishes, wash all dirty dishes, wipe down the sink and counter, wring out any dish towels, sponge or other items used, and drain and clean the tray.

7.1.3 Refill empty soap bottles and order more soap as needed.

7.2 Staff Room

7.2.1 Tidy and wipe down all counters, clean out all ashtrays, sweep the kitchen and staff room floors.

7.2.2. On a weekly basis go through shelving and clear any accumulated clutter throughout the week.

7.3 Glass Cleaning

7.3.1 Using our glass cleaner spray bottle and either paper towel or newspaper, clean both sides of the front door (pay particular attention around the handle), the mirror and window in the vapour lounge, the glass top of the pipe display case, the outside of the distribution fridge door, the outside of all four sides of the distribution display case, the insides of the case as needed, and the mirror in the bathroom (you can do this when you clean the bathroom if you prefer).

7.4 Common Area Surfaces

7.4.1 Using the simple green spray bottle and either paper towel or a cloth, clean all exposed horizontal surface areas (except those in the vapour lounge) including the front desk, the art desks, the desks in the office, and all member seats, the front door handles, the security gate handle, the front door deadbolt, the handle of the distribution fridge door, office and bathrooms door knobs, computer monitors, and fan blades.

7.5 Garbage

7.6.1 There are four garbages in the building. Those in the kitchen, distribution, the bathroom, and the front desk areas should be emptied near the end of the day if they are full. The one in the box should be emptied after the box has been cleaned at the very end of the day. Tie all garbage bags that are reasonably full, replace them, and then put them in the large rubbish bin in the janitorial storage area past the stereo. Also empty the paper recycling near the water cooler into the paper bin.

7.6 Bathroom

7.7.1 Using the simple green spray bottle and a clean cloth or paper towel, clean the towel dispenser, the

soap dispenser, the safety bar, the sink including the taps, and the toilet (in this order).

7.7.2 The cloth used in the bathroom cannot be used anywhere else. After use, hang it on the sink pipe to dry. Put the cloth(s) from the previous day in the bathroom laundry bag (next to the kitchen sink), then mop the floor by filling the mop bucket with a small amount of water and simple green spray.

7.7 Vapour lounge

7.8.1 The vapour lounge should not be cleaned until after it is closed. The vapour lounge closes half an hour before the club itself closes. At 6:25 pm, give a warning to users of the vapour lounge that it will be closing and at 6:30 (5:30pm on Sundays and holidays). Clean all surfaces with Simple Green, wash rolling trays and ashtrays, then sweep the floor and wipe it with the swiffer and Simple Green spray.

8. Security / Privacy

8.1 Our Situation

8.1.1 The club doesn't benefit from the protection of the law as other businesses do. Any time the police are called to the Club for any reason, their professional obligations are to ensure the safety of the public and themselves. We are operating in a legal grey zone which means we need to be alert to police presence in the club, but they have a long history of working with the VCBC and are not to be feared. Only call the police when it is absolutely necessary in a conflict situation.

8.1.2 When dealing with potentially dangerous situations, always remember that it is best to avoid personal harm at all costs.

8.2 Protocol

8.2.1 Staff members must always aim to diffuse a situation, never instigate or further provoke.

8.2.2 Staff members should never use physical force unless they or others are in direct physical danger.

8.2.3 Staff members should only do what they feel safe and comfortable doing in a given situation.

8.2.4 Video surveillance hardware is placed in the reception area to record entry and exit of the club.

8.3 Privacy

8.3.1 The VCBC keeps strict control over information that could affect the safety and security of club members, staff, the dispensary, and the community. We have a Non-Disclosure Agreement as well as a Social Media agreement all staff must complete as a component of our privacy policy.

8.3.2 The VCBC keeps all patient information both confidential and secure.

8.3.3 All staff must understand and follow the guidelines for the Social Media Policy and our Non Disclosure Agreements attached in Appendix F and Appendix G.

9. Bakers' Duties

9.1.1 Pre-orders are recorded on the Pre-Orders section of the Bakery Order Sheet.

9.1.2 The vital information for bakers (member name, member number #, due date, order) should be communicated directly to the bakery immediately.

9.1.3 If possible, bakers should double check the Pre-Orders and Bakery Order Sheet forms everyday.

9.1.4 Once a pre-order is complete, it should be labeled and left in the lowest section of the distribution fridge, then write your staff initials in the "Order Ready" column on order form. Please mark the special orders distinctly when sending it down to the club.

9.1.5 Inventory Managers in the club need to check the inventory in the store in the first hour of their shift. Based on the in house inventory, the Inventory Manager uses the Bakery Order Sheet to communicate what we need to be made everyday.

9.1.6 Ingredients and supplies must be accounted for in the inventory sheet in the bakery. When supplies are running low, the bakers need to communicate in the Bakery order sheet so the inventory manager can place orders for supplies.

9.1.7 Give receipts for purchases to the manager for accounting and reimbursement if required.

10. Employee Compensation

10.1 Wages

10.1.1 All regular staff are paid \$18.00/hour to start for the first three months. After this probation period, wages increase to \$19.00/hour.

10.1.2 Wages are paid weekly by the most senior staff member unless otherwise arranged. They are prepared on Monday and left to be picked up in the front office with pay stubs.

10.2 Hours

10.2.1 A full shift is 9.5 hours (9:45am-7:15pm) except Sundays and statutory holidays which are 7.5 hours (10:45-6:15pm). Hours should be recorded in the hour logbook for payroll purposes.

10.2.2 Full shifts get 1.5 hours of paid breaks daily (unless a staff member is late, see sec. 14), half shifts get 0.5 hour of paid break. Breaks can be taken all at once so long as you communicate and get approval from others working that day. If you must leave early at the end of the day in unusual circumstances communicate with the manager to see what can be arranged for coverage.

10.2.4 All staff are paid for one hour for attending staff meetings, which happen on the second Tuesday of every month at 7:30 pm. Dinner is provided.

10.2.5 The VCBC averages scheduled work hours over a period of 4 weeks. This means that over a period of 4 weeks, full time employees will work an average of up to 40 hours per. The maximum amount of hours within a four week period will not exceed 160, without written consent from the employee and

senior management.

10.2.6 Employees will be requested to sign the Averaging Agreement (Appendix I) when they are hired. The agreement will exist from the employees date of hire, on an ongoing basis and is only terminated upon termination of employment. This Agreement must be reviewed and signed in conjunction with The VCBC Hiring Package. This Agreement outlines the VCBC's policy and pay structure for overtime hours and banked hours.

10.3 Staff Medicine

10.3.1 Full shifts (including bakers) receive 1g of cannabis each day worked; half shifts receive 0.5 grams. Staff may also take the dollar equivalent of edibles or topicals or hash (\$6 for full shifts; \$3 for half shifts).

10.3.2 Staff may purchase cannabis, kief, edibles and topicals at cost plus GST.

10.3.3 Some staff who work outside of the club building or have worked for the club in the recent past also get staff prices. Most of these are noted in their computer account as Friends and Helpers or you can ask a senior staff member if the person still qualifies for staff prices.

10.4 Sick Time

10.4.1 All staff are paid two weeks of paid sick time with 100% pay rate. Entitled sick time is calculated by averaging your year to date hours. If an employee exceeds these two weeks, exceptions for further situations can be made upon management approval with a doctors note.

10.4.2 If a staff member is sick enough to need hospitalization, a doctor's note may be required before they may return to work.

10.4.3 A staff member may claim up to 2 weeks of sick days in a given year without need of a doctor's note. Any sick days beyond that will require a doctor's note if the staff member wishes to collect pay for that day.

10.4.4 It is imperative that if you are sick you do not come to work. We are a medical facility and we are supplying medicine to patients with compromised immune systems. Contact the staff in the group chat or your direct manager to get coverage. Do not panic about whether or not you should come in, we will do what we can to figure it out and keep everyone healthy and comfortable.

10.5 Vacation Time

10.5.1 The club offers three weeks of full pay and two weeks unpaid vacation per calendar year. Vacation time becomes available 6 months after the employee starts. One week is determined by your average amount of hours worked per week. Ex. Working 36 hours per week on average = 108 hour

10.5.2 Paid vacations are offered to both full and half time staff.

10.5.3 Paid vacations cannot be claimed before 6 months of completed employment.

10.5.4 Staff may also take two weeks of unpaid vacation time per calendar year.

10.5.5 Vacations can be taken at one time or in chunks.

10.5.6 Vacations must be confirmed by senior management and should be booked as far in advance as possible.

10.5.7 Additional unpaid vacation time can be taken if shifts are covered by other staff.

10.5.8 Vacation Overpayment Policy is attached as Attachment K. This document outlines the procedure for repayment of vacation hours if a staff member takes over three weeks of vacation payment.

10.6 Medical and Dental

10.6.1 The club provides benefits for staff that includes a range of services. For a full breakdown of the benefits payment structure, see Appendix J.

10.6.2 Medical benefits cannot be claimed before 3 months of completed employment.

10.6.3 Medical benefits include staff dependents.

10.6.4 The club pays 50% of most school or training of the individual's choice, including tuition, books and travel costs that relate to self improvement and further education. Staff members must discuss any training they wish to take with senior management before commencing it in order to decide the level of funding, and funding is discretionary to the decision of senior management.

10.6.6 100% of the cost will be covered if the training is 100% related to work at the club as determined by senior management (e.g., Food Safe and first aid courses).

10.6.7 School benefits cannot be claimed before 3 months of completed employment.

10.7 Parental Leave

10.7.1 New parents can take up to 3 months of full pay leave.

10.7.2 Grandparents can take up to 2 days of full pay leave per calendar year.

10.7.3 Parental benefits cannot be claimed before 6 months of completed employment.

10.8 Complaint Procedure

10.8.1 An employee may file a complaint by contacting the Harassment, or Human Resource officer. The complaint may be verbal or preferably in writing with the date of the incident and the date the letter was written. If the complaint is made verbally, the Harassment officer will record the details provided by the employee.

10.8.2 The employee should be prepared to provide details such as what happened; when it happened; where it happened; how often and who else was present (if applicable). Wherever appropriate and possible, the issue should be resolved between individuals. If this is not possible, the next step is to file a

complaint. If the issue becomes a case of harassment, see Appendix H for the Anti-Harassment policy.

10.8.3 Complaints should be made as soon as possible but no later than within 30 days of the last incident of perceived harassment, unless there are circumstances that prevented the employee from doing so.

10.8.4 Professionalism, privacy, and the club's interest are the central priorities of the Harassment officer. Therefore, the HR officer will address issues to do with the club or organizational issues, but will not be involved in personal matters. Management can work with staff if issues arise between staff, but the role of the HR officer is limited to representing the best interest of the organization.

10.8.5 Every effort will be made to resolve complaints between staff within 30 Days. The Harassment Officer will advise both parties of the reasons why, if this is not possible.

10.8.6 If either party to a complaint believes that the complaint is not being handled in accordance with this policy, he or she should contact Ted Smith.

10.8.7 If necessary a mediator may be provided for interpersonal conflicts in the workplace. The mediator will be a neutral person, agreed upon by both parties. The mediator will not be involved in investigating the complaint. Each party to the complaint has the right to be accompanied and assisted during mediation sessions by a person of their choosing.

10.8.8 If a complaint is substantiated, the Harassment Officer, and Ted Smith will decide what action is appropriate. Remedies for the employee who was raised the complaint may include: an oral or written apology.

10.8.9 Corrective action for the employee found to have engaged in inappropriate behaviour may include: a reprimand; a suspension; a transfer; a demotion; and/or dismissal. Both parties to the complaint will be advised, in writing, of the decision.

10.8.10 All parties to a complaint are expected to respect the privacy and confidentiality of all other parties involved and to limit the discussion of a complaint to those that need to know.

11. Employee Expectations / Requirements

11.1 Requirements

11.1.1 All employees must be at least 19 years of age.

11.1.2 All employees must be legally employable in both British Columbia and Canada.

11.1.3 All employees must be mentally and physically capable of carrying out their required duties during their scheduled working hours.

11.1.4 Basic hygienic standards must be upheld by all staff. Fingernails must be kept neatly clipped, body odor must be kept to a minimum, and breath should be fresh. Some effort should be put into other aspects of personal hygiene.

11.1.5 Staff members must not distribute any controlled substances, even on their own time.

11.2 Expectations

11.2.1 The VCBC strongly supports the empowerment of its members via education about cannabis and its uses. To this end, all employees are expected to possess a wide base of knowledge that they can use to assist members.

11.2.2 All staff are expected to have a good working knowledge of the pharmacological aspects of cannabis. Memorization isn't required, but knowing where to access the information is. Since the state of cannabis research is in such a constant state of flux and progress, staff should make an effort to maintain a current understanding of the field.

11.2.3 For many members distribution are their main sources about news related to cannabis advocacy, politics, and legal developments. For this reason, all staff are expected to maintain an overall understanding of the current situation, especially in regards to Canada and British Columbia.

11.2.4 All staff are required to have an up to date understanding of club policies and operations.

11.3 Dress Code

11.3.1 Proper clothing must be worn while at work. The basic dress code dictates clean clothes, tear and stain free. Sleeveless shirts and open toed shoes are permitted.

11.3.2 The VCBC is a family friendly and inclusive space. To foster this atmosphere, VCBC staff should refrain from wearing clothing with inflammatory or derogatory designs on them.

12. Lateness Policy

12.1 Staff begin getting paid at 9:45 am (10:45 am on Sundays and stat holidays). It is important to arrive on time so that the club is ready for members by 10:00am. If a staff member is going to be late, they must send a message to the group chat with their ETA.

12.2 Staff will not be paid for the time that they miss. If we receive no notice at all and they are more than ½ hour late, and will forfeit the pay for their regular paid 1 ½ hour lunch break that day. Staff members who are late regularly will be officially written up for their lateness, and this may ultimately result in their termination.

13. Regulatory Standards

19.1 The VCBC strives to be compliant with the regulations outlined by both the “Food Premises Regulation” section of the British Columbia Public Health Act (http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/11_210_99) and the “Guide to Food Safety” provided by the Canadian Food Inspection Agency as a part of the Guidance Document Repository (<http://www.inspection.gc.ca/food/non-federally-registered/safe-food-production/guide/eng/1352824546303/1352824822033>).

19.2 The VCBC follows the safety guidelines established within the Occupational Health and Safety

Regulations (<http://www2.worksafebc.com/Publications/OHSRegulation/Guidelines.asp>).

19.3 The VCBC complies with the legal requirements for a Business License outlined by the City of Victoria (<http://www.victoria.ca/EN/main/business/permits-licences.html>).

19.4 Due to the current quasi-legal nature of dispensaries in Canada, some of the requirements of the above regulations may be impossible to fulfil.

14. Community Involvement

14.1 Cannabis Digest

14.1.1 The VCBC is the publisher of the Cannabis Digest, a quarterly newsletter about the changing face of the science of cannabis, current social concerns within the community, education aimed at helping people understand how to personally use cannabis more effectively, and the current political situation focused in the local context.

14.1.2 All writing for the digest is on a volunteer basis.

14.2 Social Collaboration

14.2.1 The VCBC works to provide educational materials both to the general public as well as to a variety of organizations. If you know of an individual or location that could use copies of the Cannabis Digest or any of our various educational materials, please feel free to take copies to provide. We ask only that you be respectful of these materials and the wishes of other organizations in regards to them. In other words, only leave them where you have permission!

14.2.2 At various points, the VCBC has worked together with various individuals and organizations to host informational sessions for the membership and staff of the VCBC.

14.2.3 Exceptional circumstances notwithstanding, at least one staff member of the VCBC should always be available to answer questions from individuals who are not members of the club itself. Often, individuals choose which dispensary to frequent based off of the knowledgeability and competency of the staff they interact with. Do not hesitate to take as much time as necessary to assist as much as possible in these circumstances. Although we only provide cannabis and cannabis based products to members of the VCBC, the club's mandate to educate about and advocate for the medical use of cannabis extends to everyone. Always remember that you could represent the entire movement to the person you are talking to!

15. Accessibility Rights and Options

15.1 Physical Accessibility

15.1.1 In an effort towards convenience to as many different members as possible, with as many different conditions as possible, the VCBC is open 365 days a year. Cancer doesn't take a day off, so neither do we!

15.1.2 Hours of operation: 10:00AM to 7:00PM from Monday to Saturday, 11:00AM – 6:00PM Sunday

and all statutory holidays.

15.1.3 If the club must be closed at any other time than those above that fact will be well communicated to members, both verbally and via signage.

15.1.4 The VCBC is and always will be fully wheelchair accessible. Any VCBC event will also be wheelchair accessible if it is held at a location other than the VCBC. Special considerations for special needs can be accommodated with sufficient notice.

15.2 Safety from Discrimination

15.2.1 The VCBC strives to be a fully accessible and discrimination free organization, inclusive to all regardless of disability, ethnicity, gender, sexual orientation, religious affiliation, political affiliation, or any other aspect of their self-identity that does not infringe on the rights of others. I.e., religious icons are allowable, hate group symbolism is not.

15.2.2 The VCBC strongly supports the right of members to visit the club without fear of persecution or discrimination, and any instances of such will be taken very seriously. In severe cases, members may lose their membership rights.

15.3 Administration Routes for Cannabis Consumption

15.3.1 The VCBC strongly supports the right of members to choose an application route that is ideal for them. To this end, we provide a number of different devices for the administration of cannabis. These devices (vaporizers, pipes, etc...) are resold at cost plus a small handling fee. Our intent is not to turn a profit, but to encourage and facilitate the effective and efficient administration of both cannabis and cannabis based products.

15.4 Account Tracking

15.4.1 The VCBC uses secure third-party inventory and member database management software to track inventory movement as well as individual member's purchase history. This means that members can ask for information about past purchases. This is useful for helping recall purchasing habits and effective strains.

15.4.2 The VCBC keeps a record of all sales of electronics and will do everything possible to replace any defects that are a result of manufacturing errors (not improper use). Members should be aware that there are any number of issues that could make this impossible.

APPENDIX A: Orientation Procedure

All new members are to go through the orientation procedure. New members should be encouraged to ask for clarification or ask additional questions at any time. The sign-up process can take between a few minutes to 45 minutes and 1 hour. It is up to you to ask the member about their experience with cannabis and how detailed they wanted to be in the orientation. Some people are long time cannabis patients and just need to know the price of a gram. Some patients need to learn when THC and CBD are and what's the difference, use your discretion. Before beginning sign-up, collect a copy of the strategic plan of the VCBC, each of the educational pamphlets and the sign up guideline posted on the clipboards in the office if you need support.

Below are two sign up procedures that include the basic details you must communicate in a sign up, as well as a more detailed version for those who need more information.

A) New Member Sign Up - Short Welcome Orientation

- 1) Note - this list is meant to serve as a guide! Feel free to modify and adapt this list to suit the new member's needs
- 2) Hours of operation - open 365 days per year, Monday- Saturday 10AM until 7PM, Sundays and Stat Holidays 11AM - 6PM
- 3) Resale rule - Money can't change hands for vcbc products but sharing is caring ex. Sharing joints.
- 4) Display boards - Explain how to read them
- 5) Distribution Etiquette -
 - a) Wait to be called up behind the line (privacy)
 - b) Try to have membership card or ID waiting
 - c) Cash only
- 6) Product Check in - Ask the member about their experience with cannabis. ask questions to lead the discussion and discover their needs and how our products might work best for them.
 - a) "What is your experience with cannabis consumptions?" "What do you want to try today?"
 - b) "Is there anything cannabis related you are avoiding using?" ex. Smoke around children in the house.
 - c) "What is your budget?"
- 7) VCBC Tour including The Box - even if its not applicable, give a brief explanation of our safe consumption site.
- 8) Pamphlets - Give member a Welcome to the VCBC pamphlet and any others that may relate to their product check in
- 9) Introduce them to a new staff member in distribution

B) Long Orientation Procedure Welcome

1) You are becoming a member of a family-oriented, incorporated non-profit society run by a board of directors that has been elected by the members themselves. This is now your club as much as anyone else's. As such, we expect everyone to treat each other with both dignity and respect.

2) *Give member pamphlets with info on club's origins/goals.*

3) We are not affiliated with any government or law enforcement agency. All dispensaries in Canada work outside of Health Canada's Medical Marijuana program. This means that your membership offers you no legal protection, but experience and common sense dictate that if you are polite and respectful, the police will usually treat you the same. Always be polite to the police! If required, explain your ailment(s), how cannabis helps you, and where you obtained it.

4) If you wish to obtain a legal exemption for the possession of cannabis, Health Canada's Marijuana for Medical Purposes Regulations program is currently the only means in Canada to possess and use cannabis legally. We are happy to provide information in regards to the application process.

5) We are open 365 days a year. Our hours of operation are as follows: Monday through Saturday – 10AM to 7PM, Sundays and Stat. Holidays – 11AM to 6PM.

C) Rules

1) Membership is a privilege, not a right and may be revoked at any time at the club's sole discretion. Appeals may be made in writing to the Membership Committee.

2) Our most important rule: All purchases are for your personal consumption only. You may not sell any part of your purchase. Doing so will result in immediate termination of your membership. The only exception to this rule is that members are free to share their medicine with other members of the VCBC. If you know of someone who could benefit from the products and services we provide, we encourage you to bring them in to sign-up for a membership.

3) Do not smoke or expose cannabis within a one block radius of the club. We have a vapour lounge for your comfort and convenience.

4) Always put away all of your medicine before you leave either the distribution area or the vapour lounge. No cannabis should be visible from the street at any time.

5) Cell phones, recording devices and cameras are not to be used or seen in the distribution area.

6) Bring your membership card or photo ID each time you visit. As this is a members-only club, please do not pass the front desk until you have been signed in and given the go ahead to enter the club. A \$1 replacement fee will be charged if you have lost or destroyed your membership card.

7) You are limited to one purchase of cannabis per day. However, if you make a purchase of \$10 or less before tax, a "small purchase", you may make one additional purchase of cannabis that day. Edible and topical items are not included in this restriction.

8) Friends can come into our lobby to wait while you make a purchase or use the vapour lounge. Friends should not wait outside the store or anywhere on the block.

9) Please do not park in the commercial loading or residential pick up zones outside of the club at any time, even weekends. If you are parked there you will be refused entry, including if you are dropped off and the driver remains in the vehicle.

10) We are a no scent environment. Please refrain from wearing any perfumes or colognes, as well as using scented deodorants, heavily scented soaps or any other strong scents. This is out of respect for members who suffer from allergic hypersensitivity to chemicals contained within these types of products.

11) Please leave pets at home if possible. If pets are brought to the club, please keep them closely under your supervision and control. You will be held personally responsible for your pet's behaviour. No pets are allowed into the vapour lounge under any conditions.

12) If you are intoxicated you may be refused service and/or asked not to use the vapour lounge for the remainder of the day.

13) If you have a contagious disease such as the flu or a cold, please do not visit the club unless absolutely necessary. This is due to the fact that a significant portion of our member base suffers from some sort of immune deficiency (caused by AIDS, chemotherapy, etc.) which would make a normally insignificant illness a much more serious problem for them.

14) We offer delivery service most days within the city and is based on staff availability. There is no fee for delivery but there is a \$20 minimum order.

15) Due to our hidden doorway, use caution when entering and exiting the club; also be aware that there are busy driveways which intersect the sidewalk on either side of the club.

16) We ask that you bring a personal medicine container to reduce plastic waste. An airtight glass container is ideal. We sell a number of such containers to members at cost.

17) Our phone number is on your membership card as well as listed in the phone book.

18) The VCBC is a cash only establishment. We cannot accept any form of debit or credit card as payment.

19) In case of any problems, please contact Dieter MacPherson, the executive director of the club. If he is unavailable, feel free to approach any other staff member and we will strive to resolve the issue and/or pass your comments along to him. Email is an excellent way to contact us. We strive to reply to all inquiries as quickly as possible. Our email address is on your membership card.

20) The VCBC takes no responsibility for lost or damaged personal property.

21) *Give member Code of Conduct (Rules) pamphlet.*

D) Conditions

1) We strongly caution against driving or operating heavy equipment while under the influence of our products.

2) All medicated products purchased from the VCBC should be stored out of the reach of children and pets.

3) The VCBC will not be held responsible for any respiratory, mental health or other medical problems that may result from using our products.

4) For those suffering from heart problems, please be advised that cannabis may either increase or decrease heart rates. We recommend abstaining from sativa dominant strains if one has tendencies towards tachycardia (irregular heart palpitations) or anxiety/paranoia.

5) You should be aware that there are potentially negative interactions between cannabis and some pharmaceutical drugs used for mental health issues. Please see our “Interactions” pamphlet for more information.

6) Should you experience any negative side effects in association with our products, we can assist in determining possible causes and take steps to monitor individual reactions through use of our online tracking system.

7) *Give member Interactions pamphlet.*

E) Pharmacology

1) The resins from cannabis plants can contain over 400 different organic compounds, over 100 of

which are produced nowhere else in nature. These unique compounds are known as cannabinoids, many of which have been shown to possess different therapeutic benefits. Measured by relative concentration, there are two major cannabinoids that are responsible for the most well-known medical benefits of cannabis: THC and CBD.

2) Tetrahydrocannabinol, more commonly known as THC, is the most famous of these and is usually found in the highest concentration. It is energizing and uplifting, is a strong analgesic (pain-killer), a powerful topical antibiotic, and it relieves pain, nausea, external and internal inflammation, muscle spasms, and convulsions. THC is responsible for the majority of the psychoactive properties of cannabis.

3) Cannabidiol, more commonly known as CBD, has recently begun to be the subject of an increasing amount of public interest. CBD is a potent antioxidant, a neuroprotective (brain protecting), has anti-tumoral properties, is a powerful anti-inflammatory agent, a fast-acting anxiolytic (anti-anxiety), powerful analgesic (pain-killer), antispasmodic, and anti-nauseant.

4) Over the last 40 years, cannabis has been bred to have higher levels of THC. Since both THC and CBD are created from the same chemical pathways (building blocks), an increase in one must be achieved by the reduction of the other. Most modern cannabis has anywhere from 20-28% THC and as little as 0.5-1.5% CBD. In the last decade, some organizations have been breeding cannabis to produce higher amounts of CBD. At the VCBC, we have access to two strains that contain roughly 10% CBD and 10% THC, by weight.

5) When CBD is used in a 1:1 ratio to THC it counteracts the majority of the psychoactive effects of THC, resulting in symptom management without the accompanying 'high' usually associated with cannabis use.

6) *Give member CBD pamphlet.*

7) Cannabis strains are either sativa, indica, or some mix of the two, based off of their effect profile. An effect profile is a description of the realm of possible effects that are associated with a particular strain.

8) The differences in the effects of the different strains is partly due to their cannabinoid content, but is also strongly influenced by the terpene, terpenoid, and flavonoid content of a given strain. These are aromatic (scent) compounds that are produced by many plants, including cannabis. Many of these compounds are psychoactive, and different types have distinct effects. The distinctive aroma of a given type of cannabis is largely a result of the strain's terpene content.

F) Application Routes

1) The VCBC strongly supports the worth and importance of both topical and internal methods of cannabis use.

2) Inhalation of cannabis is the quickest method of delivery, with effects usually taking full effect within 10 minutes and providing effects that last between 2-6 hours. The speed of effect of inhalation makes acute titration (fast-acting dose management) a simple process that is vital for certain conditions, especially those typified by the sudden onset of symptoms (epilepsy, multiple sclerosis, etc.). Unfortunately, this method of administration frequently leads to blood levels of the various active components that are far higher than the ideal therapeutic range, followed by a rapid decrease in their

effect. Inhalation also increases the likelihood of undesirable irritation of the throat and lungs.

3) Ingesting cannabis is a slower method of delivery with onset effects usually felt 1-3 hours after ingestion, with effects lasting between 4-12 hours. This allows for a longer period of effect, as well as a slower eventual increase and subsequent decrease in blood concentrations. This allows for simpler and more effective maintenance of ideal blood levels of the various therapeutic compounds contained within cannabis. Additionally, a properly organized regimen of oral and/or topical administration is significantly less expensive than a regimen focused on inhalation.

4) Topical application of cannabis relieves and helps heal localized pain due to illness or injury, fights bacteria and fungus, is a fast-acting muscle relaxant, anti-inflammatory, and is a general analgesic (pain-killer).

5) Cannabis can exert pain-reducing effects in two distinct ways that synergize (work) with each other to greater effect than either could alone. When administered internally (via ingestion or inhalation), cannabis exerts its effects via the central nervous system (brain and spinal cord) to reduce the intensity of the incoming pain signals. When administered topically, cannabis acts to reduce pain by directly reducing the peripheral nervous system' (sensory nerves') sensitivity to pain, thus reducing the number and intensity of pain signals sent to the central nervous system (brain and spinal cord). This means that the combined use of topical products with some form of internal administration can provide significantly greater pain relief than either could on its own.

G) Product and Store Tour

1) Next, introduce our topical and edible products. Give the new member a copy of each of the Edibles, Topicals, Capsules, and Extracts pamphlets, as well as the most recent copy of the Cannabis Digest. Follow this with a brief tour of the club. Starting with the front desk and lounge, point out the art desks, the bathroom, the vapour lounge, off limit areas (storage room, staff lounge, and front office) and finish in distribution.

G) Purchasing Cannabis

1) There are normally 18 different strains of cannabis, several types of unpressed hash (kief), a variety of different cannabis extracts, as well as a wide variety of topical and edible products on the menu.

2) The sample jars of cannabis in the display case contain 3 grams of each strain, while the sample jars of kief contain 1 gram of each type. This allows members to get an idea of the relative volume of the medicine.

3) Indicas are kept to the member's right, with the most indica-dominant strains on the farthest right; sativas are kept to the member's left, with the most sativa-dominant strains on the farthest left; the hash strains are arranged towards the centre of the display, with a similar left-right/sativa-indica organization.

4) The "I" on a strain's jar and on the price guide indicates that a strain has been grown indoors, while and "O" indicates that it has been grown outdoors.

5) "AAA", "A", and "B" are our price grades and denote (show) the price we pay to our suppliers and the resulting cost to our members. It is important to note that a strain labelled "AAA" is not necessarily the best quality medicine we have available. We often acquire top quality medicine for a great price and

pass along the savings to members. Always talk to the distributor to find the best balance of price, quality, and effect.

6) The cannabis price chart shows members the weight of cannabis received for a given grade and dollar amount. Note that the price per gram goes down with larger purchases, and that members can combine different strains/price grades to qualify for the discount applied to larger amounts.

8) The “Burn Report” shows members our evaluation of the quality of the burn of each strain, including harshness/smoothness of the smoke when inhaled and the color of the ash. This report grades the burn quality only; it does not relate to the potency or effects of a strain. Strains are ranked on a grading system of A/B/C, with A being the best quality burn, and C being the poorest.

9) If a member brings their own container, they can receive a free rolling paper. Rolling papers can be bought individually for 5 cents each.

10) Members are welcome to make cannabis purchases in any amount starting at a half gram and going up to one ounce.

11) Bag bottoms (“bottoms”) are available for two weeks each month if there are sufficient quantities. Members may only purchase 1 gram of bottoms for \$5.25 on any given day. Members may add an additional \$5 before tax of cannabis or kief on top of the bottoms purchased. Members may not make another purchase of cannabis or kief on a day when bottoms are purchased. This restriction does not apply to topical or edible products.

12) All of the cannabis provided by the VCBC is thoroughly inspected prior to sale, but members should always inspect their medicine for mold or mildew prior to use. We are always happy to exchange any medically unsatisfactory medicine for an equivalent amount of another type of medicine, so long as the return is due to dissatisfaction with the safety or medical efficacy (usefulness) of the original purchase.

13) Each member can access up to \$20 in credit towards the purchase of medicine, beginning with their second visit to the club. It is loaned at 0% interest and you do not need to pay us back before you make another purchase.

14) A \$5 emergency fund is available each month to members who are in need and have already used up their \$20 dollar credit. You are not expected to pay back this donation, but a member must spend a minimum of \$20 at the club before they can again make use of the emergency fund.

At this point, the walkthrough is complete. Introduce the new member to one of the distributors (or complete their first purchase yourself) and inform them they are free to make a purchase so long as all the membership requirements have been met, which should be the case at this point. Don't forget to conclude with a hearty handshake and warm welcome to the club!

H) How to do a PHONE sign up

- 1) Phone Signups are for people with physical limitations on their ability to come into the shop or for members out of town. Phone sign ups can also be done with the members' caregiver if

- communicating the details of the signup is too complicated, ex. For elderly members.
- 2) Most likely the POC and the member application have been emailed to the club. Print both documents and complete the paperwork side of a signup the same as a normal one. Enter Member Info into the computer then phone them so you are prepared to give them their member number.
 - 3) Our hours of operation, we are open 365 day per year
 - 4) Go through our rules - **BE SURE TO NOTE THE NO RESALE RULE**
 - 5) Explain mail order process: you can literally read out what is written below if you like -
 - a) Members check our website: vcbc.live for a current menu. We process mail orders Mon to Fri.
 - b) We take mail orders primarily through email but can also take them over the phone if email is inaccessible.
 - c) Once we have your order, we put it together (sealing any flower or hash), email you an invoice with the total and mail out your package.
 - d) As we don't have credit/debit (banks are federally regulated), all payments are accepted VIA e-transfer. We ask that all members use their membership number twice for an e-transfer password.
 - e) Shipping: For orders over \$250, shipping is free. We ship via Canada Post (usually expedited with no signature) but if you request it, we do have the express post and signature option available for you. Expedited is 15\$ and Express is 25\$.
 - f) When we receive your e-transfer we take the mail to the post office and email the tracking numbers to the recipient.
 - 6) After you have gone over the details of ordering, take the time to discuss the patient's experience with cannabis and discuss products according to their use, history with this medicine, and the method of consumption they desire.

APPENDIX B: Distribution Charts

A) Cannabis Price Chart

Weight	I-AAA	I-A/O-AAA	I-B/O-A	O-B
0.4g	\$3.80	\$3.50	\$3.00	\$2.80
0.5g	\$4.80	\$4.40	\$3.75	\$3.50
1g	\$9.55	\$8.75	\$7.50	\$7.00
2g	\$19.10	\$17.50	\$15.00	\$14.00
3g	\$28.65	\$26.25	\$22.60	\$21.00
3.5g	\$32.55	\$30.45	\$25.65	\$22.95
\$/gram	\$9.30/g	\$8.70/g	\$7.33/g	\$6.56/g
7g	\$60.90	\$56.70	\$49.65	\$43.25
\$/gram	\$8.70/g	\$8.10/g	\$7.09/g	\$6.18/g
14g	\$115.50	\$105.00	\$91.25	\$81.10
\$/g	\$8.25/g	\$7.50/g	\$6.52/g	\$5.79/g
21g	\$162.75	\$141.75	\$129.10	\$115.50
\$/g	\$8.25/g	\$7.20/g	\$6.55/g	\$5.85/g
28.5g	\$210.00	\$189.60	\$168.00	\$147.00
\$/g	\$7.37/g	\$6.63/g	\$5.89/g	\$5.16/g

B) Kief Price Chart

	\$7/g	\$8/g	\$9/g	\$10/g	\$11/g	\$12/g	\$13/g	\$14/g
1g	\$7.35	\$8.40	\$9.45	\$10.50	\$11.55	\$12.60	\$13.65	\$14.70
2g	\$14.70	\$16.80	\$18.90	\$21.00	\$23.10	\$25.20	\$27.30	\$29.40
3g	\$22.05	\$25.20	\$28.35	\$31.50	\$34.65	\$37.80	\$40.95	\$44.10
3.5g	\$36.75	\$29.40	\$33.10	\$36.75	\$40.45	\$44.10	\$47.80	\$51.45
7g	\$46.20	\$53.55	\$60.90	\$68.25	\$75.60	\$82.95	\$90.30	\$97.65
\$/g	\$6.60/g	\$7.65/g	\$8.70/g	\$9.75/g	\$10.80/g	\$11.85/g	\$12.90/g	\$13.95/g
10g	\$63.00	\$73.50	\$84.00	\$94.50	\$105.00	\$115.50	\$126.00	\$136.50
\$/g	\$6.30/g	\$7.35/g	\$8.40/g	\$9.45/g	\$10.50/g	\$11.55/g	\$12.60/g	\$13.65/g
14g	\$86.10	\$100.80	\$115.50	\$130.20	\$144.90	\$159.60	\$174.30	\$189.00
\$/g	\$6.15/g	\$7.20/g	\$8.25/g	\$9.30/g	\$10.35/g	\$11.40/g	\$12.45/g	\$13.50/g
21g	\$126.00	\$147.00	\$169.05	\$191.10	\$213.15	\$235.20	\$257.25	\$279.30
\$/g	\$6.00/g	\$7.00/g	\$8.05/g	\$9.10/g	\$10.15/g	\$11.20/g	\$12.25/g	\$13.30/g
28g	\$161.70	\$191.10	\$220.50	\$249.90	\$279.30	\$308.70	\$338.10	\$367.50
\$/g	\$5.78/g	\$6.82/g	\$7.88/g	\$8.93/g	\$9.98/g	\$11.03/g	\$12.08/g	\$13.13/g

C) Edible and Topical Limits

Product	Daily Max \$	Daily Max #	PreOrder Max#	PreOrder Max\$
Cookies	\$18	12	\$60	40
Daytime Bud.	\$42	32	\$84	64
Budda Ball	\$25	10	\$50	20
Capsules	\$64	160	\$128	320
Hash Caps	\$80	40	\$160	80
Cannoil	\$105	4	\$210	8
Lozenge	\$21	16	\$84	64
Kamut Puff	\$21	20	\$84	80
Massage Oil	---	4	---	8
Coconut Massage	\$24	2		4
Cannapatch	\$10.50	4	\$42	16
Salve	---	2	---	8
Lip Balm	\$12.60	3	\$50.40	12
	Per Day Total		Pre-order Total	
Total Edibles	\$40 not incl. Cannoil/Hash Caps		\$100 not incl. Cannoil and DayBuds	
Total Topicals	\$50		\$100	

APPENDIX C: Wholesale Purchasing

A) Suppliers

- 1) New (prospective) suppliers should deal exclusively with senior management. If no one is available, the supplier should be asked to come back. It should be explicitly expressed to the supplier that it is very unlikely we are requiring additional cannabis supply.
- 2) Suppliers should always be dealt with as discreetly as possible.
- 3) Suppliers typically bring their product(s) to the club. If they prefer not to come to the club, another location can usually be arranged in advance.
- 4) All products from suppliers are accepted on a consignment basis unless otherwise arranged.
- 5) In order to ensure the safety of patients, suppliers of the VCBC should supply only the VCBC, other CAMCD-certified dispensaries, or other eligible recipients.
- 6) Product(s) may be returned or reduced in price at the club's discretion
- 7) The manager or quality control inspector should do an inspection of the product(s) for mold, pests or other impurities.
- 9) The price the club will pay is negotiated between management and the supplier and the retail price reflects this cost.

B) Flowers

- 1) Inspect cannabis for quality (bud structure, trim, moisture level, smell) and obvious defects (mold, mildew, poor trimming including too much stalk).
- 2) When doing a smoke test, note the quality (cleanliness of burn, potency, flavor).
- 3) If there are doubts regarding the quality visually or in smoking, ask the supplier about the current status of their facility, including whether they have had any problems lately and what their flushing/drying/curing procedure is.
- 4) A thorough inspection will be done once the supplier has left (see Appendix D, sec E).
- 5) All new suppliers should be given a copy of the Suppliers Guidelines (Appendix E).
- 6) New suppliers should be informed of our policy regarding mold and mildew.
- 7) The club recommends that all trimming be done by experienced trimmers, as it is during the trimming process that many damaged buds (including any mold and mildew) are discovered and can be removed prior to bagging.
- 8) Regardless of mold or mildew content, buds that are substantially inferior should be discarded and not brought to the club. Inferior buds include: buds that contain yellow patches, buds that are a sickly looking color, and buds that look burnt or are rust-coloured.
- 9) The club requests that large tops be cut down to their smaller bud constituents.
- 10) Stalk should be very minimally visible in all buds.

- 11) Excessive stalk may be a cause for price reduction or, in extreme cases, return.
- 12) Trimmers should strive to remove all discoloured leaves (especially yellow leaves).
- 14) Accepted bags should be labeled with club labels that have been completely filled out and a purchase order should be made in Biotrack and then filed with the manager.
- 15) All cannabis is graded according to cost. The Club pays the following prices for cannabis by grade:
 - \$9.55: >\$1800/lb
 - \$8.75: \$1500/lb to \$1800/lb
 - \$7.50: <\$1500/lb
 - \$7: < \$1300/lb
 - \$6: <\$1200/lb
 - \$4: <\$1000/lb or donated cannabis

C) Kief

- 1) Kief, also referred to as hash, may be brought to the club in any quantity.
- 2) It is recommended that kief is transported in a sealed glass jar(s).
- 3) Kief will be weighed at the club with the supplier and a price agreed upon.
- 4) The club pays \$4 to \$11 per gram for kief, and charges three dollars per gram over cost. See Appendix B for the Kief price charts.

D) Extracts

- 1) The VCBC is extremely cautious about any form of extract (e.g., shatter, honeycomb, etc..) purchased by the club. There is a requirement for the facility to conform to both Good Maintenance Policy and Good Production Policy guidelines, and as such we require complete transparency into the processing of the extracts.
- 2) Anyone wishing to sell any form of extract to the club must be willing to submit to occasional audits of their facility and business.
- 3) The products in question must have a proven track record of quality and consistency.

APPENDIX D: Quality Control

All cannabis is to be inspected for quality, mold, and powdery mildew, prior to being served to members. There are three common types of mold that affect cannabis: white, grey/brown, and black.

A) White Mold

1) White mold is the most common type found in nature and in cannabis. Typically a variety of aspergillus, it is usually very white and looks fluffy, airy or stringy, often resembling dense spider webs.

2) Though it is in some ways the least dangerous type of mold (most people inhale small amounts frequently throughout the day as it is so common in nature), it can be damaging to those with compromised immune systems, particularly if inhaled in larger quantities as may be found in infected cannabis.

3) White mold must be carefully inspected for as it can be easy to miss due to the fact that it can resemble dense clusters of cannabis resin.

4) White mold is typically caused by excessive moisture at the site of the mold, often due to overly large buds and/or a lack of adequate airflow into the bud.

5) The best method for suppliers to combat white mold is to ensure ample air movement via oscillating fans; air should be a fresh supply from a dedicated intake line. In addition, manually opening the large “tops” (colas that typically form at the top of branches and that contain several node sites that often grow into one another) to allow airflow between the nodes can be effective.

B) Gray/Brown Mold

1) Grey/brown mold is also common in nature and cannabis is susceptible to it. Also called “bud rot”, it is typically a variety of botrytis.

2) This mold will usually have a distinctly rotten look and the color will appear sickly and unhealthy compared to healthy buds. The infected areas will often also look more moist than healthy areas of the bud, or they may look burned or rusty, or they may look both moist and burned/rusty.

3) Grey/brown mold may also contain patches of white mold within it or around it.

4) Grey/brown mold is caused by excessive moisture in the bud and is suggestive that there may be excessive humidity in the growing facility and/or that plants are being over-watered. A lack of airflow is also a common causal factor.

5) Suppliers can best fight grey/brown mold by keeping a constant proper room humidity of less than 60% (ideally less than 50%), by having ample air movement via oscillating fans of fresh air from a dedicated intake line, and by manually opening larger tops. Suppliers should also ensure that they are not over-watering their plants.

6) Damaged buds allow grey/brown mold to take hold more easily. Suppliers should ensure buds are not damaged from excessive room heat or light hot spots or are otherwise not stressed including from over or under watering.

7) Heat at the top of the canopy should ideally be kept under 90F; heat should be measured at the top of the canopy under the lights, not on an adjacent wall where the temperature can be much lower.

C) Black Mold

1) Black mold is typically a variety of stachybotrys and is usually a symptom of a larger mold problem within the growing facility. Black mold will appear black or very close to black and is very toxic to smoke.

2) Black mold is typically the variety of mold that causes substantial damage to the infrastructure of a facility.

3) It is not common to find black mold on cannabis. If any black mold is found, the entire crop (not just the bag in which it was found) must be immediately marked for return and it should be reconsidered whether to accept any further cannabis from the supplier.

4) Black mold is the only type of common mold that is likely to infect a whole facility (white and grey/brown mold are usually locally caused within specific buds and only spread if growing conditions and grower attention is extremely poor).

5) Black mold may require sterilization of the entire facility and may require replacing walls and/or insulation, as well as items such as tables and shelving.

6) 99% isopropyl or bleach can help reduce or remove black mold, but in general an expert in mold should be consulted if a black mold infection is found.

D) Powdery Mildew (PM)

1) PM is a fungus that is very common in nature and can be a problem on cannabis plants.

2) PM is extremely detrimental to smoke and if any is found all bags of the entire crop (not just the bag in which it was found) must be immediately marked for return as PM easily spreads and the risk of widespread contamination, as with black mold, is great.

3) PM looks like fine confectioner's sugar. It also may look like clumps of small insect eggs.

4) On a casual glance, PM may be confused for white mold. Upon closer inspection, PM is dustier (small, powdery granules grouped together) whereas white mold is stringy and lace-like. PM is also more prone to lay flat on a surface, whereas white mold may jut out from the surface like small spiderwebs.

5) PM typically starts by attacking leaves and then moves into the bud. It is most commonly found on the leaves (often trimmed) that protrude from a bud, though it may be more apparent upon opening the bud where the infected leaf protrudes.

6) As opposed to many cases of mold, PM is usually a very obvious disease during the growing process and should be found and removed by the supplier prior to packaging. Failure to do so is a sign of an inattentive or inexperienced grower and they should be reconsidered as a supplier for the club.

7) PM typically starts in one or a few isolated locations but will quickly spread if not immediately

destroyed.

8) PM thrives in cold temperatures (under 65F) and humid (over 60% humidity) environments. The colder the temperature and the higher the humidity, the more likely PM will take hold and/or spread. A lack of fresh airflow, poor air movement, and long periods of darkness also assist PM in taking hold and/or spreading.

9) Suppliers can best fight PM by creating facility conditions that discourage it. Suppliers should also frequently inspect plants to catch any PM outbreaks early.

10) If PM is found, the recommended remedy is to carefully and immediately cut off all parts of all plants where it is found; to be extra safe, the entire plant(s) where any PM is found can be destroyed. Infected plant matter should be put in sealed bags and removed from the facility immediately, or the plant matter can be burned.

11) In addition to physical removal, using a sulphur burner is a very effective method of combating PM. Sulphur serves to inhibit PM spores from germinating and spreading. A sulphur burner will vaporize elemental sulphur, coating everything in the room with a fine film of sulphur. Sulphur burners should always be used at night with exhaust fans off and oscillating fans on, for between 1-4 hours per night until all symptoms are gone. Since sulphur is not a desirable thing to have on cannabis buds, sulphur burners must cease being used when buds start to form (typically around six weeks prior to harvest, or around three weeks after flowering is induced, depending on the length of the flowering cycle).

12) There are a variety of things that can be sprayed onto plants that can be effective, including water-soluble sulphur and neem oil.

E) Inspection Procedure

- 1) All cannabis must be inspected by a qualified inspector.
- 2) Before inspecting a cannabis bag, weigh it. In a regular ziplock bag, the total weight should be about 240g (227g of cannabis plus 12-13g for the bag). Make a note on the label if the bag is over or under by more than 3g.
- 3) Clean the inspection area, thoroughly wash your hands, dump the entire bag into a clean large stainless steel bowl.
- 4) Use an overhead fluorescent light. Optionally, also use a strong headlamp with high power white LEDs on full power. The room light should be on as well, and you should also have a USB microscope at hand hooked up to a computer for close-up views.
- 5) First take note of the overall colour(s) of the cannabis. This will serve as the base color(s) that will allow you to notice colour(s) that are out of the ordinary.
- 6) Also, note the overall level of dryness of the cannabis. This will serve as a base for seeking areas that are more moist.
- 7) Look for any black spots, unusually dark green spots, grey/brown areas, yellow areas, white areas or rusty brown areas. Notable unusual colors on the outside of a bud are indicative that there may be mold

within the bud at the site of discoloration.

8) Sometimes mold is associated not with an obviously discolored area, but rather with an area on a bud that has a slightly sickly looking color when compared to healthy buds. These areas are more difficult to spot and require greater vigilance.

9) The color of the small leaves that protrude from within the bud can also be a sign of possible mold. These leaves may be partially clipped during the trimming phase of cannabis production.

10) Look for leaves that are a different color from the majority of leaves. Often these leaves will be either yellow, brownish or rusty, or a sickly looking green.

11) Look as well for leaves that look shriveled or limp compared to other leaves.

12) When you see an unusual looking leaf, the bud should be opened at the spot from which the leaf protrudes. If the unusual color or physical characteristic ceases where the leaf enters the bud, mold is less likely. If the unusual color or the physical characteristic continues to the bud's stem, mold is more likely.

13) On smaller buds (buds that contain only one node site), mold is usually found near the bottom of the bud where it attaches to the stem, as there usually is or was a higher moisture content at this location than at the top of the bud.

14) Pay special attention to larger buds. Healthy looking buds are more likely to contain mold than healthy looking smaller buds since there is a greater likelihood that there was or is excessive moisture in the larger tops.

15) Mold is usually found on the lower 1/2 of a bud, either at the bottom of the bud or in between node sites.

16) Buds should be opened to inspect for mold. The nodes that form the top should pry apart quite easily allowing you to view the stem. Do not hesitate to remove nodes to inspect more closely.

17) Tops that display any exterior damage or signs of possible mold should be carefully inspected. These tops should be opened at multiple spots to inspect.

18) UV light can be used with all other lights turned off. Some molds will appear a distinct color under UV.

19) The black light may be used to confirm the presence of mold, but it should not be used as the sole method to confirm the absence of mold as it is ineffective at finding mold hidden within buds, where it is most commonly located.

20) A digital microscope is used to confirm the presence of mold, as well as variety and maturity. Pictures should be taken of major sites of contamination to provide each producer and to be used as a reference.

F) Categories of Inspected Cannabis

1) No mold or PM found: bag is to be marked on the attached label with the signature of the inspector.

2) White or grey/brown mold found: since white or grey/brown molds usually form in isolated buds, it is acceptable to seek and remove buds that contain these types of mold and still offer the rest of the

cannabis to members. The inspector must use their experience and discretion. As a general rule, bags that contain more than three buds with white or grey/brown mold should be marked with an "X" and returned. These bags may not be offered to members at any time.

3) As a general rule, if half of the bags of a crop each contain more than three buds with white or grey/brown mold, the whole crop should be returned. If a crop is being returned, all bags from the crop are to be marked with an "X". In this case, cannabis from this crop is not to be offered to members at any time.

4) Black mold or PM found: mark the bag with an "X" next to the strain name. All cannabis from the crop must be returned to the supplier. All bags from the crop are to be marked with an "X". Under no condition is any cannabis from the crop to be offered to members. This should be noted by the purchaser and if it becomes a continuous problem for the supplier their status with the club should be reconsidered.

APPENDIX E: Grower's Guidelines

Generally speaking our growers produce contamination free, quality cannabis. These guidelines are to assist in a standardized quality.

A) Nutrients and Flushing

1) The club does not state a preference for organically or non-organically grown cannabis. Considerable experience over many years has indicated that both organic and non-organic nutrients have the capacity to produce high quality, potent and clean burning cannabis or otherwise, both types of nutrient can produce low quality, weak or poorly burning cannabis.

2) In general, organically grown cannabis should be more heavily flushed at the end of its growing life as organic compounds are more difficult to flush from the growing medium.

3) It is recommended that organic cannabis be flushed for a minimum of two weeks (or 5 flushes) prior to being harvested.

4) In general, non-organically grown cannabis flushes more easily than organically grown as the salts used to make non-organic nutrients are water soluble and thus removed easily.

5) It is recommended that non-organic cannabis be flushed for a minimum of one week (or three flushes) prior to being harvested.

6) It is recommended that suppliers check the PPM (Parts Per Million) or EC (Electrical Conductivity) of their feed runoff throughout the growing cycle and specifically during the flushing phase.

7) Both PPM and EC are measurements of the Total Dissolved Solids (TDS) in a solution. It is important to note that PPM is a calculation based on the EC, and that slightly different formulas are used depending on the brand of meter used. EC is the only method of measuring nutrients that is universally consistent. For the purpose of this manual, an estimated average PPM calculation is used.

8) During the flowering cycle, the EC of the runoff should never exceed 3.0 (2000 PPM).

9) The EC of the runoff of the final flush prior to harvest should be under 1.0 (700 PPM) and preferably under 0.7 (500 PPM).

10) Runoff over 1.0 EC is likely to yield badly burning cannabis.

11) Some organic nutrients, such as the Bio-Canna line, may not be accurately measured by EC or PPM meters, in which case the supplier must use their experience to ascertain when sufficient flushing has taken place.

B) Drying/Curing Expectations

1) Cannabis is considered fully dry when all stalks will crack and/or snap when bent.

2) Cannabis is slightly too moist if stalks “crunch” but do not snap when bent.

3) Cannabis is far too moist if stalks simply bend when bent.

- 4) Overly moist cannabis may allow mold to grow and may be returned at the club's discretion.
- 5) Cannabis is too dry if the bud crumbles when rolled between your fingers.

C) Drying

1) It is vital to note that the best grown cannabis can become notably inferior if poorly dried and cured. Conversely, poorly grown cannabis can become better if perfectly dried and cured. The drying and curing process should be considered as important as any other part of the growing process.

2) Method 1: Hang plants upside-down on string or wire. Optionally, all leaves or just the fan leaves may be removed before hanging (this will decrease the amount of time required to dry but may reduce the quality of the smoke). Plants should have enough room so as to not be crowded into one another.

3) Method 2: Cut plants down into individual buds; lay the buds out on screens. Do not lay buds on a solid surface with no vertical airflow. Buds should have enough room on the screens so as to not be crowded into one another.

4) Method 3 involves "sweating" buds. This is an advanced method that is not recommended and will not be covered in this manual.

5) In general, the longer it takes to dry cannabis, the better the quality will be. Since Method 1 should always take longer than Method 2, with all other factors considered equal, Method 1 will produce higher quality cannabis.

6) In general, cannabis should take at least one week to dry.

7) Cannabis dries best in a stable environment. Ideally, the temperature in the drying room should be 70F with 50% humidity. For the first 1-3 days, the humidity will be higher as the plants shed their initial moisture rapidly, but after this period a stable 70/50 temperature/humidity should be achievable for the rest of the dry.

8) Temperatures under 60F will substantially increase the drying time and may allow for mold or mildew to appear. Temperatures over 80F will substantially decrease the drying time and may lead to poorly burning cannabis.

9) It is highly advisable that suppliers put a temperature and humidity meter in their drying room that keeps track of the current levels as well as historic highs/lows. Historic highs/lows should be noted and cleared daily to provide better data.

10) Cannabis must always be dried in the dark. Brief periods of light for daily inspections are not problematic.

11) A drying room needs a minimal amount of constant airflow from one side to the other. In general, a 4" inline fan will supply ample airflow for most drying rooms.

12) Other than the outflow fan, no fans should be used in a drying room. Direct air blowing onto drying buds will cause the outside of the buds to dry more rapidly than the inside, resulting in overly crunchy buds that are likely to smoke poorly. In addition, "crunchy" buds may lead a supplier to remove plants from the drying room early, which can lead to mold depending on the storage method used during the

curing phase.

13) Dehumidifiers can be used but should not be necessary. Proper room design and increasing/decreasing the amount of airflow should suffice to set the proper humidity during the drying process.

14) Heaters or air conditioners can be used to obtain an optimal temperature, but proper room design should usually make this unnecessary.

E) Curing

1) Curing is the final process of producing cannabis. The drying process should reduce the moisture content in the buds to approximately 20-25%. Curing further reduces the moisture content to the ideal 10-15% range. The curing process allows this final reduction to occur more slowly and ensures that the moisture in the buds is evenly distributed. Buds that are reduced to their final 10-15% moisture content more rapidly via the drying process are likely to not burn as well due to unevenly distributed moisture.

2) There are many methods of curing. The suggested method is to store cannabis in large, grocery- store sized paper bags with the bag tops sealed by rolling them up. The paper bags should be kept in the drying room with the 70/50 temperature/humidity.

3) Bags should never be stored directly on the floor.

4) Paper bags allow cannabis to maintain a good humidity level and allow small amounts of air transfer.

5) Paper bags should be opened daily and the cannabis disturbed to allow nitrogen off-gas to escape and fresh oxygen in.

6) A more advanced method of curing involves storing cannabis in paper bags and storing the paper bags in rubbermaid totes. This method is superior in that it creates a microenvironment where moisture is very evenly distributed amongst buds. This method requires that the bins/bags be opened more frequently; initially after drying, they may need to be opened several times a day.

F) Storing

1) Cannabis brought to the club is to be stored in 1/2 lb (227g) amounts. If a supplier is using regular ziplock bags, the combined weight of cannabis and bag should be 240g.

2) Sealing the 1/2 lb bags in larger vacuum sealed (food saver) bags is the best method of smell retention.

3) Each 1/2 lb bag must have the supplied labels attached with the correct information filled in.

APPENDIX F: Social Media Agreement

VCBC SOCIAL MEDIA AGREEMENT

Social media definition: Online, electronic, or Internet media, tools, communities, and spaces for social interaction, sharing user generated content, or public or semi-public communication.

Social media can take many different forms, including internet forums, blogs & microblogs, online profiles, wikis, podcasts, pictures and video, email, text, instant messaging, music- sharing, and chat, to name just a few. Examples of social media include but are not limited to the following: LinkedIn, Facebook, Instagram, Wikipedia, YouTube, Twitter, Pinterest, and blogs.

Being on social media on your cell phone or computer while on company time, including but not limited to Facebook Messenger, Twitter, Instagram, or Pinterest, is also akin to being on a personal call while at work. Please do your best to focus during your work hours and check these applications during personal time like lunch breaks or at the end of the day.

Violation(s) of the social media policy will be subjective to progressive discipline, up to and including termination.

1. Some subjects can invite a flame war. Be careful discussing things where emotions run high (e.g. politics and religion) and show respect for others' opinions.
2. Your job comes first. Unless you are an authorized Social Media Manager, don't let social media affect your job performance.
3. If you make a big mistake, correct it immediately and be clear about what you've done to fix it. Contact the social media team or management if it's a significant issue.
4. Don't even think about it.... Talking about financial information, sales trends, strategies, forecasts, legal issues, future promotional activities. Giving out personal information about customers or employees. Posting confidential or non-public information. Responding to an offensive or negative post by a customer. There's no winner in that game.

Date:

Employee Name: _____

Employee Signature: _____

Senior Staff Name _____

Staff Signature _____

APPENDIX G: Non Disclosure Agreement

Non Disclosure Policy for The Victoria Cannabis Buyers Club

This policy affects all employees, including board members, investors, contractors and volunteers, who may have access to confidential information.

Policy Elements

Confidential and proprietary information is secret, valuable, expensive and/or easily replicated. Common examples of confidential information are:

1. Unpublished financial information
2. Data of Customers/Partners/Vendors
3. Patents, formulas or new technologies
4. Member lists (existing and prospective)
5. Data entrusted to our company by external parties
6. Pricing/marketing and other undisclosed strategies
7. Documents and processes explicitly marked as confidential
8. Unpublished goals, forecasts and initiatives marked as confidential

What employees should do:

1. Lock or secure confidential information at all times
2. Shred confidential documents when they're no longer needed
3. Make sure they only view confidential information on secure devices
4. Only disclose information to other employees when it's necessary and authorized
5. Keep confidential documents inside our company's premises unless it's absolutely necessary to move them
6. Wait for members to approach first when interacting outside of the VCBC without previous permission

What employees shouldn't do:

1. Use confidential information for any personal benefit or profit
2. Disclose confidential information to anyone outside of our company
3. Replicate confidential documents and files and store them on insecure devices

When employees stop working for our company, they're obliged to return any confidential files and delete them from their personal devices.

Employees who don't respect our confidentiality policy will face disciplinary and, possibly, legal action.

We'll investigate every breach of this policy. We'll terminate any employee who willfully or regularly breaches our confidentiality guidelines for personal profit. We may also have to punish any unintentional breach of this policy depending on its frequency and seriousness. We'll terminate employees who repeatedly disregard this policy, even when they do so unintentionally.

This policy is binding even after separation of employment.

Date:

Employee Name: _____

Employee Signature: _____

Senior Staff Name _____

Staff Signature _____

APPENDIX H: Anti Harassment Policy

Victoria Cannabis Buyers Club **Anti-harassment Policy and Procedures**

Policy Statement

The Victoria Cannabis Buyers Club is committed to fostering a harassment-free workplace where all employees are treated with respect and dignity.

The Canadian Human Rights Act protects employees from harassment based on race, national or ethnic origin, colour, religion, age, sex, sexual orientation, marital status, family status, disability or pardoned conviction. Harassment at the Victoria Cannabis Buyers Club is not tolerated.

Employees who are found to have harassed another individual may be subject to disciplinary action. This includes any employee who: interferes with the resolution of a harassment complaint; retaliates against an individual for filing a harassment complaint; or files an unfounded harassment complaint intended to cause harm.

Application of Policy

This policy applies to all current employees of the Victoria Cannabis Buyers Club, including full and part-time, casual, contract, permanent and temporary employees. This policy also applies to job applicants. This policy applies to all behaviour that is in some way connected to work, including during off-site meetings, training and on business trips.

Definitions

Harassment is:

- offending or humiliating someone physically or verbally;
- threatening or intimidating someone; or
- making unwelcome jokes or colour, religion, age, sex, sexual orientation, marital status, family status, disability or pardoned conviction.

Sexual harassment is:

- offensive or humiliating behaviour that is related to a person's sex;
- behaviour of a sexual nature that creates an intimidating, unwelcome,

hostile or offensive work environment; or

- behaviour of a sexual nature that could reasonably be thought to put sexual conditions on a person's job or employment opportunities.

Responsibilities and Expectations

The Victoria Cannabis Buyers Club is responsible for providing all employees a harassment-free workplace.

The Harassment Officer is responsible for:

- ensuring that this policy is applied in a timely, consistent and confidential manner;
- determining whether or not allegations of harassment are substantiated; and determining what corrective action is appropriate where a harassment complaint has been substantiated.

The Harassment Officer is responsible for:

- the administration of this policy; reviewing this policy annually, or as required; and
- making necessary adjustments to ensure that this policy meets the needs of the organization.

Supervisors are responsible for:

- fostering a harassment-free work environment and setting an example about appropriate workplace behaviour;
- communicating the process for investigating and resolving harassment complaints made by employees;
- dealing with harassment situations immediately upon becoming aware of them, whether or not a harassment complaint has been made;
- taking appropriate action during a harassment investigation, including separating the parties to the harassment complaint, when appropriate; and
- ensuring harassment situations are dealt with in a sensitive and confidential manner.

Employees are responsible for:

- treating others with respect in the workplace;
- reporting harassment to the Harassment Officer ;
- cooperating with a harassment investigation and respecting the confidentiality related to the investigation process;

Employees can expect:

- to be treated with respect in the workplace;
- that reported harassment will be dealt with in a timely, confidential and effective manner;
- to have their rights to a fair process and to confidentiality respected during a harassment investigation; and
- to be protected against retaliation for reporting harassment or cooperating with a harassment investigation.

Procedures for Addressing a Harassment Complaint**Filing a Complaint**

An employee may file a harassment complaint by contacting the Harassment officer. The complaint may be verbal or in writing. If the complaint is made verbally, the Harassment officer will record the details provided by the employee.

The employee should be prepared to provide details such as what happened; when it happened; where it happened; how often and who else was present (if applicable).

Complaints should be made as soon as possible but no later than within 30 days of the last incident of perceived harassment, unless there are circumstances that prevented the employee from doing so.

The Harassment Officer will tell the person that the harassment complaint has been made against, in writing, that a harassment complaint has been filed. The letter will also provide details of the allegations that have been made against him or her.

Every effort will be made to resolve harassment complaints within 30 Days. The Harassment Officer will advise both parties of the reasons why, if this is not possible.

If either party to a harassment complaint believes that the complaint is not being handled in accordance with this policy, he or she should contact Ted Smith.

Mediation

Wherever appropriate and possible, the parties to the harassment complaint will be offered mediation prior to proceeding with a harassment investigation. Mediation is voluntary and confidential. It is intended to assist the parties to arrive at a mutually acceptable resolution to the harassment complaint.

The mediator will be a neutral person, agreed upon by both parties. The mediator will not be involved in investigating the complaint.

Each party to the complaint has the right to be accompanied and assisted during mediation sessions by a person of their choosing.

Investigation

If mediation is inappropriate or does not resolve the issue, a harassment investigation will be conducted. All investigations will be handled by an individual who has the necessary training and experience. In some cases, an external consultant may be engaged for this purpose. The investigator will interview the person who made the complaint, the person the complaint was made against and any witnesses that have been identified. All people who are interviewed will have the right to review their statement, as recorded by the investigator, to ensure its accuracy.

The investigator will prepare a report that will include:

- a description of the allegations;
 - the response of the person the complaint was made against;
 - a summary of information learned from witnesses (if applicable); and
- a decision about whether, on a balance of probabilities, harassment did occur.

This report will be submitted to the club manager. Both parties to the complaint will be given a copy.

Substantiated Complaint

If a harassment complaint is substantiated, the Harassment Officer will decide what action is appropriate. Remedies for the employee who was harassed may include: an oral or written apology.

Corrective action for the employee found to have engaged in harassment may include: a reprimand; a suspension; a transfer; a demotion; and/or dismissal. Both parties to the complaint will be advised, in writing, of the decision.

Other Redress

An employee who is not satisfied with the outcome of the harassment complaint process may file a

discrimination complaint with the Canadian Human Rights Commission.

Privacy and Confidentiality

All parties to a harassment complaint are expected to respect the privacy and confidentiality of all other parties involved and to limit the discussion of a harassment complaint to those that need to know.

The Victoria Cannabis Buyers Club and all individuals involved in the harassment complaint process, will comply with all requirements of the The Personal Information Protection and Electronic Documents Act to protect personal information.

Review

The Victoria Cannabis Buyers Club will review this policy and procedures on an annual basis, or as required, and will make necessary adjustments to ensure that it meets the needs of all employees.

Enquiries

Enquiries about this policy and related procedures can be made to the Harassment Officer.

Acknowledgement of Policy

I have read and understand The Victoria Cannabis Buyers Club Anti-harassment Policy; I will adhere to it.

Date: _____

Employee Signature: _____

Employee Name: _____

Witness Name: _____

Witness Signature: _____

APPENDIX I: Averaging Agreement

VCBC Averaging Agreement

The VCBC averages scheduled work hours over a period of 4 weeks. This means that over a period of 4 weeks, full time employees will work an average of up to 40 hours per week.

Employees will be requested to sign the Averaging Agreement when they are hired. The agreement will exist from the employees date of hire, on an ongoing basis and is only terminated upon termination of employment. This Agreement must be reviewed and signed in conjunction with The VCBC Hiring Package.

A full time employee will be scheduled for an average of 40 hours per week over the 4 week period. The maximum amount of hours within a four week period will not exceed 160, without written consent from the employee and senior management.

Daily shift hours

To allow an employee to work up to 40 hours in a four day period, the standard length of a daily shift will be 9.5 hours. Employees will be given 1.5 hours in paid breaks per 9.5 hour shift. As per this averaging agreement, employees who are being paid for a 9.5 hour shift will not be paid the daily overtime rate applicable after 8 hours. Break times will be chosen daily by employees through a sign up process; this will be on a first come, first serve basis.

Staff Meetings

Once per month, employees will be required to attend an after hours staff meeting. Staff meetings are a total of 1.25 hours, beginning 15 minutes after closing.

If a staff member did not work the day of the staff meeting and comes in to attend it, they will be paid for two hours, as per BCESA.

If the staff member did work the day of the staff meeting, the daily total of 10.75 hours will be averaged into their four week period.

Banked Hours - How to be paid

Banked hours can be saved up to be paid out later in the year. All banked hours can be saved for up to a maximum of six months. The maximum amount of hours that can be banked is up to 80.

Overtime requirements

If a requirement arises for an employee to work more than 160 hours in a four week period, this overtime must be pre-authorized by Ted Smith, our Executive Director. Approved overtime is voluntary and will

be paid at the appropriate rate, as per the BCESA.

Termination of employment

The employer will retain the Averaging Agreement for 2 years after the employment terminates.

For more information, please refer to the Employee Standards Act and Regulations for BC -

http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/00_96113_01

<https://www2.gov.bc.ca/gov/content/employment-business/employment-standards-advice>

Victoria Cannabis Buyers Club Averaging Agreement

The Averaging Agreement contains important information about the averaging of hours of work and details of overtime compensation at The Victoria Cannabis Buyers Club. This agreement may be subject to change without notice.

I understand that I should consult with my Manager regarding any questions I have about the Averaging Agreement.

I have received the Averaging Agreement and I understand that it is my responsibility to read and comply with the policies contained in the agreement and any revisions made to it.

In signing this document, I understand that I am agreeing to average my hours as per the Averaging Agreement. I understand that the Agreement will exist from my date of hire, on an ongoing basis and is only terminated upon termination of employment.

Employee hire date: _____

Termination of employment date: _____

Date : _____

Employee Signature: _____

Employee Name: _____

Senior Staff Member Signature: _____

Senior Staff Member Name: _____

APPENDIX J: Staff Benefits

- Pay rate - \$18 per hour for the first 3 months then \$19 per hour after 3 months

Vacation Time

- Vacation Time – 3 weeks paid, 2 weeks unpaid per calendar year
 - **Vacation time becomes available 6 months after the employee start date**
- One week is determined by your average amount of hours worked per week
 - Ex. Working 36 hours per week on average = 108 hours
 - Ex. Working 20 hours per week on average = 60 hours
- It is your responsibility to write your vacation hours on the hours sheet to ensure you are paid. You can arrange with management to have your hours accounted for ahead of time if you will be out of town.

PLEASE NOTE – Vacation time is not optional! You have to actually take a paid vacation. Please plan to use your vacation time so that you don't end up taking it all in December! Taking payment in lieu of vacation time is not permitted unless there has been an agreement made with management under extreme circumstances.

Sick Time

- 2 weeks of paid sick time (100% pay rate)
- Entitled sick time is calculated by averaging your year to date hours.
- If employee exceeds these two weeks, exceptions for further situations can be made upon management approval with a doctors note

Positive Life Benefit

- The Club will happily reimburse you for half of anything you do physically to better your health or positively improve your life. You are able to spend up to \$150 per month and receive up to \$75 back.
- Health Benefits do not need to be claimed within the same month they are used, you need only be employed at the club during that time. (It is ok to bring a January receipt to the club in February)
- This benefit is applicable to physical health equipment purchases, as it is an investment in long term health!

Health Benefits Plan

- As of Feb 21, 19 - Benefits will be provided to employees after 3 months of continuous employment
- Health benefits are provided through the VCBC, not private insurance to make benefits accessible to all employees.
 - **Dental** - \$1500 Annually, 100% Coverage
 - **Prescriptions** – 100% Coverage, no deductible (email or bring receipts to management – please black out the actual prescription details before hand for privacy protection)
 - **Counseling** - \$500 Annually, 100% Coverage
 - **\$2500 Flex Bag** – 100% Coverage. Every employee has an annual \$2500 TOTAL flex bag that can be used for any of the services below.
 - Massage (To access Eastern Massage Therapy, we do not require a RMT)
 - Acupuncture
 - Naturopath
 - Chiropractor
 - Physiotherapist
 - Medical and Dental for Dependant Children and family
 - Glasses and Eye Exams
 - Veterinary Care
 - Vitamins and Supplements
 - Other medical equipment - check in with Management in advance to discuss appropriateness of the item for coverage prior to purchase.

Inform your manager before your appointment to confirm the eligibility, total amount payable and the date of the appointment.

All employees' have the option of having these services paid for prior to the treatment (especially regarding Dental). If you would like to do this:

1. Give your manager the clinic name and contact information
2. Inform the clinic that they will be hearing from us and that you give your permission for them to talk about your benefits

If you would like to pay for the service yourself, bring the receipt to your manager so that it can be recorded on our Staff Benefit Spreadsheet.

- If you would like to find out how much of each benefit you have available, plus what you have used so far, ask your manager to give you an update on your Personal Staff Benefit Spreadsheet in the Google Drive. You can access this document to review available benefits whenever you need.

Grams of the Day

VCBC Staff are welcome to a “gram of the day” to be used towards anything that the VCBC sells.

IT IS EACH STAFF MEMBERS PERSONAL RESPONSIBLE TO KEEP TRACK OF THEIR GRAMS OF THE DAY!

If you are a VCBC Dispensary Staff member:

- You earn a \$6 Gram of the day after a full day worked
- You earn a \$3 Gram of the day for a half day worked
- Grams of the day need to be used within the one week pay period

If you are a VCBC Bakery Staff member:

- You earn a \$6 Gram of the day after a full day worked
- You earn a \$3 Gram of the day for a half day worked
- Grams of the day CAN be saved up
- Grams of the day are processed under your own personal staff member number at the club - Your purchase history is used to account for Gram of the day purchases
- With ample notice, you are welcome to contact the dispensary to have your grams of the day prepared and sent up with Ted

APPENDIX K: VACATION OVERPAYMENT POLICY

Vacation Overpayment Policy

If an employee is paid beyond their vacation entitlement, the following is to occur:

- Ted Smith and any other concerning management will be informed
- Employee will be notified
- Ted will talk to the employee
- Ted Smith will decide the necessary course of action
- Management staff will inform the employee of the appropriate action to be taken

Options Include:

1, Wait till the time becomes available - VCBC management can instruct payroll to deduct the number of vacation days taken in advance from their vacation entitlement once they have actually earned it. As this creates more work for the administration, it needs to be approved by management.

2, Repayment Plan - A reasonable repayment plan can be established. In order to arrange this, a meeting must be held between VCBC management, the VCBC Harassment Officer and the employee.

*Please note - If there is no interest charged on top of the repayment plan, CRA based interest rates will be applied to the amount in order to calculate accurate CPP, EI and tax rates. Employee T4's will be adjusted accordingly.

I have read and understood the vacation overpayment policy.

Employee Signature: _____

Senior Employee Signature: _____

Date: _____

This is Exhibit F referred to in the affidavit of
Ted Smith
affirmed before me at Victoria, BC
this 26 day of March, 2021.
[Signature]
A Commissioner for taking Affidavits for British
Columbia



Victoria Cannabis Buyers Club Application for Membership

826 Johnson St.
Victoria, BC
V8W 1N3

For more information
see: <https://vcbc.live>
PH: (250) 381-4220

Club copy : Patient copy : Member #: _____

Applicant's Name: _____

Address: _____

City: _____ Prov: _____ Postal Code: _____

Phone number(s): Home: _____ Work: _____ Cell: _____

Date of birth (dd/mm/yyyy): _____ E-mail: _____

I would like to receive information and email updates about the club :

Physician's Name: _____

Physician's Signature: _____

Physicians Stamp

Proof of condition Doctor's recommendation Naturopath ACMPR

Medical condition(s) and symptoms

How did you hear about the club? _____

Do you consent to the release of your medical information to other dispensaries for the purposes of diagnosis confirmation? Yes No

_____ (Initial) Confidentiality: VCBC will not release your personal information unless under court order, an emergency situation where you or another are in danger, or with your written consent.

_____ (Initial) The VCBC is not responsible for any negative responses to using our cannabis products including; physical, mental health or other health problems.

_____ (initial) Due to its broad range of effects, cannabis can cause a variety of potentially negative interactions with many over-the-counter and prescription medications, as well as most recreational drugs. **See our "Interactions" pamphlet for more details.**

_____ (initial) Membership is a privilege, not a right and may be revoked at any time at the club's sole discretion. Appeals may be made in writing to the HR Committee.

Rules (please initial each point after reading)

_____ You may not **resell** any part of your purchase. Doing so will result in immediate termination of your membership.

_____ **Do not park in the commercial loading or residential pickup zones outside of the club at any time.** Our neighbours get mad when we take their parking spots.

_____ Friends may not wait outside the store or anywhere on the block. Please bring them inside where they are welcome to wait in the lobby area.

_____ We are a no scent environment. Please maintain good hygiene and refrain from wearing any perfumes, colognes, scented deodorant or any other strong scents.

_____ You must be over the age of 19 to enter the VCBC.

_____ If you have a contagious disease such as the flu or a cold, please do not visit the club unless absolutely necessary. You are welcome to send a caregiver or see if a delivery is possible as an alternative.

_____ If you are intoxicated, rude, or disruptive you may be refused service and/or asked to leave.

_____ Discrimination, slander, religious persecution, defamation of character, harassment, and intimidation are not tolerated on VCBC premises. Any of these actions will result in a suspension of service and membership may be revoked.

_____ Do not drive or operate heavy equipment while under the influence of our products.

_____ Store all medicated products out of the reach of both children and pets.

I, _____

have read and understood the rules and policies of the VCBC. I consent for the VCBC to purchase cannabis on my behalf and I agree to respect the rules and environment of the VCBC.

Signature _____

Date (dd/mm/yyyy) _____

Staff Name: _____

Signature: _____

This is Exhibit G referred to in the affidavit of

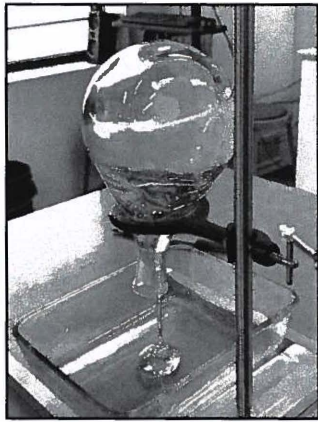
Ted Smith

affirmed before me at Victoria, BC

this 26 day of March, 2021.

[Signature]

A Commissioner for taking Affidavits for British
Columbia



What are cannabis concentrates?

They are a concentration of cannabinoids and terpenes that have been extracted, and isolated, from the starting plant material.

Solvents (such as butane, propane, CO₂ and ethanol) are used to strip the cannabinoids and terpenes from the plant, leaving behind a highly concentrated and potent final product.

The final product goes through a rigorous purge and evaporation process and contains trace amounts of solvents in the final product; less than we consume when we light a joint with a butane lighter.

Cannabis concentrates can also be made without solvents (i.e. keif, rosin, ice water hash extraction) for those concerned about residual solvents.

Types of Cannabis Concentrates

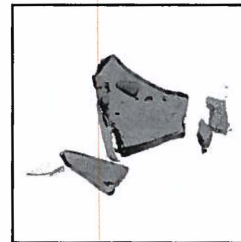
Kief

Also known as dry sift or pollen, kief is composed of the resin glands (trichomes) that form on the flower, leaves and stems of the cannabis plant.



Shatter/Wax

Shatter or wax refers to different textures of cannabis concentrates made using a solvent. Typical solvents include butane, CO₂, or propane. The solvents are evaporated and are not present in the finished cannabis concentrate if done properly. Shatter generally has an amber colour and glass-like consistency while wax can resemble a thick paste or a dry crumble.

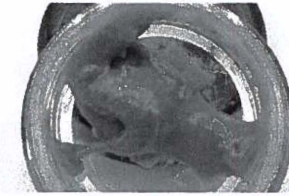


Rosin

Rosin is a solventless extraction that uses extreme heat and pressure to extract oils from the buds. There is no purging stage necessary due to the lack of solvents so it can be made and vaporized within minutes.

Live Resin

Live Resin is achieved by flash freezing freshly harvested cannabis to subcritical temperatures prior to and throughout the extraction process.



By doing so, the cannabis plant retains its valuable terpene profile and the plant's original flavor and fragrance that can then be carried over into the final product.

Hash

Hash is most commonly made by applying heat and pressure to kief together. Another method of making hash is called Water Hash which uses water, ice and agitation to separate resin glands from plant materials; afterwards the material is sifted through screens to collect the concentrated hash.

Distillate

Cannabis distillates (i.e. honey oil, cherry oil) are made by further processing a solvent extraction to remove terpenes, lipids, solvents and impurities. This creates a flavourless and odourless product and generally has a higher concentration of THC and CBD.



FECO (Full Extract Cannabis Oil)

FECO, or Rick Simpson Oil (RSO), is a popular medicine amongst cancer patients as well as patients treating other serious ailments such as epilepsy, multiple sclerosis and Parkinson's disease.

FECO is an alcohol extraction, made with either ethanol or isopropyl or both. This extraction method is used to extract THC and other cannabinoids and terpenes from bud and leaf that are removed in other more refined cannabis concentrates. FECO is used primarily as an edible or topical product or suppository. FECO is not recommended for smoking.

How do you consume concentrates?

Some concentrates like shatter, rosin, wax or distillate are meant to be vaporized while full extract cannabis oil is meant to be used as an edible or suppository. To vaporize concentrates more discreetly we offer portable vapor pen kits.

Vaporizing is the safest and most effective method for the inhalation of cannabis extracts. Although this method requires specialized equipment, the recent popularity of vaporizers on the market has made vaporization a viable (and desirable) technique for medical cannabis patients.

Vaporizers use heat to gently evaporate the extracts. This means that vaporization is significantly more efficient than methods using higher heats, as almost none of the active constituents are destroyed by excessively high temperatures.

Since the vapors being inhaled are relatively cool and do not contain combusted plant matter, the risk of respiratory irritation is significantly lower than any other method.

Dabbing (pictured below) is a method of consuming cannabis concentrate that can either be vaporized at low temperatures, or combusted at high temperatures.



Some patients rely on high temperature consumption of cannabis concentrates in glass dab rigs because it is the fastest method to get cannabis medicine into the body for immediate relief of chronic symptoms. Dabbing is an ideal method to consume high doses of cannabis without consuming the combusted plant material present in joints.

Victoria Cannabis Buyer's Club

Founded in 1996

Open Everyday



Cannabis Concentrates & Extracts

*Open Everyday 10am - 7pm
Sunday and Holidays -11am*

**826 Johnson St
Victoria BC V8W 1N3
Phone: 250-381-4220
Email: hellovcbc@gmail.com
Web: <http://vcbc.live>**

This is Exhibit H referred to in the affidavit of

Ted Smith

affirmed before me at Victoria, BC

this 26 day of March, 2021.



A Commissioner for taking Affidavits for British
Columbia

Description:

High-THC softgels made using MCT carrier oil and 10mg of THC per capsule. Manufactured in-house by a team of experts with 15+ years of softgel manufacturing experience in a pharmaceutical environment. These products contain high-quality, full-spectrum cannabis oil that has gone through a secondary micro-filtration.

Features:

- Contains 30 softgels
- Total THC 300mg | 10mg per softgel

Ingredients: Bovine gelatin, MCT oil, Water, Glycerin,

THE ORIGINAL

FARM



CANNABIS

CBD

ACCESSORIES

SALES



LIGHT YEAR THC SOFTGELS

ZKITTLEZ

\$44.99

30 CAPSULES

ADD

DOWNTOWN VICTORIA



DUNCAN



HILLSIDE VICTORIA



LANGFORD




- click prices above to add to cart -



Amount

\$21⁴³

each

add to bag 

Cloud Nine Collective Victoria

Open until 8pm


About this product

81.45mg CBD per bottle 75.15mg THC per bottle (THC and CBD potency will vary from each lot) Redecan 5:5 softgels are made from oils that are ethanol-extracted from a blend of Redecan's greenhouse-grown cannabis from the Niagara region in Ontario. Each of the 20 softgels contains an estimated 5mg of THC and 5mg of

Amount

\$45⁰⁰

each

add to bag 

Cloud Nine Collective Victoria

Open until 8pm

About this product

Dosecann CBD Capsules each contain 25mg of CBD and 1mg of THC. The capsules are made from a CBD extract blend and formulated using Ahiflower Seed Oil.

Ahiflower is non-GMO and sustainably sourced. Dosecann capsules are proudly developed and manufactured in Charlottetown, PEI. Produced in Prince Edward

Island Producer Dosecann Brand Dosecann Common name BLEND Species Hybrid

CBD total 750.0mg THC total 30.0mg Dried cannabis volume equivalency SKU

1030063: 0.22g per unit Extraction process CO2 Carrier oil(s) Ahiflower Seed Oil

Packaging material Polyethylene terephthalate (PET)

This is Exhibit I referred to in the affidavit of
Ted Smith
affirmed before me at Victoria, BC
this 26 day of March, 2021.
R. C. Pij
A Commissioner for taking Affidavits for British
Columbia

Chocolate Buddha Ball

25mg THC **\$4.50**

Four Doses Per Ball (Avg.)

Ingredients: (*Organic)

- Cannabis Leaf Infused Olive Oil
- Lecithin
- Rolled Oats*
- Shredded Coconut
- Chocolate Chips
- Sunflower Seeds
- Honey*
- Hemp Hearts*
- Whey Protein
- Hemp Protein
- Almond Powder

Buddha Ball

\$4.50

25mg THC

Four Doses Per Ball (Avg.)

Ingredients: (*Organic)

- Cannabis Leaf Infused Olive Oil
- Lecithin
- Rolled Oats*
- Shredded Coconut
- Sunflower Seeds
- Honey*
- Hemp Hearts*
- Whey Protein
- Hemp Protein
- Almond Powder

Pumpkin Protein

Buddha Ball

25mg THC **\$4.50**

Four Doses Per Ball (Avg.)

Ingredients: (*Organic)

- Cannabis Leaf Infused Olive Oil
- Lecithin
- Rolled Oats*
- Shredded Coconut
- Sunflower Seeds
- Honey*
- Hemp Hearts*
- Pumpkin Protein
- Hemp Protein
- Almond Powder

Ginger Cookie

75mg THC **\$2.50**

Four Doses Per Cookie (Avg.)

Ingredients: (*Organic)

- Cannabis Leaf Infused Butter*
- Lecithin
- Whole Wheat Flour*
- Fancy Molasses
- Eggs
- Raw Sugar
- Baking Soda
- Sea Salt

CBD Oatmeal Cookie

75mg 1:1THC/CBD **\$2.50**

Four Doses Per Cookie (Avg.)

Ingredients: (*Organic)

- CBD Cannabis Leaf Infused Butter*
- Lecithin
- Whole Wheat Flour*
- Rolled Oats*
- Eggs
- Cane Sugar
- Honey*
- Raisins*
- Baking Powder
- Sea Salt
- Powdered Kelp*
- Cinnamon
- Clove Powder

Double Chocolate Cookie

\$2.50

75mg THC

Four Doses Per Cookie (Avg.)

Ingredients: (*Organic)

- Cannabis Leaf Infused Butter*
- Lecithin
- Whole Wheat Flour*
- Dutch Cocoa Powder
- Eggs
- Raw Sugar
- Honey*
- Raisins*
- Baking Soda
- Sea Salt
- Semi Sweet Chocolate Chips

Oatmeal Cookie

75mg THC **\$2.50**

Four Doses Per Cookie (Avg.)

Ingredients: (*Organic)

- Cannabis Leaf Infused Butter*
- Lecithin
- Whole Wheat Flour*
- Rolled Oats*
- Butter
- Eggs
- Cane Sugar
- Duram Flour
- Baking Powder
- Sea Salt
- Powdered Kelp*
- Apricots*
- Cinnamon
- Clove Powder

Peanut Butter Chocolate Chip Cookie

\$2.50

75mg THC

Four Doses Per Cookie (Avg.)

Ingredients: (*Organic)

- Cannabis Leaf Infused Butter*
- Lecithin
- Whole Wheat Flour*
- Duram Flour*
- Eggs
- Honey*
- Semi Sweet Chocolate Chips
- Raw Sugar
- Natural Peanut Butter
- Baking Soda
- Sea Salt

Peanut Butter Cookie

75mg THC **\$2.50**

Four Doses Per Cookie (Avg.)

Ingredients: (**Organic*)

- Cannabis Leaf Infused Butter*
- Lecithin
- Whole Wheat Flour*
- Duram Flour*
- Eggs
- Honey*
- Raw Sugar
- Natural Peanut Butter
- Baking Soda
- Sea Salt

Hash Brownie \$10

200mg THC

Four Doses Per Brownie (Avg.)

Ingredients: (**Organic*)

- Hash Infused Coconut Oil*
- Lecithin
- Eggs
- Honey*
- 22% Cocoa
- Black Cocoa
- Coconut Flour
- Coconut Oil
- Vanilla*

Daytime Buddies

\$1 each or 8 for \$6

Ingredients: (**Organic*)

- Cannabis Leaf Infused Coconut Oil
- Flaxseed
- Water
- Lecithin
- Kelp Powder
- Rolled Oats Flour
- Raw Organic Sugar
- Sea Salt

Kamut Square \$2.50**Made from Stalkenol - THCA****Ingredients:** (**Organic*)

- Cold Infused Cannabis Butter
- Lecithin
- Puffed Kamut Grains*
- Marshmallows
- Hemp Hearts*

GF Chocolate Chip Cookie \$7.00**200mg THC**

Four Doses Per Cookie (Avg.)

Ingredients: (**Gluten Free*)

- Gluten Free Flour Blend*
- Brown Sugar
- Chocolate Chips
- Honey
- Baking Powder
- Cannabis Infused Coconut Oil
- Butter
- Egg
- Vanilla
- Baking Soda
- Molasses
- Sea Salt
- Guar Gum
- Xanthan Gum

Coconut Oil \$13**Ingredients:**

- Cannabis Infused Coconut Oil
- Vitamin E Oil

GF Peanut Butter & Honey Cookie

200mg THC **\$7.00**

Four Doses Per Cookie (Avg.)

Ingredients: (*Gluten Free)

- Gluten Free Flour Blend*
- Peanut Butter
- Brown Sugar
- Honey
- Chocolate Chips
- Peanut Butter Chips
- Baking Powder
- Cannabis Infused Coconut Oil
- Butter
- Egg
- Vanilla
- Baking Soda
- Molasses
- Sunflower Lecithin
- Guar Gum

Butter

\$10

CBD – INDICA – SATIVA

3 x 1/3 cups - 1 cup total

Ingredients:

- Triple Strength Cannabis Infused Butter
- Lecithin

GF Chocolate Sea Salt Cookie

\$8.50

300mg THC

Four Doses Per Cookie (Avg.)

Ingredients: (*Gluten Free)

- Gluten Free Flour Blend*
- Brown Sugar
- Cocoa
- Honey
- Chocolate Chips
- Peanut Butter Chips
- Baking Powder
- Cannabis Infused Coconut Oil
- Butter
- Egg
- Vanilla
- Baking Soda
- Molasses
- Sunflower Lecithin
- Sea Salt
- Xanthan Gum

Regular Massage Oil 65ml**\$10****Ingredients:**

- Cannabis Infused Coconut Oil
- Vitamin E Oil

CBD Triple Hemp Oil**30ml - \$32****60ml - \$50****120ml - \$70****Ingredients:**

- Whole Plant Extract from Canadian Grown Hemp
- Grapeseed Oil
- Olive Oil
- MCT Oil
- Hempseed Oil
- Sunflower Oil
- Lecithin
- Essential Oil of Oregano
- Essential Oil of Lemongrass
- Essential Oil of Grapefruit Seed Extract

Arnica Massage Oil**65ml****\$13****Ingredients:**

- Arnica Flower Infusion
- Cannabis Leaf
- Infused Olive Oil
- Vitamin E Oil

Green Lion Massage Oil 65ml**\$13****Ingredients:**

- Eucalyptus Oil
- Camphor Oil
- Menthol Oil
- Lavender Oil
- Tea Tree Oil
- Wintergreen Oil
- Cinnamon Oil
- Peppermint Oil
- Cannabis Infused Olive Oil
- Vitamin E Oil

Comfrey Massage Oil 65ml**\$12****Ingredients:**

- Comfrey Infused Massage Oil
- Cannabis Leaf Infused Olive Oil
- Vitamin E Oil

Ice Cream 1:1 THC/CBD**\$12****Ingredients:***(*Organic)*

- 1:1 CBD/THC Flower
- Cocoa Butter*
- Shea Butter*
- Mango Butter*
- Magnesium Oil
- Jojoba Oil*
- Almond Oil*
- Cinnamon Oil*
- Menthol*
- Lavender Oil*
- Rosemary Oil*
- Birch Oil*
- Ginger Oil*
- Juniper Oil*
- Peppermint Oil*
- Turmeric Oil*
- Vitamin E Oil*
- Tea Tree Oil*
- Arnica Oil*
- Copaiba Oil*

Arnica Salve \$14**Ingredients:**

- Arnica Infused Olive Oil
- Cannabis Infused Olive Oil
- Beeswax
- Vitamin E Oil

Green Lion Salve

\$14

Ingredients:

- Eucalyptus Oil
- Camphor Oil
- Menthol Oil
- Lavender Oil
- Tea Tree Oil
- Wintergreen Oil
- Cinnamon Oil
- Peppermint Oil
- Cannabis Infused Olive Oil
- Vitamin E Oil
- Beeswax

St. John's Wort Massage Oil

65ml

\$15

Ingredients:

- Cannabis Leaf Infused Olive Oil
- St. John's Wort Infused Olive Oil
- Vitamin E Oil

Heat Score

\$12

(*Organic)

Ingredients:

- CBD Hash 13mg
- THC Rosin 69mg
- Jojoba Oil
- Ginger*
- Cinnamon*
- Ylang Ylang*
- Copaiba*
- Cayenne*
- Eucalyptus*
- Frankincense*
- Myhrr*
- Menthol*
- Cocoa*
- Neroli

Regular Salve \$12

Ingredients:

- Cannabis Infused Olive Oil
- Beeswax
- Vitamin E Oil

Melting Pot 1:1 THC/CBD \$12

Ingredients: (*Organic)

- 1:1 CBD/THC Flower
- Cocoa Butter*
- Shea Butter*
- Mango Butter*
- Magnesium Oil
- Jojoba Oil*
- Almond Oil*
- Cinnamon Oil*
- Lavender Oil*
- Juniper Oil*
- Rosemary Oil*
- Ginger Oil*
- Ylang Ylang Oil*
- Peppermint Oil*
- Turmeric Oil*
- Birch Oil*
- Cayenne Oil*
- Frankincense Oil*
- Orange Oil*
- Clove Oil*
- Myrrh Oil*
- Coco Oil*
- Black Pepper Oil*
- Vitamin E Oil*
- Tea Tree Oil*

Cannoil

Cannabis Infused Olive Oil

**(All capsules contain Lecithin and are VEGAN)*

Average per Cap: 3.5mg CBD – 3mg THC

1 capsule	\$0.60
20 capsules	\$10
2oz bottle	\$32

#417154v1

CBD Cannoil:

CBD Cannabis Infused Olive Oil

Mixed Cannoil:

Hybrid Cannabis Infused Olive Oil

Sativa Cannoil:

Sativa Cannabis Infused Olive Oil

Indica Cannoil:

Indica Cannabis Infused Olive Oil

Sativa Ginger Cannoil:

Sativa Cannabis Infused Olive Oil + Ginger

Indica Ginger Cannoil:

Indica Cannabis Infused Olive Oil + Ginger

Hash Capsules

Cannabis Hash Infused MCT Oil

**(All capsules contain Lecithin and are VEGAN)*

1 capsule	\$1.50
10 capsules	\$15

Sativa Hash Capsules:

Sativa Cannabis Hash Infused MCT Oil

Average per Cap: 30mg THC**Indica Hash Capsules:**

Indica Cannabis Hash Infused MCT Oil

Average per Cap: 30mg THC**CBD Hash Capsules:**

CBD Cannabis Hash Infused MCT Oil

Average per Cap: 7.5mg CBD - 3mg THC

Super Capsules

Cannabis Infused MCT Oil

**(All capsules contain Lecithin and are VEGAN)*

1 capsule	\$1.00
10 capsules	\$10

Super Sativa Capsules:

Sativa Cannabis Infused MCT Oil

Average per Cap: 18mg THC

Super Indica Capsules:

Indica Cannabis Infused MCT Oil

Average per Cap: 18mg THC

Super CBD Capsules:

CBD Cannabis Infused MCT Oil

Average per Cap: 7mg CBD - 3mg THC

Rosin Capsules

Rosin + MCT Oil

**(All capsules contain Lecithin and are VEGAN)*

Regular Rosin Capsules:

Average per Cap: 65mg THC

1 capsule	\$3.00
5 capsules	\$15

Double Rosin Capsules:

Average per Cap: 130mg THC

1 capsule	\$5.00
5 capsules	\$25

Low Dosed Capsules

**(All capsules contain Lecithin and are VEGAN)*

Ryanol Capsules:

Cannabis Leaf Infused Olive Oil

Average per Cap:	2.5mg THC
1 capsule	\$0.35
20 capsules	\$5

Stalkinol Capsules:

Non-decarboxylated Cannabis Stalk Infused Olive Oil

Average per Cap:	3mg THC
1 capsule	\$0.35
20 capsules	\$5

RAW Cannoil Capsules:

Gently decarboxylated Cannabis Infused Olive Oil

Average per Cap:	5mg THC
1 capsule	\$0.25
20 capsules	\$5

CBD Spray \$20

560mg CBD – 11mg THC

Approx. 1mg CBD per spray

50:1 125ml

Ingredients:

- CBD Isolate
- THC Distillate
- MCT Oil

Pet Spray \$15

500mg CBD

Approx. 1mg CBD per spray

37ml

Ingredients:

- MCT Oil
- Cannabidiol

Ethos Small Creatures CBD

\$23

1:50 **30ml**

THC:CBD

300mg CBD

Approx. 0.5mg CBD per drop

Ingredients:

- Organic Hemp Oil
- Full Spectrum Cannabis Distillate

Ethos THC Tincture

\$30

30:1 **30ml**

THC:CBD

900mg THC

Approx. 1.5mg THC per drop

Ingredients:

- Organic Hemp Oil
- Natural Organic Flavours
- Full Spectrum Cannabis Distillate

Ethos CBD Tincture

\$50

1:30 **30ml**

THC:CBD

900mg CBD

Approx. 1.5mg CBD per drop

Ingredients:

- Organic Hemp Oil
- Natural Organic Flavours
- Full Spectrum Cannabis Distillate

Ethos THC-A Tincture

\$50

1:20:20

30ml

THC:THC-A:CBD

920mg Cannabinoids

Approx. 1.5mg per drop

Ingredients:

- Organic Hemp Oil
- Natural Organic Flavours
- THC-A (Live Resin)
- Full Spectrum Cannabis Distillate

Mango CBD Tincture

SALE

\$14

20:1

30ml

CBD:THC

250mg CBD : 12.5mg THC

Approx. 0.4mg CBD per drop

Ingredients:

- MCT Oil
- CBD
- THC
- Sunflower Oil
- Natural Flavour
- Stevia

Euphoria Dark Chocolate Bars

375mg

\$13

750mg

\$25

- Cocoa Mass
- Sugar
- Cocoa Butter
- Emulsifer
- Soya Lecithin
- Natural Vanilla Flavour

Euphoria Milk Chocolate Bars

375mg \$13

750mg \$25

- Sugar
- Whole Milk Powder
- Cocoa Butter
- Emulsifer
- Soya Lecithin
- Natural Vanilla Flavour

Arnica Massage Oil

65ml \$13

Ingredients:

- Arnica Flower Infusion
- Cannabis Leaf Infused Olive Oil
- Vitamin E Oil

CBD Triple Hemp Oil

30ml - 300mg - \$32

60ml - 600mg - \$50

120ml - 1200mg - \$70

Ingredients:

- Whole Plant Extract from Canadian Grown Hemp
- Grapeseed Oil
- Olive Oil
- MCT Oil
- Hempseed Oil
- Sunflower Oil
- Lecithin
- Essential Oil of Oregano
- Essential Oil of Lemongrass
- Essential Oil of Grapefruit Seed Extract

PAPERS

#1 – RAW 50pk Classic 1 ¼ \$1.60

#2 – RAW 50pk Black 1 ¼ \$1.60

#3 – RAW 50pk Organic 1 ¼ \$1.60

#4 – RAW 50pk Classic Single Wide \$0.80

#417154v1

#5 – RAW 50pk Organic Single Wide \$0.80

#6 – RAW 100pk Classic \$1.25

#7 – RAW 100pk Organic \$1.25

#8 – RAW 300pk Classic \$3.70

#9 – RAW 50pk Connoisseur \$1.60

#10 – RAW 5 Meter Roll \$2.00

#11 – RAW 21pk Pre-rolled Tips \$0.80

#12 – Elements 50pk 1 ¼ Ultra Thin \$1.60

#13 – Elements 100pk Ultra Thin \$1.25

#14 – Elements 50pk Rolling Tips \$0.55

#15 – Canadian Lumber 40pk \$1.30

#16 – Boost Humidity Control Pack \$0.80

Bath Bombs \$10
400mg THC

Ingredients:

- Cannabis Flower Infusion
- Essential Oils

Bath Salts \$14
250mg THC : 50mg CBD

Ingredients:

- Cannabis Flower Infused Salts
- Essential Oils

PAPERS

#1 – RAW 50pk Classic Single Wide \$0.80

#2 – RAW 50pk Organic Single Wide \$0.80

#417154v1

#3 – RAW 50pk Classic 1 ¼ \$1.60

#4 – RAW 50pk Black 1 ¼ \$1.60

#5 – RAW 50pk Organic 1 ¼ \$1.60

#6 – RAW 100pk Classic \$1.75

#7 – RAW 100pk Organic \$1.75

#8 – RAW 300pk Classic \$3.70

#9 – RAW 50pk Connoisseur \$1.60

#10 – RAW 5 Meter Roll \$2.00

#11 – RAW 21pk Pre-rolled Tips \$0.80

#12 – Elements 50pk 1 ¼ Ultra Thin \$1.60

#13 – Elements 100pk Ultra Thin \$1.75

#14 – Elements 50pk Rolling Tips \$0.50

#15 – Canadian Lumber 40pk \$1.30

#16 – Boost Humidity Control Pack \$0.80

This is Exhibit J referred to in the affidavit of
Ted Smith
affirmed before me at Victoria BC
this 26 day of March, 2021.
Reed Pirie
A Commissioner for taking Affidavits for British
Columbia

VIRIDESCO

*Oil for Life

Viridesco is a latin verb, meaning "I become green"

Inspired by ancient herbalists and alchemists, our oils and resins are unadulterated, lab tested extracts of hemp and cannabis – the most effective form. We share these products in the hope we can all become more green together.

Viridesco (Latin)

Origin & history: From viridis ('green') + ēscō

Verb: viridēscō (defective conjugation)

1. I become green

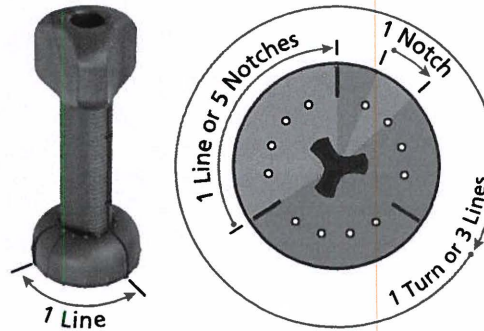


The Staff of Asclepius (Æsclepius, Asklepios), (Personification of Medical or healing Art and its ideals). The traditional symbol of medicine, the staff of Asclepius with a single serpent encircling a staff, classically a rough-hewn knotty tree limb.

Asclepius (an ancient greek physician deified as the god of medicine) is traditionally depicted as a bearded man wearing a robe that leaves his chest uncovered and holding a staff with his sacred single serpent coiled around it, symbolizing renewal of youth as the serpent casts off its skin.

Wadjet "the Green One", the serpent goddess of Lower Egypt from the Pre-Dynastic period demonstrates the earliest known representation of a single serpent entwined around a pole – in this case a papyrus reed.

 **patron**® Usage Guidelines



Start by prepping your dispenser by carefully bringing the level of oil to the tip of the nozzle. This step is achieved by gradually adding more pressure on the gasket, by turning the threaded piston in clockwise direction.

Now that the oil is at the surface of the nozzle, create your dose by following the guidelines below.

Action		Volume
1/5 Line	1 Notch	0.01 mL
5 Notches	1 Line	0.05 mL
10 Notches	2 Lines	0.10 mL
3 Lines	1 Turn	0.15 mL
12/3 Turns	5 Lines	0.25 mL
31/3 Turns	10 Lines	0.50 mL
15 Lines	5 Turns	0.75 mL
62/3 Turns	20 Lines	1.00 mL

Always remember to release the pressure in the system by backing off the gasket. To complete this important step turn the threaded piston in a counter clockwise direction.

If the product is cool it may prove difficult to dispense. Reduce the viscosity by holding the dispenser in hand for a few minutes or by immersing it in a cup of warm tap water for a few minutes. Warming the dispenser and oil slightly will make the product dispense more smoothly.



Topical

These products can be diluted into any quality organic cold-pressed oil, such as coconut oil or hemp oil. To achieve this, first warm the carrier oil and then add the desired ratio of product. After they are well mixed allow the combined carrier oil to cool sufficiently before applying to the skin. Rub a small amount of oil in to the desired area as often as necessary.

The oil may leave a sticky residue on your skin. In order to remove the sticky residue from your skin rub with coconut oil or butter, and wash with warm water.

Oral / Sub-Lingual

The most effective manner to ingest cannabinoids is sub-lingually, by holding the product under your tongue for a few minutes before ingesting. To aid the digestion, follow this step with a cup of warm tea or lemon water.

Oral doses can also be diluted into an edible organic cold pressed oil. Follow the rendering process in the Edible/Cooking & Baking section.

Vaporizing / Smoking

There are many good vaporizer technologies specially designed for extracts. To smoke these oils put a drop on top of a herbal bowl or smear a drop or two onto a rolling paper before or after rolling. Use rubbing alcohol to clean any mess or residue left on hard surfaces.

Use caution when vaporizing or smoking this oil as it is very potent, much more concentrated than its flower counter part.

Edible / Cooking & Baking

To cook with these products, it is best to render it into a carrier, such as coconut oil, hempseed oil, grapeseed oil, or organic butter. The rendering process should be performed at a low temperature (below 175°F/80°C) to not compromise the cannabinoids in the oil.

Determine what strength you want your portions to be and calculate your recipe to use accordingly.

Grades	Description
VVV	Very-Very-Vapable
	Live Resin, Rosin
VV+	Very-Vapable Plus
	Budder, Honey Oil, CO ₂ Oil
VV	Very-Vapable
	Shatter, Winterized BHO
V+	Vapable Plus
	Cherry Oil
V	Vapable
	RSO, Phoenix Tears
R:B	Ratio:Blends
	THC:CBD proprietary formulas
P	The Program
	Pre-mixed 30, 60, and 90 day kits
CBD	Oil of Hemp
	Edible, topical with carrier oil

INDICA
The blue serpent indicates a product that is greater than 67% Indica

SATIVA
The red serpent indicates a product that is greater than 67% Sativa

HYBRID
The green serpent indicates a Hybrid Product

CBD
The orange serpent indicates a CannaBiDiol product derived from hemp

Rendering Example:
60.00% product contains approx. 600mgs per 1mL. Therefore, a 2mL Cartridge would contain 1200mgs and a 5mL Cartridge would contain 3000mgs.
If 2mL/1200mgs were rendered into 2lbs of butter, it could be portioned as follows:
¼ lb of butter per 150mgs
½ lb of butter per 300mgs
1 lb of butter per 600mgs

**V-RSO 2mL
1200mg-THC**

Bubba Kush Oil

80% Indica

Cannabinoid Facts:

Delta-9 THC	60.00%
CannaBiDiol	4.20%
CannabInol	2.22%
CannabiGerol	1.11%
CannabiDiVarin	3.33%

Oil for Life

KEEP OUT OF REACH OF CHILDREN

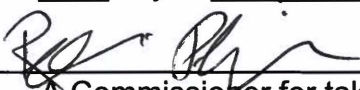
*All values individually batch tested at certified laboratory.



Cannabinoid Strength%		Volume Dispensed										
90%	85%	80%	75%	70%	65%	60%	30%	25%	20%	15%	10%	
9 mg	8.5 mg	8 mg	7.5 mg	7 mg	6.5 mg	6 mg	3 mg	2.5 mg	2 mg	1.5 mg	1 mg	0.01mL
45 mg	42.5 mg	40 mg	37.5 mg	35 mg	32.5 mg	30 mg	15 mg	12.5 mg	10 mg	7.5 mg	5 mg	0.05mL
90 mg	85 mg	80 mg	75 mg	70 mg	65 mg	60 mg	30 mg	25 mg	20 mg	15 mg	10 mg	0.10mL
135 mg	127.5 mg	120 mg	112.5 mg	105 mg	97.5 mg	90 mg	40 mg	37.5 mg	30 mg	22.5 mg	15 mg	0.15mL
225 mg	212.5 mg	200 mg	187.5 mg	175 mg	162.5 mg	150 mg	75 mg	62.5 mg	50 mg	37.5 mg	25 mg	0.25mL
450 mg	425 mg	400 mg	375 mg	350 mg	325 mg	300 mg	150 mg	125 mg	100 mg	75 mg	50 mg	0.50mL
675 mg	637.5 mg	600 mg	562.5 mg	525 mg	487.5 mg	450 mg	225 mg	187.5 mg	150 mg	112.5 mg	75 mg	0.75mL
900 mg	850 mg	800 mg	750 mg	700 mg	650 mg	600 mg	300 mg	250 mg	200 mg	150 mg	100 mg	1.00mL

VIRIDESCO
*Oil for Life

Proudly made with strict quality control in British Columbia, Canada.
KEEP BC GREEN.

This is Exhibit K referred to in the affidavit of
Ted Smith
affirmed before me at Victoria, BC
this 26 day of March, 2021.

A Commissioner for taking Affidavits for British
Columbia



Hash Brownie

200 mg THC

Keep out of reach of children and pets.

Four Doses Per Ball (Avg.) NOT FOR RESALE

Ingredients: Hash Infused Coconut oil*, lecithin, Eggs, Honey, 22% Cocoa, Black Cocoa, Coconut Flour, Coconut Oil, Vanilla* (*Organic)

Made On: 2-Mar-2021



Ginger Cookie

75mg of THC per cookie

Ingredients: Cannabis Leaf Infused Butter, Lecithin, Whole Wheat Flour*, Fancy Molasses, Eggs, Raw Sugar, Baking Soda, Sea Salt.*

Keep out of reach of Children and Pets.

Four Doses per cookie (avg)

Made On 2-Mar-2021

This is Exhibit L referred to in the affidavit of

Ted Smith

affirmed before me at Victoria, BC

this 26 day of March, 2021.

Ron Poirer

A Commissioner for taking Affidavits for British
Columbia

From: Victoria Cannabis Buyers Club <hellovcbc@gmail.com>
Sent: Friday, February 28, 2020 12:29 PM
To: Horgan.MLA, John LASS:EX <John.Horgan.MLA@leg.bc.ca>; James.MLA, Carole A LASS:EX <Carole.James.MLA@leg.bc.ca>; mayor@victoria.ca; hedy.fry@parl.gc.ca; Farnworth.MLA, Mike LASS:EX <Mike.Farnworth.MLA@leg.bc.ca>; PSSG Cannabis Secretariat PSSG:EX <Cannabis.Secretariat@gov.bc.ca>
Subject: temporary exemption for Victoria Cannabis Buyers Club

Ted Smith
President and Founder
Victoria Cannabis Buyers Club

February 28th, 2020

Mary Shaw
Lead Executive
BC Cannabis Legalization and Regulation Secretariat

To Mary Shaw,

I am writing to request your support in granting the Victoria Cannabis Buyers Club (VCBC) a temporary exemption to the BC Cannabis Control and Licensing Act, as outlined in Section #130.

My name is Ted Smith and I am writing as the President and founder of the VCBC. We are a 24 year old cannabis compassion club that provides low cost, high quality medicine to sick and impoverished medical patients in Victoria, BC and across Canada. On November 14th, 2019 our club was raided by the Community Safety Unit (CSU) for our non-compliance with the current regulations.

After this devastating act, we petitioned the city and other local politicians for their support. On January 21st, 2020 the Victoria Mayor and city council voted unanimously and without debate to write to the province to express the municipality's support in requesting an exemption from the Cannabis Control and Licensing Act for our compassion club. I am writing to describe the political situation our organization faces, to outline the support we have gained, and to request a temporary exemption for the VCBC.

Since these cannabis regulations are very new legislation, we understand we may be the first in requesting an exemption. We can appreciate that the process to apply for and receive exemptions might not be entirely fleshed out yet.

First, a bit more about the VCBC. We operate as a medical user only facility and have been from the beginning. To purchase with our club, patients must provide proof of a chronic medical condition to access our products and to consume their medicine in our safe and dignified private smoking lounge.

When the club was founded 24 years ago, little was known about the medical uses of cannabis. However, it was clear that people suffering from AIDS, Hepatitis C, cancer, chronic pain and other serious medical conditions were able to find relief from their symptoms by smoking, eating and topically applying cannabis products. The past 24 years at the VCBC have been defined by our persistent and humble resistance to unsensible cannabis regulations. In that time our facilities have survived being raided 6 times, and succeeded in seeing all 15 charges laid against staff overturned in court using various constitutional arguments.

As it stands, if we were to fully comply with the regulations as they are written we would put the lives of marginalized, poor, and chronically sick people at risk. Our club provides cannabis medicine at a fraction of the price as compared to the legal medical market. We also supply a range of products including suppositories, high dose edibles, and topicals that are not permitted in the legal medical market.

Our most famous contribution to medical cannabis law in Canada was the unanimous 2015 Smith decision where the Supreme Court of Canada declared cannabis extracts and edibles legal for patients. That decision had multiple effects, forcing the legal medical institutions to recognize the significant benefits of eating cannabis for the seriously ill. Before this decision, Health Canada considered smoking cannabis to be the only legal and constitutional way for patients to consume medical cannabis. Shortly after the Smith decision, the federal Liberals added legalization to their election platform.

We hope to work with your office in designing a plan towards full compliance with the law. We do not want to operate illegally, but we want to develop a plan to become legal that will keep the needs of patients at the centre of the discussion.

Our organization faces multiple barriers to transitioning into the legal system such as the costs of licensing and rezoning, the inability to provide the range and dose of products our members rely on, as well as having to close our smoking lounge. Additionally, if we were to comply with the laws as they are now, we would risk compromising the health of our patients and would risk the financial ruin of our non-profit society. Of course we want to comply with the law and become legal, but we will only make that change as it unfolds with the best interests of our patients in mind, many of whom are poor or living on fixed disability incomes.

As I discussed above, we provide many products that are simply unavailable in the legal medical market right now and thousands of our patients rely on everyday. Because we are a small scale non-profit compassion club, we have been making our own infused cannabis edibles in house for the past two decades. Our bakery is the heart of our business, and over the years we have developed healthy, consistent, and high potency cannabis products that thousands of patients use to subside their pain and allow them to function as contributing members of society.

As it stands in the legal market, we would not be allowed to vertically integrate our bakery and our retail store. Vertical integration of production and distribution is an integral component of our business and is our only method of guaranteeing the quality, price, and consistency of products for our patients.

The VCBC has had a turbulent relationship with cannabis laws over the years. However, our goodwill with the community is immeasurable and is the result of decades of consistent non-violent action, being good neighbours, focusing on patient care, putting patients before profits, and paying all applicable business taxes to our municipality, province and other governmental agencies.

We have been an asset to the city of Victoria, and the country as a whole, and we are renowned for our compassion to the needs of medical patients. We have a great relationship with the Victoria Police Department and our City Council. In all of our interactions with governmental authorities we are polite, friendly, and kind. Over time we have earned a deep embrace by this city for helping the sick and marginalized while never wavering in our determination to do what's right.

Perhaps the most compelling argument to allow us to continue operating lies in the horrifying realities of the opioid crisis in our province. Cannabis, especially when eaten, can be an excellent pain reliever, controls nausea and stimulates appetite, and provides general symptom management for opioid withdrawal. Cannabis is an ideal medicine for patients looking to cut down or quit using opiate drugs. If this government is serious in any way about helping poor citizens struggling with opiates, then enforcing these new regulations would be a contradiction to its own mandates to address addiction, poverty and improving health care services.

We are asking for an opportunity to present our case before your office in person, as the BC Cannabis Legalization and Regulation Secretariat, so we can discuss how a temporary exemption to the Cannabis Control and Licensing Act might take place. Anything less than an in person meeting would not be fair, as this is a complex situation that deserves careful thought and human interaction. The mayor and city council supported this exemption with just cause and it is incumbent that the provincial government puts in an honest effort to consider how this temporary exemption might unfold.

In the letter written by the Victoria city council in January, the Mayor requests that the province hold off any further enforcement action until the an exemption for the VCBC has been fully considered. As you can see, attempts to further inflict penalties against us, before all legal avenues have been exhausted, would be cruel and unnecessary. It is our intent to appeal any further punitive actions taken by the province through the court system.

Municipalities should have substantial influence in shaping the way legalization looks in their communities. Cities that do not want cannabis stores have been allowed to ban the retail sale of cannabis products in their region. Communities that wish to protect long-standing compassion clubs should be granted the same respect and authority. Since cities witness the negative consequences of policies created by distant higher levels of government, extra measures should

be taken to ensure the voices of municipalities have a place at the regulating table, especial when considering vulnerable populations.

Included in this email is a link to a letter I recently wrote to Vancouver federal Liberal MP, Hedy Fry. The document explains more about why we feel this exemption is critical for our members. The VCBC has been fighting for equitable cannabis regulation for years and we hold significant support for our club amongst politicians and the public. As long as your Ministry shows some patience and cooperation, there is every reason to know that we will transition the VCBC into the legal system smoothly, over time, and in ways that will benefit our members and the health of British Columbians more broadly. Meeting in person and a serious consideration of a temporary exemption for our longstanding club would demonstrate a sincere concern for the voices of cannabis patients.

We are preparing a report that will contain more detailed information on the background of our non-profit society and the current status of the VCBC. We will also provide a proposed guideline for the exemption so as to get started on the work of drafting the details of how a temporary exemption would take place. It is our intention to have this report available to you within the next month.

If you have any questions or would like to discuss this proposal further, please do not hesitate to contact me at 250-381-4220 or hellovcbc@gmail.com.

Thank you for your time and consideration.

Ted Smith

Founder, Victoria Cannabis Buyers Club

c/c

John Horgan, BC Premier

Mike Farnworth, BC Minister of Public Safety

Carole James, BC Deputy Premier, BC Minister of Finance, Victoria MLA

Hedy Fry, Vancouver Liberal MP

Lisa Helps, Victoria Mayor

Hedy Fry Letter:

<https://docs.google.com/document/d/1TWaff8yVnVcii5NsF6NBce85BHZWhS7OTs1UtcKTKso/edit?usp=sharing>

Cannabis Buyers Club

826 Johnson Street V8W 1N3

Victoria, British Columbia, Canada

250-381-4220 hellovcbc@gmail.com

<https://vcbc.live/>

This is Exhibit M referred to in the affidavit of

Ted Smith

affirmed before me at Victoria, BC
this 26 day of March, 2021.

Robert P. H.

A Commissioner for taking Affidavits for British
Columbia

From: **PSSG Cannabis Secretariat PSSG:EX** <Cannabis.Secretariat@gov.bc.ca>
Date: Wed, May 6, 2020 at 4:00 PM
Subject: RE: temporary exemption for Victoria Cannabis Buyers Club
To: Victoria Cannabis Buyers Club <hellovcbc@gmail.com>

Dear Ted Smith:

Thank you for your February 28, 2020 email regarding a temporary exemption for the Victoria Cannabis Buyers Club under section 130 of the *Cannabis Control and Licensing Act*. I apologise for the delay in my response. I am not able to meet at this time, but am pleased to respond to the issues raised in your email.

As you likely know, while the Province is responsible for regulating non-medical cannabis sales, Health Canada regulates medical cannabis, including access and sales. Storefront sales are not permitted under the federal medical cannabis regime. In addition, under both provincial and federal criminal law, it is illegal to sell cannabis that was not produced by a producer licensed by Health Canada. While I appreciate the intentions expressed in your proposal, the Province will not authorize sales of cannabis that are illegal under federal criminal law.

Your letter also indicates that the types of product available on the legal market do not meet the needs of your clients. The federal government is responsible for determining the types of cannabis products legal for sale in Canada, including maximum THC. We recognize that the 10 mg cap on the amount of THC permitted in cannabis edibles may mean that these products are not suitable for some medical users. Ingestible extracts are allowed to contain higher levels of THC, and may therefore be a better fit. If there are other classes of products you believe should be permitted, I encourage you to share those views with Health Canada.

With respect to concerns about the ability of lower income medical users to pay for legal medical cannabis, you may be interested to know that prices for legal cannabis products are trending down; in the BC non-medical market, we are now seeing some dried flower priced below \$5/gram. As well, some medical users may be able to access lower pricing through the compassionate pricing programs offered by many licensed producers.

Finally, thank you for your feedback about vertical integration; we are undertaking policy work to explore options to support the development of a robust and diverse legal cannabis industry in British Columbia and will consider your comments in our analysis. However, even if the Province were to enable some form of vertical integration, it would only apply to producers properly licensed by Health Canada.

I appreciate your taking the time to share information about the Victoria Cannabis Buyers Club, and I encourage you to contact Health Canada to determine whether there is a type of licence that could allow you to continue to provide certain services to your clients. You may also wish to share with them your views about the importance of enabling medical users to access cannabis through a storefront model. You can contact Health Canada at: cannabis@canada.ca.

Sincerely,

Mary Shaw

Executive Lead

Cannabis Legalization and Regulation Secretariat

Cannabis.Secretariat@gov.bc.ca

C/563999

This is Exhibit N referred to in the affidavit of

Ted Smith

affirmed before me at Victoria BC

this 26 day of March, 2021.

Rd. Phi

A Commissioner for taking Affidavits for British
Columbia

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Local News

Medical pot shop opens downtown

Wayne Lowrie

Aug 29, 2020 • August 29, 2020 • 2 minute read • Join the conversation



Tom Scott inside one of the pods in his Brockville area grow-op. Wayne Lowrie/Recorder and Times

A budding local business has become the first in the region to open a retail pot store.

But there is a catch. Completely Cannabis at 189 King St. W. in Brockville is licensed by Health Canada to sell medical cannabis only to patients with a doctor's prescription.



Tom Scott, manager of Completely Cannabis, said the doctor's prescription rule is not a barrier to most customers, however. He said doctors are now more willing to prescribe pot as the medical benefits of cannabis become well-known.

And if a customer doesn't have a prescription, the pot store can arrange one, Scott said, although he recommends that people try their general practitioner first.

The entire process takes about 45 minutes. The customer fills out a medical form and the store submits it to an Ottawa medical professional who reviews it, interviews the customer online and then issues the prescription.

The prescription cost is borne by OHIP and some private insurance companies cover medical cannabis, although most don't, he said.

STORY CONTINUES BELOW

This advertisement has not loaded yet, but your article continues below.

Medical cannabis has been found useful in the treatment of arthritis, chronic pain, depression and a multitude of other disorders, he said.

Scott said that Completely Cannabis is one of only three brick-and-mortar medical-pot stores to be

licensed by Health Canada in the entire country, and the only one in Ontario.

As a small medical-pot retailer, Scott said his store is able to access cannabis products from small licensed cultivators and processors that are shut out of the recreational pot market by the big producers.

That means his store can offer high-quality cannabis from the micro-producers, he said.

Scott drew a parallel with small-batch micro-breweries versus Big Beer. In this analogy, his suppliers would be the niche breweries while Canopy Growth would be Molson's.

Inside the downtown store, clients are able to consult with trained staff on a range of cannabis products, including edibles, dry herb, drinks, teas, coffees, balms and lotions, Scott said.

He said the store often recommends edibles or cannabis drinks instead of smoking pot, which some people find unpleasant. A nice herbal tea in the morning is a lot more pleasing to many people than toking on a joint.

Completely Cannabis is also going to grow its own, Scott said. It is setting up a grow-op at a location that Scott didn't want to disclose for security reasons.

The opening of the store this month is the end result of 22 months of navigating through the bowels of the Health Canada bureaucracy. Scott said the initial application form ran to 278 pages and his company had to revise it six times. It had to renovate the building to the government's specifications with security measures that include a vault.

wlowrie@postmedia.com



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BC Compassion Club Society

March 24, 2021

The Honorable Patty Hadju

Minister of Health

House of Commons

Ottawa

ON K1A 0A6

Dear Ms. Hadju,

We write this letter to you in support of the Victoria Cannabis Buyers Club (VCBC) and their application for temporary exemptions under *Section 130 of the Cannabis Control and Licensing Act*. As a similar not-for-profit organization, The BC Compassion Club Society (BCCCS) has spent over 20 years providing vital, much-needed cannabis medicines to over 7,000 low-income members. Similar to the VCBC, we share their vision of a space in the dispensary sector where cannabis is both affordable, accessible to all, and free from discrimination.

Unfortunately, the current licensed dispensary system does not address the needs of many medicinal users. Recreational dispensary storefronts are ill-equipped to provide the kind of compassionate, caring model of service that allows medicinal patients to access cannabis and cannabis-derived products in a secure and supportive environment, with staff members who are solely focused on patient's health, quality of life and safe cannabis consumption. Many of these recreational retailers are unable to provide the kind of high-quality, high-potency cannabis extracts that are often needed when treating debilitating chronic pain and complex symptoms of those with severe chronic illnesses such as MS, cancer, and Parkinson's disease. Most recreational dispensary staff are ill equipped to provide the ongoing support related to appropriate strains, products, and dosing, while ensuring that there are no conflicts with existing

prescription pharmaceuticals. Cannabis is a substance to be taken seriously by those invested in using it.

There is also a barrier to access that relates to cost. Like the VCBC, most of our membership base is disadvantaged economically. Their only sources of income are often a combination of low-income or part-time employment, disability, limited pensions and/or social assistance. Some are even homeless or do not have a permanent address. They are unable to afford licensed medicinal dispensaries that currently charge 30 to 50 percent higher than our medicinal outfits, something which many of our members on limited incomes can not afford. Many also do not have internet access, credit cards or even bank accounts with which to purchase legal medicinal cannabis online, which is the only currently approved method of delivery.

If compassionate dispensaries such as the VCBC and the BCCCS were to close, or be forced to significantly alter their operational model, their membership would be forced to make the decision that no one in pain should have to make. Patients would be forced to either frequent a government dispensary they cannot afford, to go without their medicine and perhaps relapse into the chronic and dangerous overuse of prescription opioids, or to access the illicit black market, putting both their health and safety in jeopardy.

It is for these reasons that an organization such as the VCBC should be allowed to continue its operations and should be allowed an exemption to the Health Canada's licensing regulations. They have catered solely to the medicinal cannabis market for over 23 years, filling a gap in patient care that our current system of distribution does not adequately address.

The VCBC's mission to provide high quality affordable medicinal cannabis to those in need - along with their continued partnership with harm reduction organizations and educational institutions seeking to find new ways to address the opioid crisis - makes them an invaluable part of the Victoria community and a vital touchpoint for those most at risk. They have created a space where vulnerable members of our society can seek out alternative treatments for addictions, debilitating chronic pain, and a variety of other conditions. Unlike recreational cannabis companies, they are not a model focused on profit. Their purpose is to serve the needs of patients who have obtained a recommendation from their medical doctor or nurse practitioner to use cannabis for medical purposes.

As strong supporters of cannabis legalization and regulation, the BCCCS would like to see both of our operations continue under an exemption from the current Health Canada dispensary regulations, or by working with government policymakers to create a third option of operation that meets regulatory standards of quality and care, but as medicinal cannabis *storefronts*, with

compassionate pricing that removes any economic barriers to access. This, we believe, will lead to a reduction in patients self-prescribing cannabis and accessing recreational outfits that do not have sufficient knowledge or expertise to properly assist with dosage and product recommendations. This will also keep our members from utilizing potentially fatal alternatives on the black market.

We ask that you consider the needs of the patient first and allow these types of dispensaries to continue providing critical care to their membership base. They are a service to our communities, provide important knowledge and expertise, and offer a place where those most in need can access safe, affordable cannabis medicine.

Sincerely,

The BC Compassion Club Society

2995 Commercial Drive,

Vancouver BC,

V5N 4C8

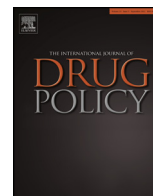
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CC Honourable David Lametti, Minister of Justice and Attorney General
 Honourable Mike Farnworth, Minister of Public Safety and Solicitor General
 Health Canada, via email: cannabis@canada.ca

Contents lists available at [ScienceDirect](http://www.sciencedirect.com)

International Journal of Drug Policy

journal homepage: www.elsevier.com/locate/drugpo

Research paper

“Should I Buy or Should I Grow?” How drug policy institutions and drug market transaction costs shape the decision to self-supply with cannabis in the Netherlands and the Czech Republic

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ARTICLE INFO

Article history:

Received 2 May 2014

Received in revised form 5 December 2014

Accepted 7 December 2014

Keywords:

Cannabis cultivation
Self-supply
Drug policy practice
Institutional economics
Transaction costs
Comparative analysis

ABSTRACT

Background: This paper uses the framework of institutional economics to assess the impact of formal and informal institutions that influence the transaction costs on the cannabis market, and users' decisions to self-supply in the Czech Republic and the Netherlands, two countries with seemingly identical policies towards cannabis cultivation.

Methods: A comparative analysis was conducted using secondary qualitative and quantitative data in four areas that were identified as relevant to the decision to cultivate cannabis: (i) the rules of the game – cannabis cultivation policy; (ii) “playing the game” – implementation of cannabis cultivation policy, (iii) informal institutions – cannabis cultivation culture, and (iv) the transaction costs of the cannabis market – availability, quality, and relative cannabis prices adjusted by purchasing power parity.

Results: Although the two policies are similar, their implementation differs substantially. In the Czech Republic, law enforcement has focused almost exclusively on large-scale cultivation. This has resulted in a competitive small-scale cultivation market, built upon a history of cannabis self-supply, which is pushing cannabis prices down. In the Netherlands, the costs of establishing one's own self-supply have historically outweighed the costs associated with buying in coffee shops. Additionally, law enforcement has recently pushed small-scale growers away from the market, and a large-scale cannabis supply, partly controlled by organised criminal groups, has been established that is driving prices up. The Czech cannabis prices have become relatively lower than the Dutch prices only recently, and the decision to buy on the market or to self-supply will be further shaped by the transactions costs on both markets, by policy implementation and by the local culture.

Conclusions: The ability to learn from the impacts of cannabis cultivation policies conducted within the framework of UN drug treaties is particularly important at a time when increasing numbers of countries are seeking more radical reforms of their cannabis policy.

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Introduction

Several studies suggest that drug policies have little effect on any type of prevalence (lifetime, current, etc.) of drug use, but influence the behaviour of people who use drugs (PUD) in ways that militate or mitigate the potential for harm of drug use (Grund,

Stern, Kaplan, Adriaans, & Drucker, 1992; Huigen, 2013a, 2013b; MacCoun & Reuter, 2001; Reinerman, Cohen, & Kaal, 2004). However, it remains unexplored how particular drug policies shape the decision to purchase or self-supply illicit drugs in cases where it is possible – typically, with cannabis, and, to a somewhat lesser extent, with other psychoactive substances.

This paper aims to analyse the relevant factors in the decision to cultivate cannabis under two cannabis cultivation policies that at first sight seem very similar and that “allow” the cultivation of up to five cannabis plants. In the Czech Republic, ‘home-grown’ is a rather common source of cannabis, whereas in the Netherlands, cannabis cultivation for personal use is much less widespread. This paper

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compares cannabis policies and their everyday implementation, the cultures of cannabis cultivation, the market prices of cannabis, and other factors that may shape the decision “to buy or to grow” of cannabis users in the two countries. In this paper, we apply the theoretical framework of institutional economics, which explains the choices of individuals who participate in markets as an outcome of legal constraints, cultural boundaries, and, most importantly, the so-called “transaction costs”.

Our paper contributes to the recent debate on the impact of emerging regulated markets (Uruguay and two states of the USA, with more countries and US states debating similar measures) by scrutinising whether cannabis cultivation for personal use is a deliberate choice or, and to what extent, it is shaped by policy, culture, or other market factors.

Transaction costs and institutions on the illegal market

Institutional economics is an area of economics that centres around so-called “*transaction costs*”, a concept that is considered of primary influence in modern economic theory (Coase, 1937; Williamson, 2000). Transaction costs are the costs of finding an agreeable and reliable market counterpart, of the negotiations between these parties, and of reducing the uncertainty as to whether the parties to a contract will comply with their commitments. This is the case especially in the formally unregulated market transactions that are typical of illicit markets. For instance, an entrepreneur going into business has to contract suppliers, staff, and facilities. Each time, the price and contractual conditions have to be settled so that both contractual parties are *maximising utility* from the transaction, as the basic principles of the market have been defined since Adam Smith (Mankiw, 2007; Smith, 1776a, 1776b). The magnitude of the transaction costs is understood to predict the organisation of a particular market.

In order to minimise the transaction costs on the market, societies create *formal and informal institutions*, such as contractual laws or the enforcement of property rights. In this context, an “institution” is understood as any common principle that regulates how market participants behave (Commons, 1931). According to Williamson, there are four types of institutions that influence the decision making of individuals in a market: (i) informal institutions, customs, and culture; (ii) formal “rules of the game,” such as laws and legislation, which commonly evolve out of the former type; (iii) “playing the game,” especially contract enforcement, and (iv) resource allocation on the level of a firm.

On the illicit drug market, no formal institutions in the form of laws, legislation, or enforceable bi-partisan contracts exist that could regulate market behaviour, since the transactions themselves are prohibited. The transaction costs on these markets are remarkably high. In fact, all formal prohibitive laws that target the drug market aim to increase the transaction costs and discourage interested parties from participation in the market. Among those costs we can count the risk of arrest and of seizure of the product, or the risk of low product quality and lack of choice, as well as the risks of violence, which, in illegal markets, substitutes for the legal enforcement of property rights (Andrade, Sifaneck, & Neaigus, 1999; Decorte, 2008; Reuter & Kleiman, 1986; Sifaneck, 2005). Although the term “transaction costs” has not been commonly used in analyses of these illicit market risks, it has been acknowledged that they increase substantially with each transaction or encounter between vendor and customer, in particular in rushed transactions between parties in the market who are unknown to one another.

As a result, illicit market players create *informal norms* aimed at reducing the transaction costs imposed on the market participants by the formal embargos. Wilkins and Casswell (2003) and Wilkins (2001) have shown that transaction costs in an illicit market can be reduced by establishing trusted relations among market

players. These can involve rules encouraging “*friends supplying friends*” (Belackova & Vaccaro, 2013; Coomber & Turnbull, 2007; Grund, Kaplan, Adriaans, & Blanken, 1991) or encouraging market participants to act in a “friendly” manner (Belackova & Vaccaro, 2013). These behavioural patterns can be referred to as “cannabis culture” (we define the term later) and act as institutions that reduce the transaction costs in the illegal market.

In the economic theory, another option for reducing transaction costs is leaving the market by establishing “*the firm*” instead (Coase, 1937; Crook, Combs, Ketchen, & Aguinis, 2013; Williamson, 1989). Within the firm, the transaction costs of bi-partial market contracts are obviated or diminished by long-term arrangements. For instance, instead of contracting with different supply chains, the entrepreneur uses management, administration, and governance instruments in order to produce marketable goods. If the transaction costs in a particular market are high, it pays off to bear the full costs of production – even when the associated costs would be lower had the product been outsourced as a result of *economies of scale* achieved by a specialised market counterpart.

This paper focuses on the role of formal and informal institutions in shaping users’ decision to “leave the market” and establish a firm – (small-scale) cannabis cultivation for personal use. It demonstrates how institutions outlined in economic theory (in particular, the *rules of the game* in the form of cannabis policies, *playing the game* in terms of law enforcement, and cannabis (cultivation) *culture* and *transaction costs*, such as availability, quality, and relative market price) influence the choice to cultivate cannabis.

Cannabis cultivation in the Czech Republic and the Netherlands

Domestic (indoor) cannabis cultivation has largely replaced imported cannabis products in developed countries in recent decades. In most Western European markets, much of the imported hashish has been overtaken by a wide variety of cannabis hybrids, referred to by Potter (2008) as the “green avalanche”. In other countries, domestically produced high-grade indoor cannabis has taken the place of the established outdoor cannabis production and imported indoor cannabis (Belackova & Zabransky, 2014b; Duffy, Schaefer, Coomber, O’Connell, & Turnbull, 2008; Hough et al., 2003). Domestic cannabis production is widely (but not exclusively) practised by small-scale cannabis cultivators, who mostly produce the herb for personal consumption (Decorte, 2008, 2010a, 2010b; Hakkarainen & Perala, 2011).

The two countries subjected to our analysis, the Czech Republic and the Netherlands, have notably different levels of small-scale cultivation for personal use. In the Czech Republic, about 9% of the last-year cannabis users recruited within a representative population sample claimed to have cultivated the cannabis they used the last time (Belackova, Nechanska, Chomynova, & Horakova, 2012), and so did 14% of the Czech cannabis users that participated in an EU online survey focusing on drug markets (Trautmann, Kilmer, & Turnbull, 2013).¹ The role of these small-scale growers in the Czech cannabis market is complemented by the relatively large proportion of the Czech cannabis users in this survey (44%) who declared they had received cannabis for free. This is much higher than in any of the other EU countries that participated in the survey – and more than twice the Dutch figure of 21%. Indeed, the Dutch respondents buy their cannabis at twice the rate of their Czech counterparts, 75% as opposed to 37%. Only 2% of the Dutch respondents using cannabis claimed to have grown their own – which was the lowest figure for all the survey participating countries. In the 2014 Global

¹ Non-probability sample of self-nominated respondents, recruited from a large cannabis cultivation discussion board.

Drug Survey,² the figure was not much higher: only 5.1% of the 1290 Dutch cannabis-using respondents (out of 2807 Dutch participants) who had used cannabis in the last year grew their own cannabis. The vast majority (76.7%) of the Dutch cannabis consumers in GDS2014 purchased their cannabis in coffee shops. A sizable minority, 21.6%, indicated that they bought their cannabis from a dealer (Winstock, 2014).

Previous studies described people's motivations for cultivating their own cannabis as the desire to compensate for the lack of a quality product on the market, distrust of non-organic production techniques, or the unavailability of particular strains and the desired potency, the low availability of cannabis in general, and discomfort with "supporting" criminal organisations (Hakkarainen & Perala, 2011; Potter, 2006). These motives can be understood as avoidance of the transaction costs of the illegal market. At the same time, the reasons for cultivating one's own cannabis include more general trends, such as the "do-it-yourself" (DIY) phenomenon – individuals brewing beer or crafting furniture or devices for a variety of motivations, including lack of product quality and availability (Wolf & McQuitty, 2013). While such DIY activities are increasingly popular in Western countries, in post-communist countries their popularity is to a great extent shaped by the recent history of scarcity of many consumer goods that were taken for granted in the West. In the communist countries, more than elsewhere, strong alcohol was distilled in sheds and basements, while drug users later on copied this practice by cooking up powerful injectable drugs from poppies or over-the-counter medicaments (Grund, Zabransky, Irvin, & Heimer, 2009; Zabransky et al., 2012).

In this paper, we analyse what factors might contribute to the notable difference between the Czech Republic and the Netherlands in terms of the proportion of people who grow their own cannabis.

Methods

We conducted a secondary analysis of various data sources focusing on the three major areas that have an impact on the decision of people who use cannabis to leave the market and cultivate their own supply. We conceptualised these as institutions that influence the transaction costs of the market: the *rules of the game*, *playing the game*, the *informal culture* that emerges on the cannabis market, and the *transaction costs*. An overview of the data sources used in our analysis is presented in Table 1.

The first part of the analysis is focused on (i) *cannabis policy* and (ii) *its implementation*. We first discuss the available legislation on cannabis cultivation. In line with previous studies (MacCoun & Reuter, 1998; Meier, 1992), we operationalise 'cannabis policy implementation' as the enforcement of cannabis laws reflected in official police statistics. We analyse cannabis plant seizures (the number of annual seizures, total number of plants seized annually, and average number of plants per seizure recounted from the former two indicators) from the online databases of the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA), supplemented by the national sources for the Netherlands. To assess the relative extent of cannabis seizures in the country, we relate them to the number of last-12-months cannabis users from the latest data available in the EMCDDA online statistical databases.

The second part of the analysis is dedicated to what we term (iii) *the cannabis cultivation culture*. By this term we mean the socially transmitted information that generates behavioural

expectations around cannabis cultivation that are contingent on specific historical developments. This conceptualisation of culture aligns with the institutionalistic perspective of culture (Jütting, Drechsler, Bartsch, & de Soysa, 2007; North, 1990; Williamson, 2000), but differs from the concepts that are common among drug policy scholars. It is broader than the understanding of *cannabis culture* as the media outputs that incorporate cannabis cultivation as its core topic (Potter, Bouchard, & Decorte, 2010), than the sub-cultural rituals and symbols inherent to sociologically deviant groups (Grund, 1993; Hammersvik, Sandberg, & Pedersen, 2012; Micinski, 2014; Reinerman & Cohen, 2007) or the understanding of it as contrasting to profit-driven market behaviour (Potter, 2010). Our conceptualisation of "cannabis cultivation culture" acknowledges the co-existence of multiple cannabis market cultures in a given country (Sandberg, 2012), but instead of divorcing these from one another, it merges their varying expressions into a country-specific understanding of the habits, environments, rituals, and generally acknowledged rules among people involved in the phenomena in one way or another. Our definition of "culture" takes into account the development of public opinion towards cannabis use and cannabis cultivation.

To describe the specific cannabis cultivation culture of both countries, qualitative data from pre-existing studies was summarised. This data primarily came from interviews with cannabis users, sellers, and cultivators. Thus, we used the data collected from a recent comprehensive policy assessment of the Czech cannabis market and from several studies of the Dutch cannabis market to qualitatively capture the development of the cannabis cultivation scenes in both countries in the last four decades.

Finally, we looked at (iv) *the transaction costs of the cannabis market* that influence the decision to self-supply. In this part of the study, we analysed the availability of cannabis and cannabis market prices. While availability and quality represent the traditional understanding of the transaction costs that consumers face on the (black) market (see the background section), cannabis prices deserve further conceptualisation. We hypothesise that retail cannabis prices compensate for the transaction costs that are incurred at the wholesale and production levels, and that these are passed on to the consumer. High retail prices thus mean high risks of enforcement and compensate for losses (e.g. of stocks) at higher market levels (Caulkins, 1993; Caulkins & Reuter, 1998; Caulkins, Reuter, & Taylor, 2006).

We assessed the price levels of cannabis in the Czech Republic and in the Netherlands through a comparison of real cannabis prices in each country weighted by the purchasing power parities (PPPs) retrieved from Eurostat (2012). The cannabis price indicators used were the mean prices per gram at retail level. PPPs convert different currencies to a common currency and, in the process of conversion, equalise their purchasing power by eliminating the differences in the price levels between countries. In its simplest form, PPP analysis shows how the prices of cannabis compare to those of other comparable goods.

Results

The Czech Republic and the Netherlands are currently in the "liberal" segment of EU cannabis policies with Italy, Spain, Denmark, Portugal, and Luxemburg, reflected in the amount of cannabis allowed for personal possession and by the associated legal consequences (EMCDDA, 2013a). Until recently, this liberal approach towards consumption was also reflected in legislative and practical "tolerance" towards small-scale cannabis cultivation. Below, we present an outline of the national cannabis policies and their similarities and differences, followed by an analysis of their implementation.

² An online survey which targets active drug consumers (non-probability sampling).

Table 1
Data sources used in the analysis.

	The Netherlands	Years	The Czech Republic	Years
(i) Cannabis policy and its' implementation				
Cannabis-related criminal offences	Soft-drug "registered incidents" (Jongste et al., 2007; Kalidien and Lange, 2013)	1995–2004	Based on the statistics of the Ministry of Justice (MOJ, 2007–2011); police statistics retrieved from EMCDDA (EMCDDA, 2014)	2003–2011
Cannabis plant seizures	No. of seized cannabis plants, no. of seized cannabis plantations (EMCDDA, 2013c, 2013d), accounted for the prevalence of cannabis use (EMCDDA, 2013b)	2005–2012 1997–2011	No. of seized cannabis plants, no. of seized cannabis plantations (EMCDDA, 2013c, 2013d), accounted for the prevalence of cannabis use (EMCDDA, 2013b)	2003–2011
(ii) Cannabis cultivation culture				
Public opinion on cannabis	Yearly National Household Survey on opinions of Dutch citizens on society and culture (N = around 2000 respondents every year) (SCP, 1998)	1970–1996	National Household Survey on the Use of Psychotropic Substances and Attitudes Towards It (Belackova et al., 2012; Mravcik et al., 2013)	2011–2013
	Public poll survey amongst 1894 Dutch citizens who regularly participate in public opinion surveys (Panelclix, 2009)	2009	Annual Report on the Drug Situation in the Czech Republic 2002	2002
	Public opinion survey amongst at least 3000 Dutch citizens who regularly participate in public opinion surveys (Peil.nl/Maurice de Hond, December 2013)	2013		
Qualitative data from cannabis users and market players	Analysis of articles in a national newspaper (Parool 1950–1975) and interviews with 18 witnesses to the introduction of cannabis in the Netherlands between 1950 and 1970 (amongst them first-time users and cultivators, policemen, and journalists) recruited via judgement sampling (Maalsté, 1993)	1991–1992	66 last-12-months cannabis market participants recruited via respondent-driven sampling for a policy assessment study in 2009; aged 18–61; 1/3 of them had a history of selling cannabis, 1/10 have been growing cannabis for their own use or for sale (Belackova & Zabransky, 2014a, 2014b)	1985–2009
	Interviews with 10 cultivators, 10 coffee shop visitors, 10 middlemen, 15 criminal investigators, 4 lawyers, and 6 researchers (Boekhoorn, van Dijk, Loef, Oosten, & Steinmetz, 1995)	1994–1995		
	Ethnographic study in coffee shops (Jansen, 2002)	1993–2002		
	Analysis of police documents, conversations with criminal investigators and other officials that are involved in cannabis prosecution and observations during 'dismantlings' (Bovenkerk, Hogewind, & Milani, 2002)	2000		
	Interviews with 45 entrepreneurs in the Dutch cannabis sector (cultivators, coffee shop and growshop visitors, middlemen) recruited via theoretical sampling; 35 of them had a history of cultivating cannabis for sale (with a minimum of 10 plants and a maximum of 24,000 plants); aged 25–61 years; 1–40 years experience in the cannabis sector (Maalsté, 2008; Maalsté & Panhuysen, 2007)	2003–2006		
	Interviews with 60 criminal investigators in 25 police regions and 20 coffee shop visitors, observations during 'dismantlings' and a survey amongst 119 criminal investigators (Korf, Benschop, & Wouters, 2007)	2006–2007		
	Analysis of criminal investigations (Boerman et al., 2008)	2008		
	Interviews with 8 purchasers of cannabis products sold in coffee shops recruited via judgement sampling; experience in cannabis sector: 2 < 10 years, 2 10–20 years, 4 > 10 years) (Huigen, 2013a, 2013b)	2012		
(iii) Transaction costs of the cannabis market				
Mean retail level price of cannabis, adjusted for purchasing power parities (Eurostat, 2012)	Price of Nederwiet and hashish from a yearly monitor that analyses weed and has samples recruited from 50 random selected coffee shops (Niesink & Rigter, 2006, 2013)	1999–2011	Price of herbal cannabis and hashish from police statistics as reported by the National Focal Point (Mravcik et al., 2004, 2003; Zabransky et al., 2002)	2001, 2002, 2003
			Police statistics as reported to the EMCDDA (EMCDDA, 2003e)	CZ 2004–2011
Cannabis availability among 16 year olds	Availability of cannabis among 16 year olds according to the ESPAD survey (ESPAD, 2013, 2014)	1995–2011	Availability of cannabis among 16 year olds according to the ESPAD survey (ESPAD, 2013, 2014)	1995–2011
Cannabis availability in the adult population	Number of coffee shops in the Dutch municipalities (Maalsté et al., 2014)	1999–2014	Availability of cannabis according to general population surveys (Zabransky et al., 2002; Belackova et al., 2012)	2002–2008

Rules of the game – cannabis (cultivation) policies

In the Czech Republic, the cultivation of up to five cannabis plants for personal use is considered a misdemeanour or infraction, an administrative offence punishable with a fine of up to 15,000 CZK (approximately 600 EUR). This relatively tolerant situation emerged recently when a newly defined criminal offence under the Czech criminal law came into force in January 2010. Through the introduction of the criminal offence of “growing a greater than small number of psychoactive plants”, the cultivation of (five or less) cannabis plants is no longer included in the criminal offence of “narcotics production”, where it had belonged since 1937. Cultivating more than five plants can now result in up to six months’ imprisonment, or up to five years when large numbers of plants or quantities of cannabis are involved.

The exact amount of “a small number of plants” is set by governmental decree, and it is seen as binding for police and courts. The rationale for criminalising only “greater than small” amounts of illicit drugs has been applied to the possession of illegal drugs in the Czech Republic since 1999. Until 2010, “greater than small” amounts were not universally defined by any norm in a bylaw or a court binding decision. Courts had to determine this amount on a case-by-case basis. In 2009, an ad hoc governmental commission proposed 15 grams as the lower limit for “greater than small” amounts of cannabis and this amount was subsequently adopted by the Government. Following the decision of the Constitutional Court on this specific part of the drug legislature (Ústavní soud [Constitutional Court], 2013), the Supreme Court set the “greater than small” amount at 10 grams of herbal cannabis, which is now seen as binding (Nejvyšší Soud [Supreme Court], 2014). A verdict of the constitutional court is expected on the arrangement over the ‘five plants’ is still awaited.

The cultivation of any number of cannabis plants is a criminal offence in the Netherlands, although in the last decade (since 2000) the cultivation of up to five cannabis plants by adults has normally not been prosecuted. Until 2012, this situation was treated in the same way as the possession of a small amount of cannabis for personal use (tolerance policy). The detection of up to five plants normally resulted in the police dismissing the case if the owner gave up the cannabis plants immediately. If, on the other hand, the owner refused to surrender the plants, he or she could still be criminally prosecuted. If the police detected more than five plants it was considered professional cultivation punishable by four years’ imprisonment and/or a fine of up to €67,000.

In recent prosecution guidelines for the Opium Act (January 1, 2012), the policy of tolerance towards five cannabis plants was amended. Previously, only the number of plants was considered, but not the size of the plants or other factors. Since 2012, indicators of the level of “professionalism” have also mattered. The policy of tolerance towards five plants now only applies to amateurs who are obviously cultivating for personal use. To determine if a plantation is a professional setup, a number of instructions are included in the prosecutorial guidelines. If two or more reference points apply, the plantation is considered a professional setup, notwithstanding the number of plants. The reference points include the presence of ventilation, heating, artificial light, disease control, a centrally controlled irrigation system, the use of seedlings, and the use of CO₂ supplements. It is not yet clear how strictly the police will interpret and apply the new prosecution guidelines in practice, and this paper goes into the evidence provided by the available data. However, it is clear that five cannabis plants are no longer tolerated by definition.

Playing the game – cannabis (cultivation) law enforcement

Both the Czech Republic and the Netherlands have rather tolerant approaches to cannabis-type drugs. In both countries, the share of cannabis-related offences on all drug crimes is substantially lower than the European average (59.8% in 2011). Rather surprisingly, a lower share of cannabis-related crimes was reported for the Czech Republic (40.7% in 2012) than for the Netherlands (53.5% in 2011) (EMCDDA, 2014).

Neither the Dutch nor the Czech legal regulations criminalize small-scale cannabis cultivation, but the implementation of these laws seems to differ substantially in the two countries. In order to analyse these differences, data on cannabis seizures and arrests were assessed. In our analysis the law enforcement data is considered to reflect enforcement priorities and efforts to a large extent, rather than the underlying market characteristics.

The Czech police used the recently established paragraph of the criminal code on the cultivation of more than five psychoactive plants 145 times in 2010, 168 times in 2011, and 193 times in 2012; statistics on cultivation-related administrative offences concerning less than five plants are not available (Mravčík et al., 2013).

Although one might expect a decrease in the number of charges for “illicit drug production” (the previous qualification of all cannabis cultivation-related offences), as a result of cultivation crimes being moved from “production” into the new paragraph of the criminal law (and those concerning five or less plants to administrative offences) after 2010, these actually increased from 2443 in 2009 to 2516 in 2010, and up to 3097 in 2011. The increases in cannabis cultivation crimes in the Czech Republic in 2010 and 2011 suggest that the *de jure* policy liberalisation has not translated into *de facto* changes in the policing of cannabis cultivation but, most likely, more people were arrested for cannabis cultivation after the legislative changes than before 2010. As a result of the clarification of the specific sanctions and the threshold number of plants for cannabis cultivation offences, not only cannabis users and cultivators but also police officials gained greater legal security in terms of what can be prosecuted under the criminal law.

Czech court statistics, on the other hand, show a decrease in the numbers of “illicit drug production” charges after 2010 (from 1820 court cases in 2009 to 1441 in 2010). This decrease is only partially compensated for by the increase in the number of new court cases involving the cultivation of more than five cannabis plants (170 cases in 2010). While from 2011 to 2012, the number of drug production-related court decisions increased again, the number of cannabis cultivation court cases dropped further, to 99. During a period of legislative changes, Czech judges are obliged to make decisions that are based on the legislation that is more beneficial for the offender. In 2010, a number of convictions for drug production from the previous period were probably dismissed as administrative offences involving cannabis cultivation. To summarise, although the number of arrests for cannabis cultivation increased in 2012, the number of court decisions in these cases dropped, suggesting that cannabis cultivation crimes are registered more often by the police, but are less likely to end up in court.

In the Netherlands, the prosecution of professional cultivators has intensified since the turn of the century, as the options for administrative enforcement have been extended with several additions to the Opium Act, including the *Victor Act* (2002). The latter regulates the cooperation between the police and several other stakeholders, such as energy companies, insurance companies, housing corporations, municipal organisations, and others (Grund & Breeksema, 2013). Further measures aimed at repressing cannabis cultivation include an anonymous tip line to which cannabis plantations can be reported and the distribution of “cannabis scent cards” with police appeals to report neighbours who are growing cannabis.

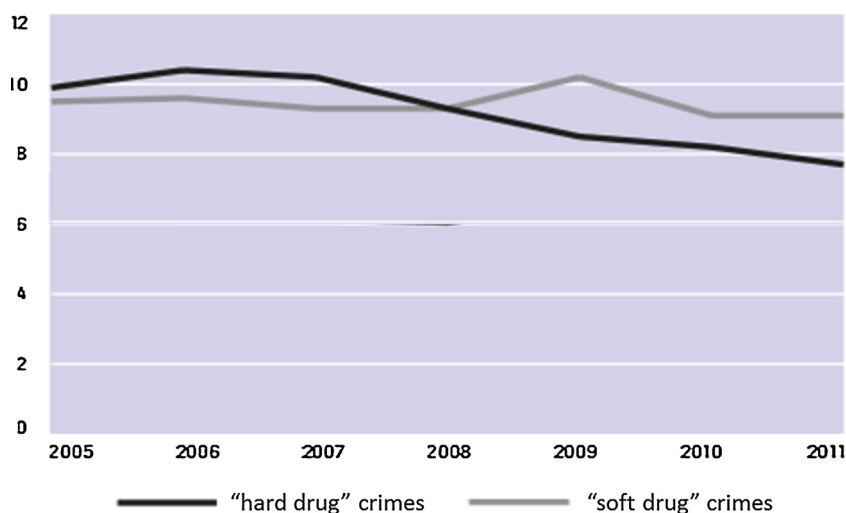


Fig. 1. Registered drug crimes in the Netherlands, $\times 1000$.

Source: van Rosmalen et al. (2012).

In 2012, the Dutch police recorded nearly 38,000 “incidents” concerning (alleged) drug offences (Kruize & Gruter, 2014). About 30% of those “incident records” were related to cannabis cultivation, indicating that over 10,000 cannabis-related offences were recorded in that year. The “incident records” can equally refer to cannabis plantations raided or to other types of incidents, such as a phone call from a local resident about a strange (hemp) smell (Kruize & Gruter, 2014). In 2011, the police recorded 17,000 drug crimes (see Fig. 1). The number of registered drug crimes gradually decreased after 2006, when they were 14% lower than in 2005. Both the number of recorded Schedule II crimes (“soft drugs” or cannabis) and Schedule I crimes (“hard drugs,” such as heroin, cocaine, amphetamines, or other synthetic drugs) decreased between 2005 and 2011, by 4% and 23% respectively (van Rosmalen, Kalidien, & de Heer-de Lange, 2012). More detailed Dutch police data concerning the number of recorded offences associated with cannabis cultivation, to be compared with the Czech figures, are not available. Dutch national police registrations do not specify the types of drug offences beyond schedule I and schedule II. Changes in registration practices and reorganisations of police structures interfere with valid distinctions between offence categories, such as production, trafficking, or dealing. Nor it is possible to distinguish offences related to personal consumption from supply-related offences (van Laar, Cruts, & van Gageldonk, 2014). Furthermore, registered offences under the Opium Act are usually the outcome of investigative police work and crime statistics may therefore partly reflect law enforcement and political priorities (van Rosmalen et al., 2012).

The change in the structure of the crimes investigated by the police towards “soft drugs” (i.e., cannabis-type drugs) may explain the decline in the number of cases brought to court which reflects the lower level of social danger posed by cannabis drugs, an aspect that courts are by definition more sensitive to than any other level of criminal proceedings (Table 2).

Another indicator of policy implementation is the number of seizures of cannabis plants. In 2011, the Netherlands had the second highest number among European countries after the United Kingdom of cannabis plantations seized, with 5435 plantations being seized. Yet 15 years ago, in 1996, the same indicator was 10 times lower for the Netherlands than for the UK, with only 342 plantations being seized. In the Czech Republic, 240 cannabis plantations were seized in 2011 – a number around the EU median. Nonetheless, this represents a fourfold increase in cannabis seizures in the Czech Republic since 2002 (EMCDDA, 2013d).

Across the EU, a median of 63 plants per 1000 cannabis users in each country are confiscated by the police annually (European Monitoring Centre for Drugs and Drug Addiction, 2013). Approximately 58 plants per 1000 cannabis users were seized in the Czech Republic – close to the 2011 EU median – at a relatively low number of plantation sites, witnessing the focus on large-scale sites. In the Netherlands, more than 1500 plants were seized per 1000 cannabis users, or 1.5 plants for each (last-12-months) Dutch cannabis user, the highest number in the EU. Fig. 2 shows a comparison of European countries in terms of the number of plantations seized and the average number of plants per 1000 users.

As depicted in Fig. 1, several countries, especially Belgium, followed by Finland, the UK, Ireland, and Greece, have seized a rather larger number of small-scale plantations per 1000 cannabis users. The Netherlands are an outlier in terms of seizing both a high number of plantations and a high number of plants. While this could suggest that large-scale plantations are being targeted, a more detailed analysis of the variation within the Dutch seizure data suggested that the median number of plants seized could be much lower than the average. In 2004, the average number of plants seized per Dutch plantation was 474, with a minimum of three, maximum of 5460, and a median of 150 plants (Jacobs, 2007, p. 14). This suggests that small-scale plantations in the Netherlands may be detected more frequently than large ones. For further analysis, we focus on the time trend of the number of plantations seized, and

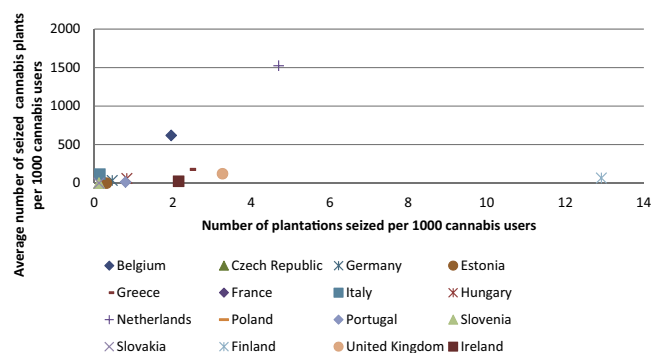


Fig. 2. Cannabis seizures and average number of plants per 1000 cannabis users in the EU as of 2011 (countries that reported on both indicators only).

Source: EMCDDA (2013b, 2013c, 2013d).

Table 2
Outcomes of court cases in the Netherlands involving Schedule II (“soft drugs”) crimes, 2005–2012.

No. of persons	Year							
	2005	2006	2007	2008	2009	2010	2011	2012
(i) Declared guilty (at first verdict ^a)	2987	3131	2703	2762	2842	2575	2431	2451
(ii) Punished with a fine	892	857	707	807	805	686	544	510
(iii) Punished with community service	1649	1764	1538	1504	1538	1407	1351	1353
(iv) Punished with imprisonment	330	396	313	317	315	353	367	354

Source: Kalidien and Lange (2013 – (i) Table 6.5, p. 524; (ii) Table 6.9, p. 538; (iii) Table 6.11, p. 544; Table 6.13, p. 550).

^a Some of these convictions may be overturned at appeal.

the number of plants seized per operation, calculating the average number of plants seized per operation.

Between 1996 and 2011, the number of plantations seized in the Netherlands increased sixteen times. During the 1990s, the average size of the cannabis plantations dismantled by the Dutch police was above 1800 plants, with a total of 342 sites reported (van Laar et al., 2014). Since 2004, there has been a clear decrease in the average number of plants per site raided, dropping from 596 in 2003 to 130 in 2006 and 325 in 2012.

In the Czech Republic, the number of plants seized per plantation has been growing gradually, from an average of 56 plants in 2002 to 262 in 2011 (when a slight decrease occurred after a peak of 548 plants in 2008). The number of plantation sites dismantled grew steadily as well – from 58 in 2002 to 240 in 2011 and 218 in 2012. This suggests that law enforcement agencies in the Czech Republic focus their enforcement activities on detecting large-scale plantations. In contrast, the Dutch police seem to have increasingly targeted smaller cannabis entrepreneurs. These trends are depicted as relative changes compared to the baseline year in Fig. 3.

Informal institutions – cannabis cultivation culture

First, we analyse the role of cannabis cultivation in both countries and its acceptance by the public. We then discuss the specific cannabis cultivation cultures that emerged in the history of each country.

Both countries report rates of cannabis use above the EU average. In the Czech Republic, the lifetime prevalence of cannabis use for 16-year-olds was 42% in 2011, compared to 27% in the Netherlands and the European average of 20% (ESPAD, 2014). In the adult population, the average European prevalence of cannabis use during the last year is 5%, 7% in the Netherlands and 10% in the Czech Republic, which has the third highest last-year prevalence after Italy and Spain (EMCDDA, 2013b). Thus, concerning cannabis use, the Czech Republic and the Netherlands can be characterised

as high- and above-average-prevalence countries. This translates into the societal context and public attitudes towards cannabis.

Yet in 2002 (the earliest public opinion survey on cannabis policy questions in the Czech Republic), half of the Czech citizens (50%) agreed with the statement that “cannabis use should be prosecuted under the criminal law” (Mravcik et al., 2003). When the same question was asked 10 years later, the majority of the Czech citizens surveyed (56% in 2012) opposed the idea (Mravcik et al., 2013), suggesting a shift in attitudes to cannabis in the last decade. An even larger percentage of the respondents in the same 2012 survey disagreed with “criminalising cannabis cultivation for personal use”, 73%, up from 43% in 2002. This strong rejection of criminalising small-scale growers may be associated with recent developments in medical cannabis legislation, explaining the sharp increase from the 43% level of support for the decriminalisation of cultivation in 2002. It seems that after the widely published beneficial effects on certain disease syndromes, small-scale cannabis cultivation is less stigmatised in contemporary Czech society than (recreational) cannabis use itself.

Dutch society has also gone through a transition in its opinions to cannabis. In 1975, 70% of the Dutch thought that smoking cannabis should be punished severely. This suggests that the 1976 legislative changes were initially only supported by a minority of the Dutch population. As Grund and Brecksema (2013) noted, the Dutch political process has historically aimed to include and protect minorities, even when public opinion or political majorities favour more repressive approaches. Likewise, the opportunity principle – a part of Dutch law since 1878 – allows a prosecutor to forego criminal proceedings when these would be harmful to the public good or lead to social unrest (Grund & Brecksema, 2013). Over the years, the Dutch started considering cannabis to be not unlike alcohol, and in 2009 public opinion survey they had clearly swung: about 77% of the Dutch thought cannabis should be decriminalised, regulated, or legalised (Sarosi, 2009).

Coffee shops per se, however, continue to carry stigma in the Dutch population. In 1998, 47% of Dutch adults (>19 years) thought that coffee shops should be allowed, while 43% thought they should not be (SCP, 1998). The ‘Sociaal en Cultureel Planbureau’ researchers explained the lower level of acceptance of coffee shops as a NIMBY³ response, “Society perceives coffee shops as ‘trading enterprises’. People rather don’t want to have them in their own neighbourhood.” Dutch opinions on cultivation have not been explicitly queried. In December 2013, two-thirds of Dutch citizens agreed to legalisation to “conform to the example of Uruguay”, which would transform the Dutch tolerance model towards the actual legalisation of cannabis cultivation for personal use and cultivation and wholesale supply (to coffee shops or perhaps other licensed retail outlets) by licensed companies (De Hond, 2013). Below we explore how these attitudes may interact with the developments in the cannabis cultivation culture in each country.

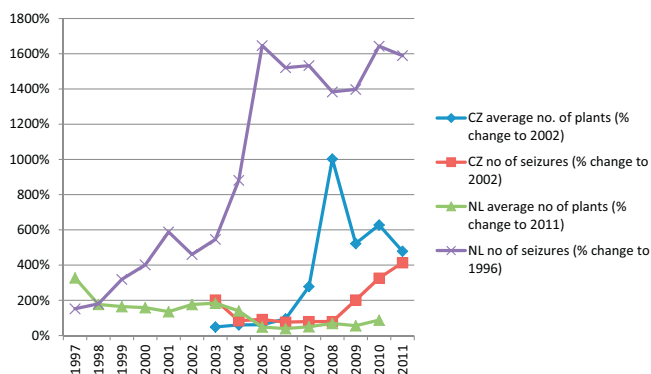


Fig. 3. Average number of cannabis plants seized per plantation and the number of seizures (% change from the baseline year).

Source: EMCDDA (2013c, 2013d).

³ “Not In My Back Yard”.

In the Czech Republic (former Czechoslovakia), outdoor cannabis cultivation was already practised in the communist period. This herbal cannabis was distributed free of charge in the non-monetary or 'tit-for-tat' grey economy that represented the only market alternative during communism, when the country's borders were closed to international drug markets (Gabrhelík, Kubu, Miovsky, & Zabransky, 2008; Grund et al., 2009). Self-supply and the grey economy were in fact the primary source of many other consumer goods that were either unavailable in the centrally planned economy or supplied in low-quality versions only (e.g., sewing the household's own clothes, growing fruit and vegetables, and crafting furniture were common in many households). Since the 1989 Velvet Revolution, the cannabis market in the Czech Republic has evolved in two stages, the first being the development of commercial markets in imported indoor cannabis (1995–2005) and the second an increase in "large- and small-scale domestic indoor cannabis cultivation within a highly competitive market and resulting in price decreases (2005–present)" (Belackova & Zabransky, 2014b).

A substantial segment of current Czech cannabis users refer to their cultivation efforts as a hobby and the product is often distributed for free with pride. Another segment of Czech cannabis users – typically, those from rural areas – continue to prefer outdoor varieties because of their "natural character," and, in contrast to cannabis produced indoors, outdoor varieties are commonly smoked without tobacco (Belackova & Zabransky, 2014b).

However, outdoor cannabis cultivation entails significant risks in terms of theft of the crop and robbery. Indoor cannabis cultivation, on the other hand, is considered to involve greater risks to people living in rented housing or condominiums, since neighbours might complain to the property owners or the police. In addition to these *variable costs*, there are significantly higher *fixed costs* associated with indoor cannabis production than with outdoor production, where, for example, lighting and nutrients are provided by nature. To reach a cost comparable to market price, many indoor growers therefore also tend to supply cannabis users in their friendship networks, exposing themselves to substantial risks of criminal investigation. In turn, these activities have contributed to the cannabis market becoming increasingly competitive more recently, with many small-scale cannabis growers selling at low prices and at substantial discounts when selling "quantity". Vietnamese drug trafficking networks that produce cannabis on a large scale in the Czech Republic have also promoted this development since about 2005. Those networks produce primarily for export to neighbouring – higher-income – countries but a non-negligible part of their product is funnelled into the Czech cannabis market (Belackova & Zabransky, 2014b).

On the Dutch market, Morocco, Pakistan, and Lebanon were the most important source countries of the cannabis until 1990 (Jansen, 2002). The imported cannabis concerned mainly hashish, as the more bulky cannabis was harder to smuggle (Boekhoorn, 2002; Maalsté, 1993). Around the 1970s, Dutch cannabis enthusiasts pioneered outdoor cannabis cultivation. Initially, the Dutch cannabis was of low purity and few cannabis consumers were interested. The cannabis sold at coffee shops during the 1980s was mostly imported, e.g. from Jamaica or Thailand. In those days, indoor-grown cannabis could already be purchased in various coffee shops, although its quality, while increasing, was varied, with stronger strains still only on limited offer. As the consumption and demand for cannabis grew in the 1990s (in particular between 1997 and 2001 (Trimbos Institute, 2012)) and more coffee shops opened up, imported cannabis could no longer meet the growing demand. When indoor growing took off and various new cannabis strains were introduced, hobbies turned into small businesses and many home growers sold their product at the "back door" of the coffee shops.

Among the respondents of the 2014 Global Drug Survey, the most common types of cannabis used in the last 12 months were high-potency indoor cannabis (44.2%), herbal/grass (32.8%), hashish (21.6%), and edibles (1.3%) varieties. At 44.9%, high-potency indoor cannabis was also the type of cannabis most preferred by the majority of last-year users, followed by hashish (28.6%), (imported) outdoor (20.7%), and edible (4.9%) varieties (Winstock, 2014).

Jansen (2002) attributed the success of "Nederwiet" to innovations in the fields of genetics, fertilisers, lighting, air conditioning, pest control, and the prevention of unwanted attention (e.g. smell, noise). Agricultural production in greenhouses is core to the Dutch export economy and several universities and research companies are at the cutting edge of cross-breeding and biotechnology. This rich reservoir of agricultural knowledge soon became available to the pioneering cannabis growers (Jansen, 2002; Potter, 2008). Furthermore, breeding new cannabis strains was not against the Dutch Opium Act and is still legal. Within a decade, "over 80% of the internal demand for cannabis in the Netherlands was met through domestic production" (Jansen, 2002).

Although it did not take steps towards further regulation of the production of cannabis or the supply to the coffee shops, during the 1990s the Dutch government's position on home growing was rather sympathetic. The 1995 government policy paper, *Continuity and Change*, actually suggested that home growers might theoretically be able to supply all the coffee shops. As the government sought to reduce the influence of organised crime in the supply of the coffee shops as much as possible, it gave low enforcement priority to small-scale, non-professional home cultivation (Dutch Government, 1995a).

Far into the 1990s, law enforcement did not pay much attention to cannabis cultivators. In this atmosphere, the indoor cannabis cultivation culture developed at a rapid pace. In the late 1980s, the first "growshops" opened their doors, prompting a professionalisation of indoor cannabis cultivation in the Netherlands. The growshops opened up the cannabis market to new players without 'green fingers', providing them with access to advanced agricultural equipment and knowledge.

Several studies suggested that growshops became an important link between cultivators and coffee shops, selling seedlings (clones) and purchasing and distributing the harvest of various plantations. Some growshops supplied start-up cannabis farmers with the necessary equipment free of charge in exchange for (part of) their harvest (Boerman, Grapendaal, & Mooij, 2008; Wouters, Korf, & Kroeske, 2007). By 1990, there was no denying that the cannabis market had changed and had become dominated by indoor cannabis. While in 2014, hashish is still imported from Morocco or Afghanistan, around 90% of the cannabis sold in coffee shops concerns various strains of Nederwiet (cannabis from the Netherlands) (Maalsté, Huigen, & Lallush, 2014).

In the eighties, the emerging 'cannabisness' started attracting the attention of commercial entrepreneurs and individuals who were already involved in other illegal activities, and indoor cannabis cultivation became a relatively low-risk source of revenue. Soon, Nederwiet became an important export product and high-potency Dutch indoor Nederwiet (or "skunk") became increasingly available in cannabis markets across Europe (Jansen, 2002).

In the 1990s, there seemed to be a clear distinction between cultivators that were involved in so-called export weed and cultivators that supplied Dutch coffee shops. The cultivation of export weed was controlled by organised crime groups. The domestic production and supply to the coffee shops was dominated by smaller-scale individual and independent growing operations, each often producing less than 10 kilograms per year.

In 2002, Bovenkerk and his colleague Hogewind argued on the basis of interviews with police officers that almost all hemp cultivation had become a matter of organised crime, rather than of

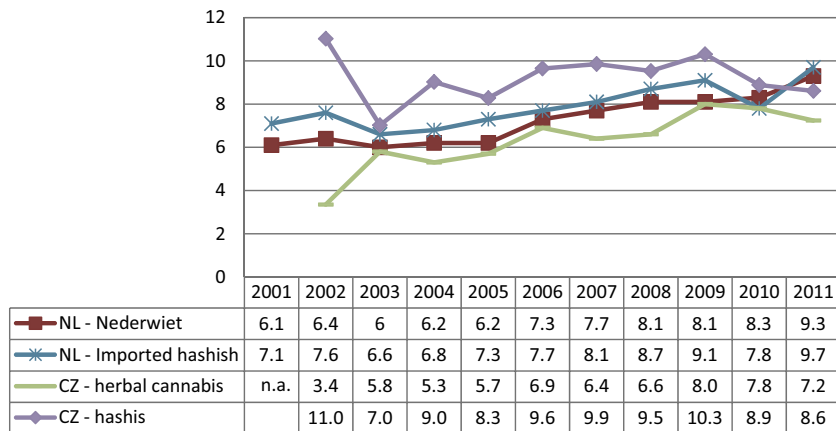


Fig. 4. Nominal cannabis prices in the Czech Republic and in the Netherlands (coffee shop prices) in €.

Source: EMCDDA (2003e), Mravcik et al. (2003, 2004), Niesink and Rigter (2013), Zabransky et al. (2002).

innocent gardening (Bovenkerk & Hogewind, 2002). The cannabis growers interviewed by Maalsté and Panhuysen (2007) also testified about the increasingly criminal character of the cannabis trade (threats of violence, weapon possession, rip-offs, and snitching) and linked these to increasingly repressive police tactics and the increasing dominance of commercial and criminal entrepreneurs in the cannabis sphere.

In terms of economic theory, these newcomers can be seen as “risk takers”. In contrast, earlier generations of “idealistic” and small-scale cultivators were less prone to taking risks when the chances of being caught increased. Thus, cannabis cultivation quickly lost its attraction for small-time home growers for whom these activities were not their primary source of income and who wished to avoid a criminal record or eviction from their home (Grund & Brecksema, 2013).

By 2014, the distinction between cannabis intended for export or local consumption seems to have disappeared. Because of the intensified repressive approach, direct contact between growers and coffee shop owners became a liability. Contacts between growers and retailers are increasingly facilitated by “brokers” that buy and sell the products and determine which product ends up in a coffee shop or abroad.

Over the years, cannabis culture has become ‘diluted’ in the Netherlands. Many coffee shops have become take-out-only outlets, no longer serving as a social meeting space, while a “joint” is no longer automatically shared, even when smoking with close friends.

Many current Dutch cannabis consumers grew up with coffee shops. For them, coffee shops and smoking cannabis are part of their normal daily life. One has to engage in a particular scene to know about cannabis or buy cannabis. In the larger Dutch cities, acquiring cannabis is little different from buying a packet of cigarettes. Identification with cannabis and/or with a “cannabis lifestyle” is much less common than in other countries. Most cannabis consumers do not consider themselves as being different because they smoke cannabis. It is merely one of the activities they do. Nor do they feel that they belong to a specific (deviant) community.

Transaction costs on the cannabis market – retail prices and availability

Cannabis prices can, to some extent, influence the decisions on whether to purchase cannabis or to grow one’s own. At the same, they reflect the *transaction costs* that are incurred at the wholesale and production levels. We chose to compare cannabis prices in the Czech Republic and in the Netherlands, adjusted for purchasing

power parity. First, we adjusted the cannabis prices according to the purchasing power parity (PPP) in relation to alcohol, tobacco, and narcotics (further referred to as *the real cannabis price*). Secondly, we assessed the influence of the relative prices of cannabis adjusted to the prices of electricity, gas, and other fuels on the decision to buy or grow.

The data on cannabis prices for the Czech Republic was retrieved from the EMCDDA database and inconsistencies with national data as of 2011 were double-checked and corrected. The Dutch data concerns prices in coffee shops as reported by the Trimbos Institute (Niesink & Rigter, 2006, 2013). Given that in the Czech Republic, most of the price data would account for herbal cannabis and imported resin, we chose to compare it with Nederwiet and with hashish imported into the Netherlands. The *nominal prices* (the money paid for the goods at each transaction) of (mainly imported) hashish remain comparable or even higher in the Czech Republic (while the nominal Dutch average annual wage is more than double the Czech one (OECD, 2014)). The nominal Czech herbal cannabis prices remain, however, lower than those in the Netherlands (see Fig. 4).

As shown in Fig. 4, nominal cannabis prices in the Netherlands nearly doubled between 2001 and 2011, possibly as a result of increased law enforcement and pressure on cultivators. The Czech cannabis prices have been on the increase since these were first monitored in 2002, which is probably a reflection of the gradual increase in the quality of the cannabis and of the increasing mean and median nominal income in the country (according to the Czech Statistical Office, 2014, the average salary rose from 15,407 CZK in 2003 to 25,500 CZK in 2014).

However, after 2009, the Czech cannabis prices decreased when the market became increasingly competitive because of the growing number of small-scale cultivators and the establishment of large-scale Vietnamese growers/distributors. Qualitative research on the Czech cannabis market (Belackova & Zabransky, 2014b) suggests that the price fall was actually more profound and occurred already before the year suggested by the time series data from the police presented in Fig. 4, pointing at 2008 as the start point of decreases in the (purchase) price. Given the increase in the Dutch coffee shop prices and the recent homogenisation between the Czech cannabis and hashish prices, the price gap between the Czech and the Dutch prices seems to be closing.

When the prices are PPP adjusted to the prices of the closest substitutes (alcohol and energies), the picture changes slightly. After adjustment, cannabis products were almost twice as expensive in the Czech Republic as in the Netherlands (2003 data, see Fig. 5). Combined with the absence of “risk-free” venues for acquisition

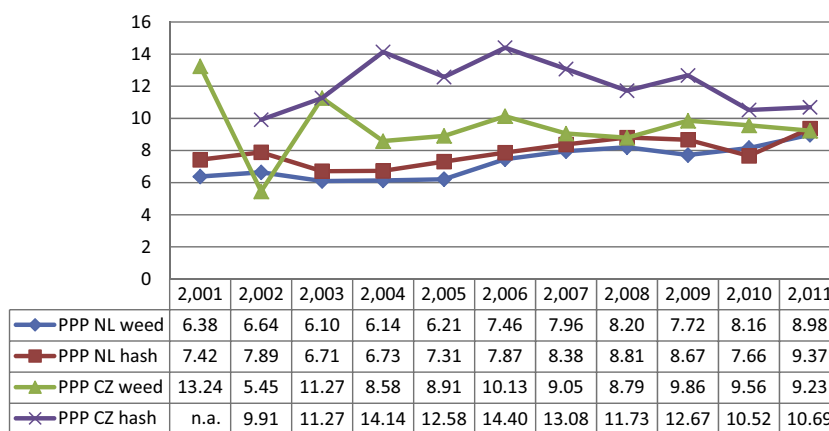


Fig. 5. Relative cannabis prices in the Czech Republic and in the Netherlands – re-counted with purchasing power parity for alcohol, tobacco, and narcotics (EU27) in €. Source: EMCDDA (2003e), Eurostat (2012), Mravcik et al. (2003, 2004), Niesink and Rigter (2013), Zabransky et al. (2002).

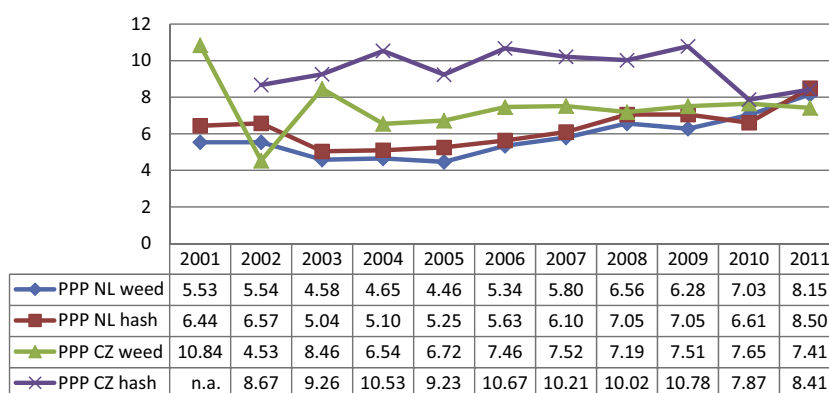


Fig. 6. Real cannabis prices in the Czech Republic and in the Netherlands – re-counted with purchasing power parity for electricity, gas, and other fuels (Eurostat, EU27) in €.

Source: EMCDDA (2003e), Eurostat (2012), Mravcik et al. (2003, 2004), Niesink and Rigter (2013), Zabransky et al. (2002).

(such as the officially tolerated coffee shops), this in turn provided relatively strong incentives for Czech cannabis users to avoid the market and cultivate “free-of-charge” outdoor cannabis. Only since 2010–2011 does this difference seem to have been disappearing, which seems to be a logical stage of the development of the market. Purchasing cannabis on the market was also relatively more expensive in the Czech Republic in the early 2000s when the costs of energy or equipment to cultivate one’s own indoor cannabis are taken into account (see Fig. 6). In 2010, the Czech market prices probably reached the point at which it paid off to purchase cannabis on the market rather than to cover the cost of energy and other necessities for cultivating one’s own.

The transaction costs of cannabis acquisitions are also determined by its availability, in particular that of good-quality strains. In the ESPAD 1995–2011 surveys, the proportion of EU respondents that perceived cannabis as “fairly easy” or “very easy” to obtain was between 24% and 34%. In both the Czech Republic and the Netherlands, perceived access to cannabis for 16-year-old students has been above average for the entire period (except for the Netherlands in 1995). In the Czech Republic this statistic peaked in 2007 at 66% and in the Netherlands in 2011 with 59% (ESPAD, 2013).

Likewise, between 1994 and 2000, 19% and 23% respectively of Czech citizens aged 15–64 had been offered an illegal drug in their lifetime (Zabransky et al., 2002). In 2001 this increased to 27% of the respondents, almost doubled to 50% in 2004 and then stabilised at 49% in 2008 (Belackova et al., 2012).

Whether one is offered cannabis is perhaps a less relevant indicator of availability for the Netherlands, as every adult can simply purchase the drug in coffee shops. Fig. 7 depicts the number of coffee shops, the number of municipalities, and the number of municipalities with coffee shops in the Netherlands from 1999 to 2012.

According to the latest available figures, there are 608 coffee shops in the Netherlands as of 2014, a decrease from 846 in 1999 (Maalsté et al., 2014). In 1995, the Dutch government estimated the number of coffee shops at 1500 (Dutch Government, 1995b). The number of municipalities where coffee shops are available has remained rather stable – 105 in 1999 and 103 in 2014. About half of those are in cities with over 200,000 residents. The Dutch coffee shops are concentrated in the “Randstad” (the urbanised area between Amsterdam, Rotterdam, and Utrecht) and in medium-sized cities in the provinces. More than half (52%) of all the Dutch coffee shops are located in the six major cities with more than 200,000 residents, with 286 coffee shops (46%) located in Amsterdam, Rotterdam, or The Hague, which are the only municipalities with over 20 coffee shops. 10% of the coffee shops are located in municipalities with fewer than 50,000 inhabitants. Very few municipalities with under 20,000 residents have coffee shops (van Ooeyen-Houben, Bieleman, & Korf, 2014).

Discussion

Our paper contributes to the recent debate on the impact of emerging regulated markets (Uruguay, two states of the USA, and

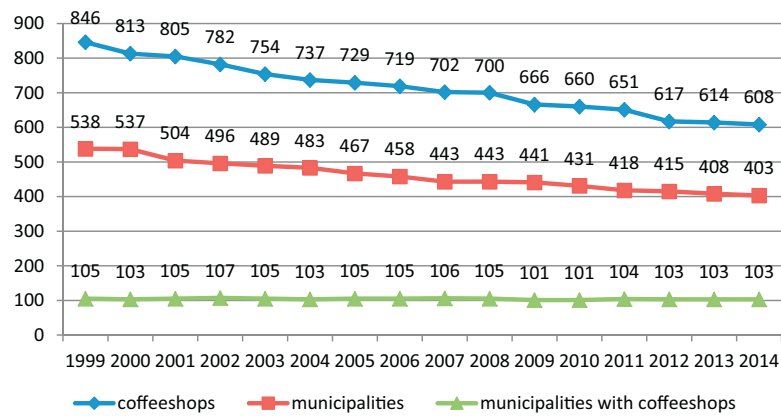


Fig. 7. Number of coffee shops, number of municipalities, and number of municipalities with coffeeshops 1999–2014.

Source: Maalsté et al. (2014).

Spain) by scrutinising whether cannabis cultivation for personal use is a deliberate user's choice and to what extent it is shaped by policy, culture, or other market factors. To cast some light on these important yet difficult questions, we studied two, at first glance, very similar policy models of partial decriminalisation. However, they show quite different emphases in terms of what is tolerated and what is enforced.

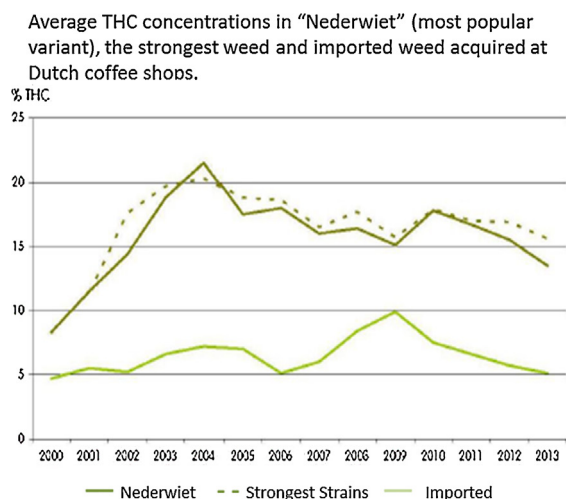
The severity of the punishment for small-scale cannabis cultivation of up to five plants is comparable for the two countries but, when the five plants limit is exceeded, the Dutch laws appear to have more serious consequences. The Czech regulations only consider the scale of the cannabis plantation when deciding whether it is exempt from criminal proceedings or not. The Dutch prosecution guidelines have recently introduced a rather arbitrary qualitative indicator of "professionalism" (the technology used in cultivation) that discourages small-scale cultivation for personal use, as many of these technologies – ventilation, heating, artificial light, irrigation, or disease control are used by just about all indoor cannabis growers – amateurs and professionals alike.

Clearly, *playing the game* – the practical implementation of policies on cannabis cultivation in both countries – differs substantially between the two countries. Five to six thousand dismantled plantations in the 16 million population-sized Netherlands contrasts strongly with about 150 dismantled plantations in the 10 million population-sized Czech Republic. In 2013, the Dutch police

estimated the total number of illegal cannabis plantations at 30,000, estimating the risk of police detection to any grower at 16–20% (RIEC, 2013).

The individual cultivator can avoid the risk of low or unknown product quality by securing his/her own. By self-supplying with cannabis, s/he also avoids interaction with illegal market players, which significantly reduces the risks of police intervention and the resulting seizure of the cannabis and/or prosecution. This could be despite the costs related to the small-scale technology of production. It will be important for his/her decision on whether (not) to grow whether or not s/he can produce at a price competitive with the market price, inclusive of its transaction costs.

Our findings clearly show that the Dutch law enforcement practice has deterred small-scale home cultivators in particular (increased their risk/costs, while the cost of "commercial" cannabis in coffee shops was relatively low), leaving the market to competitors with less of a commitment to conventional society and with more resources to avoid detection (Grund & Breeksema, 2013; Solinge, 2010). Thus, while home cultivation in the Netherlands declined, criminal organisations rapidly took over the market, and since 2008, non-professional plantations have only seldom been found. There is no doubt that the situation with the dominance of organised criminal groups is less desirable for the public than the one with small-scale growers, supplying mostly themselves and, possibly, the coffee shops (Fig. 8).



Average THC concentrations in "Nederhasj" and imported hashish in the different samples acquired at Dutch coffee shops.

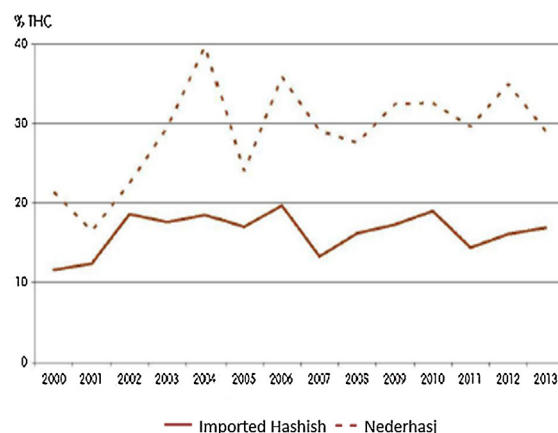


Fig. 8. Average concentrations of THC in cannabis and hashish in Netherlands, 2000–2013.

Source: Maalsté et al. (2014), Niesink and Rigter (2013).

The Dutch are justifiably considered to be the most liberal nation in Europe when it comes to commercial consumer-level transactions, but they flinched from regulating cultivation and the supply to the coffee shops (the so-called “back door problem”). Policing cannabis cultivation and supply to the coffee shops was not a policing priority for a quarter of a century after the 1976 drug policy reform. After 2000, the changing Dutch political landscape shifted the attention of politics and law enforcement to cannabis. While there was rather broad support for the coffee shops in general, the increasing association of cannabis cultivation and wholesaling with organised crime resulted in increasing financial investments in policing these two essential components of any supply chain. However, Dutch drug policy scholars contend that the government’s stricter approach after 2000 triggered the scale-up and criminalisation of the cannabis supply side (Solinge, 2010; Maalsté, 2008). This development represents a very impressive example of numerous unintended consequences of restrictive drug policies in a country where few from the outside would expect it.

Quite the reverse, the Czech police continue to dismantle growing sites run by organised crime, as well as to prosecute any known operation of cannabis sales. Nonetheless, the implementation of the policy on cultivation is substantially more liberal than in the Netherlands, resulting in a vibrant self-supply cannabis cultivation culture that extends into a “friends providing to friends” system that is large enough to compete with (internationally operating) criminal entrepreneurs.

The Czech cannabis cultivation culture emerged in response to the strict prohibition under the communist regime, when drug users started to produce their own drugs, including cannabis and injectable drugs (Grund et al., 2009; Zabransky, 2007), to compensate for the lack of imports caused by the “iron curtain”, which minimised the movement of people and goods across borders. These efforts were driven by scarcity, an important determinant of drug cultures (Agar, 1977; Grund, 1993). After the Velvet Revolution, the emerging liberal drug policy opened up the space for the further development of small-scale amateur cultivation. In the Netherlands, on the other hand, the amateur cultivators always remained a small minority. Trautmann et al. (2013) and the Global Drug Survey data suggest that only between 2 and 5% of cannabis consumers grow cannabis for their own use. Although idealistic growers and connoisseurs continue to contribute to the Dutch cannabis market, in terms of market behaviour, the players that currently dominate cannabis cultivation and the wholesale market in the Netherlands can be characterised as risk-taking individuals that thrive in the unregulated production and wholesale parts of the cannabis supply chain, using the latitude provided by the overall liberal drug policy setting.

In terms of *cannabis cultivation culture*, a concept established for the purpose of this paper, we understood it as an interplay between the drug policy, its incentives and the general culture. This is in contrast to Sandberg’s definition of cannabis culture, who presents cultural aspects of three cannabis markets – private, semi-private, and public markets, each of them possessing its own specific culture. He stipulates that in the course of the sellers’ careers, the culture preceded their market behaviour, and from this he assumes the superiority of the culture over the market behaviour. To us, however, the cannabis cultivation culture has been constructed by the specific features of historical market and policy developments. For instance, competitive market operations offer significant economies of scale. This has characterised the Dutch cannabis prices in the recent decades. Easy access to affordable cannabis in a safe and regulated environment (coffee shops) and relatively high risks when growing one or two plants above the norm have significantly reduced the incentive to grow your own. “Why bother?” would be the answer of most Dutch cannabis users.

In economic terms, the coffee shop system has protected cannabis users from the *transaction costs* of the illegal market. In contrast to the Czech situation, the costs of establishing one’s own self-supply (<5 plants) firm in the Netherlands greatly outweigh the costs associated with participating in the coffee shop market.

In the Czech Republic, on the other hand, prohibition and high prices have pushed cannabis consumers towards growing their own. Cannabis prices have only recently decreased, when competition among market players evolved. In 2010, the Czech cannabis market prices reached the point where it paid off to purchase cannabis on the market rather than to cover the costs associated with cultivating one’s own – a development that transpired rather rapidly with the rise of the coffee shops in the Netherlands several decades earlier. In the Czech Republic, outdoor cannabis cultivation remains a viable option. In the densely populated Netherlands, the options for outdoor cannabis cultivation are limited, while the new enforcement guidelines on distinguishing small-scale self-supply from professional plantations may deter minor indoor growing.

PPP-corrected Dutch cannabis prices have equalled those in the Czech Republic recently. Nevertheless, within the current policy framework Dutch cannabis consumers are exempt from the transaction costs of the illegal market. Prices would probably have to rise drastically before Dutch cannabis consumers step out of the familiar and safe coffee shop market to establish their own firms.

Although successful in many ways, over the years the Dutch model has become more susceptible to the fallout from its “blind spot,” the omission of regulating the “back door” of the coffee shops – cannabis production and the supply to the shops. The Czech experience with more tolerant policies is of more recent provenance and has spawned quite a different cannabis market and culture. However, in essence both the Czech and Dutch legislation and policies are impartial solutions, offering ample opportunities to black market entrepreneurs.

Self-suppliers meet an important part of the Czech demand for cannabis; the estimate gained from metaanalysis of relevant surveys is that 60% of Czech cannabis consumers either use cannabis grown by themselves or receive it for free, eventually from the grower (Mravcik et al., 2013), and yet, the self-supply and small-scale growing have not completely replaced commercial cultivation and wholesale and retail transactions. As a result, the Vietnamese dominate the international and purely commercial cannabis business in the Czech Republic now (Národní protidrogová centrála Policie ČR [National Drug Squad of the Czech Police], 2014).

In theory, formal institutions grow out of informal ones – this means that laws are generally product of the culture (Bardhan, 1989). Cannabis policies, however, are not “pragmatic” or “natural” in most countries around the world, as they are driven by global drug prohibition. The cultures emerging around substance use can, in fact, be a product of the rather artificially established drug policies. The Czech “friends providing to friends” tradition (or the Spanish and Belgian cannabis social clubs) are perhaps not devoid of commercial interests and incentives, but in most cases these are driven by a mixture of economic, hedonistic, policy and security motives, centring around the reduction of *transaction costs*, developing new, high-quality, and pleasant cannabis strains, protection against outside threats (from both noxious market players and drug enforcement bodies), and building communities of like-minded people, similar to beer-brewing or wine-tasting clubs. As those communities have developed quite a strict moral codex (no sharing with the under-aged, no profit above maintenance costs, etc.), the financial stimuli that are supportive of the higher prevalence of high-risk and high-frequency use of cannabis (because everyday frequent drug users, albeit small in number, representing 5–25% in the EU countries, are those responsible for

around 70% of the cannabis consumption (Trimbos Institute, RAND Europe, & ICPR, 2013) are somehow suppressed.

Although the very idea seems naïvely idealistic, the removal of high profits as a commercial motor of high cannabis consumption is at the heart of the current legalisation and regulation of both medical and recreational cannabis in Uruguay (personal communication of TZ with Julio Calzada Mazzei). We will have an opportunity to observe how viable this concept is and what its impacts will be when compared to, e.g., the one in Colorado, which is purely commercial (personal communication of TZ with Robert Booth).

Data limitations

Methodologically, this paper clearly demonstrates the irreplaceability of qualitative methods in drug policy research, both for better interpretation of the quantitative data and avoiding the “epidemiological fallacy” and for the very understanding of the everyday “living drug policies” by those targeted by them. As a synthesis of qualitative studies is by its very nature complex and vulnerable to different sorts of bias (Barnett-Page & Thomas, 2009), the mixed methods approach – a combination of quantitative and qualitative metaanalysis – is probably the best way to make sense of data from different sources.

For the Czech Republic, the EMCDDA quantitative data was used (congruent with the data presented by the Czech Annual Report on the national drug situation). Data on drug seizures and drug-related offences in the Netherlands are collected by the National Police Intelligence Service (IPOL) of the National Police Services Agency (KLPD). The KLPD/IPOL reports are not published regularly and therefore for some of the comparisons we used secondary sources that refer to these reports. These data may be distorted by several factors, including variations in registration practice and changes in the organisation of the police. The KLPD was established on January 1, 2013, merging 25 regional police forces. Before 2013, cannabis cultivation-related offences and seizure data were not consistently registered by the regional police forces. For example, in 2004, only 18 of the 25 police forces gathered data about cannabis seizures. Whether such variations in registration practice (e.g. between the larger cities and rural municipalities) are present in the Czech data is not known. Additionally, the law enforcement data, derived from seizures and arrests, are inevitably biased; not only do they represent a rather small sample compared to the number of people involved in drug-related activities and to the amount of drugs that is consumed (e.g., according to Mravcik et al. (2014), the annual consumption of cannabis is estimated at 21,400 kg in the Czech Republic, and the overall seizures were 735 kg, i.e. 3.3% of what was consumed), but it is also highly probable that the “police samples” differ from the entirety in terms of both people and commodities, simply because the work of the police is not random. Therefore, the comparisons that include police data should be interpreted with extreme caution and supplemented by other sources – both qualitative and quantitative – as much as possible.

Although both the Netherlands and the Czech Republic are relatively well developed in their parts of the EU when it comes to drug research, studies of drug markets are relatively rare and the data on them must be supplemented by different proxy indicators and studies where, again, the representativeness of the sample being studied is not guaranteed (such as with the online studies used extensively in this paper).

Nonetheless, we believe that our analysis adds to the understanding about the evolution of cannabis markets and the economic factors involved therein and that it allows some useful conclusions to be drawn.

Conclusion

Having much in common in their priorities of drug policies and *de jure* policies on small-scale cannabis cultivation, the Netherlands and the Czech Republic can learn from each other as the implementation guidelines in both countries differ, as does their enforcement.

Of course, the experiences of one country cannot always simply be applied to another. In our opinion, key criteria in applying foreign experiences ought to be their ‘fit’ with local practices and culture, and their potential to contribute to ousting criminal enterprise from the cannabis market and overall reductions in drug-related harms, including those associated with cannabis policies (such as criminal records and relatively severe punishments for relatively small and non-violent infractions without victims).

On the basis of our findings above, a few major conclusions and recommendations can be proposed for each of the countries within the current control regime as framed by the UN Drug Conventions (United Nations, 1961, 1971, 1988):

- the Dutch should design/implement measures that stimulate and regulate home growing in an orderly fashion; in other words, we believe that it is in the best interest of the Netherlands (and in accordance with its tradition of protecting public health and public order) to abandon the current measures that aim to suppress such growing and – most probably unintendedly, but effectively – “clean” the market for organised criminal groups, with all the negative consequences such cartels bring along with them;
- the Czechs should further maintain and deepen their policy supporting small-scale growing and avoid police excesses such as increased policing despite of liberalized legislation; in the current system, the only possible way would be better coordination of police activity so that it would, as much as possible, be in accord with the broader goals of Czech drug policy; in other word, the police should reflect the national drug policy strategically in their priorities in the drugs field, not to create their own policy based on partial and short-term interests;
- any country that is willing to implement pragmatic cannabis policies that minimise the harms to public health and safety shall keep in mind the importance of policies targeting cannabis cultivation; tolerance to small-scale cannabis cultivation has a potential to reduce the role of organized crime in the country and reduce the size of commercial market in its scope as well as size; the individual decisions to self-supply with cannabis, however, are dependent on the cultural context as well as past policy approaches, and on the *transaction costs* of the commercial market;
- in the mid-term, careful social and governmental support for “hedonistic connoisseur” cannabis-growing communities should be analysed legally with regard to the UN Treaties with the clear aim being to make them another experimental approach within the current space for manoeuvring. The authors of this paper deem them far more desirable than those entirely aimed at profit maximisation – whether within the law or outside it.

The ability to learn from each other’s successes and failures is more important than ever – not only for the Netherlands and the Czech Republic – on the eve of the 2016 United Nations General Assembly Special Session on the drug problem (UNGASS, 2016). Uruguay and the US states of Colorado and Washington have recently legalised cannabis for any purpose/use, regulating the entire supply chain. Another three US states decided to do so in ballots held in November 2014 (Alaska, Oregon, and Washington, DC) and at least another five US states⁴ will hold similar ballot

⁴ Arizona, California, Maine, Massachusetts, and Nevada.

initiatives in 2016. Political discussions at the highest level on thorough regulation reforms related to cannabis – and other drugs – are topical in many countries of Latin America and elsewhere, and are increasingly being brought onto the UN stage (Haase & Youngers, 2013).

Importantly, these ongoing and future resolute legal reforms – while differing in their details – should be built on the foundation of the (early) experiences with (less radical) cannabis reform in Europe. By doing so, the pioneers have taken the lead in the debate on cannabis reform and drug policy in general. Probably the most important lesson they have to take to heart is that legal reform of the cannabis situation should be comprehensive, regulating sales to consumers, wholesale supply, and cultivation so that the results of novel cannabis policies are accountable against clearly stated aims and goals – a desirable state of the art which the cannabis policies analysed in this paper still largely fail to achieve.

Funding source

IGA MZD NS/10034-4.

Role of the funding source

The funding source(s) had no such involvement in study design; in the collection, analysis and interpretation of data; in the writing of the report; and in the decision to submit the article for publication.

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The Impact of Medical Cannabis Legalization on Prescription Medication Use and Costs under Medicare Part D

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Abstract

In the past 20 years, the drive to legalize medical cannabis has gained national attention with the public and policy makers. However, little is known about whether medical cannabis is being used clinically to any significant degree. Using data on all prescriptions filled by Medicare Part D enrollees in the United States from 2010 to 2015, we find that the use of prescription drugs for which cannabis could serve as a clinical alternative fell significantly once a medical cannabis law (MCL) was put in place. Overall savings to the Medicare program when states implement MCLs are estimated to have been as much as \$638.8 million per year by 2015. Counterfactually, if all states had adopted dispensary-based MCLs by 2015, we estimate that programmatic savings would have been between \$1.4 and \$1.7 billion. The availability of medical cannabis has a significant effect on prescribing patterns and spending under Medicare Part D.

1. Introduction

In the past 20 years, the drive to legalize medical cannabis has gained national attention with the public and state policy makers. Research began to emerge in the late 1980s that cannabis has a positive effect on the lives of many people with a variety of ailments. Because cannabis is currently listed as a Schedule I drug under the Controlled Substances Act (CSA), there are significant barriers to obtaining cannabis products for clinical use or even for primary research projects studying the pharmacological and behavioral impact of cannabis use. Despite

The authors would like to thank Amanda Abraham, Grace Adams, Ernst Berndt, Karen Conway, Jason Hockenberry, Mike Paulden, Vincent Pohl, Dan Rees, Joseph Sabia, Meghan Skira, and seminar participants at the Centers for Disease Control, the Bates-White Life Sciences Conference, the University of North Carolina at Chapel Hill, the University of New Hampshire, the 2016 Association for Public Policy Analysis and Management Fall Research Conference, the American Association of Health Economists, and the American-European Health Economics Study Group for their helpful comments and suggestions.

[*Journal of Law and Economics*, vol. 61 (August 2018)]

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such barriers, 29 states and the District of Columbia had adopted laws legalizing cannabis for medical purposes by mid-2017. Surprisingly, although there is a rapidly growing literature on the spillover effects of medical cannabis laws (MCLs), few studies have examined how these state policies affect clinical care and health care spending. The first two papers to provide preliminary evidence for whether state MCLs are associated with changes in the use of prescription drugs approved by the Food and Drug Administration (FDA) find evidence consistent with the clinical use of cannabis (Bradford and Bradford 2016, 2017).

However, many questions remain unanswered regarding how MCLs may affect prescription drug use under the Medicare program. We investigate how implementing state-level MCLs changed prescribing patterns and programmatic expenditures for FDA-approved prescription drugs in nine important diagnosis categories under Medicare Part D in 2010–15. We substantially expand on the preliminary evidence provided in Bradford and Bradford (2016) in five important ways. First, we distinguish between the types of MCLs—most particularly whether they involve dispensary distribution or home cultivation—and show substantial differences in how prescription drug use responds across those types. Second, there is strong a priori reason to suspect that the impact of substance use policies, including MCLs, may differ for urban compared with rural areas, so we estimate models permitting substate heterogeneity in the response to an MCL. Third, drugs may be used on or off label, and we show that there are important MCL response dynamics that differ across this dimension. Fourth, we estimate difference-in-differences models across all states and separately for states that implemented MCLs compared with states that had not implemented an MCL as of the end of our study period. Fifth, we use a longer panel of data than was available in Bradford and Bradford (2016).

Research on the positive or negative effects of the medical use of cannabis has been mixed. Historically, opponents of legalization have cited addiction, criminal activity, status as a gateway drug, and lack of demonstrated medical value as reasons for maintaining prohibition. However, the causal links between the use of cannabis and the use of harder drugs and between medical cannabis and criminal activity have not been definitively proven. In fact, Anderson, Hansen, and Rees (2013) estimate that traffic fatalities dropped 8–11 percent following the passage of state medical cannabis legislation. The incidence of opiates detected in fatal automobile accidents has been found to be lower for men in states with an MCL than in states without an MCL (Kim et al. 2016). Related research finds evidence that suicide rates are lower for men (although not for women) in their 20s and 30s after states implement MCLs (Anderson, Rees, and Sabia 2014). These findings are representative of an unsettled literature. In general, while many questions remain to be addressed, the trend in the literature is to view the legalization of (at least) medical cannabis as a policy innovation that is more likely to increase welfare than reduce it (Anderson and Rees 2014).

One issue that has received surprisingly little attention is whether medical cannabis is being used clinically to any significant degree. As mentioned above,

only two studies examine changes in the use of prescription pharmaceuticals—for which cannabis may be a direct substitute—in response to MCLs. The first of these studies examines 4 years of Medicare Part D data and finds that implementing an MCL, without differentiating type, is associated with fewer prescriptions written for seven of nine broad diagnostic categories (Bradford and Bradford 2016). The second study examines Medicaid prescribing at the state-quarter level for the same set of drugs but over a longer time frame (2007–14), and finds broadly similar patterns of response (Bradford and Bradford 2017).

In this paper, we ask four straightforward questions. Does implementing an MCL change prescribing patterns under Medicare Part D for traditional (FDA-approved) drugs that treat conditions that cannabis may treat? Does it matter whether states authorize dispensaries as a distribution path instead of relying on home cultivation? Are MCLs equally effective within states, or do physicians in urban counties respond differently than physicians in rural counties? And what is the effect on overall spending (programmatic and patients' out of pocket), if any, from such changes?

2. The History of Medical Cannabis Policy

The landscape for medical cannabis has changed drastically in the past 4 decades. The current (illegal) status of cannabis was established in 1970 when Congress passed the CSA, which classified cannabis as a Schedule 1 drug, along with heroin and LSD. Schedule 1 status, and restrictions on where any researcher, federally funded or not, can purchase cannabis for clinical trials (known informally as the NIDA [National Institute on Drug Abuse] rule), has severely limited the amount of research on the medical applications of cannabis. Since the CSA went into effect nearly 5 decades ago, numerous unsuccessful attempts have been made to change the status of cannabis at the federal level.

The first statewide initiative that allowed access to cannabis for medical purposes passed in California in 1996 (Proposition 215); it permitted the possession and cultivation of cannabis for treatment of cancer, acquired immune deficiency syndrome, chronic pain, and “any other illness for which cannabis provides relief.” Alaska, Oregon, and Washington quickly followed California's lead and passed their own MCLs in 1998 (Marijuana Policy Project 2016). Since these pioneering pieces of legislation, 29 states and the District of Columbia (as of mid-2017) passed laws that recognize the medical efficacy of botanical cannabis and removed state criminal sanctions against patients attempting to possess it (Marijuana Policy Project 2016; Powell, Pacula, and Jacobson 2015; ProCon.org 2017; Wen, Hockenberry, and Cummings 2015). In addition to these laws, 13 states have more limited laws that recognize the medical efficacy of cannabis extracts (such as oils high in cannabidiol and low in tetrahydrocannabinol) but are not generally classified as having actual MCLs in research that explores the issue (NCSL 2018). We provide summaries of the dates of adoption of whole-plant, or botanical, cannabis laws in Table OA1 in the Online Appendix.

There is, however, significant variation in states' policies for medical cannabis (Cerdá et al. 2012). Every state that currently allows medical cannabis requires that a clinical provider (of some sort) recommend the drug and that it be recommended only if the patient presents with an approved illness (Klofas and Letteney 2012).^{1,2} Some states allow caregivers to distribute cannabis, although states differ in the definition of caregiver and with respect to how many patients each caregiver is legally allowed to manage (O'Keefe 2013; Pacula, Boustead, and Hunt 2014). The limit on legal possession also differs greatly from state to state. For example, Montana allows 1 ounce and four plants per person, while Oregon allows 24 ounces and 24 plants per person (Chu 2014).

Home cultivation of cannabis is sometimes permitted, although it may not be an ideal vector for many patients since the process for growing viable cannabis plants is burdensome (O'Keefe 2013; Pacula, Boustead, and Hunt 2014). Home cultivation might be particularly difficult for older Medicare enrollees, who are more likely to have limited mobility. It is, however, a strategy that some states employ when creating an MCL in order to circumvent current federal laws that specifically prohibit the manufacture, distribution, and sale of cannabis (Cerdá et al. 2012). Currently, 15 states allow patients to cultivate cannabis at home.³

In 2007, New Mexico became the first state to pass an MCL that formally includes state-regulated dispensaries as a source of the drug.⁴ Every state that has passed an MCL since 2009 has included some form of regulated-dispensary program (O'Keefe 2013). Currently 24 states and the District of Columbia have MCLs that include a dispensary program, although dispensaries are not yet active in some states. The distinction between access points for medical cannabis (home cultivation or dispensaries) is an important aspect of the policy that has been studied less frequently in the literature, mainly because of a lack of data. However, Pacula and Sevigny (2014) argue that researchers should model those dimensions. Consequently, we estimate models that differentiate between states that provide access only via home cultivation and states with at least one dispensary.

Finally, medical perceptions of cannabis have evolved along with state policies. In January 2017, the National Academies of Sciences, Engineering, and Medicine (NAS) published a comprehensive review of over 10,000 English-language peer-reviewed journals that examines the clinical uses of cannabis. The NAS de-

¹ These illnesses include chronic pain, nausea, cachexia, wasting syndrome resulting from human immunodeficiency virus, glaucoma, acquired immune deficiency syndrome, and cancer, among others.

² As of late 2016, eight states had approved the recreational use of marijuana for adults. Recreational access is obviously not disease conditional. However, even in states with recreational marijuana, the requirement that medical dispensaries (which are often required by state law to be separate from recreational dispensaries) be shown evidence of a medically qualifying condition remains.

³ Arizona and Nevada allow home cultivation if the patient lives 25 or more miles from a dispensary. Massachusetts allows cultivation in certain situations, such as in cases of financial hardship.

⁴ While organizations that resemble dispensaries existed in California before the formal legalization of medical cannabis in 1996, dispensaries were not formally protected under state law until 2003.

terminated that there is “conclusive evidence” that cannabis (including botanical cannabis and extracts) has clinical benefit for a number of conditions, including chronic pain (NAS 2017, p. S-10).

3. Data

We examine the use of pharmaceutical products that treat conditions for which there is some evidence that cannabis could be effective. We use three primary sources that summarize the clinical evidence: a 1999 summary of the clinical cannabis literature conducted under the auspices of the Institute of Medicine (Joy, Watson, and Benson 1999), a recent meta-analysis of the clinical uses of cannabis (Whiting et al. 2015), and the NAS report (NAS 2017). These sources highlight eight broad categories of illness for which sufficient studies support a preliminary conclusion of at least some benefit. Given the paucity of evidence from large double-blind clinical trials, we study drugs used to treat conditions for which there is some evidence—even if preliminary—of a cannabis treatment effect.

3.1. Determining Which Drugs to Study

On the basis these reviews, we examine nine diagnosis categories that either have some evidence of clinical effectiveness or are commonly cited in state legislation allowing the use of medical cannabis (even if the clinical evidence is pessimistic, as it is for spasticity). The first eight categories are anxiety disorders, depression and mood disorders, nausea, pain, psychosis, seizure disorders, sleep disorders, and spasticity. We also examine drugs used to treat glaucoma, which is a commonly cited condition in state legislation (see Table OA2 in the Online Appendix), even though the clinical literature to date does not highlight cannabis as highly promising for glaucoma. We examine the degree to which physicians changed their prescribing patterns for FDA-approved prescription drugs used to treat these broad categories under Medicare Part D. We use several steps to determine which drugs to study.

Before drugs can be marketed in the United States, manufacturers must receive approval from the FDA. Approval of a new drug is based on the submission of detailed evidence from clinical trials by the manufacturer; if the evidence establishes that the product is safe and effective, the drug is approved for marketing. Critically for this paper, when drugs are approved, they are always approved for specific diagnoses or indications. For example, when Forest Pharmaceuticals submitted approval for Lexapro (escitalopram), it requested and was given approval for the product to be used in the treatment of major depressive disorder and was required to use a label specifying that use. In subsequent years, Forest Pharmaceuticals conducted additional clinical trials and submitted evidence to expand the label to include generalized anxiety disorder as an FDA-approved on-label use.

However, clinical medicine is not so straightforward as simply treating patients according to preapproved FDA drug labels. Physicians are permitted to prescribe

a drug to treat conditions for which it is not formally approved, an off-label use. For example, beta-blockers such as atenolol, metoprolol, and propranolol have been used for decades to treat hypertension, cardiac dysrhythmias, and other conditions. Clinicians note that beta-blockers also control physical sensations associated with anxiety (such as rapid heartbeat, tightness in the chest, and trembling) and that when patients do not feel these sensations, their psychological experience of anxiety is significantly reduced. As a result, these drugs are widely prescribed off label for situational and other forms of anxiety. Lin, Phan, and Lin (2006) estimate that 52 percent of prescriptions for beta-blockers were off label from 1999 to 2002. Recent studies conclude that more than a third of all drugs prescribed in the United States are written for some off-label indication (see, for example, Bradford, Turner, and Williams 2015).

Consequently, it would not generally be sufficient to study the impact of MCLs on the use of drugs that are FDA approved to treat the conditions we consider; defining the set of drugs in that fashion could potentially exclude drugs that are used to treat the conditions in clinical practice. To address this, we gather data on prescription drug use from the Pharmacy Event Files of the Medical Expenditure Panel Survey (MEPS) maintained by the Agency for Healthcare Research and Quality.⁵ The MEPS is a longitudinal survey of individuals and households representative of the US population and conducted continuously since 1996. Approximately 35,000 individuals (representing around 12,000 households) are surveyed three times per year over a 2-year period as part of the Household Component (HC) of the survey.

One component of the MEPS HC is the Prescription Drugs event file, which records all prescriptions filled by respondents to the MEPS HC. Included in the file are details of each prescription event (an initial prescription or refill), including the First Databank (a widely cited pharmaceutical price compendium) brand (or generic) name and up to three recorded diagnostic reasons for the prescription as reported by the respondent. Diagnoses are matched to International Classification of Diseases, version 9 (ICD-9), codes by MEPS staff. Using the MEPS, it is possible to identify all drugs that are prescribed for each diagnosis code—whether the drugs are being used off label or on label. We extract all prescription events for 2007–11 and retain the prescription records that have at least one of the three-digit ICD-9 codes associated with the nine categories of conditions for which cannabis is commonly cited as a treatment. (For details of the drug selection process and a list of the initial screening ICD-9 codes, see the Online Appendix.)

After we identify the complete set of prescriptions that respondents reported were prescribed for these conditions, we eliminate the drugs that were recorded

⁵ US Department of Health and Human Services, Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, Download Data Files, Prescribed Medicines files (https://meps.ahrq.gov/mepsweb/data_stats/download_data_files.jsp).

only a few times over the 2007–11 period.⁶ The resulting data contain all prescription products used to treat the target diagnosis categories, both on and off label. We chose to restrict our data to drugs that were more closely tied to the on-label options. To compile this more conservative set of drugs, we identify those that were on label using data on FDA-approved indications for each product in the Merck Manual.⁷ We then compiled a list of drugs that were in the same drug class (using the Cerner Multum level 2 classification code) as these on-label options. These prescription drugs—one set for each condition listed above—are the basis of our main analyses. The resulting Cerner Multum Lexicon (level 2, or three-digit) drug categories in our set with at least one on-label option are listed in the Online Appendix.

This process results in some inclusions that may seem counterintuitive. For example, bupropion is used on label to treat anxiety (as Wellbutrin or its generic alternatives). However, bupropion is also used on label to treat smoking cessation (as Chantix or its generic alternatives). As a result, smoking-cessation agents appear as one of the drug classes we use to select the Medicare Part D records to include in the study. To avoid excluding some drugs that are widely used clinically to treat a target diagnosis, we chose to be inclusive in our list of candidate drug classes. So, while smoking-cessation agents would not generally be associated with treatment for anxiety or depression, they appear in our list of drug classes for which there is at least one on-label alternative. This may leave in drugs for which passing an MCL will have no theoretical effect, which will drive the estimated treatment effect toward 0. In this sense, our estimated impact of implementing an MCL will be conservative.

Thus, our primary data sets contain drugs that are both on label and off label for each of the broad diagnosis categories we study. To assess the sensitivity of our findings to the inclusion of off-label options, we also create data sets that include only drugs that are on label for each of the diagnosis categories and rerun all of our models using the restricted sets of data. Figure OA1 in the Online Appendix provides an overview of our drug selection process.

3.2. *Extracting Data on Medicare Part D Prescriptions*

Beginning in January 2006, Medicare enrollees had the option of purchasing a prescription drug benefit plan under the Medicare Part D program, which was initiated by George W. Bush's administration as part of the Medicare Modernization Act of 2003. Since 2006, enrollees who want prescription drug coverage have three basic options: enroll in Medicare Parts A and B and purchase a sep-

⁶ Many products were listed only a handful of times over the 5 years for a given diagnosis, which we assume is evidence that the use of the specific product for that condition is so nonstandard as to not warrant inclusion. We find none of these drugs that were on label for the diagnoses we studied—which provided the basis for selecting both our on- and off-label drugs—so their exclusion does not affect our final analysis.

⁷ For details, see Merck & Co., Merck Manual: Professional Version (<https://www.merckmanuals.com/professional>).

arate prescription drug plan (typically part of a retiree benefits program); enroll in a Medicare Advantage plan (Medicare Part C), which offers comprehensive inpatient, outpatient, and prescription drug coverage; or purchase a Part D plan as a supplement to the traditional Medicare Parts A and B. Part D is available to all Medicare enrollees (including the disabled), including low-income enrollees dually eligible with Medicaid, at a monthly premium cost (2016 base premiums were \$34.10) (Cavanaugh 2015). By 2015 the program had enrolled over 39 million beneficiaries, accounting for nearly 72 percent of all Medicare enrollees.

The Centers for Medicare and Medicaid Services (CMS) maintains records of all prescription drugs purchased through the Medicare Part D program in its Medicare Part D Prescription Drug Event (PDE) standard analytic file. Public-use versions of these data for 2010–12 were made available under a Freedom of Information Act request by ProPublica; CMS has an essentially identical data set available for 2013–15. The PDE data are compiled by CMS to the physician-drug level each year. Drug names are assigned by linking the national drug code to a generic or brand-name drug (where applicable) using the First Databank's drug names.⁸ The data also include basic information about the prescribing physician, including national provider identifier number, sex, specialty, and home and business addresses.⁹ The ProPublica and CMS public-use files contain data on all prescription drugs filled under Medicare by Part D enrollees (approximately 35.7 million enrollees in 2013), whether they had stand-alone Part D plans (approximately 23 million enrollees in 2013) or prescription coverage under a Medicare Advantage Prescription Drug plan (approximately 13 million enrollees in 2013).¹⁰ We retain only observations associated with physicians operating in a US state and Washington, DC; thus, prescriptions filled on overseas military bases or in a US territory are excluded.

Each record in the PDE data represents a drug prescribed by a physician in a year. Thus, each prescribing physician has as many records in the data as unique drugs that he or she prescribed in each year. The data include the number of unique prescriptions that were filled (initial prescription for the year and any refills), total days of treatment supplied, and total drug costs borne by the Medicare program. Drug costs include the amounts paid by the Part D drug plan, covered by government subsidies, and paid by any other third-party payers (including Medicaid). Importantly, costs also include any out-of-pocket payments made by the beneficiaries.

⁸ Since drugs are listed by national drug code, there are different lines of data for different formulations, for example, extended release versus immediate release, and package sizes.

⁹ In the data for 2010–12, only physicians' national provider identifier (NPI) numbers appear in the public-use Prescription Drug Event data. We merge information about physicians' characteristics and practice location with the analysis file by NPI number and the Centers for Medicare and Medicaid Services' National Plan and Provider Enumeration System.

¹⁰ Because of privacy concerns, any drug that was prescribed 10 or fewer times by a physician in any year was excluded from the public-use file (PUF) for that physician. Thus, for example, in 2013 the PUF captures 86.8 percent of all drugs filled under Part D. Missing drugs are largely those that are very rarely prescribed.

3.3. *Constructing the Data Sets for Analysis*

The Medicare Part D data (from ProPublica's Freedom of Information Act and the CMS's direct release) contain over 132.6 million physician-drug-year observations. We processed the data nine times, once for each of our diagnosis categories. During each pass through the data, we retained records associated with drugs in the class for which some on-label treatment option existed for the diagnosis category. We aggregate the drug-specific observations to the physician level. Each observation thus represents, for each physician, the total number of daily doses and the cost per daily dose of the drugs prescribed in each of the nine diagnosis categories in each year. Note that a daily dose represents the number of days' treatment dispensed, so if the standard use of a drug is two pills per day, and a prescription was dispensed in a bottle that contained 60 pills, then the prescription represents 30 daily doses. The adjustments for daily dose based on standard use are calculated by CMS and included in the raw data. We use this daily-dose measure, rather than some other measure such as the number of prescriptions written, because it captures a standardized quantity of each drug purchased.

We separate the observations into nine data sets, one for each diagnosis category. We merge the data on county-level demographics from the Health Resources and Services Administration's Area Health Resources Files to capture variables that include factors that are expected to influence the aggregate demand for drugs dispensed under Medicare Part D.¹¹ We construct a Herfindahl-Hirschman index (HHI) for Medicare Part D prescribing at the county level and an indicator variable that equals one when a prescription is filled in a state and year with an effective MCL in place (that is, where there was approval for state residents to use homegrown cannabis or purchase from a dispensary in a state where a dispensary is open). In other models, we include indicator variables for whether a dispensary is open and whether home cultivation is permitted. These MCL indicators are the key policy variables of interest. Finally, we construct year and state indicator variables.

The resulting nine data sets at the diagnosis-physician-year level are used for our main analyses. Means for the variables in the diagnosis-determined data sets are presented in Table 1. These primary data sets range from 889,201 observations to 3,924,276 observations. In addition to the main analysis, we repeated the data construction procedures outlined above, again retaining only on-label drugs to support subanalyses.

4. Conceptual Framework

From the perspective of the market for existing prescription drugs, the implementation of an MCL in a state is essentially isomorphic to introducing a new prescription option: patients and physicians then have a new (or at least newly legal under state law) treatment option that can compete with existing therapeu-

¹¹ Health Resources and Services Administration, Area Health Resources Files (<https://data.hrsa.gov/health-workforce/ahrfr>).

Table 1
Variable Means for Drugs by Approved Class

	Anxiety	Depression	Glaucoma	Nausea	Pain	Psychosis	Seizures	Sleep Disorder	Spasticity
Filled daily doses	12,288.0	10,493.1	2,794.6	10,617.2	30,894.2	12,478.9	9,726.0	8,212.1	2,024.9
Medical cannabis law	.356	.355	.340	.353	.360	.356	.360	.355	.322
Dispensary open	.240	.240	.240	.232	.236	.229	.239	.241	.218
Home cultivation allowed	.115	.115	.115	.122	.125	.116	.121	.115	.103
Prescriptions written HHI	.0166	.0169	.0188	.0175	.0152	.0165	.0161	.0168	.0237
Medicare physician HHI	.0167	.0169	.0188	.0175	.0152	.0165	.0161	.0168	.0237
Legalized recreational cannabis	.0247	.0248	.0223	.0238	.0239	.0245	.0244	.0246	.0225
Physician sex	.649	.651	.672	.623	.640	.652	.656	.654	.646
County-level variables:									
% Below federal poverty level	15.84	15.85	15.86	15.83	15.80	15.83	15.86	15.85	16.13
Median household income	53,872.4	53,799.4	53,426.7	53,936.8	54,357.3	53,922.0	54,011.0	53,799.6	51,898.2
Deaths	7,650.3	7,624.8	7,421.5	7,631.6	7,904.1	7,682.1	7,805.8	7,640.9	6,612.7
Medicare emergency department visits	653.8	654.1	655.6	654.0	653.6	653.7	654.2	653.9	660.8
% Unemployed	7.480	7.464	7.429	7.431	7.439	7.472	7.460	7.488	7.653
% Enrolled in Medicare	.0719	.0722	.0742	.0728	.0715	.0719	.0720	.0720	.0739
% Eligible for Medicare and Medicaid	22.24	22.22	22.18	22.39	22.47	22.25	22.39	22.22	22.14
% With Medicare Advantage	.318	.318	.318	.319	.320	.319	.320	.318	.309
Population	2,841,893.8	2,813,287.1	2,684,766.2	2,790,695.2	2,916,078.0	2,848,533.2	2,867,961.2	2,838,696.0	2,469,777.5
% Black	.133	.133	.132	.133	.137	.133	.135	.133	.128
% Hispanic	.155	.155	.153	.156	.158	.156	.158	.155	.146
% Other race	.0764	.0761	.0729	.0756	.0776	.0764	.0768	.0762	.0685
Rural	.0307	.0315	.0373	.0341	.0272	.0303	.0295	.0311	.0503
N	2,923,288	2,893,905	1,924,360	2,317,632	3,924,276	3,053,903	3,139,837	2,819,298	889,201

Note. Results are at the condition and physician level. State, year, and physician specialty indicator variables are not shown. HHI = Herfindahl-Hirschman index.

tic alternatives. While it is true that the new option (medical cannabis) is not covered by any insurance plan, this is not unknown for new prescription drugs and in any event would be the same as introducing a new FDA-approved drug with a very high price and thus a high copayment.

Conceptually then, our empirical model is based on a model of uncertainty and learning in the prescription drug market, as explored by Coscelli and Shum (2004) and Crawford and Shum (2005). The essential characteristics of the prescription drug market, in this framework, are that decisions are made in an environment of uncertainty and that the uncertainty is both general (namely, the average treatment effect) and individual (namely, the idiosyncratic patient response to any given drug). Patients are assumed to possess unobservable symptomatic and curative response parameters to each available drug conditioned on their clinical diagnosis. Physicians are unable to observe these parameters and so must estimate (with error) which drug would be the most effective on both dimensions. Thus, initial prescribing following diagnosis is an exercise in experimentation. The quality of any given match will vary with the diagnosis. Physicians and patients then learn about the match quality of each drug used over time. If the learned match quality falls below the expected match quality of a drug that has not been sampled, the patient will switch.

Crucially in this model, risk aversion serves as a source of switching cost and reduces the incentive to switch. This is because risk aversion generates a risk premium that increases the opportunity cost of sampling a new drug simply because the curative and symptomatic treatment effects for the untested drug are uncertain while the treatment effects are known for the sampled drug. Thus, risk aversion introduces something akin to a status quo bias: when a new treatment option is introduced, all patients may not immediately switch to it even if the average treatment profile is superior to existing options. The status quo bias will be larger where the uncertainty surrounding the average and idiosyncratic treatment effects from the new drug is greater or where the treatment effect from the currently used drug is greater (that is, where the existing match between patient and treatment is very good). It should also be noted, however, that even without risk aversion, not all patients using an therapy will switch when a new option (cannabis or otherwise) is made available. Patients' responses to therapy are heterogeneous, so the expected benefits of a new option could be lower than the observed benefits from current treatments for many patients; unless the new treatment is less costly, those patients will not switch. For these reasons, diffusion is likely to be gradual and may accelerate after time has passed and physicians acquire experience with the new drug, thereby decreasing uncertainty.

However, the model in Crawford and Shum (2005) does not take into account any demand expansion that might take place as a result of a new product being introduced. One key force in demand expansion is that when new products are available, the information sets change. Information sets may change because of advertising or because a new product stimulates discussion of the condition in the media (Bradford et al. 2006). For example, Keith (1995) and Ruben (1991)

argue that one primary effect of direct-to-consumer advertising for prescription drugs is that it alerts patients that they may have a condition or informs patients who have been diagnosed of the possibility of effective therapy, and previously undiagnosed patients go to their physician to seek treatment. Thus, even if advertising has no effect on changing any patient's demand elasticity, it could nonetheless increase consumption by bringing new patients into treatment. Medical cannabis is frequently the object of intense media coverage, which frequently includes discussions of the clinical conditions that cannabis is believed to treat (Benson 2012; Demillo 2012; Jeffries 2015; Lannom 2017; Wyloge 2010). Such media coverage can serve the same role as advertising and may be effective in stimulating demand.

These two theoretical forces work together to alter the use of existing prescription drugs in ways that either increase or decrease use. We assume that medical cannabis, like the large majority of newly approved drugs, is a net substitute for existing FDA-approved products for any given diagnosis. However, in a world characterized by heterogeneity in match quality, risk-averse patients, and changing information sets, just because cannabis is a substitute for existing products does not immediately imply that the demand for those products will fall when an MCL is in effect. When MCLs are being passed and implemented, the set of people who know or believe that they have a defined set of conditions should increase as a result of the public discourse, an effect highlighted by Keith (1995) and Rubin (1991). New information drives more people to seek medical attention, and they should have less severe illnesses on average than the population that sought treatment before the policy debate over MCLs (otherwise, they would have already sought care). So patient populations—and the population of people who can use both cannabis and existing FDA-approved drugs—increase. Once patients consult with physicians, the heterogeneity and status quo biases can come into effect. For some patients and some diagnoses, the evidence for the relative effectiveness of cannabis may be sufficiently strong that physicians overcome the status quo bias and recommend trying cannabis (although they cannot technically prescribe it); in that circumstance, consumption of FDA-approved products should decrease.

For other patients and some diagnoses, the expected treatment effect of cannabis may not be large enough to overcome the persistence in choosing prescription drugs; in that case, diagnosed patients still need to be treated and will continue to receive an FDA-approved drug. If diagnoses increase after an MCL is enacted, the use of those products may increase on aggregate (because there are more patients to use them). An example of this response involves glaucoma. There has been a great deal of popular discussion about whether cannabis can help manage glaucoma, and glaucoma is one of the most widely approved conditions in the text of states' medical cannabis legislation; however, the clinical evidence strongly suggests that while cannabis reduces intraocular pressure, the effect lasts only about an hour (Joy, Watson, and Benson 1999; NAS 2017). Thus, cannabis may complement traditional pharmacological treatment but cannot be expected to supplant it. While open-angle glaucoma, the most common form, has few symptoms un-

til the condition becomes advanced, media coverage of the belief that cannabis may treat the disease could induce people with risk factors (for example, family history, African-American or Latino ancestry, and diabetes or cardiovascular disease) to have their eyes checked. That, combined with the fact that glaucoma has very serious consequences if left untreated, suggests that we may observe an increase in diagnoses and so an increase in FDA-approved drugs for glaucoma following the implementation of an MCL.

On the other hand, with a condition like chronic pain and a great deal of popular attention and associated evidence that cannabis is effective as a therapy (according to NAS), we would expect to see a large reduction in prescription drug use as patients are diverted to try cannabis. Indeed, the effect for conditions like chronic pain may be initially muted somewhat because of risk aversion and may therefore grow larger over time as physicians and patients use cannabis and the uncertainty about average and idiosyncratic treatment effects decreases. That possibility is left for future research with data spanning longer time periods. Here we test the general predictions of this framework using data on all Medicare Part D prescriptions written in the contiguous US states from 2010 to 2015.

5. Empirical Models

5.1. General Models

We implement the conceptual model outlined above using a simple difference-in-differences regression framework estimated separately for each of the diagnostic categories: anxiety, depression, glaucoma, nausea, pain, psychosis, seizures, sleep disorders, and spasticity. Models have the general form

$$y_{ist} = \beta_0 + \mathbf{X}_{st}\beta_1 + \mathbf{Z}_{it}\beta_2 + \text{MCL}_{st}\delta + \boldsymbol{\tau}_t + \boldsymbol{\eta}_i + \varepsilon_{ist}, \quad (1)$$

where y_{ist} is daily doses filled by physician i in county s in year t (estimated separately for each category), \mathbf{X}_{st} are county characteristics, \mathbf{Z}_{it} are a set of physician characteristics, MCL_{st} is an indicator variable for whether an MCL was in effect in state s in year t , $\boldsymbol{\tau}_t$ is a vector of year indicator variables, $\boldsymbol{\eta}_i$ are a complete set of physician fixed effects, and ε_{ist} is an error term. Since the policy variable of interest (MCL) varies by state, we cluster standard errors at the state level. Dates for the effective implementation of an MCL (namely, the date on which a state's resident could feasibly obtain medical cannabis) are provided in Table OA1. For comparison, we also estimate a baseline version of equation (1) for each diagnostic category that contains only the MCL indicator, year fixed effects, and physician fixed effects (with standard errors clustered at the physician level).

Physician characteristics include sex and a set of indicator variables for specialty. State characteristics are captured by a complete set of state indicator variables.¹² County characteristics include an HHI for daily doses written by physi-

¹² We also estimated versions of the models with state-specific time trends. The results are qualitatively identical, although the MCL coefficients are somewhat larger in magnitude and are available on request from the authors.

cians at the disease-county level, an HHI for all Medicare prescribing (irrespective of diagnosis), an indicator variable for whether the county is in a state with approved recreational cannabis, percentage of residents below the federal poverty line, median household income, number of deaths, Medicare emergency department visits, unemployment rate, percentage of the population enrolled in Medicare, percentage of Medicare enrollees who were also eligible for Medicaid, percentage enrolled in Medicare Advantage plans, population, whether the county is rural (fewer than 50,000 residents), percentage of the population that is black, percentage of the population that is Hispanic, and percentage of the population that is of another race. Indicator variables for physician specialty are general and family practice, internal medicine, emergency medicine, pain medicine, psychiatry, and whether the prescriber was a nurse practitioner or physician's assistant.

Note that, because we include physician fixed effects and cluster at the state level, we must exclude the few physicians who change states during our 6-year window. The number of physicians who move varies slightly by diagnosis category but is very small. For example, in our pain-medicine category (the largest of the nine data sets), we exclude 9,936 observations (of more than 3.9 million) from the 651 prescribers who moved to another state.

The model in equation (1) is first estimated on data from all contiguous states. However, our full analysis data sets for each diagnosis category compare prescribing in three regimes: states that did not have an MCL from 2010 to 2015 ("never" states), states that adopted an MCL during 2010–15 (switching states), and states that adopted an MCL prior to 2010 ("always" states). While the MCL indicator specified in this way does represent a difference-in-differences estimate, we conduct a subanalysis by estimating equations (1) and (2) only for the never states and switching states to obtain a pure difference-in-differences effect.

Next we estimate a set of models with the same dependent variables but a policy specification of

$$y_{ist} = \beta_0 + \mathbf{X}_{st}\beta_1 + \mathbf{Z}_{it}\beta_2 + \text{DISP}_{st}\delta_1 + \text{CULT}_{st}\delta_2 + \tau_t + \eta_i + \varepsilon_{ist}, \quad (2)$$

where DISP_{st} indicates whether there is a medical cannabis dispensary open in the state in each year and CULT_{st} indicates that the state permits only home cultivation of medical cannabis in each year. Dates of dispensary openings and effective dates of home-cultivation laws are provided in Table OA1.

Finally, in terms of both accessing health care and experiencing health outcomes, rural and urban areas in the United States have remarkably different trajectories. Rural areas are much more likely to be medically underserved (Council on Graduate Medical Education 1998). The epidemic of opioid-related fatalities has shifted dramatically from urban to rural areas in the past decade (Okie 2010). In these and many other ways, rural counties are under greater health-related stressors than their urban counterparts. Not only are there fewer physicians to prescribe drugs to Medicare Part D enrollees in rural areas, but the capacity to legally access cannabis—if permitted—may also be quite different. Thus, we expect that having access to medical cannabis may affect prescription drug use

differently in rural and urban areas. To test this, we estimate the general model in equation (1) separately for physicians practicing in counties with fewer than 50,000 residents (rural counties) and those practicing in counties with 50,000 or more residents. This break is consistent with thresholds used by the Bureau of the Census in many of its reports.¹³

All of the models are estimated for the complete set of prescription drugs from Medicare Part D included in any Cerner Multum drug class for which there is at least one on-label prescription for an ICD-9 code covered under one of the nine diagnosis categories. As a final sensitivity analysis, we reestimate the first three models using the set of on-label-only options.

5.2. *Estimating Changes in Costs*

To put our ultimate findings in perspective, we conduct one additional exercise. As mentioned above, the Medicare Part D utilization data also contain information on total spending that results from the prescriptions filled; these dollar amounts include Medicare payments, government subsidies for low-income patients, and patients' out-of-pocket costs. We use these data to calculate costs per daily dose for each observation in our original drug-level data. Recall that prescription products may be assigned to multiple diagnosis categories. For example, some selective serotonin reuptake inhibitors (SSRIs) (like escitalopram) can be used to treat anxiety and depression, and the drugs appear in both the anxiety- and depression-specific diagnostic categories. If we calculate cost savings from MCLs on each file separately and add them together, we would double count the savings. Since we never observe data on patients, we cannot distinguish SSRIs (in this example) prescribed for anxiety and those prescribed for depression—there is uncertainty about which disease each daily dose is intended to treat. This becomes an issue when we want to aggregate the responses to an estimate of program-wide cost savings.

To control for uncertainty in why each dose is prescribed for drugs that have multiple uses, we estimate upper and lower bounds on the potential net total reductions in Medicare payments and patients' out-of-pocket costs for the drugs associated with states adopting MCLs. To accomplish this, we first convert our estimated change in quantity at the drug class level from equation (1) into percentage changes in daily doses by class (assigning a value of 0 where the estimated effect of an MCL is not significant at the 5 percent level or better). We then apply those percentage changes in prescription use separately to data at the drug-physician-year level in each diagnosis category. Cost savings are calculated using the observed cost (Medicare payment, patient's out-of-pocket, and low-income subsidy) multiplied by the percentage change in utilization associated with an

¹³ We also conducted sensitivity analyses in which we defined "rural" using a threshold value of the census's Rural-Urban Continuum Code; the coefficients in Table 5 are very robust to either definition. Estimates from the Rural-Urban Continuum Code-based definitions are available from the authors on request.

MCL, resulting in an estimate of the change in cost associated with an MCL for each physician-drug-year in each of the nine diagnosis categories.

We then pool the resulting predicted changes in cost into a single data set. When a physician-drug-year observation appears in more than one data set, we estimate a lower bound on the cost savings by keeping only the observation associated with the smallest change in cost and dropping all duplicates. We estimate an upper bound by repeating the process and keeping only the observation with the largest estimated cost savings and excluding duplicates with smaller estimated savings.

Finally, we repeat the exercise using models that distinguish between dispensary and home-cultivation-only MCLs expressed in equation (2). We apply the cost-reduction parameter appropriate to each observation (that is, $DISP_{st} = 1$, $CULT_{st} = 1$, or $DISP_{st} = CULT_{st} = 0$, depending on the state law operational during the year). Again, we estimate lower and upper bounds by excluding the highest or lowest duplicated cost estimates.

6. Results

Before estimating the regression models on prescribing frequency and volume, we first estimate a series of simple bivariate comparisons across observations in states and times with an MCL in effect and those without an effective MCL in place. We conduct these bivariate tests for the full sample (on- and off-label drugs). We conduct standard t -tests on differences in daily doses filled across MCL and non-MCL states for each of the clinical diagnosis categories to assess the statistical strength of the difference in the number of prescriptions filled and the number of daily doses filled. The t -tests for differences in prescriptions written are presented in Table 2. For the full sample, we find that for each clinical diagnosis category, except for glaucoma, the number of prescriptions filled fell by between 538 and 4,337 prescriptions per physician per year. These reductions were all significant at high levels of confidence, with t -statistics ranging from 11.57 to 78.03. Recall that our data represent a near census of all prescriptions filled under the Medicare Part D program from 2010 to 2015—thus, in a very real sense the differences in Table 2 represent the true differences across MCL status.

The pattern of prescription drug utilization for glaucoma differs from that of other conditions. Recall that it is possible (given the literature on direct-to-consumer advertising for prescription drugs) that glaucoma diagnoses could increase following media coverage of MCLs in a state. The observed increase in average glaucoma-related prescriptions following approval of an MCL shown in Table 2 is at least consistent with a scenario in which diagnoses increase following MCL media coverage but FDA-approved prescription use remains essential.

While the simple bivariate comparisons demonstrate that, with the exception of glaucoma, fewer daily doses for FDA-approved prescription drugs used to treat conditions in our selected diagnosis categories are filled after an MCL, this does not mean that the MCL is the causal effect. To identify a precise treatment

Table 2
Daily Doses of Drugs by Approved Class

	No MCL	MCL	Difference	<i>t</i> -Test
Anxiety	12,808.36	11,345.03	1,463.33	50.54
Depression	10,975.09	9,618.50	1,356.59	51.05
Glaucoma	2,741.32	2,898.24	-156.93	-11.57
Nausea	11,111.78	9,712.60	1,399.18	59.13
Pain	32,457.35	28,119.91	4,337.44	65.21
Psychosis	12,978.22	11,574.17	1,404.05	46.59
Seizures	10,358.50	8,600.72	1,757.78	78.03
Sleep Disorders	8,558.96	7,583.06	975.90	50.75
Spasticity	2,197.78	1,660.27	537.51	67.96

Note. Results are at the physician level. MCL = medical cannabis law.

effect and have more confidence in the association, we need to control for other factors that may be driving differences in prescribing across states that do and do not have MCLs in effect. Thus, we conduct a series of difference-in-differences analyses as specified in equations (1) and (2).

We present our MCL coefficients for the measures of prescribing using the data for all related drugs (both on- and relevant off-label drugs) in Table 3. The results for the difference-in-differences models are very consistent. For anxiety, depression, nausea, pain, psychosis, seizures, and sleep disorders in our baseline models (with MCL and time and physician fixed effects only), we find that implementing an effective MCL led to a reduction of between 533.6 fewer annual doses (for depression) to 1,652.5 fewer annual doses (for pain). When we include county and physician characteristics, the estimated effects shrink to reductions of between 363.1 annual daily doses (for depression) and 1,232.9 annual daily doses (for pain) but otherwise remain quite stable. Each of the marginal effects is significant at the 5 percent level or better, except for prescriptions for depression, which is only marginally significant at the 10 percent level. The estimated effect of an MCL on spasticity medications is statistically insignificant. As with the bivariate comparisons, physicians in states that implement any type of MCL prescribed 184.0 more annual doses of glaucoma medications, although that effect is only marginally significant at the 10 percent level.

Table 3 presents the estimated MCL effect for models that capture MCLs as a single binary indicator, restricting the analysis to states that enacted an MCL during 2010–15 and states that never had an MCL. (The number of observations for these models is, naturally, lower than that for the full samples.) The patterns for this “pure” difference-in-differences model are very similar to those for the full sample: the precision of the estimates rises substantially, and the magnitudes of the estimated MCL effects are generally larger in the samples of switching versus never states, even when county and physician covariates are included. (The pure difference-in-differences, fully adjusted, models have coefficients that are very close to those found in the baseline model for all states.)

Table 3
Daily Doses Prescribed for Diagnoses under Medicare Part D

	N	MCL	MCL	Switching and Never States	Dispensary	Home Cultivation
Anxiety	2,923,288	-946.2* (-2.45)	-731.7** (-2.83)	-967.2** (-4.45)	-966.9* (-2.22)	-720.6** (-2.88)
Depression	2,893,905	-533.6* (-1.91)	-363.1* (-1.83)	-528.3** (-3.16)	-595.2* (-1.88)	-351.8* (-1.85)
Glaucoma	1,924,360	238.3* (2.33)	184.0* (1.93)	164.3* (2.26)	149.1 (1.37)	185.7* (1.96)
Nausea	2,317,632	-663.2* (-1.86)	-511.8* (-2.05)	-661.7** (-2.90)	-1,074.6** (-2.83)	-490.6* (-2.16)
Pain	3,924,276	-1,652.5* (-1.94)	-1,232.9* (-2.01)	-1,563.7** (-2.85)	-2,343.9* (-2.50)	-1,195.6* (-2.11)
Psychosis	3,053,903	-890.2* (-2.39)	-678.1* (-2.68)	-893.5** (-4.19)	-926.1* (-2.20)	-666.8** (-2.73)
Seizures	3,139,837	-970.0** (-3.69)	-766.1** (-4.31)	-889.8** (-6.08)	-1,230.5** (-4.44)	-747.8** (-4.65)
Sleep	2,819,298	-696.4* (-2.45)	-583.5** (-2.83)	-732.3** (-4.09)	-695.0* (-2.08)	-578.1** (-2.87)
Spasticity	889,201	36.6 (.94)	19.1 (.51)	8.75 (.24)	-54.2 (-.92)	23.9 (.69)
Physician characteristics		No	Yes	Yes	Yes	Yes
County characteristics		No	Yes	Yes	Yes	Yes

Note. Values are aggregated to all prescriptions in diagnosis category by physician. All regressions include indicators for medical cannabis law (MCL) and physician and time fixed effects. Other variables included but not shown are physician's sex and the following county-level variables: Herfindahl-Hirschman index for daily doses, percentage of residents below the federal poverty level, median household income, deaths, Medicare emergency department visits, unemployment rate, percentage of the population enrolled in Medicare, percentage of Medicare enrollees eligible for Medicaid, percentage with Medicare Advantage plans, total population, percentage black, percentage Hispanic, percentage of another race, rural, and year and individual physician fixed effects. Standard errors, in parentheses, are clustered at the state level.

+ $P < .10$.
* $P < .05$.
** $P < .01$.

We also present the results from models that distinguish between dispensary-based and home-cultivation-only MCLs in Table 3. Consistent with recent research on MCLs, we find that distinguishing the type of MCL in this fashion is quite important (Pacula et al. 2015). Except with regard to glaucoma, the effect of being in a state with a functioning medical cannabis dispensary is substantially larger—by as much as a factor of 2—than being in a home-cultivation-only state. Most notably, having access to a medical cannabis dispensary results in 2,343.9 fewer annual daily doses filled for prescription pain medications (up from 1,232.9 fewer daily doses per year if a simple binary indicator is used). Whereas dispensaries, with their similarities to traditional pharmacies, are associated with large reductions in the use of prescription medications, home-cultivation-only MCLs are sometimes associated with much smaller decreases in use. While access to only home-cultivated cannabis is less common during this time period (only 11–12 percent or so of the sample are in those states), we find that it is associated with decreases in prescribing for anxiety, depression, nausea, pain, psychosis, seizures, and sleep disorder drugs.

The picture becomes somewhat more complex when we examine the sample of on-label prescriptions, the results of which are presented in Table 4. As might be expected, the magnitudes of most estimated MCL effects are somewhat different across the sample of on-label drugs compared with the sample of all drugs. The estimated effect of any MCL on doses of drugs for anxiety, depression, and spasticity is two or three times as large in the on-label-only sample than in the sample of related drugs. The effect for pain medications, for which off-label use is very high, falls by a similar factor. This emphasizes the large role that off-label prescribing plays (Bradford, Turner, and Williams 2015) and the inadequacy of examining only drugs specifically approved by the FDA for some clinical conditions; actual medical practice is too complex for that.

Table 5 presents the findings when we estimate equation (1) separately for physicians practicing in urban and rural counties using the data for all drugs (on and off label). The differences in findings between urban counties and rural counties are striking. Physicians operating in urban counties prescribe many fewer daily doses per year for anxiety, depression, nausea, pain, psychosis, seizures, and sleep disorder drugs when MCLs are in effect, with all effects statistically significant at better than the 5 percent level (except for depression, which is significant only at the 10 percent level); however, for each condition, there is no statistically significant response by physicians in rural counties. This is particularly striking for pain medications, for which urban physicians filled 1,249.7 fewer daily doses; rural physicians did not respond in any significant way after enactment of an MCL (and indeed, even the MCL point estimate for rural physicians is quite small). As before, glaucoma medications are different, with urban physicians prescribing more when MCLs are in effect (as expected) but rural physicians prescribing less. This illustrates the different nature of glaucoma treatment from the treatment of other conditions; this substate heterogeneity perhaps warrants further research.

A large portion of prescriptions for pain medications filled under Medicare

Table 4
Daily Doses Prescribed for Diagnoses under Medicare Part D: On-Label Drugs Only

	N	MCL	MCL	MCL	Switching and Never States	Dispensary	Home Cultivation
Anxiety	1,567,570	-1,670.6** (-3.29)	-1,433.4** (-4.34)	-1,771.9** (-5.59)	-1,968.3** (-4.11)	-1,415.2** (-4.31)	
Depression	1,628,727	-1,497.9** (-3.19)	-1,262.2** (-4.21)	-1,564.4** (-5.57)	-1,842.2** (-3.99)	-1,242.1** (-4.28)	
Glaucoma	292,094	384.2 (1.10)	224.7 (.57)	413.0 (1.18)	-55.3 (-.09)	230.8 (.59)	
Nausea	1,609,011	3.13 (.02)	54.9 (.36)	-19.8 (-.17)	-18.6 (-.10)	58.3 (.38)	
Pain	2,971,223	-548.2** (-3.29)	-446.0** (-3.94)	-543.7** (-5.65)	-703.3** (-3.85)	-434.7** (-4.10)	
Psychosis	1,412,185	-1,302.6** (-3.53)	-1,148.9** (-4.45)	-1,386.5** (-5.50)	-1,623.3** (-4.54)	-1,133.6** (-4.40)	
Seizures	1,534,291	-461.0** (-4.24)	-377.9** (-3.87)	-397.3** (-3.84)	-620.3** (-4.71)	-371.5** (-3.81)	
Sleep	1,071,599	-187.5** (-2.86)	-166.8** (-3.35)	-195.1** (-3.86)	-138.9 (-1.59)	-167.3** (-3.41)	
Spasticity	364,147	-124.2** (-2.68)	-121.2** (-2.76)	-143.3** (-3.09)	-221.9** (-3.62)	-114.8** (-2.91)	
Physician characteristics		No	Yes	Yes	Yes	Yes	Yes
County characteristics		No	Yes	Yes	Yes	Yes	Yes

Note. Values are aggregated to all prescriptions in diagnosis category by physician. All regressions include indicators for medical cannabis law (MCL) and physician and time fixed effects. Other variables included but not shown are physician's sex and the following county-level variables: Herfindahl-Hirschman index for daily doses, percentage of residents below the federal poverty level, median household income, deaths, Medicare emergency department visits, unemployment rate, percentage of the population enrolled in Medicare, percentage of Medicare enrollees eligible for Medicaid, percentage with Medicare Advantage plans, total population, percentage black, percentage Hispanic, percentage of another race, rural, and year and individual physician fixed effects. Standard errors, in parentheses, are clustered at the state level.
** $P < .01$.

Table 5
Daily Doses Prescribed for Diagnoses under Medicare Part D: Urban and Rural Counties

	Anxiety	Depression	Glaucoma	Nausea	Pain	Psychosis	Seizures	Sleep	Spasticity
Urban	-740.0** (-2.87)	-369.2+ (-1.85)	199.8* (2.19)	-511.1* (-2.05)	-1,249.7* (-2.03)	-685.9** (-2.72)	-774.7** (-4.31)	-587.0** (-2.89)	22.3 (.60)
Rural	-247.2 (-.22)	-35.2 (-.04)	-588.5** (-6.93)	-523.4 (-.99)	116.4 (.06)	-239.6 (-.21)	-155.1 (-.20)	-413.5 (-.49)	-87.7 (-1.65)

Note. Values are aggregated to all prescriptions in diagnosis category by physician. All regressions include indicators for medical cannabis law, physician and county characteristics, and physician and time fixed effects. Other variables included but not shown are physician's sex and the following county-level variables: Herfindahl-Hirschman index for daily doses, percentage of residents below the federal poverty level, median household income, deaths, Medicare emergency department visits, unemployment rate, percentage of the population enrolled in Medicare, percentage of Medicare enrollees eligible for Medicaid, percentage with Medicare Advantage plans, total population, percentage black, percentage Hispanic, percentage of another race, rural, and year and individual physician fixed effects. Standard errors, in parentheses, are clustered at the state level.

+ $P < .10$.

* $P < .05$.

** $P < .01$.

Part D are for opioids. Previous work using state-level analysis suggests that MCLs affect opioid prescribing under Medicare Part D (Bradford et al. 2018). We find that MCLs appear to have the effect of shifting urban patients away from pain medication—and opioid—use and so likely help address the opioid death epidemic there, but these benefits are not shared by rural patients. Thus, it is clear that there are stark differences in how MCLs impact rural populations compared with urban ones. At least for opioid-related public health battles, our findings suggest that rural patients who already disproportionately suffer from opioid abuse and death may be left out of any benefits from cannabis-induced opioid diversion.¹⁴ This disparity should be explored in more depth.

For the sake of brevity, tables with the full set of coefficients for the model in equation (1) are presented in the Online Appendix. (Full results for other models are available from the authors on request.) A number of other results are potentially interesting. Physicians generally prescribe fewer drugs in less competitive markets, as evidenced by higher values of the Herfindahl-Hirschman index (again, with the exception of glaucoma). Counties with a larger proportion of other-race residents tend to have physicians who prescribe fewer daily doses. Median household income is generally negatively associated with the number of daily doses prescribed.

Finally, we observe that physicians who operate in states with legalized recreational cannabis prescribe significantly fewer daily doses in all diagnosis categories (including glaucoma). While the magnitude of the effect is larger than the effect for MCLs, only four states and Washington, DC, approved legalization for adult use during our study period (Colorado and Washington in 2013 and Alaska, Washington, DC, and Oregon in 2015), so it is too soon to draw reliable inferences from those legalizations using our data. This is clearly an area that requires further research.

One may ask whether our estimated effects sizes are plausible. After all, we do not observe how much medical cannabis people are consuming, only how many fewer prescriptions are being filled. So it is reasonable to question whether there are enough medical cannabis patients in any state to account for what appear to be cannabis-induced reductions in prescription use. Unfortunately, estimating the number of people enrolled in Medicare Part D (who are mostly over age 65) who legally access cannabis for medical purposes in any given state is extremely difficult, given the varieties of access mechanisms (home cultivation, dispensaries, and even caregivers, which we do not explore here) and the varying degree to which states require registration.

¹⁴ According to NAS (2017), there has never been a documented death attributable to tetrahydrocannabinol or cannabis consumption. In 2014, more than 32,000 people died from prescription opioid overdoses.

7. Discussion

To date, a number of researchers have investigated a variety of negative externalities associated with MCL approval at the state level. Remarkably, there are relatively few studies that investigate the extent to which cannabis is used medically as a result of implementing MCLs. This is perhaps due to the fact that there are no data sources that combine detailed information on cannabis use with details on the use of traditional medical services. We provide evidence on the clinical effect of medical cannabis availability by examining the impact of MCLs on the use of substitute products: FDA-approved prescription drugs paid for by the Medicare Part D program.

We use nine data sets that contain annual prescription data aggregated to the physician-drug level; each data set is defined by a broad diagnosis category and contains only prescriptions in a drug class in which there is at least one product that had FDA approval to treat the condition in question. Using a series of difference-in-differences models, we compare prescribing patterns in states that did not have an MCL with states (and years) for which an MCL was in effect. In general, we find that when an MCL went into effect, prescribing for FDA-approved prescription drugs under Medicare Part D fell substantially. The only exception was for glaucoma-related drugs. One cautionary indicator in our findings for policy makers is that the response to MCLs varies significantly within a state, with urban physicians accounting for essentially all of the observed effect.

Medicare Part D is an important laboratory to use when investigating this issue. Medicare pays for an increasing proportion of the overall cost of prescriptions in the United States. According to the Kaiser Family Foundation (2017), Medicare accounted for 29 percent of prescription drug spending in 2015, a substantial increase from 18 percent in 2006. Limiting our analysis to Medicare recipients may cause some to question the generalizability of our findings to the market overall, given that many people's prior belief would be that elderly adults are the least likely group to consume medical cannabis. However, Americans over the age of 50 make up between 20 and 60 percent of medical cannabis users (Nicholas and Maclean 2016). In addition, recent evidence indicates that this proportion is increasing significantly over time and will likely continue to do so (Kaskie et al. 2017).

One remaining question is how to understand the importance of our estimated effects. The number of prescriptions decreased for all conditions except glaucoma, but how much of a change does this represent? To put our findings in perspective, we conduct the cost saving exercise outlined in Section 5.2. Table 6 presents the calculations for net savings nationally by year for actual policies. Our primary analysis in equation (1) (which includes county and physician characteristics and year and physician fixed effects) suggests that prescription drug spending in the Medicare program fell by between \$107.4 million and \$146.5 million in 2010 and that cost savings had risen to between \$314.9 million and \$440.3 million by 2015 when we model the effect of the presence of an MCL. When we allow

Table 6
Effect of Medical Cannabis Laws (MCLs) on Estimated
Annual Change in Medicare: On-Label Drugs

Year	Any Effective MCL		Dispensary and Home Cultivation		States with an MCL ^a
	Lower Bound	Upper Bound	Lower Bound	Upper Bound	
2010	-107,411,653	-146,458,775	-175,880,109	-217,081,823	15
2011	-120,288,524	-163,701,181	-193,097,920	-237,848,270	17
2012	-144,828,775	-198,062,885	-228,512,144	-275,574,800	18
2013	-188,275,009	-257,915,373	-313,815,854	-381,841,375	20
2014	-305,095,367	-426,551,908	-464,759,077	-575,016,613	24
2015	-314,907,354	-440,294,062	-513,220,213	-638,827,580	24

Note. Estimates are from baseline models that include all states. Lower bounds reflect the lowest estimated change per drug after eliminating duplications; upper bounds reflect the highest estimated change per drug after eliminating duplications.

^a Includes Alaska and Hawaii.

Table 7
Estimated Annual Change in Medicare Spending If All States Implemented a
Medical Cannabis Law (MCL): On-Label Drugs

Year	Any MCL		Dispensary-Based MCL	
	Lower Bound	Upper Bound	Lower Bound	Upper Bound
2010	-462,519,745	-626,253,401	-867,662,958	-1,065,187,192
2011	-484,742,103	-654,994,455	-905,926,995	-1,110,361,345
2012	-554,517,685	-754,055,415	-1,032,116,265	-1,249,072,978
2013	-655,141,621	-894,001,366	-1,213,571,097	-1,482,438,931
2014	-735,892,516	-1,029,525,800	-1,362,962,870	-1,711,942,247
2015	-751,436,229	-1,051,276,994	-1,391,921,386	-1,745,584,928

Note. Estimates are from baseline models that include all states. Lower bounds reflect the lowest estimated change per drug after eliminating duplications; upper bounds reflect the highest estimated change per drug after eliminating duplications.

for the nature of the MCL (dispensary versus home cultivation), the estimates increase substantially, accounting for between \$513.20 million and \$638.8 million in 2015. In 2015, these savings accrued from only 24 states with some form of implemented MCL policy.

In Table 7 we ask the counterfactual question of what programmatic savings would have been if all 50 states and the District of Columbia had in place either an undifferentiated MCL or a dispensary-based MCL during the period of our analysis. We forecast that if all states had adopted a dispensary-based MCL by 2015, Medicare Part D programmatic spending would have been as much as \$1.75 billion less than it would be with no state adoption in that year.

Such reduced spending on Medicare does not represent a pure change in welfare, as some of the figure is a transfer of costs from the program to enrollees who purchase cannabis out of pocket. But in times of significant budget pressure, the potential of saving of as much as \$1.75 billion is not trivial. Thus, while lowering Medicare program costs is not a sufficient justification for approving cannabis

for medical use—a decision that is complex and multidimensional—these savings should nonetheless be considered when changes in cannabis policy are discussed.

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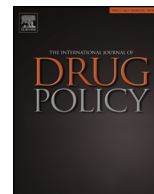
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Contents lists available at ScienceDirect

International Journal of Drug Policy

journal homepage: www.elsevier.com/locate/drugpo

Research paper

Are dispensaries indispensable? Patient experiences of access to cannabis from medical cannabis dispensaries in Canada

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ARTICLE INFO

Article history:

Received 3 January 2017

Received in revised form 7 May 2017

Accepted 22 May 2017

Keywords:

Cannabis

Medical marijuana

Access to medical cannabis

Medical cannabis dispensaries

Cannabis regulations

Canada

ABSTRACT

Background: In 2001, Canada established a federal program for cannabis for therapeutic purposes (CTP). Medical cannabis dispensaries (dispensaries) are widely accessed as a source of CTP despite storefront sales of cannabis being illegal. The discrepancy between legal status and social practice has fuelled active debate regarding the role of dispensaries. The present study aims to inform this debate by analysing CTP user experiences with different CTP sources, and comparing dispensary users to those accessing CTP from other sources.

Methods: We compared sociodemographic characteristics, health related factors and patterns of cannabis use of 445 respondents, 215 who accessed CTP from dispensaries with 230 who accessed other sources. We compared patients' ratings of CTP sources (dispensaries, Health Canada's supplier, self-production, other producer, friend or acquaintance, street dealer) for *quality and availability of product, safety and efficiency of access, cost, and feeling respected while accessing*.

Results: Patients using dispensaries were older, more likely to have arthritis and HIV/AIDS, and less likely to have mental health conditions than those not using dispensaries. Those accessing dispensaries used larger quantities of cannabis, placed greater value on access to specific strains, and were more likely to have legal authorization for CTP. Dispensaries were rated equally to or more favourably than other sources of CTP for *quality, safety, availability, efficiency and feeling respected*, and less favourably than self-production and other producer for *cost*.

Conclusion: Given the high endorsement of dispensaries by patients, future regulations should consider including dispensaries as a source of CTP and address known barriers to access such as cost and health care provider support. Further research should assess the impact of the addition of licensed producers on the role and perceived value of dispensaries within the Canadian medical cannabis system.

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For over half a century, international regulations have confined almost all cannabis access and distribution to illicit markets. However, the dramatic resurgence of interest in the therapeutic use of cannabis has invigorated debate and innovation related to the provision of cannabis for therapeutic purposes (CTP). Canada was the second country in the world to establish a federal program for CTP distribution, and Canadian CTP users have engaged both legal and illegal avenues for accessing CTP. Of these avenues,

legally prohibited storefront medical cannabis dispensaries (hereafter 'dispensaries') are one of the most widely accessed, and have garnered substantial attention from the public and policymakers. The role of dispensaries has been the subject of active and contentious debate; whereas proponents endorse the provision of a valuable health service and locate dispensaries within a tradition of conscientious civil disobedience, others have protested the illicit nature of these operations (Canadian Association of Medical Cannabis Dispensaries, 2011; Capler, 2010; Koven, 2016; Lucas, 2008). The present study adopts a patient-centred approach to comparing sources of access to CTP, with a focus on the relative status of dispensaries.

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Dispensaries have not been included as an authorized source of CTP in Canada's federal government regulations for medical cannabis to date. Pre-dating Canada's legal CTP program, and modelled after the venues that emerged in the United States following the 1996 passage of a medical cannabis ballot initiative in California, dispensaries have been in operation in select communities throughout Canada since 1997 (Capler, 2010). The primary purpose of dispensaries, also known as compassion clubs, is to provide high quality cannabis to those in medical need. Medical need is typically verified by dispensaries through documented confirmation of a medical condition for which CTP is indicated or a recommendation from a licensed health care provider (Capler & Lucas, 2006).

In 2001, a court ruling confirmed the constitutional right of Canadians to use CTP (*R. v. Parker*, 2000). In response to the ruling, the government of Canada – through the office of Health Canada – published the *Marihuana Medical Access Regulations* (MMAR), which established eligibility criteria and a process for obtaining authorization to possess and access a legal supply of CTP (Government of Canada, 2001). Applications were processed centrally by Health Canada, and successful applicants were presented with three legal options for accessing CTP: self-producing, designating another person to produce on one's behalf, and purchasing cannabis from a single private government-contracted supplier. The MMAR were in effect from July 2001 until April 2014, and were replaced by the *Marihuana for Medical Purpose Regulations* (MMPR) (Government of Canada, 2013), under which the government no longer contracted a single private company and phased out personal and designated production licenses. Instead, authorized Canadians could mail-order cannabis from commercial producers licensed by Health Canada. The regulations stipulated security and production requirements for these licensed producers. Neither the MMAR nor MMPR included dispensaries as a legal option for accessing CTP.

Notwithstanding accelerating growth in the last few years of its tenure, fewer than 5% of the more than 500,000 estimated users of CTP in Canada registered under the MMAR (Adlaf, Begun, & Sawka, 2005), indicating that the majority of Canadian CTP users accessed cannabis without federal approval. Several factors have been proposed to explain the low uptake of the MMAR, and barriers to access under this program have been well characterized (Belle-Isle & Hathaway, 2007; Belle-Isle et al., 2014). Indeed, only 7% of patients authorized under the MMAR accessed CTP exclusively from legal sources, with as many as 80% shown to obtain CTP from dispensaries (Belle-Isle et al., 2014; Walsh et al., 2013). The inadequacies of access under the MMAR, and the MMPR, resulted in several patient-led legal challenges to the program. In one such challenge, the court noted the existence of storefront medical cannabis dispensaries, which had “historically provided a safe source of marijuana to those with the medical need” (*Hitzig v. Canada*, 2003). In another challenge, the court noted that “dispensaries are the heart of cannabis access” (*Allard et al. v. Canada*, 2014). The MMPR were replaced by the *Access to Cannabis for Medical Purposes Regulations* (ACMPR) in August 2016 (Government of Canada, 2016), which reinstated personal and designated production licenses in addition to the licensed producers. Dispensaries were not included as an authorized source of CTP in the ACMPR. Currently, approximately 130,000 patients are registered with one of Canada's 43 licensed producers (Health Canada, 2017).

In 2013, when the MMPR came into effect, there were approximately 40 dispensaries nationwide, serving an estimated 40,000 patients (Canadian Association of Medical Cannabis Dispensaries, 2013). A proliferation of dispensaries in Canada followed, with national estimates from April 2016 indicating over 175 dispensaries in operation, mostly concentrated in larger urban

centres in British Columbia and Ontario (Cain, 2016; Fumano, 2016; Kari, 2016; Reid, 2016; Wilson, 2016). It is estimated that dispensaries are serving between 100,000 and 200,000 patients (Hager, 2015). In the regulatory gap for dispensaries, some dispensaries jointly developed their own self-regulation, including standards of operation and a certification program, to foster best practices and engender support from various stakeholders (Canadian Association of Medical Cannabis Dispensaries, 2014). There is a wide range of dispensary models, and they vary in the quality and types of products and services they provide. While some of these dispensaries focus exclusively on CTP users, others may also cater to non-medical users. The cannabis supplied by dispensaries is unregulated. Despite their illegal status at the federal level, tolerance for dispensaries varies considerably across jurisdictions, and some municipalities have developed licensing systems to regulate these establishments despite the federal prohibition (City of Vancouver, 2015; City of Victoria, 2016). Debate regarding the role of dispensaries has accelerated since the April 2017 introduction by the Canadian government of legislation legalizing and regulating the sale of cannabis for nonmedical use, expected to be implemented in the Summer of 2018 (Bill C-45, 2017). The Bill proposes that the provinces and territories formulate regulations for distribution and retail, which may include storefront dispensaries. Regulations for medical cannabis may be impacted by these new regulations in the future.

The present study was designed to inform the current debate in Canada surrounding the potential role of dispensaries in CTP access. To our knowledge, this study is the first to focus specifically on CTP user experiences of dispensaries, and to compare these experiences with those of accessing CTP from other legal and illegal sources, namely from friends or acquaintances, street dealers, self-production (with or without a license), other producers (with or without a license), and the government contracted producer under the MMAR. These analyses help to characterize patients accessing dispensaries by comparing them to CTP users who access cannabis from other available sources and provide novel information regarding features that distinguish dispensaries from those other sources of access. Given the dearth of empirical research investigating CTP access, and growing interest in regulating cannabis, this study provides historical context for emerging data regarding access to cannabis under new and evolving regulatory frameworks for medical and nonmedical cannabis use in Canada. This study also has the potential to inform policy development in Canada and other nations grappling with similar issues.

Methods

Participants were 445 adults drawn from the Cannabis Access for Medical Purposes Study (CAMPS; for more details of study characteristics see Walsh et al., 2013). Respondents were current users of CTP in 2011–2012 drawn from two samples; a *national* sample ($n = 366$) that completed the questionnaire online and a *local* sample ($n = 79$) that completed the survey in-person at a single British Columbia dispensary. The *local* group consisted of members of the dispensary who were either authorized to possess cannabis through Health Canada or had documented confirmation of a medical condition for which CTP shows therapeutic benefits. This recruitment strategy was selected as it allowed for comparison of the less controlled online *national* condition with the confirmed CTP users queried in-person in the *local* condition. Participants in the *local* group received a \$10 compensation and help from research assistants; participants in the *national* group did not receive financial compensation or assistance. Health Canada authorization to possess cannabis for medical purposes was reported by 30% ($n = 133$). The survey was developed by a team comprising academic researchers, representatives from community-based and

non-governmental organizations, and people who use CTP. The questionnaire consisted of 414 questions that queried demographics, CTP use, medical condition and symptoms for which they were using CTP, communications with health care providers, access to and experiences with CTP, and general indicators of health and well-being. The survey was organized in a hierarchical manner, with skip logic, such that exposure to many items was contingent on prior responses. As a result, the number of recorded responses varied across items. All reported percentages are based on number of responses to given items rather than on the entire sample. Organizations and media that serve people who use CTP assisted with promoting the online survey (e.g., Canadian AIDS Society, Canadian Aboriginal AIDS Network, dispensaries, social media). The study was approved by the Behavioural Research Ethics Board of the University of British Columbia.

We conducted two sets of analyses. In the first, we compared socio-demographic characteristics (i.e., gender, age, ethnicity, income, education), health related factors (i.e., medical condition, health status, relationship with health care provider and Health Canada authorization), and cannabis use patterns (i.e., amount of cannabis used, mode of use, and preferred type of cannabis) of respondents who accessed CTP from dispensaries exclusively or in combination with other sources ($n = 215$, 48%), to those who did not use dispensaries ($n = 230$, 52%). Comparisons were conducted using χ^2 tests for dichotomous variables and ANOVA for continuous analyses. The second set of analyses included respondents who accessed CTP from a dispensary and from at least one other source ($n = 156$) using within-person comparisons of ratings related to dispensaries relative to ratings of other sources of access (i.e., private company under contract with Health Canada, self-production, other producer, friend or acquaintance, street dealer) on a five-point Likert-type scale of their perception of *quality of product and safety of access*, their satisfaction with *availability of product, efficiency of access*, and *cost*, and their level of *feeling respected while accessing*.

Results

Descriptive statistics and comparisons of dispensary users and those not using dispensaries are displayed in Table 1. Respondents

were primarily male, European-Canadian, and ranged in age from 17 to 78 (mean age = 39.3, SD = 13.0). Comparisons identified differences across sociodemographic characteristics, health variables and cannabis use factors. With regard to sociodemographic characteristics, dispensary users were similar to those not using dispensaries with regard to gender ($\chi^2(1) = 0.22$, $p > .05$), ethnicity ($\chi^2(1) = 0.02$, $p > .05$), income ($\chi^2(1) = 3.01$, $p > .05$) and education ($\chi^2(1) = 0.05$, $p > .05$). The only demographic difference we identified was that dispensary users were older than non-dispensary users ($F(1,421) = 25.18$, $p < .01$). Regarding health variables, dispensary users were more likely to report HIV/AIDS ($\chi^2(1) = 11.00$, $p < .01$) and arthritis ($\chi^2(1) = 7.02$, $p < .01$) as the conditions for which they use CTP, whereas respondents who did not use dispensaries were more likely to report using CTP to address mental health conditions ($\chi^2(1) = 27.37$, $p < .01$). Dispensary users were also substantially more likely to have discussed CTP use with a physician ($\chi^2(1) = 75.27$, $p < .01$) and to have obtained Health Canada authorization to use CTP ($\chi^2(1) = 54.46$, $p < .01$). Dispensary users and those not using dispensaries did not differ in self-reported ratings of their health (excellent, very good, good, fair, or poor) ($\chi^2(1) = 0.32$, $p > .05$). With regard to cannabis use, dispensary users were more likely to use larger amounts of cannabis (i.e., >14 g/week) ($\chi^2(1) = 7.62$, $p < .01$), and were also more likely to value access to a specific preferred strain of cannabis ($\chi^2(1) = 5.69$, $p < .05$). Dispensary users were not more likely to value variety of strains ($\chi^2(1) = 3.46$, $p > .05$), nor did they differ from those not using dispensaries on preference for smoking cannabis ($\chi^2(1) = 0.46$, $p > .05$) or oral administration ($\chi^2(1) = 0.74$, $p > .05$).

As shown in Fig. 1, dispensaries were rated as 'good' or 'very good' on all parameters other than cost by close to or above 90% of those who used them. Most respondents who used dispensaries also accessed cannabis from other sources ($n = 156$, 73%). We conducted within-subject analyses that compared continuous scores on a 5-point scale for those who used dispensaries and another source in order to directly compare perceptions of individuals who had accessed via dispensaries and at least one other mode. The most frequently reported other source of access was from a friend ($n = 110$, 51%). Analyses comparing access from dispensaries with access from a friend indicated that access from

Table 1
Demographic, health, and cannabis use characteristics.

	All		Dispensary		Non-Dispensary	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<i>Demographic characteristics</i>						
Mean age	39.3	–	45.5**	–	36.3**	–
Male	294	67%	145	68%	149	66%
European-Canadian	408	92%	198	92%	210	92%
<\$30,000 income	210	48%	110	52%	100	44%
<High school education	188	42%	92	43%	96	42%
<i>Health characteristics</i>						
HIV/AIDS	46	11%	33**	16%	13**	6%
Arthritis	66	15%	42**	20%	24**	11%
Pain – Spinal	53	12%	25	12%	28	13%
Pain – Other	80	18%	38	18%	42	19%
Mood	78	18%	17**	8%	61**	27%
Fair/poor health	146	34%	73	36%	73	33%
Discussed CTP with physician	356	80%	208**	97%	148**	64%
Health Canada authorized	133	30%	100**	47%	33*	14%
<i>Cannabis use</i>						
>14g per day	167	41%	95**	48%	72**	34%
Access preferred strains	321	73%	167*	78%	154*	68%
Access variety of strains	357	81%	181	84%	176	77%
Smoking preferred method	259	59%	121	57%	138	60%
Oral preferred method	108	25%	56	27%	52	23%

Note: Comparisons are for each group versus aggregation of all other groups.

* $p < .05$.

** $p < .01$.

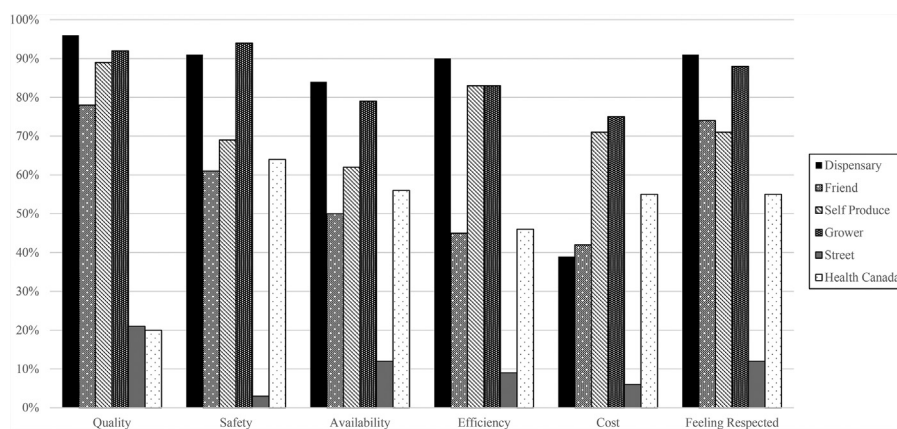


Fig. 1. Percent of respondents reporting “good” or “very good” for Quality, Safety, Availability, Efficiency, Cost, and Feeling Respected for each mode of CTP access (Dispensary, $n = 156$; Friend, $n = 110$; Self-Production, $n = 55$; Other Grower, $n = 48$; Street, $n = 32$; and Health Canada’s supplier, $n = 10$).

dispensaries was perceived to be superior with regard to the majority of parameters: Quality ($F(1,109) = 27.52, p < .01$), Safety ($F(1,108) = 35.84, p < .01$), Availability ($F(1,108) = 32.17, p < .01$), Efficiency ($F(1,108) = 65.05, p < .01$), and Feeling Respected ($F(1,106) = 65.05, p < .01$). Access from a friend was rated as equivalent to dispensaries with regard to Cost ($F(1,108) = 1.52, p > .05$). Self-production was the second most frequently reported other source of access ($n = 55, 26\%$). Self-production was rated as being inferior to dispensary access with regard to Safety ($F(1,55) = 11.93, p < .01$), Availability ($F(1,55) = 10.84, p < .01$), and Feeling Respected ($F(1,55) = 5.45, p = .02$), and was rated more favourably with regard to Cost ($F(1,55) = 35.89, p < .01$). Ratings of self-production were equivalent to dispensary ratings for Quality ($F(1,55) = 2.18, p > .05$) and Efficiency ($F(1,54) = 3.75, p > .05$). Access from other producers was reported by 22% ($n = 48$) of dispensary users and was rated as being equivalent to dispensary access with regard to Quality ($F(1,47) = 0.55, p > .05$), Safety ($F(1,47) = 0.64, p > .05$), Availability ($F(1,47) = 0.06, p > .05$), Efficiency ($F(1,47) = 0.07, p > .05$), and Feeling Respected ($F(1,47) = 0.00, p > .05$). Access from other producers was ranked more favourably with regard to Cost compared to dispensaries ($F(1,47) = 24.35, p < .01$). Access from the street was reported by 15% of those using dispensaries ($n = 32$), and was rated as being inferior to dispensary access across all parameters [Quality ($F(1,32) = 85.71, p < .01$), Safety ($F(1,32) = 142.14, p < .01$), Availability ($F(1,32) = 81.21, p < .01$), Efficiency ($F(1,32) = 119.21, p < .01$), Cost ($F(1,32) = 25.22, p < .05$), Feeling Respected ($F(1,32) = 95.96, p < .01$)]. Access from Health Canada was only reported by 5% of dispensary users ($n = 10$), which limits the value of statistical significance testing to examine differences. Nonetheless, the Quality of Health Canada cannabis was rated as inferior to dispensary cannabis ($F(1,9) = 25.14, p < .01$). Health Canada access was rated statistically equivalent to dispensary access across the remaining parameters [Safety ($F(1,10) = 2.17, p > .05$), Availability ($F(1,8) = 2.17, p > .05$), Efficiency ($F(1,10) = 3.60, p > .05$), Cost ($F(1,10) = 1.68, p > .05$), Feeling Respected ($F(1,10) = 1.54, p > .05$)].

The local sample was drawn from a single dispensary and comprised a substantial portion of those who used dispensaries (37%). To examine the extent to which differences related to dispensary use were due to overrepresentations by clients of this particular dispensary rather than to dispensaries more broadly we conducted a parallel series of analyses that excluded the local sample. Supplementary analyses excluding those in the local condition evinced an equivalent pattern of results, with only two modest divergences. In both cases the smaller sample evinced

relationships that were not evident in the inclusive sample – no relationships identified in the larger sample were absent in the restricted sample. First, in the restricted sample, dispensary users identified access to a variety of strains as being more important than did respondents who did not use dispensaries ($\chi^2(1) = 5.15, p < .05$). Second, in within-subject analyses, participants identified accessing other producer as superior to dispensary with regard to Safety ($F(1,38) = 6.17, p < .05$).

Discussion

We found that those using dispensaries and those not using dispensaries, although similar in many regards, differed on sociodemographic, health and cannabis use factors. Respondents who accessed CTP from dispensaries were older, and were more likely to have discussed CTP use with their health care provider and to have received CTP authorization from Health Canada under the MMAR. Individuals who used dispensaries were also more likely to report using cannabis to address symptoms of HIV/AIDS and arthritis, and less likely to use cannabis to treat mental health conditions. Those accessing dispensaries used greater quantities of cannabis, and placed higher importance on access to a specific preferred strain of cannabis.

Regarding age, respondents who used dispensaries were older than those not using dispensaries, perhaps reflecting that services that these dispensaries provide, such as storefront access and personalized service, may be particularly appealing to older adults. Also, Canadian census data indicate that older adults are the group least likely to use cannabis in a non-medical context (Rotermann & Langlois, 2015), perhaps due to its illegality. As such, dispensaries may be the most easily accessible source for older Canadian adults, given their relative unfamiliarity with and hence poorer access to cannabis from less formal illicit sources, and the more general barriers to obtaining legal authorization (Belle-Isle et al., 2014).

Our finding of higher levels of MMAR authorization and physician communication among dispensary users may reflect common criteria for MMAR authorization and access to dispensaries, both of which require documentation from health care practitioners. Interestingly, it appears that encouraging patient-physician communication regarding the therapeutic use of cannabis may be an unanticipated, and potentially salutary, correlate of the emergence of dispensaries. High levels of MMAR authorization among dispensary users raises the possibility that dispensaries may have encouraged MMAR registration. Despite the exclusion of dispensaries from the MMAR, some individuals may

have registered with the MMAR primarily for the legal protection it afforded them with the intention of accessing the reportedly higher-quality and greater selection provided by dispensaries, many of which accept evidence of MMAR authorization as documentation for registering patients. Further research is required to determine the extent to which this practice continues under the current ACMPR.

A prior analysis conducted with a sample that overlapped with the present sample reported higher levels of CTP-related health care practitioner communication among individuals with HIV/AIDS and arthritis (Belle-Isle et al., 2014). Our findings of greater dispensary use among these groups may be related to such communication. Arthritis and HIV/AIDS were among the first conditions included in the MMAR (Canada Gazette, 2001), and severe arthritis accounted for 65% of those authorized (Arthritis Society, 2015). Individuals with HIV/AIDS were early and active proponents of legal access to CTP in Canada, and as such the use of CTP to address symptoms related to HIV/AIDS may be relatively well recognized by health care providers (Belle-Isle, 2006; Wakeford v. Canada, 1998). In short, HIV/AIDS and arthritis may be conditions for which support from a health care practitioner – and attendant access to dispensaries – is relatively easier to obtain. Conversely, there appear to be more obstacles for obtaining support from health care practitioners for those seeking authorization to use CTP to treat mental health conditions (Belle-Isle et al., 2014), and we found that these individuals were underrepresented among dispensary users. Difficulties obtaining support from health care practitioners for mental health conditions may be a result of the relative dearth of research examining cannabis use for these conditions, and equivocal results. It has been proposed that some strains of cannabis may be beneficial while others may aggravate symptoms, possibly as a result of ratios of the cannabinoids Δ 9-tetrahydrocannabinol (THC) and cannabidiol (CBD) (Morgan & Curran, 2008; Schubart et al., 2011). Such new evidence may lead to increased health care providers support for this use. Along with the concurrent stigma related to these conditions and to cannabis use (Bottorff et al., 2013; Walsh et al., 2013; Walsh et al., 2017), the blurred boundaries between nonmedical and medicinal cannabis use may also be a deterrent for health care practitioners (Belackova et al., 2014; Ziemianski et al., 2015), perhaps more so for mental health conditions given the psychoactive effects of cannabis, and the recreational use of other substances, such as alcohol, to address symptoms such as anxiety and depression. This is concerning as it suggests that individuals with mental health conditions may have to resort to reportedly lower quality and less safe illicit sources to access CTP (Belackova, Tomkova, & Zabransky, 2016). Future research and physician education that address identified knowledge gaps may result in changes in clinical practice in this regard (Ziemianski et al., 2015), as may changes to health care practitioner requirements in the MMAR and ACMPR.

A larger proportion of dispensary clients considered access to their preferred strain to be important than those not using dispensaries. The differential therapeutic activity of distinct strains of cannabis is an understudied area of substantial scientific interest. Patients have reported that strain type is an important determinant of effectiveness (Walsh et al., 2013; Sexton, Cutter, Finnell, & Mischley, 2016), and those providing CTP, including dispensaries and licensed producers of cannabis under the MMAR and ACMPR, also make distinctions among cannabis strains they provide. Theoretical work on cannabinoid and terpenoid synergy provides a rationale for why some strains may be more effective for specific conditions (Russo, 2011; Russo & Guy, 2006; Sawler et al., 2015); the empirical clinical literature, however, remains largely mute on this topic. One difference between dispensaries and the

other sources we examined is that dispensaries are more likely to consistently offer a variety of cannabis strains. As such, our finding that those who are exposed to such consistency and variety are more likely to value access to a specific strain adds to the literature that highlights the potential importance of strain-level distinctions. Future studies that compare the therapeutic and subjective effects of distinct strains of cannabis are required to clarify this important issue.

The relatively higher quantity of CTP use by dispensary users might be related to ease of access provided by these dispensaries. Alternately, it may be that individuals who require greater quantities of CTP are also more inclined to seek dispensary services, perhaps to supplement other sources. For example, the MMAR encouraged a limit of 5 g per day, which for some patients may be insufficient. Similar limits are encouraged by some dispensaries (Canadian Association of Medical Cannabis Dispensaries, 2014), however other sources may not have purchase limits. Our data do not speak to the extent to which these differences may reflect under-dosing among those who do not use dispensaries or over-consumption by dispensary users. Longitudinal studies are required to inform the nature of this relationship. Such studies are also required to delineate the health consequences of higher quantity cannabis use; indeed, in light of recent literature on substitution effects (Bachhuber, Saloner, Cunningham, & Barry, 2014; Lucas et al., 2016), the estimation of the extent that levels of cannabis use might impact the use of other medications is required to adequately capture the consequences of quantity of CTP use. Our data also do not address possible non-medical use by those accessing different sources, nor different potencies of CTP available from different sources, both of which may affect quantities used.

Most participants who used dispensaries also used other sources. Respondents who accessed cannabis from other sources in addition to dispensaries rated dispensaries equally to or more favourably than those other sources on most of the parameters we assessed. In particular, dispensaries were rated as having superior Quality of cannabis than cannabis from friends, street sources, and Health Canada's supplier, and rated as equivalent in quality to cannabis accessed from self-production and other producers. Equivalence of dispensary quality with self-production and other producers may reflect that these sources are all focused on supplying CTP users. Indeed, although not permitted by the regulations, some producers who were licensed under the MMAR to supply specified individuals, directed their excess production to dispensaries (Lupick, 2015).

With regard to Safety and Availability, dispensaries were rated more favourably than access from friends, the street, or self-production and were equivalent to other producers and Health Canada's supplier. This suggests that third party sources specifically geared toward supplying CTP may address the perceived safety risks associated with accessing from less formal or unknown sources, particularly street sources, and may provide the best assurance of consistent availability. Whereas self-production is also focused on CTP, it may be considered less safe and reliable due to the possible attendant risk of theft or crop failure. In terms of Efficiency of access dispensaries were perceived more favourably than friend and street sources, and equivalent to self-production, designated producers and Health Canada's supplier. This also suggests that sources dedicated to CTP production may be more efficient in supplying CTP users.

The one parameter on which dispensaries received less favourable ratings was Cost. Respondents were less satisfied with the cost of cannabis from street sources, equally satisfied with the cost from friends and Health Canada's supplier, and more satisfied with the cost from self-production and other growers than with the cost from dispensaries. These findings suggest that sources that

are closest to production are able to provide CTP at the lowest cost, whereas those separated from production may incur increasing cost at each level of product transfer. Dispensaries typically purchase CTP from other producers rather than producing their own supply. However, some producers offer lower prices to dispensaries allowing them to pass on the reduced cost to those most in need of support (British Columbia Compassion Club, 2016). Finally, and perhaps unsurprisingly, CTP users felt most *Respected* when accessing CTP from self-production. They felt equally respected by dispensaries, other growers and Health Canada's supplier, and more respected accessing from dispensaries than from street and friend sources. This further suggests the value of specialized services provided by sources dedicated to CTP access. Of note, other growers were rated equally to dispensaries on all dimensions except cost, on which they were rated more favourably. Dispensaries act as intermediaries between CTP users and growers, which is necessary for those who do not have direct access. Although more costly, dispensaries may provide other services valued by clients that were not measured in this study, such as social capital and advocacy (Hathaway & Rossiter, 2007; Lucas, 2009; Penn, 2014). The parameters queried in this study were not defined in the survey, thus responses reflect respondents' perceptions. More detailed queries in future research would provide valuable information.

The limitations present in this study are those that are common to online surveys, including the potential for a single participant to register multiple responses, an unrepresentative sample, and inaccurate responding related to recall problems. These limitations are offset, however, by a relatively large sample, detailed queries of cannabis use and access, and general adherence to standards for reporting Internet-based surveys (Eysenbach, 2004). The lack of physician confirmation of medical conditions was partially offset by verification of diagnosis by the local dispensary as per their requirements, the substantial proportion of sample reporting authorization under the MMAR which also requires verification of diagnosis, as well as the detailed questions regarding medical conditions and reasons for use. Additionally, given low response rates across all parameters for Health Canada access, comparisons involving this source of access should be interpreted with caution. Findings also do not differentiate among dispensaries, which may vary in quality and types of services they provide. Indeed, a large proportion of the sample (17.8%) comes from one dispensary, which may raise questions regarding the generalizability to other dispensaries in BC and other provinces. However, similarity of results from supplementary analyses that excluded respondents from the single dispensary used for the *in person* sample suggest some consistency between the aggregated data from diverse dispensaries and from a single representative dispensary which increases our confidence that the results generalize to dispensaries across Canada. This builds on findings from a prior study of venue-based sampling through medical cannabis dispensaries which found minimal selection and respondent bias among dispensaries and survey respondents, suggesting these venues may be considered to adequately represent the greater population of medical cannabis users (Thomas & Freisthler, 2016). Similarly, since a large proportion of the sample was recruited from a dispensary, this may have led to an artificially inflated positive view of dispensaries especially since people with negative experiences with dispensaries may be less likely to be currently accessing cannabis from dispensaries. Finally, the cannabis distribution program under which these data were collected has been supplanted by a new program with additional options for access, and imminent legalization of nonmedical cannabis use in Canada prognosticates further revisions of the extant program. As such, while our findings do not directly reflect current or likely future situations in Canada,

they nonetheless have value beyond historical documentation of an obsolete system. Specifically, some of the access options at the time of this study remain options in the current medical program, and dispensaries are being considered as an option for nonmedical retail. Additionally, as one of the few nations that have provided large-scale access to medical cannabis, the results of Canada's regulatory experiments may be of interest to an international audience given the prospects for other nations to develop and regulate programs that provide access to cannabis for therapeutic and other purposes, and the dearth of research on different approaches to this controversial task.

Conclusions

This was the first study to date of patients' experience of access to CTP from dispensaries in Canada. We found differences between those who accessed CTP from dispensaries and those who did not access from this source, as well as features that distinguish dispensaries from other sources of access. First, CTP users who are older, have HIV/AIDS and arthritis, value access to specific strains of cannabis, and use greater amounts of cannabis were all overrepresented among dispensary users. As such, excluding dispensaries from current regulations has the potential to disproportionately impact these patients, and should be monitored going forward. Second, dispensary use was associated with greater levels of health care practitioner communication related to CTP, which suggests that dispensaries could potentially be integrated within existing healthcare systems in a way that accommodates patients and care providers. Third, dispensaries were widely used and well rated by respondents. Given this high level of endorsement by patients, future regulations should consider including storefront dispensaries as an authorized source of CTP. Moreover, patients gave highest ratings to dispensaries and other sources that also focus specifically on providing CTP, suggesting that specialized CTP sources may best meet patient needs. Further research is required to estimate the extent to which the addition of the licensed producers in current regulations have altered the role and perceived value of dispensaries within the Canadian medical cannabis system. Fourth, dispensaries were rated less favourably on the parameter of cost than sources of access that have less separation from the production of cannabis (i.e., self-production and other producers), suggesting that those sources are important for maintaining affordable access to CTP. Finally, it appears patient selection of CTP sources is based on a balance of different parameters and circumstances. It is instructive to note that whereas CTP users rated dispensaries equally on most parameters compared with legal sources focused on CTP, dispensary use was more widespread than the use of these other sources. To encourage the use of legal sources, new regulations must address the parameters that impact patient satisfaction as well as known barriers to access. Non-profit cannabis clubs in other jurisdictions play a similar role as intermediaries between cannabis users and growers, as well as provide an alternative to markets focused on profit, such as those established for alcohol and tobacco (Barriuso, 2011; Belackova et al., 2016; Decorte, 2015; Queirolo, Boidi, & Cruz, 2016; Subritzky, Pettigrew, & Lenton, 2016). Future regulations for cannabis access can glean from these other jurisdictions to maintain the benefits of dispensaries currently experienced by patients, while addressing some of the challenges. These findings have implications for medical cannabis policy in Canada, as well as for the potential role of dispensaries under the upcoming new regulated market for the nonmedical use of cannabis, and may also inform other jurisdictions that are developing infrastructure to support access to cannabis.

Acknowledgements

This research was supported by a grant from the UBC Institute for Healthy Living and Chronic Disease Prevention. The authors thank the people who took the time to respond to the survey and Bob Kay for facilitating local dispensary participation.

Conflict of interest: Rielle Capler was a recipient of Mitacs Accelerate internships, funded in part by Canadian Association of Medical Cannabis Dispensaries and Aphria, a licensed producer of medical cannabis. Zach Walsh is Coordinating Principal Investigator on a clinical trial of cannabis that is sponsored by Tilray, a licensed producer of medical cannabis. Kim Crosby is a paid research assistant on the Tilray-funded trial. Philippe Lucas is VP, Patient Research & Advocacy at Tilray.

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Cannabis as a substitute for prescription drugs – a cross-sectional study

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Background: The use of medical cannabis is increasing, most commonly for pain, anxiety and depression. Emerging data suggest that use and abuse of prescription drugs may be decreasing in states where medical cannabis is legal. The aim of this study was to survey cannabis users to determine whether they had intentionally substituted cannabis for prescription drugs.

Methods: A total of 2,774 individuals were a self-selected convenience sample who reported having used cannabis at least once in the previous 90 days. Subjects were surveyed via an online anonymous questionnaire on cannabis substitution effects. Participants were recruited through social media and cannabis dispensaries in Washington State.

Results: A total of 1,248 (46%) respondents reported using cannabis as a substitute for prescription drugs. The most common classes of drugs substituted were narcotics/opioids (35.8%), anxiolytics/benzodiazepines (13.6%) and antidepressants (12.7%). A total of 2,473 substitutions were reported or approximately two drug substitutions per affirmative respondent. The odds of reporting substituting were 4.59 (95% confidence interval [CI], 3.87–5.43) greater among medical cannabis users compared with non-medical users and 1.66 (95% CI, 1.27–2.16) greater among those reporting use for managing the comorbidities of pain, anxiety and depression. A slightly higher percentage of those who reported substituting resided in states where medical cannabis was legal at the time of the survey (47% vs. 45%, $p=0.58$), but this difference was not statistically significant.

Discussion: These patient-reported outcomes support prior research that individuals are using cannabis as a substitute for prescription drugs, particularly, narcotics/opioids, and independent of whether they identify themselves as medical or non-medical users. This is especially true if they suffer from pain, anxiety and depression. Additionally, this study suggests that state laws allowing access to, and use of, medical cannabis may not be influencing individual decision-making in this area.

Keywords: cannabis, marijuana, prescription drugs, pain, analgesics, opioid

Introduction

The past two decades have brought about a prodigious change in state laws and social policies regarding the use of cannabis for medical and other purposes. Twenty-eight states and the District of Columbia currently enforce legalized medical cannabis laws. Eight of these states and the District of Columbia have also legalized cannabis for recreational use.¹ Among other factors, these legislative and policy changes have resulted in shifts in social acceptance and cannabis use patterns in the US population, some of which have been driven by a growing understanding of the medicinal value of cannabis.²

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According to the Center for Behavioral Health Statistics and Quality (CBHSQ), past-month use of cannabis has risen steadily each year in the general population from 5.8% in 2007 to 8.4% in 2014. In 2015, an estimated 22.2 million of >265 million Americans aged ≥ 12 years reported having used cannabis in the past month (8.3%).³

In addition to changing use patterns, recent research suggests that physicians' drug prescribing patterns may also be changing in states with legalized medical cannabis. Bradford and Bradford⁴ reported a drop in filled prescriptions in such states between 2010 and 2013 for drugs under Medicare Part D for the treatment of conditions such as pain, anxiety, depression and others. The US Centers for Disease Control and Prevention (CDC) has issued federal guidelines on the long-term use of opiates, noting concerns that there may be negative unintended consequences associated with dose reduction, such as patients switching to the use of heroin.⁵ An alternative for patients with chronic pain is switching to the use of cannabis to navigate dose reduction and to treat their pain and/or comorbid conditions outright.⁶ A recent open-label, prospective study suggests that medical cannabis may decrease opioid use and benefit patients with treatment-resistant pain.⁷

Here, we analyzed self-reported data for frequency of prescription drug substitution with cannabis use across sociodemographic characteristics, prescription drug class, state legalization policies for medical cannabis and global quality of life health scores.

Methods

Survey

The institutional review board (IRB) of Bastyr University approved the protocol. Procedures were in accordance with the ethical standards of the Declaration of Helsinki, as revised in 2008. Documentation of consent was waived in accordance with Department of Health & Human Services regulation 45 CFR 46.117(c) by the IRB of Bastyr University on the basis that the research presents no more than minimal risk of harm. The only record linking the subject with the research would be the consent document, and thus, the principal risk would be potential harm resulting from a breach of confidentiality. A literature review was conducted to identify existing epidemiological surveys of cannabis use.⁸⁻¹³ The authors developed a novel questionnaire by assessing the strengths and weaknesses of existing surveys to meet the goals of this study. Drafts were circulated to physician researchers and cannabis users for feedback in an iterative process. The final survey consisted of 44 structured questions answered by yes/no, multiple choice, open-ended

response fields and rating scales.¹⁴ These included patient-reported outcomes (PROs) using the PROMIS® Global Health 10-item short form (part of a National Institutes of Health [NIH] initiative to produce validated, self-reported item banks for physical, mental, emotional and social health) to measure overall well-being. Study data were collected and managed using Research Electronic Data Capture (REDCap), a secure tool allowing participants to directly enter responses.¹⁵

Subjects were a self-selected convenience sample who accessed the survey through links posted on the Center for the Study of Cannabis and Social Policy and Bastyr University websites, a Facebook page, flyers in Washington State cannabis dispensaries or word of mouth from December 2013 to January 2016. Recruitment strategies included Bastyr University medical students circulating the survey through their own social media, by distributing IRB-approved fliers to local medical cannabis dispensaries in Washington State, through public lectures describing the questionnaire at King County Library Systems locations, in an article written for an online Cannabis magazine and through an article posted to an online group located at momswithms.org. The only inclusion criterion was having used cannabis at least once in the past 90 days. A total of 31 respondents from the 2,864 respondents were deemed ineligible and excluded based on this criterion. Another 14 were excluded for failure to answer the eligibility question. To minimize risk to participants, no identifying information was collected. Individuals were given the opportunity to provide a five-digit code that enabled repeat responses to be identified with only the first response analyzed. A total of 389 (10.4%) individuals failed to provide this code and were included in the final analysis. A total of 45 repeat responders were identified and deleted, leaving a total of 2,774 eligible respondents. Individuals were told that they could skip any question(s) they did not wish to answer. Those who refused to provide a five-digit code were included based on the rationale that fear of lost anonymity is more likely to motivate response refusal than repeat participation.

Data sources and measurement

Prescription drug substitution was evaluated by asking survey respondents, "Have you ever used cannabis as a substitute for prescription drugs (yes/no)?" If the respondent answered in the affirmative, an open-ended response field was available with the instructions, "Please list prescription drugs that you have substituted cannabis for:".

If a specific number of prescription drugs were entered into the open-ended response field, values were coded as the

number of drugs per category. For example, “opiate pain killers (Roxicet, Percocet, Vicodin) and benzos (Xanax)” was counted as three substitutions in the drug category of narcotics/opioids and one substitution in the drug category of benzodiazepines. If a specific number of prescription drugs were not entered, values were coded as the number of drug categories. For example, “opiates and pain killers, muscle relaxants, anti-anxiety meds and depression meds” was counted as one substitution for the following four drug categories: narcotics/opioids, muscle relaxants, anxiolytics and antidepressants.

All nonspecific drug entries mentioning “anxiety” (e.g., “anxiety meds”) were categorized as anxiolytics and then combined with drugs in the benzodiazepines category to form the broader category of anxiolytics/benzodiazepines. Combination drugs were recorded in multiple categories where appropriate, except for combinations of opioids and non-steroidal anti-inflammatory drugs (NSAIDs). Generic values like “pain medicine” were categorized as narcotics/opioids, as opposed to NSAIDs/non-opioid analgesics. Generic values like “prescription headache medication” were categorized as anti-migraine, despite the absence of language confirming the headaches were actually migraines.

Drugs available over the counter (OTC), and entered with specific names, were recorded as prescription drugs. For example, “ibuprofen” was assumed to be prescription ibuprofen, given the nature of the question(s) in the survey.

Type of cannabis use was determined by asking the question, “What kind of user do you consider yourself to be?” Respondents were given four, non-mutually exclusive options: “recreational user”, “medically indicated, recommended by licensed provider”, “medically indicated, self-prescribed” and “religious (e.g., Rastafari)”. For the purposes of this analysis, medical cannabis users were defined as those respondents identified as either “medically indicated, recommended by licensed provider” or “medically indicated, self-prescribed”, including those who were also identified as a “recreational user”.

Data analyses

Data analyses were conducted using SAS University Edition (SAS 9.4; SAS Institute Inc., Cary, NC, USA). Univariate and bivariate comparisons were conducted using PROC FREQ and chi-square tests. Odds ratios (ORs) were used to estimate strength of association using PROC LOGISTIC. Patient-Reported Outcomes Measurement Information

System (PROMIS) scores were calculated using the recommended scoring method that calibrates each score to a US national mean of 50 and standard deviation (SD) of 10.¹⁶ T-scores were calculated for only those respondents who answered all questions of the short form. Mean differences between PROMIS mental health and PROMIS physical health scores were computed using a two-sample *t*-test using PROC TTEST. Statistical significance was assessed using an alpha value of 0.05. Figures were produced using Microsoft Excel for Mac, version 15.27.

Results

Demographics

A total of 2,774 respondents were included in the final study population. A majority of respondents were males (55.72%), aged <36 years (62.71%), Caucasian (86.13%), residing in the US (83.02%) and identifying themselves as medical cannabis users (59.81%; Table 1). All 50 US states and >42 countries were represented in the survey. Just over half of respondents reported residing in the following states: Washington (32.50%), California (8.47%), Oregon (5.89%) or Colorado (4.27%).

A total of 1,248 respondents, or ~46% of respondents, responded affirmatively to the question, “Have you ever used cannabis as a substitute for prescription drugs?” The odds of reporting substituting cannabis for prescription drugs increased with age, up to 65 years of age (Table 2). The odds of reporting substituting were 1.21 (95% confidence interval [CI], 1.04–1.40) greater among females than males and 1.58 (95% CI, 1.00–2.48) greater among Native American/Asian/Pacific Islanders than Caucasians. Geographically, the odds of reporting substituting were greater among those residing in Canada (OR, 1.20; 95% CI, 0.82–1.76) and lesser among those residing in Europe (OR, 0.93; 95% CI, 0.72–1.21) as compared to those residing in the US. These geographical comparisons were not statistically significant.

Substitution for prescription drugs

A total of 1,248 respondents reported a total of 2,473 substitutions of prescription drugs. This represents approximately two drug substitutions per affirmative respondent. The most common classes of drugs substituted were narcotics/opioids (35.8%), anxiolytics/benzodiazepines (13.6%) and antidepressants (12.7%; Figure 1). Substituting cannabis for narcotics/opioids was 2.6 times more frequent than substituting cannabis for anxiolytics/benzodiazepines, the second most commonly substituted drug category.

Table 1 Sociodemographic characteristics of survey respondents during 2016 (n=2,774)

Characteristic	n (%)
Gender	
Male	1,529 (55.72)
Female	1,215 (44.28)
Missing	30
Income: last 12 months	
<\$20,000	548 (20.45)
\$20,000–40,000	644 (24.03)
\$40,000–60,000	456 (17.01)
\$60,000–80,000	298 (11.12)
\$80,000–100,000	258 (9.63)
\$100,000–150,000	268 (10.00)
>\$150,000	208 (7.76)
Missing	94
Highest level of education	
Less than eighth grade	9 (0.33)
Grade 9–11	90 (3.28)
High school/GED	771 (28.14)
Technical school	307 (11.20)
Associate	404 (14.74)
Bachelors	793 (28.94)
Masters	234 (8.54)
Doctorate	132 (4.82)
Missing	34
Age (years)	
≤21	453 (16.62)
22–35	1,256 (46.09)
36–50	601 (22.06)
51–65	361 (13.25)
>65	54 (1.98)
Missing	49
Current employment	
Full time	1,425 (52.10)
Part time	577 (21.10)
Unemployed	372 (13.60)
Retired	116 (4.24)
Disabled	245 (8.96)
Missing	39
Race/ethnicity	
Caucasian	2,354 (86.13)
Black/African–American	45 (1.65)
Hispanic	99 (3.62)
Native American	36 (1.32)
Asian/Pacific Islander	43 (1.57)
Other	156 (5.71)
Missing	41
Geography	
US	2,234 (83.02)
Canada	110 (4.10)
Europe	266 (9.90)
Other	81 (3.01)
Missing	83
Type of user	
Medical	1,659 (59.81)
Non-medical	1,115 (40.19)
Have you ever used cannabis as a substitute for prescription drugs?	
Yes	1,248 (45.55)
No	1,492 (54.45)
Missing	34

Abbreviation: GED, General Educational Development.

Table 2 Odds of reporting ever having used cannabis as a substitute for prescription drugs by sociodemographic characteristics during 2016 (n=2,740)

Characteristic	Yes (n=1,248) n (%)	No (n=1,492) n (%)	OR (95% CI)
Age (years)***			
≤21	185 (41.29)	263 (58.71)	1.00 (reference)
22–35	542 (43.29)	710 (56.71)	1.09 (0.87–1.35)
36–50	300 (50.59)	293 (49.41)	1.46 (1.14–1.86)
51–65	190 (53.52)	165 (46.48)	1.64 (1.24–2.17)
>65	16 (31.37)	35 (68.63)	0.65 (0.35–1.21)
Missing	15	60	
Gender*			
Male	661 (43.63)	854 (56.37)	1.00 (reference)
Female	581 (48.30)	622 (51.70)	1.21 (1.04–1.40)
Missing	6	50	
Race/ethnicity			
Caucasian	1,064 (45.65)	1,267 (54.35)	1.00 (reference)
Black/African American/ Hispanic	64 (44.44)	80 (55.56)	0.95 (0.68–1.34)
Native American/ Asian/Pacific Islander	45 (56.96)	34 (43.04)	1.58 (1.00–2.48)
Other	65 (42.48)	88 (57.52)	0.88 (0.63–1.22)
Missing	10	57	
Geography			
US	1,002 (45.50)	1,200 (54.50)	1.00 (reference)
Canada	55 (50.00)	55 (50.00)	1.20 (0.82–1.76)
Europe	116 (43.77)	149 (56.23)	0.93 (0.72–1.21)
Other	40 (50.00)	40 (50.00)	1.20 (0.77–1.87)
Missing	35	82	
Type of user			
Non-medical	269 (24.43)	832 (75.57)	1.00 (reference)
Medical	979 (59.73)	660 (40.27)	4.59 (3.87–5.43)
Missing	0	0	

Notes: p-values for the above comparisons were the result of chi-square analyses. *p<0.05 and ***p<0.001.

Abbreviations: OR, odds ratio; CI, confidence interval.

Medical versus non-medical users

The odds of reporting substituting were 4.59 (95% CI, 3.87–5.43) times greater among self-identified medical cannabis users as compared to non-medical cannabis users. Approximately one-quarter (24.43%) of non-medical users reported substituting cannabis for prescription drugs (Table 2).

The relationship between user type (ie, medical or non-medical) and frequency of reported substitution was assessed independently for males and females and for different categories of age. The odds of substituting were more than six times greater (OR, 6.09; 95% CI, 4.65–7.80) among female medical users than among female non-medical users. Similarly, the odds were 3.7 times (95% CI, 2.91–4.57) greater among male medical users. A trend in the odds of substituting among medical users was also seen with increased age (Table 3).

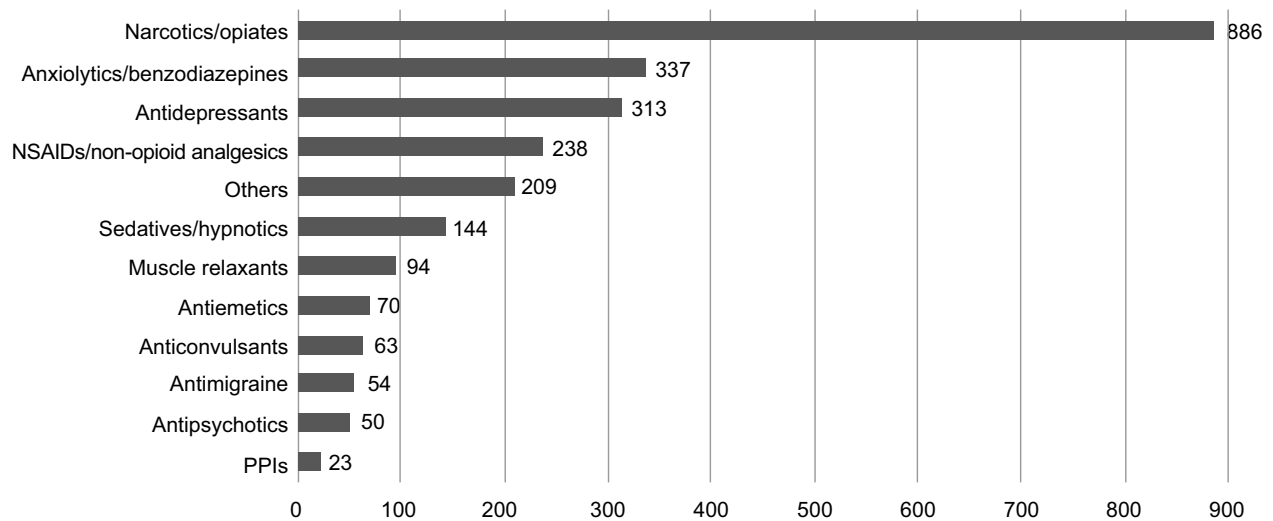


Figure 1 Number of reported prescription drug substitutions, by drug category, during 2016 (n=2,473).
Abbreviations: PPI, proton pump inhibitor; NSAIDs, nonsteroidal anti-inflammatory drugs.

Table 3 ORs and 95% CIs of reporting ever having used cannabis as a substitute for prescription drugs by user type, stratified by selected sociodemographic characteristics, during 2016 (n=2,740)

Characteristic	Medical user, OR (95% CI)
Gender	
Female	6.09 (4.65–7.80)
Male	3.67 (2.91–4.57)
Age (years)	
≤21	4.79 (3.20–7.18)
22–35	3.72 (2.92–4.73)
36–50	5.32 (3.63–7.78)
51–65	16.19 (6.75–38.79)
>65	NA

Notes: Reference, non-medical user. NA, insufficient data in one cell.
Abbreviations: OR, odds ratio; CI, confidence interval; NA, not applicable.

Comorbidities

We previously reported in an earlier survey that of 1,429 respondents, 61% reported using cannabis for managing pain, 58% reported using cannabis for anxiety and 50% reported using cannabis for depression.⁶ In the current analysis, these same conditions were also the most commonly reported conditions by respondents. Of the 1,040 participants reporting pain and/or intractable pain, 619 (59.52%) reported depression and anxiety as comorbidities. As such, the odds of reporting substituting cannabis for prescription drugs were more than one and a half times greater (OR, 1.66; 95% CI, 1.27–2.16) among those reporting using it to manage pain, anxiety and depression than among those using it to manage only one of the three conditions.

States with legalized medical marijuana

A slightly higher percentage of those who reported substituting resided in states where medical cannabis was legal at the time of the survey (47% vs. 44%, $p=0.47$). This difference was not statistically significant.

PROMIS Global Health

The 10-item short form developed and published by PROMIS was used to arrive at a bottom-line indicator of self-reported health status. By summing the physical and mental health scores separately (using only participants with complete data on each subscale), the standard PROMIS raw score to T-score conversion allowed for comparing our sample with the general population. The distributions are standardized such that a score of 50 represents the mean for the US general population, with an SD of 10 points. A total of 1,186 respondents (43%) provided complete information for the 10-item short form. For mental health, the sample scored 39.34 (SD=5.05; 95% CI, 39.15–39.53). For physical health, the sample scored 40.26 (SD=3.94; 95% CI, 40.11–40.41), placing these respondents below average for global mental health and global physical health as compared with the general population. Those reporting substituting cannabis for prescription drugs scored similar to the overall sample population (mental health, mean: 39.75 [SD=5.32; 95% CI, 39.45–40.05]; physical health, mean: 39.80 [SD=4.00; 95% CI, 39.57–40.02]). In terms of the PROMIS raw scores (i.e., non-T-score-converted scores), those who reported substituting had slightly higher mental health scores (mean difference: 0.31; $p<0.001$) and slightly lower physical health scores

(mean difference: -0.31 , $p < 0.001$) than those who denied substituting (Figure 2).

Sensitivity analysis

A total of 389 respondents failed to provide a 5-digit code anonymously identifying themselves as unique respondents. When excluded from the analysis, the percentage of respondents reporting ever using cannabis as a substitute for prescription drugs increased from 45.55% ($n=1,248$) to 46.28% ($n=1,094$), an increase of 1%.

The odds of reporting substituting among medical users versus non-medical users decreased from 4.59 (95% CI, 3.87–5.43) to 4.54 (95% CI, 3.78–5.45), a decrease of 1.5%. Finally, while the total number of prescription drug substitutions by drug category decreased from 2,473 to 2,160, the per respondent substitution ratio remained two substitutions per respondent.

Discussion

The purpose of this study was to examine whether, and how often, cannabis users report substituting cannabis for prescription drugs. Overall, these PROs underscore four key points: 1) individuals are substituting cannabis for prescription drugs, independent of whether they identify themselves as medical users (medical users are doing so at almost five times the odds of non-medical users) and independent of legal access to medical cannabis; 2) this practice increases in frequency with age, up to 65 years, and is more common in females, particularly female medical users, and Native American/Asians/Pacific Islanders; 3) the most common classes of substitution were narcotics/opioids, anxiolytics/benzodiazepines and antidepressants; and 4) the odds of reporting substituting cannabis for prescription drugs were

more than one and a half times greater among those reporting the use of cannabis to manage pain, anxiety and depression than among those using it to manage only one of these three conditions. Stated differently, pain, anxiety and depression seem to represent a comorbidity triad that is associated with greater substitution frequency.

These data are in line with previous research suggesting that cannabis is commonly used as a substitute for prescription drugs. For example, in 2013 and 2016, Lucas et al^{17,18} found that 68% of 259 and 87% of 410 physician-authorized medical cannabis users in Canada reported substituting cannabis for alcohol and illicit or prescription drugs, respectively. In 2017, Lucas and Walsh¹⁹ found that 63% of 271 such subjects reported substituting cannabis for prescription drugs such as opioids (30%), benzodiazepines (16%) and antidepressants (12%), representing the same top three categories as data presented here. These findings also agree with our previous data showing that medical cannabis users report using cannabis most frequently to manage pain, anxiety and depression.⁶ The present study contributes to a greater understanding of substitution across specific classes of prescription drugs in a largely US-based sample, in a much larger cohort and cross-section, occurring among both medical and non-medical subjects, and in areas without legal access.

While the results of research on the effects of cannabis for medical use have been largely mixed, our previous study indicated that patients reporting using cannabis for managing pain are experiencing adequate symptom relief.⁶ In 2016, Boehnke et al conducted a survey at a medical cannabis dispensary and found a 64% decrease in opioid use among those reporting using cannabis for chronic pain ($n=118$). Respondents also reported a reduction in other classes of drugs, including antidepressants and NSAIDs, as well as a

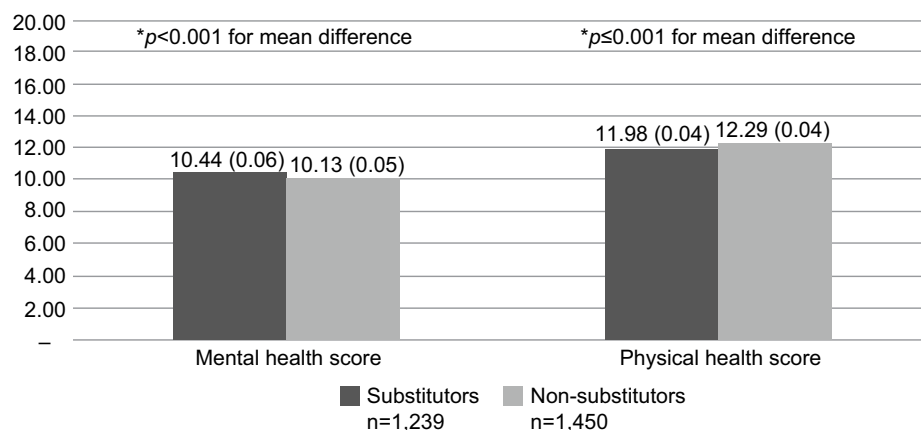


Figure 2 PROMIS Global Health short form: physical and mental health scores (mean [SE]; cannabis substitutors versus non-substitutors, 2016; raw scores [i.e., non-T-score corrected]).

Notes: Maximum score=20 for each domain. High scores reflect better functioning.

Abbreviations: PROMIS, Patient-Reported Outcomes Measurement Information System; SE, standard error.

decrease in the number of side effects of medications.²⁰ This study highlights differences between those with the comorbidities of pain, anxiety and depression and those with only one of the morbidities.

This team previously reported that in a survey of 1,429 medical cannabis users, 61% reported cannabis use for pain, 58% reported cannabis use for anxiety and 50% reported using cannabis to manage depression.⁶ In 2016, Dale and Stacey²¹ reported that those using cannabis for pain were more likely to be substituting for prescription drugs. In 2017, Walsh et al published a review of medical cannabis and mental health to try to better understand how medical cannabis use may impact areas of potential concern for clinicians. “Relaxation and relief of anxiety” and “relief of negative mood” or depression were among the most widely reported conditions in 60 publications included in their analysis.²² Because it is common for chronic pain patients to be prescribed combinatorial pharmacotherapy to address comorbidity with depression and/or anxiety, it is largely unknown how often patients may be discontinuing prescription medications when initiating cannabis use.²¹ Doctors need to have open communication with their patients regarding these matters in order to ensure that the medical community does not repeat the prescribing mistakes made in the past with opioid pharmacotherapy, namely, unchecked use of medical cannabis that leads to adverse events and abuse.²³ Furthermore, these preliminary data can serve to drive prospective research focused on whether cannabis can assist in opioid tapering protocols so that doctors can offer patients science-based guidance.

Importantly, older individuals may be substituting cannabis for prescription drugs at a higher rate than the general population, a finding in line with previous research.⁴ There are very little data on the impact of cannabis use in elderly populations. Our data show a trend toward increased substitution with age, perhaps not surprisingly, as older populations are more likely to be prescribed prescription drugs, particularly psychotropic medications.^{24,25}

We previously reported that medical cannabis users are evaluating cannabis products for the presence of a secondary, non-intoxicating cannabinoid, cannabidiol (CBD), ~40% of the time.⁶ CBD does not have the same action at the cannabinoid receptor as Δ 9-tetrahydrocannabinol (THC), the primary intoxicating constituent in cannabis. To avoid adverse effects, particularly in elderly populations, the application of CBD-dominant cannabis varieties and preparations may be warranted. There is a need for more research on mental health disorders and cannabis use, particularly with a focus

on CBD rather than THC-dominant cannabis.²² This information is needed for doctors to be able to adequately participate in conversations with their patients, regardless of age, about the role that medical cannabis may play in managing mental health conditions.²⁶

We previously reported on gender differences in cannabis use and effects, highlighting the need for focused research on this topic.²⁷ Importantly, there is evidence of differences in endocannabinoid system function across gender.^{28–30} Here, we report that female users may be more likely to substitute cannabis than male users (OR, 1.21; 95% CI, 1.04–1.40) and that female medical users may be much more likely to substitute cannabis than female non-medical users (OR, 6.09; 95% CI, 4.65–7.80). These findings are interesting given that females reported significantly less frequency and quantity of use in our previous study. In that study, women were more likely to report use for anxiety, nausea, anorexia and migraine headaches than men. Taken together, these findings provide preliminary data for future studies on gender-based differences in cannabis use and effects.

This study showed a nonsignificant difference between the proportion of individuals reporting substituting cannabis for prescription drugs in states with legalized medical cannabis versus states where cannabis remains illegal (47% vs. 44%, $p=0.47$). This finding suggests that state laws allowing access to, and use of, medical cannabis may not be influencing individual decision making in this area. This finding is in contrast to other studies showing that the use of prescription drugs fell in states once medical cannabis laws were implemented.⁴ This finding has public health implications and should be explored further.

As compared with the general population, survey respondents scored below average for global mental health and global physical health on the PROMIS 10-item short form. This association deserves further attention to determine whether individuals with lesser mental/physical health are using cannabis as a medical therapy or whether cannabis use is negatively affecting mental/physical health.

Given the current nationwide epidemic of prescription opioid-related abuse, addiction and death, there is an urgent need for alternatives with efficacy and safer toxicology profiles.³¹ It is important to note that active “substitution” with cannabis may be a conscious decision to reduce harm caused by narcotics.³² Not only may opioid therapy prove ineffective for some patients but it may also induce serious adverse reactions that complicate management, including allodynia or opioid-induced hyperalgesia, also known as “paradoxical pain”.³³ Chronic pain is an “expensive” condition, both

economically and socially, yet existing pharmacotherapeutic interventions are not always adequate.^{34–36} Taken with pre-clinical data on the role of the endocannabinoid system in stress, pain processing and immune homeostasis, it is clear that future investigation is warranted using controlled trials with human subjects to better understand the role that cannabis may play in treating pain, anxiety, depression and other conditions.^{37–46}

Limitations

The study population was a self-selected convenience sample, and it is possible that individuals with favorable opinions of, and experiences with, cannabis are more likely to have responded to the questionnaire than those with negative opinions and experiences. This, when considered with the predominance of males, Caucasians and individuals aged <35 years, indicates that our sample may not be representative of the general population. In addition, PROs are subject to reporting bias.^{47,48}

Another limitation of this study was the method by which prescription drug information was collected. The availability of an open-ended response field enabled narrative responses that made accurate categorization difficult. In some instances, this limitation may have resulted in undercounting. For example, a response of “a variety of SSRIs” was counted as one drug substitution in the drug category antidepressants. In other instances, it may have resulted in overcounting. For example, a response of “opiate pain killers (Roxicet, Percocet, Vicodin)” was counted as three substitutions in the drug category of narcotics/opioids, yet the respondent may have only substituted cannabis for “Vicodin” after previously trying “Roxicet” and “Percocet”. Additionally, drugs that are available both OTC and via prescription (e.g., ibuprofen) were counted as prescription substitutions, given the nature of the question. The substitution count for these OTC drugs would be overestimated if these drugs were not prescribed.

Data for determining the proportion of individuals reporting substituting cannabis for prescription drugs in states with legal versus illegal medical cannabis policies were analyzed as of December 31, 2016. Several states may not have had legal medical cannabis policies at the time an individual completed the survey, but did have such policies at the time of analysis, which may falsely increase the proportion of those reporting substituting in states with legalized medical cannabis.

Conclusion

These data contribute to a growing body of literature suggesting cannabis, legal or otherwise, is being used as a

substitute for prescription drugs, particularly prescription pain relievers. According to the CDC, 259 million prescriptions for pain relievers were written by health care providers in 2012.⁴⁹ In 2015, two million Americans aged ≥12 years had a substance use disorder that involved prescription pain relievers.⁵⁰ The CDC also reports that overdoses from prescription opioids are a “driving factor” in the increase in opiate overdose deaths over the past 15 years. Such deaths have more than quadrupled in the same time period with >20,000 overdose deaths attributable to prescription pain relievers alone.⁵¹

Despite the illegality of cannabis in many states and the lack of professional guidance on dosing, routes of delivery and inadequate standardization or quality control for medical use, individuals are taking it upon themselves to augment, or discontinue, US Food and Drug Administration (FDA)-approved drugs in favor of a largely unregulated herbal one.

Acknowledgment

This study was supported by NIH NCCAM K01ATTA (LKM). PROMIS was funded with cooperative agreements from the NIH Common Fund Initiative.

Disclosure

The authors report no conflicts of interest in this work.

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Understanding Patterns Of High-Cost Health Care Use Across Different Substance User Groups

Gryczynski, Jan; Schwartz, Robert P; O'Grady, Kevin E; Restivo, Lauren; Mitchell, Shannon G; Jaffe, Jerome H . Health Affairs ; Chevy Chase Vol. 35, Iss. 1, (Jan 2016): 12-19C.

[ProQuest document link](#)

ABSTRACT (ENGLISH)

Substance use contributes to significant societal burdens, including high-cost health care use. However, these burdens may vary by type of substance and level of involvement. Using the 2009-13 National Surveys on Drug Use and Health, we examined all-cause hospitalizations and estimated costs across substance use profiles for alcohol, marijuana, and other illicit drugs. For each substance, we characterized differences between abstainers, nondiagnostic users (people who used the substance but did not meet diagnostic criteria for substance use disorder), and people with substance use disorders. In a multivariate analysis, we found that the odds of hospitalization were 16 percent lower for nondiagnostic marijuana users and 11 percent lower for nondiagnostic alcohol users, compared to abstainers. Neither alcohol- nor marijuana-specific substance use disorders were associated with hospitalization. In contrast, substance use disorders for other illicit drugs were strongly associated with hospitalization: People with those disorders had 2.2 times higher odds of hospitalization relative to abstainers. A more detailed understanding of health care use in different substance user groups could inform the ongoing expansion of substance use services in the United States.

FULL TEXT

Headnote

ABSTRACT Substance use contributes to significant societal burdens, including high-cost health care use. However, these burdens may vary by type of substance and level of involvement. Using the 2009-13 National Surveys on Drug Use and Health, we examined all-cause hospitalizations and estimated costs across substance use profiles for alcohol, marijuana, and other illicit drugs. For each substance, we characterized differences between abstainers, nondiagnostic users (people who used the substance but did not meet diagnostic criteria for substance use disorder), and people with substance use disorders. In a multivariate analysis, we found that the odds of hospitalization were 16 percent lower for nondiagnostic marijuana users and 11 percent lower for nondiagnostic alcohol users, compared to abstainers. Neither alcohol- nor marijuana-specific substance use disorders were associated with hospitalization. In contrast, substance use disorders for other illicit drugs were strongly associated with hospitalization: People with those disorders had 2.2 times higher odds of hospitalization relative to abstainers. A more detailed understanding of health care use in different substance user groups could inform the ongoing expansion of substance use services in the United States.

Substance use disorders contribute substantially to the US public health burden^{1,2} and economic costs.^{3,4} One in ten deaths of working-age adults can be attributed to excessive alcohol use,⁵ and fatal drug overdoses have risen sharply during the past decade.^{6,7} The annual economic impact of substance abuse in the United States in the form of crime, productivity losses, and health care costs total hundreds of billions of dollars.^{4,8}

A fundamental shift in how substance use disorder services are financed and structured is currently under way. The Affordable Care Act (ACA) has promoted the use of a chronic care model for managing substance use disorders, designating substance use services as essential benefits and spurring their integration into primary care.⁹⁻¹¹ These changes broaden the target population for substance use services to include not only people who are addicted but also those who display potentially harmful patterns of substance use.^{11,12} Similarly, over the past decade the federal government has invested substantial resources in promoting the integration of substance use services into general medical settings through screening, brief intervention, and referral to treatment programs.^{12,13} This broadening of the target population has been justified as a public health strategy by the notion that substance users who are not addicted account for the bulk of the aggregate harms from substance use because their numbers are so large.¹¹

Impact Of Substance Use On Health Care Use And Costs

The focus on substance use disorders in the ACA and parallel government efforts to promote the integration of substance use services into medical care is driven largely by the premise that substance use is a key contributor to the national problem of escalating health care costs.^{11,12} Indeed, studies show that substance use and substance use disorders are associated with use of high-cost services such as inpatient hospitalizations and emergency department visits.¹⁴⁻¹⁶ Recent research found that mental and behavioral disorders were the most common diagnostic category responsible for hospital readmissions in Medicaid, accounting for nearly 20 percent of them.¹⁷

Many health problems leading to hospitalization stem from, or are exacerbated by, substance abuse. Proximate medical consequences of substance use include overdose, soft tissue infections, endocarditis, and intoxication-related injury and trauma.¹⁸ Medical problems that can be directly worsened by substance use include liver and kidney disease, respiratory conditions, and diabetes.¹⁸

Individuals with substance use disorders are also likely to exhibit low adherence to medical advice and treatment regimens.^{19,20} Importantly, substance use disorders appear to affect health care costs even after increased disease burden is accounted for.²¹

Previous research has examined hospitalizations clearly tied to drug or alcohol abuse, such as those for overdoses.^{22,23} However, substance use disorders often go undiagnosed during hospitalization.²⁴ And besides being the proximate cause of hospitalization in some cases, substance use can have myriad hidden "radiating effects" that could magnify its health and social burdens.²⁵

Focus Of The Present Research

Underlying many recent efforts to expand substance use services in medical settings is the plausible argument that doing so will lead to improved health and cost savings. However, there are potentially important distinctions across substances and types of users. In the current study we characterized differences in hospitalization and costs for abstainers; nondiagnostic users (those who used the substance in the past year but did not meet substance use disorder diagnostic criteria); and people who did meet those criteria for alcohol, marijuana, and other drugs.

Study Data And Methods

Data Source This study used five years of data from the National Survey on Drug Use and Health, the authoritative

source of information on the prevalence of substance use and substance use disorders in the United States.²⁶ This annual survey, conducted by the Substance Abuse and Mental Health Services Administration, is representative of the US noninstitutionalized civilian population ages twelve and older. It includes individuals residing in households or noninstitutional group quarters (such as college dormitories or homeless shelters) in all fifty states and the District of Columbia.

To improve the stability of estimates for lowerprevalence phenomena, we pooled annual surveys for the period 2009-13. There were 281,411 respondents, or approximately 55,000 each year. The data reported in this article represent five-year annual average estimates for the US population and subgroups.

Variables

* HOSPITALIZATION: Past-year all-cause hospitalization was determined by this survey question: "During the past 12 months, have you stayed overnight or longer as an inpatient in a hospital?"

* CUMULATIVE LENGTH-OF-STAY: The survey also asked about the total number of nights of hospitalization, with responses top-coded at thirty-one or more nights (that is, all responses of greater than thirty nights were coded as thirtyone nights). These counts were used for generating estimates of cumulative length-of-stay and costs (described below) that were conservative (because of top-coding).

* COSTS: Cost estimates per hospital inpatient day were obtained from the Henry J. Kaiser Family Foundation's State Health Facts initiative.²⁷ The source for these estimates is the American Hospital Association, and the data include information on operating and nonoperating expenses for US community hospitals.

We obtained the average annual cost of an inpatient hospital day for each year. We then adjusted values to 2013 dollars and computed costs incurred for each survey respondent (cumulative nights of hospitalization multiplied by cost per inpatient day for that year).

* SUBSTANCE USE PROFILES: We used survey questions to create substance use profiles for alcohol, marijuana, and all other illicit drugs (besides marijuana) combined. As described below, the category of other illicit drugs includes street drugs as well as prescription drugs such as pharmaceutical opioids, stimulants, and sedatives or tranquilizers when used for nonmedical purposes. For each profile, we divided respondents into three categories based on their behavior in the past year (the same time frame as we used for hospitalizations): abstainers (people who did not use the substance in the past year), nondiagnostic users (people who used the substance in the past year but did not meet substance use disorder diagnostic criteria), and people who did meet those criteria. Substance use disorder was defined as meeting the diagnostic criteria for substance abuse or dependence from the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV).

Categories were mutually exclusive within each substance. However, they could overlap across substances if, for example, a person had disorders for multiple substances.

Additional profiles were generated for major drugs of abuse such as heroin, opioid analgesics, cocaine, amphetamines or related stimulants, and sedatives or tranquilizers. Profiles for prescription drug misuse were limited to nonmedical use—that is, using a medication that was not prescribed or using a prescribed medication "only for the experience or feeling it caused."²⁶

Respondent Characteristics Background characteristics used as control variables in statistical models were age;

sex; race/ethnicity (white, black, Hispanic, or other); employment status (full time; part time; unemployed; or other, including not in the labor force); poverty status (income below the federal poverty level, at 100-199 percent of poverty, or at 200 percent or more of poverty); whether the respondent had health insurance, smoked cigarettes, and had a diagnosis of depression in the past year; and self-reported overall health status (excellent, very good, good, or fair/poor). Our method of selecting control or confounder variables was to include basic population characteristics commonly used in epidemiological studies, as well as basic factors that could plausibly vary in terms of substance use patterns, health, health care use, or some combination of the three.

Statistical Analysis We conducted analyses using Stata SE, version 13, and the command suite for complex survey data. We applied appropriate adjustments for survey design characteristics (population weight, primary sampling unit, and stratification layer). Sampling weights were adjusted to produce five-year annual average estimates.

To provide a descriptive snapshot of the US population, we first examined unadjusted prevalence of hospitalization by substance use profile. We also examined cumulative length-of-stay and aggregate and per person hospital costs incurred for each substance use profile.

We then fit a multivariate logistic regression model of hospitalization in the past year. The model included the three main substance use profiles (alcohol, marijuana, and other illicit drugs) as separate categorical predictors. The model additionally adjusted for survey year and respondent demographic characteristics (sex, race/ethnicity, and age), economic characteristics (poverty and employment status), and health variables (depression, cigarette use, insurance status, and self-reported health status).

We extended this approach to explore sex and age differences in detail, fitting a series of sex-specific subpopulation models in which the relationship between substance use profile and hospitalization was allowed to vary by age cohort (that is, profile by age cohort interactions). We did this because interpreting differences between substance use profile categories was complicated by the fact that hospitalization risk differs by age, doing so differently for males and females.

Limitations This study had several limitations. First, while the study offered a comprehensive epidemiological snapshot of the US population, our analyses should be considered descriptive, with the multivariate modeling representing conditional associations and a high-level approximation of the phenomenon. We avoided making assumptions about causality given the cross-sectional nature of the data. Speculation about causation must be made with caution and attention to the caveats of the design.

Second, our analysis was limited by the questions asked in the survey. For example, we could not separately examine hospitalizations due to pregnancy. Childbirth is the most common reason for hospitalization in the United States²⁸ and likely contributes to the observed spike in hospitalization during the childbearing years for abstaining women.

Third, the data were self-reported and subject to the limitations of such reporting. However, as the largest survey focused on substance use in the United States, the National Survey on Drug Use and Health employs extensive procedures to ensure data quality and maximize accuracy.²⁶

Our study also had strengths. Chief among these was its use of large nationally representative surveys spanning five years of data collection. The robust sample size is important given that hospitalization is a relatively rare event. In addition, the data source provided rich information on substance use behaviors, including an assessment

of detailed diagnostic criteria for various substances.

Study Results

Prevalence Of Hospitalization By Substance Use Profile The average annual rate of hospitalization in 2009-13 was 10.2 percent. The prevalence of hospitalization among alcohol abstainers (12.5 percent) was significantly higher than for nondiagnostic drinkers (8.9 percent) or people with alcohol use disorder (10.0 percent) (Exhibit 1). The prevalence of hospitalization among marijuana abstainers did not differ significantly from that among people with marijuana use disorder, but the prevalence was significantly lower for nondiagnostic marijuana users than for abstainers. For illicit drugs other than marijuana, rates of hospitalization differed significantly between all use profiles. When we examined other illicit drugs in detail, we found that people with substance use disorders had much higher rates of hospitalization than abstainers or nondiagnostic users in every drug category.

Cumulative Length-Of-Stay We examined cumulative length of hospital stay (total nights of hospitalization across all hospitalization episodes) descriptively (online Appendix Exhibits 1 and 2).²⁹ Nondiagnostic alcohol users had the lowest average cumulative length-of-stay (4.35 nights), while people with substance use disorders for illicit drugs other than marijuana had the highest average cumulative length-of-stay (6.99 nights).

Cost Estimates Estimated annual per person hospital costs were \$1,122 for the 17.6 million people with alcohol use disorders, \$1,057 for the 4.2 million people with marijuana use disorders, and \$2,783 for the 3.5 million people with substance use disorders involving other illicit drugs (Exhibit 2).

Multivariate Model Of Hospitalization In The Past Year We used a multivariate logistic regression model to provide information on conditional associations, adjusting for potentially important confounding factors and population differences. The model shows a good fit with the data ($F(9,52) = 0.66$; $p = 0.74$).

Nondiagnostic drinkers had 11 percent lower odds of hospitalization than abstainers (Exhibit 3). Having an alcohol use disorder was not associated with hospitalization, compared to abstaining. Nondiagnostic marijuana use was associated with 16 percent lower odds of hospitalization, compared to abstaining. The likelihood of hospitalization among people with marijuana use disorder did not significantly differ from that of either abstainers or nondiagnostic users.

For illicit drugs other than marijuana, the odds of hospitalization among people with substance use disorders were 2.2 times higher compared to abstainers. Nondiagnostic users of these drugs did not differ significantly from abstainers in their likelihood of hospitalization.

Sex And Age Cohort Differences Sex-specific subpopulation models that allowed us to identify unique profile differences by age cohort revealed some instructive nuances (Appendix Exhibit 3).²⁹ For alcohol, female abstainers and nondiagnostic drinkers ages 18- 34 experienced heightened probabilities of hospitalization—a spike that may reflect hospitalization for pregnancy and delivery in the childbearing years. Hence, for females, abstainers represent a shifting baseline for comparison. This has consequences for interpretation, particularly for alcohol and marijuana use, for which differences between profile categories can be considered subtle.

Importantly, the probability of hospitalization was considerably elevated for people with substance use disorders involving illicit drugs other than marijuana. This is a strong pattern that held for both sexes across all age cohorts.

Discussion

This article reports five-year annual average estimates of all-cause hospitalizations in the US population, examining differences among abstainers, nondiagnostic users, and people with substance use disorders involving various substances. Our study found a clear and unambiguous relationship between hospitalization and substance use disorders involving illicit drugs other than marijuana. For these substances, hospitalization rates are much higher for people meeting substance use disorder criteria than for nondiagnostic users and abstainers. More than one in four people with a substance use disorder involving heroin can be expected to experience an inpatient hospital stay in the course of a year. Similarly, we found high rates of hospitalization among people with substance use disorders specific to opioid analgesic misuse—a serious public health problem that has contributed to escalating overdose deaths in many communities.^{6,7}

Previous studies have documented the link between substance use diagnoses and hospitalization or readmission in Medicaid^{14,15,17} and in smaller samples,³⁰ and the link between those diagnoses and admissions nationally known to be directly related to drug use.^{22,23} Our study extends the literature by examining hospitalizations across relatively nuanced substance use profiles in a large nationally representative sample. A unique aspect of the study is that substance use and detailed substance use disorder criteria were independently assessed for each survey respondent and thus did not rely on clinical detection or diagnosis during hospitalization, which is likely to undercount cases of nondiagnostic substance use and substance use disorders.

Policy Implications

At the population level, hospitalization is an important indicator of serious public health burden and high-cost use of health care. A key objective of health care reform is to reduce avoidable high-cost use of health care, and early data suggest that reform has had some success in this area.³¹ It is anticipated that individuals newly insured under the ACA will have higher rates of substance use disorders, compared to existing Medicaid beneficiaries.³² Using a nationally representative survey with more than a quarter-million respondents, the current study provides a baseline from which to track hospitalization among different types of substance users in the era after health care reform.

The United States is in the midst of a major realignment of substance use and behavioral health services, which reflects a broadening of the target population and delivery venues for substance use services in an effort to improve public health and reduce system cost burdens. Hospitalization is just one of many indicators. However, our study documents important differences based on substance type and level of use.

Nondiagnostic substance users do not appear to be major drivers of public health burden or costs related to hospitalizations. Thus, the approach of targeting interventions toward a broader base of lower-risk drug users may be unlikely to prompt population-level reductions in such burdens in the short term. However, that approach could have longer-term impacts if these services are able to prevent progression toward severe substance use disorders.¹¹

Our findings also have implications for shaping the expansions of behavioral health and substance use services. For example, our results could help determine which substance user groups to target with interventions. Given the base-rate differences across substance use profiles, targeting services toward different substance user groups offers varying degrees of opportunity to affect hospitalizations.

Neither alcohol nor marijuana use disorders were associated with hospitalization, but there was a strong association between hospitalization and other drug use disorders. Similarly, costs incurred by people with

substance use disorders involving illicit drugs other than marijuana exceeded costs for people with marijuana use disorders on both an aggregate and a per person basis-which reflects the higher likelihood of hospitalization and longer cumulative length-of-stay for people in the first group. Targeting people with other illicit drug substance use disorders could offer significant opportunities for reducing hospitalizations and perhaps broader public health burdens.

Previous research has shown that hospital patients diagnosed with a drug substance use disorder are more likely to experience recurrent acute hospital utilization, compared to patients discharged without such diagnosis.³⁰ Our findings support the idea of using hospitals as possible venues in which to identify and intervene with higher-risk populations of drug users (such as people with substance use disorders involving illicit drugs other than marijuana). Such interventions could have an important impact if they linked patients with substance use disorders to effective addiction treatment and ongoing medical care, which could reduce future hospitalizations.³³ Hence, future research should identify effective strategies for expanding substance use disorder services in hospitals and facilitating the linking of patients to treatment after discharge.

Our findings with respect to marijuana are of particular interest, given the rapidly evolving nature of marijuana policy in many states. Marijuana use can have a range of adverse health consequences.³⁴ However, this study did not find elevated rates of hospitalization among people with marijuana use disorders. Moreover, nondiagnostic marijuana users tended to have a lower likelihood of hospitalization than abstainers, and this relationship held even after adjustment for potential confounding factors and population differences.

This result could suggest that marijuana use has genuine protective effects, or it could ultimately be explained by other factors. The lack of a significant contemporaneous association between hospitalizations and marijuana use disorders implies that concerns that liberalization of marijuana policy will strain hospital resources may be unfounded, at least in the immediate term. For instance, sizable public health and societal burdens from increased marijuana use might not immediately become manifest.

Conclusion

We examined nationally representative data on all-cause hospitalizations for different substance user groups. We examined hospitalization rates across substance use profile subpopulations and their independent associations in multivariate models. Relative to abstainers, the likelihood of experiencing hospitalization is lower for those who use marijuana or alcohol at nondiagnostic levels. While significant, these relationships are relatively subtle. In contrast, people with substance use disorders involving illicit drugs other than marijuana have substantially elevated rates of hospitalization. Understanding patterns of high-cost health care use across different substance use profiles can inform the continued integration of behavioral health and medical services in the US health care system.

Sidebar

Many health problems leading to hospitalization stem from, or are exacerbated by, substance abuse. People with substance use disorders involving illicit drugs other than marijuana have elevated rates of hospitalization.

These findings were previously presented at the College on Problems of Drug Dependence, Phoenix, Arizona, June 13- 18, 2015. This study was supported by the National Institute on Drug Abuse (NIDA) (Grant Nos. R01DA037942-01A1, R01DA036604, and R01DA026003). NIDA had no role in the study design, in the analysis or interpretation of data, in the writing of the report, or in the decision to submit the manuscript for publication.

Footnote

NOTES

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Appendix

(ProQuest: Appendix omitted.)

DETAILS

Subject:	Health care expenditures; Participation; Alcohol; Disorders; Criteria; Drugs; Marijuana; Profiles; Multivariate analysis; Studies; Drug use; Hospitalization; Health care; Substance use; Drug abuse; Cannabis; User groups; Diagnostic systems; Cost estimates; Health services; Cost control; Alcohols
Business indexing term:	Subject: Cost estimates Cost control
Location:	United States--US
Classification:	9190: United States; 8320: Health care industry; 9130: Experiment/theoretical treatment
Publication title:	Health Affairs; Chevy Chase
Volume:	35
Issue:	1
Pages:	12-19C
Number of pages:	11
Publication year:	2016
Publication date:	Jan 2016
Section:	HIGH-COST POPULATIONS
Publisher:	The People to People Health Foundation, Inc., Project HOPE
Place of publication:	Chevy Chase
Country of publication:	United States, Chevy Chase
Publication subject:	Insurance, Public Health And Safety
ISSN:	02782715
e-ISSN:	15445208
Source type:	Scholarly Journals

Language of publication: English

Document type: Journal Article

Document feature: Graphs Tables References

DOI: <http://dx.doi.org/10.1377/hlthaff.2015.0618>

ProQuest document ID: 1756025376

Document URL: <https://login.proxy.bib.uottawa.ca/login?url=https://www.proquest.com/scholarly-journals/understanding-patterns-high-cost-health-care-use/docview/1756025376/se-2?accountid=14701>

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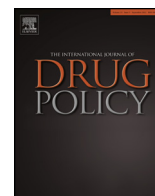
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International Journal of Drug Policy

journal homepage: www.elsevier.com/locate/drugpo

Research paper

Medical cannabis access, use, and substitution for prescription opioids and other substances: A survey of authorized medical cannabis patients

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ARTICLE INFO

Article history:

Received 27 September 2016

Received in revised form 15 December 2016

Accepted 10 January 2017

Keywords:

Cannabis

Marijuana

Opioids

Substitution

Pain

Mental health

Addiction

ABSTRACT

Background: In 2014 Health Canada replaced the Marihuana for Medical Access Regulations (MMAR) with the Marihuana for Medical Purposes Regulations (MMPR). One of the primary changes in the new program has been to move from a single Licensed Producer (LP) of cannabis to multiple Licensed Producers. This is the first comprehensive survey of patients enrolled in the MMPR.

Methods: Patients registered to purchase cannabis from Tilray, a federally authorized Licenced Producer (LP) within the MMPR, were invited to complete an online survey consisting of 107 questions on demographics, patterns of use, and cannabis substitution effect. The survey was completed by 271 respondents.

Results: Cannabis is perceived to be an effective treatment for diverse conditions, with pain and mental health the most prominent. Findings include high self-reported use of cannabis as a substitute for prescription drugs (63%), particularly pharmaceutical opioids (30%), benzodiazepines (16%), and antidepressants (12%). Patients also reported substituting cannabis for alcohol (25%), cigarettes/tobacco (12%), and illicit drugs (3%). A significant percentage of patients (42%) reported accessing cannabis from illegal/unregulated sources in addition to access via LPs, and over half (55%) were charged to receive a medical recommendation to use cannabis, with nearly 25% paying \$300 or more.

Conclusion: The finding that patients report its use as a substitute for prescription drugs supports prior research on medical cannabis users; however, this study is the first to specify the classes of prescription drugs for which cannabis it is used as a substitute, and to match this substitution to specific diagnostic categories. The findings that some authorized patients purchase cannabis from unregulated sources and that a significant percentage of patients were charged for medical cannabis recommendations highlight ongoing policy challenges for this federal program.

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Background

The past two decades have witnessed a resurgence of interest in the therapeutic potential of cannabis, with several nations and jurisdictions developing regulations to allow for access to cannabis for medical purposes (Fischer, Murphy, Kurdyak, Goldner, & Rehm, 2015). One potential salutary consequence of these developments

is the substitution of cannabis for other substances (Allsop et al., 2014; Lucas et al., 2013, 2016). Indeed, examinations of jurisdictions with legal access to medical cannabis have reported reductions in negative health outcomes associated with the use of other substances, such as opioid overdose (Bachhuber, Saloner, Cunningham, & Barry, 2014), and cannabis substitution has been forwarded as a mechanism to help explain these public health benefits. Consistent with this proposal, several large surveys confirm that medical cannabis users report substituting cannabis for other medications (Lucas, 2012a; Lucas et al., 2013, 2016; Reiman, 2009). Although extant surveys have provided broad evidence of cannabis substitution, the extent to which cannabis is

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used to substitute for distinct classes of substances by distinct patient groups has not been systematically examined from a patient-centred perspective. The present study addresses this knowledge gap by examining the extent to which physician-authorized medical cannabis users report using cannabis as a substitute for specific classes of substances, and by disaggregating this examination according to condition-based patient group. We also add to the nascent literature on medical cannabis use by describing patient characteristics, patterns of use and barriers to access.

In 2001 Canada became one of the first nations to develop a program to allow access to cannabis for medical purposes. The program has undergone numerous convolutions, culminating in the 2014 establishment by Health Canada of the Marihuana for Medical Purposes Regulations (MMPR) (Walsh et al., 2013), and ultimately in the Access to Cannabis for Medical Purposes Regulations in August 2016. One of the primary changes of the MMAR was the authorization of multiple Licensed Producers of cannabis: as of August 2016 >30 federally authorized Licensed Producers provide hundreds of strains of cannabis, as well as cannabis extracts to approximately 67,075 patients (Office of Medical Cannabis, 2016). The ACMPR adds regulations by which patients can produce their own cannabis, an option that was removed in the transition from MMAR and MMPR, and subsequently re-established through a court decision (Allard et al. v. Canada).

In contravention of the MMPR/ACMPR, a large number of patients access cannabis through community-based outlets known as dispensaries or compassion clubs, as well as from friends and other sources. In addition, although many Provincial medical colleges expressly forbid physicians from charging patients for providing patients with medical cannabis prescriptions, 3rd party patient aggregator services have emerged that provide cannabis prescriptions, occasionally in exchange for a substantial fee. To date, the prevalence of this practice among clients of LPs has not been explicitly examined. In addition to providing a more granular examination of cannabis substitution, this study also adds to the growing literature chronicling patterns of medical cannabis use and user characteristics using a novel sampling methodology: whereas prior studies generally queried self-identified medical cannabis users who may not have obtained physician authorization (Lucas, 2012b; Lucas et al., 2013; Walsh et al., 2013), to our knowledge this is the first study since the establishment of the MMPR to include only those medical cannabis users with confirmed physician authorization to access cannabis for therapeutic purposes.

Design and methods

A password protected 107 question online cross-sectional survey was made available in French and English for a 2 week period in July 2015 to patients of Tilray—a licensed producer of cannabis. 1310 participants were notified of the opportunity to participate in this study via direct email to patients that had opted in to receive online communication from Tilray upon registration. Participants were compensated \$10 credit for Tilray cannabis. The study was approved by Institutional Review Board Services, and gathered data on demographics, patient experiences, patterns of use, and cannabis substitution effect. Respondents were not forced to answer a given question in order to proceed to the next and as such the number of recorded responses varies across items. All reported percentages are based on number of responses rather than on the entire sample; we accompany all reported percentages with number of responses.

Findings

The survey was started by 301 participants, and completed by over 90% of respondents ($n=271$). The 30 non-completers only filled out the demographic section of the study, and based on this information did not differ on age, gender, education, income or work status compared to those that completed the survey. The primary demographics of respondents corresponds with the greater Tilray patient population but was more male and Caucasian, single, disabled and of lower income than the general Canadian population, with over-representation in Western Canada and Ontario, and under-representation in Quebec (see Table 1 for demographic characteristics).

While an increasingly common medical treatment, cannabis is often used for symptom relief rather than as a curative agent, therefore it's important to distinguish between the primary conditions for which cannabis is officially prescribed by a physician, and the specific symptoms for which patients report relief. For example, while a patient might report having a prescription for MS, the list of symptoms impacted might include chronic pain, spasticity, and insomnia. In this survey, respondents could select a single primary condition from a drop-down list, but could then select multiple symptoms affected by the medical use of cannabis. In regards to conditions, pain-related conditions were the most common, reported by 53% of participants ($n=144$; chronic pain 36%; ($n=98$), arthritis 12% ($n=32$), headache 5% ($n=14$)). The second most prominent class was mental health (eating disorder, PTSD & psychiatric disorder), reported by 15% ($n=41$). Other prominent conditions included gastrointestinal I disorders (11%, $n=29$), insomnia (7%, $n=18$) and multiple sclerosis (4%, $n=11$).

In regards to symptoms; the most highly endorsed were chronic pain (73%, $n=197$), stress (60%, $n=162$), insomnia (57%, $n=155$), depression (46%, $n=126$) and headache (32%, $n=87$). Gastrointestinal (GI) issues also featured prominently, with 29% ($n=79$) citing appetite loss and another 29% ($n=79$) nausea. Cannabis was perceived to be very effective at symptom relief, with 95% ($n=257$) reporting that it “often” or “always” helped alleviate their symptoms.

Patterns of use

The mean age of initiation was 18.50 ($SD=7.42$) for recreational use and 34.13 ($SD=13.74$) for medical use, as determined by responses to the question “How old were you when you first used cannabis” followed by “How old were you when you first used cannabis for medical purposes?”. It is notable that participants readily distinguished between their recreational and medical use of cannabis, with recreational cannabis use preceding medical use for 81% ($n=220$) of respondents, with 16% ($n=44$) reporting no history of recreational cannabis use, and 3% ($n=7$) reporting precedence of medical use prior to recreational use.

In regard to frequency, 88% ($n=238$) reported using cannabis at least daily, and the modal amount used per day was 1–2 g, with 29% ($n=79$) using a larger amount.

In regard to methods of use, 90% ($n=243$) had tried joints, 86% ($n=234$) vaporizers, 76% ($n=207$) oral/edibles (such as baked goods, butter, tincture, etc.) and 16% ($n=44$) had used cannabis-infused topical ointments. Regarding primary methods of use, vaporizers proved most popular (38%, $n=102$), followed by joints (25%, $n=67$), oral/edibles (14%, $n=37$), waterpipe/bongs (12%, $n=33$), pipes (11%, $n=30$), and topicals (1%, $n=2$). Regarding preferred method, vaporization was rated most highly by a plurality (44%, $n=119$), with oral/edibles second (23%, $n=63$). Respondents overwhelmingly reported that not all strains/types of cannabis were “equally effective” at relieving symptoms (77%, $n=210$): 82%

Table 1
Demographics.

	Tilray, survey respondents (n = 271) (%)	Tilray, all patients (n = 3077) ^a (%)	Canadian average, stats Canada, 2011 census ^b (%)
Gender			
Male	73	70	49
Female	27	30	51
Age	(Range: 20–77)		
Mean	40	44	41
Background			
Caucasian	94	N/A	77
Black	4	N/A	3
Aboriginal/Metis	3	N/A	4
South Asian	2	N/A	5
Asian	2	N/A	5
Marital status			
Married	43	N/A	46
Domestic partnership/civic union	9	N/A	11
Divorced/separated	10	N/A	8
Single	38	N/A	28
Education			(Age 25–64)
Less than high school	7	N/A	13
High school or equivalent	20	N/A	23
Some college/university	21	N/A	N/A
Technical and/or non-university degree	28	N/A	21
University degree	15	N/A	17
Graduate degree	8	N/A	10
Employment			15 years and over
Employed, full time	45	N/A	51
Employed, part time	12	N/A	12
Disabled	30	N/A	14
Not employed	8	N/A	7.8
Retired	5	N/A	N/A
Income			
Less than \$10,000	9	N/A	5
\$10,000–39,999	32	N/A	27
\$40,000–99,999	40	N/A	42
>\$100,000	19	N/A	26
Province of residence			
Prairies	24	19	18
British Columbia	17	22	13
Atlantic	8	7	7
Territories	1	1	1
Ontario	49	49	38
Quebec	2	2	24

^a As of July 31, 2015.^b Statistics Canada. Canadian census, 2011. <https://www12.statcan.gc.ca/census-recensement/2011/dp-pd/prof/index.cfm?Lang=E>.

(n = 222) reported a preferred cannabis type; 25% (n = 68) indicas, 21% hybrids (n = 56), 18% favoring strains high in cannabidiol (CBD) (n = 50), and 18% sativas (n = 48). While many Licensed Producers continue to identify cannabis by these phenotypes (*Cannabis sativa* and *Cannabis indica*) in keeping with classifications found in the black market, there is a growing academic debate about whether these classifications represent real and distinct genetic classifications, with evidence suggesting that the label of indica or sativa is not consistent with the actual genetics of many of these strains (Sawler et al., 2015). However, evidence that cannabinoids and terpenes are found at different ratios within each distinct cannabis phenotype supports the subjective differences between strains commonly reported by patients.

Cannabis substitution effect

Overall, 71% (n = 186) of participants report substituting cannabis for either prescription drugs, alcohol, tobacco/nicotine or illicit substances, with 63% reporting substitution for

prescription medication (n = 166), 25% for alcohol (n = 66), 12% for tobacco/nicotine (n = 31), and 3% for illicit substances (n = 9). To facilitate interpretation of substitution for prescription medications, pharmaceuticals were classed into the following 4 categories: *opioids*, *benzodiazepines*, *antidepressants* and a category of *other medication* that included diverse substances that were less frequently endorsed (e.g., NSAIDs, Methylphenidate). Respondents were allowed to report up to three medications for which they substituted cannabis; of those who explicitly listed prescription substitution 59% (n = 92) reported substituting for a single class of medications, 33% (n = 52) reported substituting for two classes, and 8% (n = 13) reported substituting cannabis for three classes. The most common form of substitution was for opioids (32%, n = 80), followed by benzodiazepines (16%, n = 40), and antidepressants (12%, n = 31) (Table 2). The reasons most frequently ranked as being most important for substituting cannabis for prescribed medications were “less adverse side effect” (39%, n = 68); “cannabis is safer” (27% n = 48), and “better symptom management” (16%, n = 28).

Table 2
Substitution for prescription medications.

Class	n	%
Opioids (Oxy/Oxyneol/Percocet/hydromorphone/morphine/codeine derivatives, etc.)	80	32
Benzodiazepines	40	16
Antidepressants	31	12
Other medication	100	40

Supplementary analyses examined variation across diagnostic groups, and indicated that respondents who used cannabis for pain-related conditions were more likely to substitute cannabis for opioids (42% (n = 57) vs. 20% (n = 23), $\chi^2 = 13.78(1)$, $p < 0.01$), whereas respondents who used cannabis to address mental health were more likely to substitute cannabis for benzodiazepines (31% (n = 12) vs. 13% (n = 28), $\chi^2 = 7.75(1)$, $p < 0.01$) and for antidepressants (26% (n = 10) vs. 10% (n = 21), $\chi^2 = 7.69(1)$, $p = 0.01$) (Fig. 1). Our data suggested no relationship between age, amount of cannabis used, mode of administration, access or affordability on substitution effect.

Access

Although all respondents accessed cannabis from Tilray, 21% (n = 56) also reported purchasing cannabis from another Licensed Producer, 25% (n = 67) purchased from dispensaries, 18% (n = 47) from a friend, and 8% (n = 20) buy from an illicit dealer. In total, 42% (n = 111) of respondents reported accessing from one or more unregulated sources. Regarding cost, 44% (n = 118) spend less than \$250 monthly and 78% (n = 212) spend less than \$500 per month on cannabis, whereas 4% spend \$1000 or more (n = 11). Capacity to “often” or “always” afford to buy enough cannabis to relieve symptoms was reported by 40% (n = 109), leaving 60% (n = 162) who report “sometimes” or “never” affording sufficient cannabis. Similarly, 53% (n = 146) reported choosing between medical cannabis and other necessities (food, rent, other medicines . . .) in the past year due to finances. Only 3% (n = 7) cited having 3rd party insurance coverage, and another 3% (n = 8) reported getting the cost of cannabis covered through Veterans Affairs Canada.

Finding a supportive physician was a reported challenge, with 31% (n = 78) having changed doctors in relation to medical cannabis use, and 55% reporting feeling discriminated against by their doctor because of medical cannabis use (n = 139). Paying a physician or clinic a fee for recommendations to use medical cannabis was reported by 55% (n = 140), with a modal price of between \$300–99 (n = 50) and

94% (n = 131) paying \$100 or more. It is therefore unsurprising that 29% (n = 75) reported that obtaining an authorization to use medical cannabis was “difficult” or “very difficult”.

Interpretation

The finding that patients using cannabis to treat pain-related conditions have a higher rate of substitution for opioids, and that patients self-reporting mental health issues have a higher rate of substitution for benzodiazepines and antidepressants has significant public health implications. In light of the growing rate of morbidity and mortality associated with these prescription medications (Bachhuber et al., 2014; Fischer, Rehm, Goldman, & Popova, 2008), cannabis could play a significant role in reducing the health burden of problematic prescription drug use. Indeed, a recent study of US states that have legalized medical cannabis, found that the number of prescriptions significantly dropped for drugs that treat pain, depression, anxiety, nausea, psychoses, seizures and sleep disorders, with the annual number of doses prescribed for chronic pain falling by more than 11% per physician (Bradford & Bradford, 2016). Additionally, according to Veterans Affairs Canada, a recent significant increase in the use of medical cannabis by patients is paralleled by a nearly 30% decrease in the use of benzodiazepines and a 16% decrease in the use of opioids (Hager, 2016). Moreover, the finding that cannabis might be used to substitute for multiple medications is particularly promising in light of concerns patients may have regarding adherence to complex pharmaceutical regimens, and attendant side effects (Brown & Bussell, 2011; Ingersoll & Cohen, 2008; Sylvestre, Clements, & Malibu, 2006). Indeed, tolerability of side effects was identified as a prominent reason for cannabis substitution.

The finding that medical cannabis is used primarily to treat chronic pain is consistent with past research (Ware et al., 2010; Ware, Wang, Shapiro, & Collet, 2015). However, the extensive self-

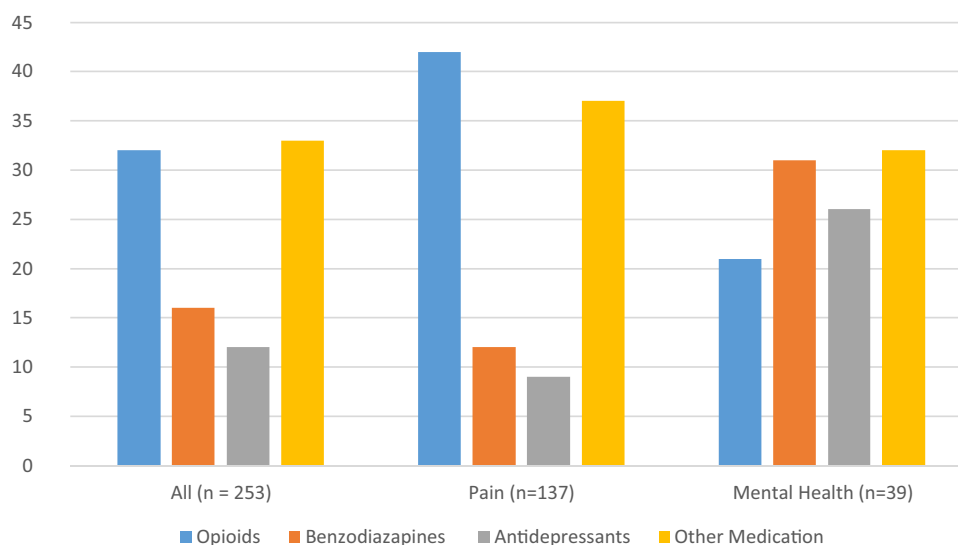


Fig. 1. Substitution by condition.

reported use to treat mental health conditions and associated symptoms represents a novel and interesting trend, and suggests that the conceptualization of cannabis as deleterious to mental health may not generalize across conditions or populations. Studies currently underway to investigate cannabis for the treatment of PTSD, anxiety, and other psychiatric conditions may soon provide more information on these potentially promising treatment options.

Our finding that most patients use 2 grams or less is consistent with past research (Carter, Weydt, Kyashna-Tocha, & Abrams, 2004; Clark, 2013; Hazekamp, Ware, Muller-Vahl, Abrams, & Grotenhermen, 2013). To our knowledge, this is the first patient survey to report vaporization as the primary method of ingestion, and non-smoked forms of ingestion as primary and preferred methods of ingestion. This marks a health conscious shift in medical cannabis use under the MMPR that may be attributed to a few factors: since patients in the MMPR require a physicians support to access medical cannabis, they may be more likely to be focused on safer methods of ingestion than non-MMPR patient populations; improvements in vaporizer technology and associated reductions in cost, patient outreach and education initiatives focused on safe and responsible use by cannabis vendors, and ongoing restrictions on smoking in the public realm.

Cannabis is rather unique as a therapeutic treatment in that many patients report some permeability between recreational and medical use (Walsh et al., 2013). However, unlike opioids where medical use via prescription often precedes recreational use and dependence (Fischer et al., 2008), the pathways between the medical and recreational use of cannabis are reversed, with previous recreational use often a precursor to prescription medical use, while the reverse is rarely the case. Although most respondents in this study had experience with recreational cannabis use prior to initiation of medical use (81%, $n=220$), transition from medical use to recreational use was only reported by 7 participants (<3%), which is suggestive of a low risk of abuse associated with medical cannabis. Additionally, with so many patients reporting use for the relief of mental health conditions like stress, insomnia and depression, much of this medical use is ultimately focused on improving psychological well being and quality of life. This perhaps blurs the lines between traditional biomedical approaches to disease and more holistic approaches (such as yoga or naturopathic medicine) used as adjunct treatments to address the symptoms, side-effects and psychological impacts of long-term illness/disability and/or the modern pressures of every day life. This is supported by previous research that has found that patients who use medical cannabis often cite depression and anxiety as a primary symptoms for which they seek relief, regardless of their actual medical condition (Bonn-Miller, Boden, Bucossi, & Babson, 2014; Ogborne, Smart, Weber, & Birchmore-Timney, 2000; Walsh et al., 2016), as well a growing amount of preclinical research supporting the use of CBD as a potential treatment for both anxiety (Blessing, Steenkamp, Manzanares, & Marmar, 2015) and depression (Linge et al., 2015).

Despite the legal protection and quality control offered through the MMPR, 42% of participants report accessing cannabis from unregulated sources which may be due to restrictions imposed on LPs by the MMPR during that period. At the time of this survey, LPs were only allowed to provide raw cannabis flowers, whereas other sources may have provided a diverse array of extracts and edibles. Since that time regulations have been altered to allow LPs to produce extracts, and to once again produce their own cannabis supply. Future research may determine whether this regulatory revision alters patient behaviour in regards to access through unregulated sources.

In light of consistent evidence that many lower income patients face affordability issues in regards to the cost of medical cannabis (Belle-Isle et al., 2014), the finding that so many patients had to pay high medical fees to gain access medical cannabis is concerning and suggests there may subsequently be an under-representation of low income patients in the MMPR/ACMPR.

Conclusions

The high rate of substitution for prescription drugs among patients with pain-related and mental health conditions suggests that medical cannabis may be an effective adjunct or substitute treatment to prescription drugs used to treat these conditions. Further research into the comparative efficacy of cannabis relative to front-line treatments for these conditions is warranted, and longitudinal research would help elucidate the context of cannabis substitution effect, and the potential impact of cannabis substitution on the quality of life of patients (in-progress, Lucas).

While the MMPR had only been in place for approximately 15 months when this survey took place, the findings that some authorized patients continue to purchase cannabis from unregulated sources and that a significant percentage of patients have had to pay high fees for medical cannabis recommendations highlight ongoing policy challenges for the federal medical cannabis program. As Canada's federal medical cannabis policy continues to evolve (both organically and in response to legal challenges) and as provinces and municipalities seek regulatory solutions to issues like dispensaries, personal production, and private medical cannabis clinics, it will be important to keep tracking the impact of these policy developments on patient access to and experiences with medical cannabis.

Limitations

The relatively low response rate to the survey (21%) leaves open the possibility this could potentially be an unrepresentative sample. It is not possible to confirm the impact of cannabis substitution on quantity of use of prescription drugs, alcohol or illicit drug use. Additionally, all data regarding the cannabis substitution effect in this study were self-reported by patients and did not benefit from biological drug detection to confirm use or non-use of a substance. In light of this potential bias, our characterisation of the therapeutic use of cannabis and/or cannabis substitution effect should be interpreted with caution pending replication by research that employs a more systematic recruitment approach, longitudinal monitoring, and biological drug testing.

However, these limitations are counterbalanced by several methodological strengths, including the large size of the sample, assurance that all participants were using medical cannabis with the support of a physician, and adherence to established standards for reporting Internet-based surveys (Eysenbach, 2004).

Declaration of interest

This study was funded by Tilray, a federally authorised medical cannabis production and research company. Philippe Lucas is currently employed as Vice-President, Patient Research and Advocacy for Tilray; however, his compensation is not tied in any way to the outcomes of this study.

Zach Walsh is currently the Primary Investigator in a Tilray-sponsored randomized clinical trial of medical cannabis and PTSD, but he receives no financial compensation for that study nor for assisting with the analysis and writing of this paper.

Acknowledgements

Funding for this study was provided by Tilray. We would like to thank all of the Tilray patients that have shared their thoughts and experiences with us, as well as Kim Crosby for assisting with some of the data analysis of this survey.

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Contents lists available at [ScienceDirect](https://www.sciencedirect.com)

Journal of Health Economics

journal homepage: www.elsevier.com/locate/econbaseDo medical marijuana laws reduce addictions and deaths related to pain killers?[☆]David Powell^{a,*}, Rosalie Liccardo Pacula^{a,b}, Mireille Jacobson^{b,c}^a RAND, Santa Monica, United States^b NBER, Cambridge, MA, United States^c University of California, Irvine, United States

ARTICLE INFO

Article history:

Received 14 November 2015

Received in revised form 15 August 2017

Accepted 30 December 2017

Available online 3 February 2018

Keywords:

Medical marijuana

Opioids

Pain killers

Dispensaries

Mortality

Substance abuse

ABSTRACT

Recent work finds that medical marijuana laws reduce the daily doses filled for opioid analgesics among Medicare Part-D and Medicaid enrollees, as well as population-wide opioid overdose deaths. We replicate the result for opioid overdose deaths and explore the potential mechanism. The key feature of a medical marijuana law that facilitates a reduction in overdose death rates is a relatively liberal allowance for dispensaries. As states have become more stringent in their regulation of dispensaries, the protective value generally has fallen. These findings suggest that broader access to medical marijuana facilitates substitution of marijuana for powerful and addictive opioids.

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1. Introduction

Drug overdose deaths have increased dramatically over the past 15 years, increasing by 137% between 2000 and 2014 (Rudd et al., 2016), and are now the leading cause of death from injuries in the United States, exceeding deaths from suicide, gunshots and motor vehicle accidents (Murphy et al., 2013). Overdose deaths are also a prime contributor to the recent rise in mortality among middle-aged non-Hispanic white Americans (Case and Deaton 2015; Case and Deaton 2017). In 2015, 22,598 deaths were caused by an overdose of a prescription opioid, representing over 40% of all drug overdose deaths, and exceeding overdose deaths from heroin and cocaine combined.¹ Over the same period, the distribution of opioid analgesics (commonly referred to as “pain medications”) quadrupled, demonstrating a parallel rise between the medical distribution of opioid analgesics and its misuse nationally (CDC,

2011). More recently, the misuse of heroin and synthetic opioids has increased, with overdose deaths involving heroin more than quadrupling between 2010 and 2015 (Hedegaard et al., 2017). The problem has reached such severe proportions that the Department of Health and Human Services and Centers for Disease Control have deemed it an epidemic.

Providing some modest hope in an otherwise bleak landscape, recent work finds that state medical marijuana laws, which allow marijuana use for medicinal purposes, reduce prescription pain medication fills in Medicare Part-D (Bradford and Bradford, 2016), prescriptions for nausea, pain, depression and seizures among Medicaid enrollees (Bradford and Bradford, 2017), hospitalizations related to opioid analgesics (Shi, 2017), the prevalence of narcotics detected among fatally injured drivers (Kim et al., 2016) as well as national age-adjusted opioid overdose death rates (Bachhuber et al., 2014). The implication from these studies is that medical marijuana laws enable individuals to substitute marijuana for opiates, particularly opioid analgesics.² Consistent with this idea, medical

[☆] This paper was supported by a grant from the National Institute on Drug Abuse to the RAND Corporation (R01DA032693). We appreciate helpful comments from participants of the 2013 Addiction Health Services Annual Meeting, the Drug Policy Research Center Seminar, the Vanderbilt Law School Drug Policy Roundtable Meeting, the Conference of the American Society of Health Economists, and the NBER Summer Institute. We received especially helpful suggestions from Abby Alpert, Donald Kenkel, Harold Pollack and three anonymous referees.

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¹ https://www.drugabuse.gov/sites/default/files/overdose_data.1999-2015.xls (last accessed July 31, 2017).

² For the purposes of the work we present in this paper, we are adopting the medical definitions of “opiate” and “opioid”, using “opiate” to refer to the broad class of narcotics that include both natural opiates derived from the opium plant, such as heroin, as well as semi-synthetic and synthetic opioids frequently produced by prescription drug companies (e.g., hydrocodone, oxycodone, and even fentanyl). The term “opioid” is used to refer to synthetic narcotics that have opiate-like properties typically patented as a prescription drug, but are not derived from opium. However, there are some naturally derived prescription drugs as well, including morphine

marijuana recommendations are often sought for severe or chronic pain (Bowles, 2012; Nunberg et al., 2011) and several reviews find the drug is effective medicine for the treatment of chronic pain (Borgelt et al., 2013; Lynch and Cambell, 2011; Leung, 2011; Martin-Sanchez et al., 2009).³ More generally, there is interest in pain management substitutes for opioid analgesics given their associated risks, and significant policy interest in the ramifications of improving access to such substitutes. Missing from most of the prior literature, however, is a clear articulation of the mechanism through which patients substitute towards marijuana.⁴ In particular, given the considerable heterogeneity in medical marijuana laws (Klieger et al., Forthcoming; Williams et al., 2016; Pacula et al., 2015), it is important to discern the specific features of medical marijuana laws that have contributed to this relationship. Without understanding the mechanisms, efforts to replicate any benefits (or, likewise, avoid any harms) may prove unsuccessful.

In this paper, we present a detailed analysis of the impact of medical marijuana laws on opiate related harm with a specific focus on not just whether a state has a law in effect but also whether that law provides an allowance for retail marijuana sales to qualified patients through dispensaries. Dispensary allowances are associated with greater access to and use of marijuana (Pacula et al., 2015; Pacula et al., 2010; Choi, 2014; Chu, 2014; Freisthler and Gruenewald, 2014) as well as the availability of more potent marijuana (Sevigny et al., 2014). If marijuana is an effective alternative to prescription opioids, then states that provide greater legal access to it should have been more likely to stem the rise of harm caused by opiates overall.

To assess these issues, we focus on two broad measures of opioid related harm: treatment admissions for addiction to pain relievers (1999–2012) and state-level overdose deaths from opioid medications (1999–2013). Because of the recent rise in heroin use, particularly in response to a 2010 reformulation of OxyContin (Alpert et al., forthcoming), we also consider treatment admissions and overdose deaths for a combined category of heroin and prescription opioids (which together will be referred to as “opiates”). We further examine how state policies influence the distribution of (2000–2013) and self-reported misuse of prescription opioid medication (2002–2012), so as to better understand whether medical use of marijuana impacted the legal distribution of opioid analgesics as a possible mechanism for our findings.

To begin, we replicate the estimates of Bachhuber et al. (2014), demonstrating a significant decline in opioid overdose death rates in states that adopted medical marijuana laws between 1999 and 2010. We show that these estimates are driven disproportionately by states that allowed for and had a legal channel for retail marijuana sales to qualified patients. We find a similar pattern of results for treatment admissions. We then show that extending the study period through 2012/2013 – a period when states began opening more tightly regulated medical marijuana retail systems – weak-

and codeine so, consistent with the CDC, we will use the term “opioid analgesics” when referring to these prescription drugs. When referring to findings from other research, however, we maintain the language used in that original work (or used by the CDC/NIDA to describe the overall “opioid epidemic”).

³ As medical marijuana is a Schedule I drug on the federal Controlled Substance Act, it cannot be prescribed by a licensed physician (as that would put the physician at risk of losing his license). Thus, state laws instead require “recommendations” by physicians, which can either be a verbal or written statement by a physician stating that it is their professional opinion that marijuana may be of medical benefit to the patient.

⁴ Kim et al. (2016) analyzes only laws that allow for medical marijuana access through one’s own or collective cultivation or through dispensaries but does not distinguish across these types of access channels. Shi (2017) tests for differential effects of dispensary operations (though not necessarily legal) on hospitalizations. Both papers use only a subset of states – 27 in Shi (2017) and 18 in Kim et al. (2016) – limiting the generalizability of the findings.

ens the overall medical marijuana law results and, to a lesser extent, even the dispensary law provisions. We discuss in the paper why we think this occurs and what these findings tell us about possible mechanisms.

We find little evidence that states with medical marijuana laws experience reductions in the volume of legally distributed opioids, as captured by the Drug Enforcement Agency’s Automation of Reports and Consolidated Orders System (ARCOS). This finding is irrespective of whether the state allows legal access to medical marijuana dispensaries. If anything, states that adopt medical marijuana laws during our sample experience a relative increase in the legal distribution of prescription opioids. This result suggests that our findings are not driven by a decrease in the legal supply of opioids.

Finally, we analyze self-reported nonmedical use of pain relievers as reported in the National Survey on Drug Use and Health (NSDUH). We find only weak evidence that access to medical marijuana dispensaries reduce nonmedical use of pain relievers. Given the limits of this question – which asks only about nonmedical use of pain relievers, rather than, for example either any or regular use of prescription opioids – and the small size of the NSDUH, we caution against over-interpreting this result.

These results combined – reductions in opioid overdose death rates and treatment admissions with no decrease in the legal distribution of prescription opioids or in their “nonmedical use” – suggest that medical marijuana dispensaries reduced some of the harms associated with the misuse of opioids. The effect of medical marijuana policies on opioid related harm diminishes over time, particularly after 2010, which might be due to the regulatory tightening of medical marijuana dispensaries, the major marijuana policy feature behind the reduced harm in the earlier period. It is not driven solely by a shift in use to heroin, as our results with respect to active and legal dispensaries remain when we include heroin in our mortality measure and treatment admissions.

The rest of this paper is organized as follows. In Section 2, we describe the data sources and study measures. Section 3 includes a discussion of our empirical strategy. The results are presented in Section 4. Section 5 concludes.

2. Data and measures

Following the literature studying opioid-related harms, we use four different measures of opioid use and misuse to study the relationship between medical marijuana laws and potential harm from opioids: opioid-related mortality, opioid-related treatment admissions, the legal distribution of opioids to states from the producers of these medications, and self-reported nonmedical pain reliever use. For each outcome, we have data for all states and Washington D.C.

We construct opioid-related deaths using the National Vital Statistics System (NVSS), a census of deaths in the United States. Opioid-related deaths are the key driver of prescription drug overdoses for over a decade (Jones et al., 2013). We code deaths as related to prescription opioids using the ICD-10 external cause of injury codes (X40–X44, X60–64, X85, or Y10–Y14) and drug identification codes (T40.2–T40.4). We follow the codes used by the CDC to categorize deaths of any intent (unintentional, suicide, homicide or undetermined).⁵ Given the rise in heroin-related mortality during our time period, we will also study deaths involving any opiate, including heroin (identification code T40.1). We limit our mortality analysis to 1999–2013 because prior to 1999, the NVSS used ICD-9 codes to identify cause of death and opioid-related deaths are

⁵ See <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6226a3.htm>.

difficult to link across ICD coding systems. We used the restricted geocoded data with state identifiers to link medical marijuana laws to opioid-related deaths. We aggregate based on state of occurrence and year.

Our second measure of problematic opioid use is the number of treatment episodes for abuse of pain relievers from the Treatment Episode Data Set (TEDS) for 1999–2012, which is collected by Substance Abuse and Mental Health Services Administration (SAMHSA).⁶ While available back to 1992, we use 1999 as the start date to remain consistent with the mortality data and due to the rarity of medical marijuana laws before 1999. Not all states report in all years so we have an unbalanced sample for our TEDS outcomes, though all states report in at least eight of the fourteen years.⁷ SAMHSA requests that all states submit treatment admissions data from facilities receiving public funding (federal block grants, state funds, public insurance dollars) even if those facilities also serve privately insured or cash only patients. While facilities serving exclusively privately insured or cash-only patients are not reflected in the sampling frame, examination of national spending on substance abuse treatment shows that the public sector (via Medicare, Medicaid or other federal, state and local grants or subsidies) has consistently paid over 75% of all substance abuse treatment in the United States since 1998 (Mark et al., 2011). Thus, in theory the TEDS data should capture the vast majority of treatment admissions. In practice, the scope of facilities included in TEDS varies by state due to differences in systems of licensure, certification, accreditation, and health care payment systems (Rutter et al., 2015; SAMHSA, 2017). As we discuss below, important differences in what gets reported across states must be accounted for statistically when analyzing the TEDS data. Prior work has found that the TEDS provides useful information regarding substance abuse (e.g., Anderson, 2010; Chu, 2014; Anderson et al., 2015). We present evidence that the reductions in treatment admissions associated with medical marijuana dispensaries represent reductions in harms and not concurrent reductions in treatment availability or reporting.

While the first two data sets provide measures related to opioid harm, we are also interested in opioid access. Data on the supply of opioids by drug type through medicinal channels, one measure of access, is captured and in the Drug Enforcement Administration's (DEA) Automation of Reports and Consolidated Orders System (ARCOS). ARCOS is the system that monitors and records the flows of controlled substances, which are tracked under the Controlled Substances Act of 1970, as they move from manufacturers to retail distributors at the local level (down to the street address and zip code). We have ARCOS data by quarter, year, drug type, and state for the years 2000–2013. Following prior work (Paulozzi et al., 2011; Paulozzi and Ryan, 2006), we measure morphine-equivalent doses of the 8 most commonly abused opioid analgesics: fentanyl, hydrocodone, hydromorphone, meperidine, methadone (distributed through narcotics treatment programs and distributed through other outlets as an analgesic), morphine, codeine and oxycodone (as OxyContin as well as in other forms). We convert the total grams distributed per capita into morphine equivalent doses drawing on standard multipliers used by the Centers for Medicare & Medicaid Services (CMS)⁸ and Paulozzi et al. (2011) and aggregate by state and year.

While data on opioid use are difficult to find at the state level, the National Survey on Drug Use and Health (NSDUH) constructs estimates of self-reported nonmedical use of pain relievers by state from its annual survey of the civilian, noninstitutionalized population aged 12 and older. Although the NSDUH data are collected annually, the portal that provided access to the geocoded individual level data has been closed for nearly two years. We therefore make use of aggregated state-level estimates of non-medical use of pain reliever medication, which SAMHSA constructs using survey-weighted hierarchical Bayes estimation methodology applied to data that is pooled over two years to overcome problems associated with small area estimates. Due to the relatively short time frame for this variable, we present regression estimates for non-medical use but provide less information about pre-existing trends and lagged effects than in our other analyses.

Information on state medical marijuana laws were obtained via original legal research of state statutes and regulations as part of a series of projects funded by the National Institute on Drug Abuse and the Robert Wood Johnston Foundation over the past decade (Chriqui et al., 2002; Pacula et al., 2002; Pacula et al., 2014). A state was identified as having a medical marijuana policy if it provided legal protections (affirmative defense) to physicians who wanted to discuss and/or recommend marijuana to their patients as well as to patients who wanted to use and/or possess marijuana for allowable conditions or symptoms permitted by the law.⁹ These policies were identified through Lexis/Nexis and state webpage searches. Once statutes meeting these criteria were identified, these statutes were then reviewed by legal scholars, economists, and policy analysts at RAND to determine whether the law contained specific provisions related to: (i) the conditions and/or symptoms for which medical marijuana would be allowed; (ii) whether the state required or recommended a patient (and subsequently caregiver) registry system, and (iii) the supply mechanism (if mentioned in the law) through which marijuana could be provided to patients (home cultivation by patient and/or caregiver, cooperatives, and dispensaries). States were categorized as legally permitting and protecting dispensaries if either (1) the statute or agency rules explicitly allowed for a dispensary, or (2) the statute or agency rules allowed for organizations that were functionally equivalent to dispensaries (e.g., allowing for qualified persons to associate under state law in order to collectively or cooperatively cultivate marijuana for medicinal purposes with no restrictions placed on membership).

Recent papers have identified in even greater detail how medical marijuana laws differ across states (Klieger et al., Forthcoming; Williams et al., 2016; Pacula et al., 2015), making it clear that simple indicators of adoption are inadequate for capturing how these laws may impact use (Sevigny et al., 2014; Pacula et al., 2014 and Pacula et al., 2015) or the size of medical marijuana markets (Smart, 2016). Legal allowances for medical marijuana dispensaries are more strongly associated with adult marijuana use than medical marijuana laws per se (Pacula et al., 2010, 2015; Choi, 2014; Chu, 2014; Freisthler and Gruenewald, 2014), as they provide legal protection to otherwise illegal entities, enabling them to spread openly throughout a state rather than operate discretely in specific jurisdictions where they are tolerated.

Because legal protection of retail dispensaries does not mean dispensaries are operational, we construct our policy measure to identify the state/year in which dispensaries are both legally protected and open for business. Our designation of states with active

⁶ TEDS lists up to three substance of abuse per admission. We categorize as pain reliever admissions those for “non-prescription methadone” and “other opiates and synthetics,” which includes all non-heroin opiates such as buprenorphine, codeine, hydrocodone, hydromorphone, meperidine, morphine, opium, oxycodone, pentazocine, propoxyphene, tramadol, and any other drug with morphine-like effects.

⁷ The results are similar if we select on the 42 states that report in each year.

⁸ <https://www.cms.gov/Medicare/Prescription-Drug-Coverage/PrescriptionDrugCovContra/Downloads/Opioid-Morphine-EQ-Conversion-Factors-March-2015.pdf> (last accessed April 8, 2016)

⁹ When we initiated these searches back in 2000 and again in 2002 and 2008, there was no distinction in any of these laws between “high CBD” and “low CBD” marijuana. Thus, laws that have been adopted since 2014 that allow for only “high CBD/low THC” marijuana to be used are not included in our legal definition of a medical marijuana law.

dispensaries comes from an extensive web search conducted from three primary sources: (1) webpages produced by marijuana advocacy groups either informing patients of where to get marijuana or linking to dispensary webpages, such as Weedmaps, the National Organization for the Reform of Marijuana Laws (www.norml.org), Marijuana Policy Project (www.mpp.org)¹⁰; (2) key word searches of old local newspapers and weekly circulars, using terms such as “medical marijuana” and “dispensary” or “cooperative”; and (3) state agency webpages responsible for licensing and regulating marijuana dispensaries. Information on the earliest month and year in which an operating dispensary could be identified from one of these sources was coded for each state. When dispensaries were identified as operating prior to the adoption of a law granting legal protections to dispensaries (e.g., Michigan, California and Colorado), we simply coded our (active + legal) policy variable as zero until the state adopted a law providing legal protections, at which point this policy turned on with the law. If dispensaries were not open prior to state adoption of legal protections (e.g., New York, Massachusetts), then this (active + legal) policy variable is turned on at the later date when the first dispensary is known to be operating (generally identified by the state licensing agency as well as news reports around the opening). We report our enactment and operational dispensary dates in [Appendix A Table A1](#).

We also distinguish between the periods before versus after 2010. We do this because of important differences in dispensary provisions over time that may be related to an October 2009 Obama administration policy ([Smart, 2016](#)). Specifically, the 2009 Ogden memo ([Ogden, 2009](#)), sent from the Department of Justice to all US Attorney Generals, deprioritized the federal prosecution of medical marijuana users and suppliers who were in clear and unambiguous compliance with existing state laws. Perhaps as a result, the dispensary policies crafted after 2010 look quite different from earlier policies ([Pacula and Smart, 2017](#)). While early adopting states (e.g., California, Colorado, and Washington) took relatively lax approaches to regulating dispensaries, later states adopted stringent guidelines that were more consistent with traditional medical care and pharmaceutical regulation ([Pacula and Smart, 2017](#); [Williams et al., 2016](#)). Studies conducted using variation in the adoption of these later laws generally do not find as strong a statistical association between dispensaries and adult use ([Wen et al., 2015](#); [Smart, 2016](#)). In contrast, states with loosely regulated systems experience large increases in marijuana use and marijuana-involved harms, even in the latter period, due to rapid commercialization that occurred because of weak state regulation ([Smart, 2016](#); [Davis et al., 2016](#); [Ghosh et al., 2015](#)).

2.1. Descriptive patterns

Our time period includes an unprecedented rise in opioid supply, substance abuse treatment admissions, and overdoses involving opioids. In [Fig. 1](#), we show these trends for all available years. We normalize all trends to 100 in year 2000 to more clearly demonstrate the dramatic increase in opioid distribution and harm over our sample period. From 2000–2012, opioid-related treatment admissions more than quadrupled. Mortality and distribution more than tripled. We show trends for overdoses involving prescription opioids (T40.2–T40.4) but excluding heroin. Heroin-related mortality experienced dramatic growth starting in 2011, motivating our analysis to study how effect sizes change when heroin is also examined.

Given the dramatic trends in [Fig. 1](#), it is important to account for national time effects. Opioid-related outcomes increased even

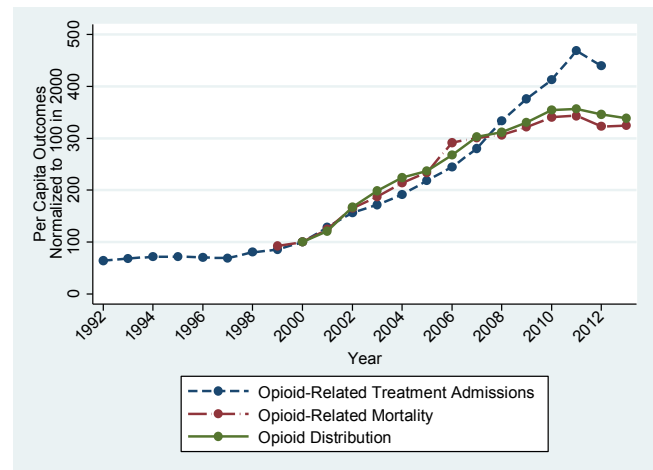


Fig. 1. Time Series Trends.

Notes: Treatment Admissions are from TEDS (1992–2012); Mortality data are from NVSS (1999–2013); Distribution data are from ARCOS (2000–2013).

as more states legalized medical marijuana and permitted dispensaries. We will study the differential outcomes in these states compared to states without medical marijuana laws and/or without legal and active dispensaries.

3. Empirical strategy

The basis of our empirical strategy is to compare changes in opioid-related mortality and treatment admissions in states adopting medical marijuana laws to those not adopting these laws. We use the timing of adoption of the marijuana policy for identification. Our primary approach is to use (1) a difference-in-differences strategy that uses non-adopting states as controls and differential timing of adoption to estimate the effect and (2) an event study analysis that estimates effects by year relative to year of adoption to assess the credibility that our estimates are causal.

Our first approach, the traditional difference-in-differences framework, compares changes in outcomes within adopting states to those in non-adopting states. We implement this strategy by including state fixed effects and year fixed effects in the following specification:

$$\ln y_{st} = \alpha_s + \gamma_t + X'_{st}\beta + MML'_{st}\delta + \eta_{st}, \quad (1)$$

where y_{st} represents an outcome, such as opioid overdose deaths per 100,000 of the population within state s at time t . The vector MML represents our two indicators for state medical marijuana laws: (1) any law and (2) operational and legally-protected dispensaries (equal to one in the first full year). X_{st} is a vector of time-varying covariates, including demographics that are associated with prescription drug misuse: the percentage of the state population that is male, the age distribution within the state, and the percentage of the state population that is white (CDC, 2011b). In addition, we control for the state unemployment rate, which might influence access to insurance/ability to pay for prescription drugs, and the state alcohol tax rate. We also include an indicator for whether a state has a “must access” state-level prescription drug monitoring program (PDMP). Nineteen states had operational PDMPs from 1999 to 2005 but these programs grew rapidly after 2005 with nearly all states having them by 2011. Although some studies have found little effect of these laws generally ([Brady et al., 2014](#); [Paulozzi et al., 2011](#)), recent studies have identified specific elements of these laws that make them more effective at reducing opioid related harm ([Buchmueller and Carey, 2017](#); [Patrick et al., 2016](#); [Pardo, 2017](#)). [Buchmueller and Carey \(2017\)](#) find that “must

¹⁰ Historical data from these webpages was also searched using the WayBack Machine (<https://archive.org/web/>).

access” PDMPs, those that require providers to access the PDMP under certain circumstances,¹¹ are effective in reducing measures of doctor shopping and abuse. In robustness tests, we have included other PDMP dimensions as well and found that our results are not meaningfully changed. Finally, we include an indicator variable equal to one if the state has a pill mill law.

Table 1 provides descriptive statistics on all the measures used in our analyses, broken out by status and period of medical marijuana law adoption, with states that adopted a law by 2009 shown in column (1); those that adopted in 2010 or later shown in column (2); and those that did not adopt during our study period shown in column (3). States that were late in adopting medical marijuana laws had lower total opioid deaths and, specifically, prescription opioid deaths than states that were early medical marijuana adopters. Never adopters had rates between the late and early adopters for prescription opioid deaths. While late adopting states had lower opioid mortality rates and slightly lower non-medical use rates (from NSDUH), they had substantially higher rates of opioid treatment admissions (from TEDS) and higher opioid distribution, reported in per capita morphine milligram equivalents (from ARCOS) than either early adopters or never adopter states. Only 6 of the 14 early adopting states passed laws during the entire time period allowing dispensaries, while nearly all late adopting states did so. Importantly, however, fewer of these late adopting states had stores that were actually open during our time period at least in part because of more stringent state regulation of these entities.

Eq. (1) represents a log-linear regression model. We rely primarily on unweighted regressions to compare our results to Bachhuber et al. (2014), though we include population-weighted estimates in the Appendix A. Following Santos Silva and Tenreyro (2006), which shows that a Poisson regression model allows for both multiplicative and additive error terms,¹² we also present Poisson regression models results, which are similar to our main results, in the Appendix. In all models, we adjust our standard errors for clustering at the state-level.¹³

We also employ a complementary event study approach to estimate lagged effects while testing for pre-existing trends. For this approach, we estimate Eq. (1) while allowing for differential effects of the MML variables based on the time relative to adoption. We will include seven indicators per MML dimension, representing 6 years or more before adoption, 5–4 years prior to adoption, 3–2 years prior to adoption, the year before and year of adoption, 1–2 years after adoption, 3–4 years after adoption, and 5 or more years after adoption. We include these seven indicators for medical marijuana laws and legal and active dispensaries and estimate event studies jointly.

4. Results

4.1. The availability of medical marijuana on measures of opioid harm

We start by revisiting the Bachhuber et al. (2014) finding that MML adoption is associated with a decline in the opioid-related mortality rate. There are a few differences between our approach

and the model estimated in Bachhuber et al. (2014) – for example, we do not age-adjust the death rates and we include some additional controls, such as an indicator for a “must access” PDMP.¹⁴ Although we do not expect our coefficient estimates to be identical, we do expect and obtain very similar results, as seen in Table 2. Our estimate, presented in the first column of Table 2, is -0.23 . This implies that medical marijuana law adoption decreases the opioid mortality rate by 21%,¹⁵ similar to the Bachhuber et al. (2014) estimate of a 25% reduction.

When we add time-varying state-specific covariates, specifically our state-level PDMP variables, pill mill laws, alcohol tax rate, unemployment rate and population demographics, our estimate of the impact of having any medical marijuana laws decreases to -0.18 and is statistically indistinguishable from zero. Moreover, when we extend the analysis sample to include just three more years of data (adding 2010–2013), the estimate of the effect of having any medical marijuana law further decreases in magnitude (to -0.084 with covariates) and is similarly statistically indistinguishable from zero.

There are two possible reasons for the reduced effect when studying the longer time period. First, there may be differences in the types and effectiveness of medical marijuana laws adopted between 2010 and 2013 compared to the earlier laws. Second, the effects of the existing MMLs may have changed over time. We disentangle these two possibilities by reporting results using the full sample period while excluding states adopting MML during 2010–2013 (see column labeled “No Late Adopters”). The magnitude of the coefficient on any medical marijuana law is similar to the estimate from the earlier time period (1999–2010), suggesting that the new MMLs have different associations with this outcome than the older MMLs. In the latter half of Table 2, we also include heroin deaths in our mortality measure. The pattern of results is similar to that just described, suggesting that the exclusion of heroin in our measure of opioid mortality is not the reason for the changing medical marijuana policy effects after 2010.

As described previously, a key difference between late and early adopters of medical marijuana laws is that although most state laws included medical marijuana dispensaries post the October 2009 release of the Ogden memo, these states tightly regulated dispensaries and significantly curtailed access to marijuana relative to early adopters (Pacula and Smart, 2017; Smart, 2016). To further probe the importance of dispensaries, we augment our models to include not only a medical marijuana law indicator but also a dispensary indicator. In all specifications including both the medical marijuana law indicator and an indicator for the presence of active and legal dispensaries, we report the significance of the sum of the parameters on these two variables in the bottom row. The sum is the total effect of active and legal dispensaries since having a medical marijuana law is a necessary condition for such dispensaries. As shown in Table 3, dispensaries – retail outlets that sell marijuana to qualified patients – contribute to the decline in opioid overdose death rates.

Using data from just the early period of these laws 1999–2010, dispensaries reduce opioid mortality rates by about 40%, above and beyond the reduction from marijuana laws alone. The total effect is estimated to be even larger. When we consider the full time period (1999–2013), the estimates imply that dispensaries reduce opioid mortality rates by about 20% while the main effect of having a law is relatively small in magnitude, implying declines of about 5%, and not statistically distinguishable from zero. Importantly, together –

¹¹ These are also commonly referred to as mandatory access provisions.

¹² It is commonly thought that Poisson regression assumes that the mean is equal to variance. While this is a feature of the Poisson distribution, it is not enforced in Poisson regression. See Santos Silva and Tenreyro (2006) for more details. Similar estimators (such as a negative binomial model) do require correctly specifying the variance, making Poisson regression more robust to misspecification (see Chapter 18 of Wooldridge (2010) for more details).

¹³ We also use a “small sample” adjustment to scale up our standard errors since we only have 51 clusters.

¹⁴ We also use the CDC’s definition of opioid-related deaths, while Bachhuber et al. (2014) create a different (though similar) measure. Lastly, there are some additional differences in covariates in our models and theirs.

¹⁵ The percent reduction is $100 * (\exp(-0.23) - 1) \% = -20.5\%$.

Table 1
Descriptive Statistics for Data Used in Analyses (1999–2013).

	Early Adopters	Late Adopters	Never Adopters
Prescription Opioid Deaths per 100,000	4.55	3.27	4.05
Total Opioid Deaths per 100,000	5.53	4.82	4.80
Opioid Treatment Admission per 100,000	54.11	84.33	50.95
Nonmedical Pain Reliever Use per 100	5.25	4.51	4.60
Morphine Milligram Equivalents per capita	584.90	679.01	589.94
% Male	49.56%	48.77%	48.96%
% 18–64	63.15%	62.57%	62.31%
% 65+	11.83%	13.54%	13.11%
% White	77.99%	80.86%	79.78%
Beer Tax	0.22	0.14	0.29
Unemployment Rate	7.04	6.02	6.07
PDMP Must Access	0.01	0.01	0.02
Pill Mill Law	0.00	0.00	0.07
Population	54,71,199	43,23,484	62,91,445
Number of states	14	6	31
Number of states legally protecting dispensaries	6	5	
Number of states with active, legal dispensaries	6	3	

Notes: Population weighted.

Table 2
Log Opioid-Related Mortality Rate.

Years	Prescription Opioids Only			Prescription Opioids and Heroin		
	1999–2010	1999–2013	1999–2013	1999–2010	1999–2013	1999–2013
Sample	All States	All States	No Late Adopters	All States	All States	No Late Adopters
Panel A: With State and Year Fixed Effects Only						
MML	–0.230* (0.115)	–0.115 (0.106)	–0.231* (0.128)	–0.202 (0.121)	–0.104 (0.111)	–0.245* (0.131)
Panel B: With State and Year Fixed Effects and Covariates						
MML	–0.180 (0.120)	–0.084 (0.109)	–0.231* (0.131)	–0.220* (0.126)	–0.106 (0.118)	–0.255* (0.140)
Pre-MML Mean	3.64	3.76	4.54	4.72	4.92	5.47
Observations	612	765	675	612	765	675

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

All regressions include state and year fixed effects. Time-varying state-specific covariates: share of the population that is male; share that is white; age distribution, state unemployment rate, state alcohol tax rate, an indicator for state-level “must access” prescription drug monitoring program, and an indicator for a state pill mill law. Standard errors allow for clustering at the state level. Pre-MML Mean is average (unweighted) number of overdoses per 100,000 before MML adoption in states adopting MMLs.

Table 3
Log Opioid Related Mortality Rate

Years	Prescription Opioids Only				Prescription Opioids and Heroin			
	1999–2010		1999–2013		1999–2010		1999–2013	
MML	–0.195* (0.100)	–0.154 (0.112)	–0.073 (0.096)	–0.048 (0.096)	–0.169 (0.108)	–0.195 (0.117)	–0.066 (0.101)	–0.072 (0.107)
Active + Legal Dispensaries	–0.572*** (0.082)	–0.520*** (0.131)	–0.254** (0.117)	–0.272** (0.112)	–0.533*** (0.099)	–0.498*** (0.163)	–0.226* (0.117)	–0.261** (0.119)
Time-varying covariates	No	Yes	No	Yes	No	Yes	No	Yes
Observations	612	612	765	765	612	612	765	765
P-value for sum	0.00	0.00	0.03	0.05	0.00	0.00	0.08	0.06

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

All regressions include state and year fixed effects. Regressions in the second column for each sample also include a set of time-varying state-specific covariates: share of the population that is male; share that is white; age distribution, state unemployment rate, state alcohol tax rate, an indicator for state-level “must access” prescription drug monitoring program, and an indicator for a state pill mill law. Active + legal dispensaries means that the state allows dispensaries to operate in the state and any regulatory hurdles to do so have been overcome. Standard errors allow for clustering at the state level. P-value for sum is the statistical significance of the sum of the two estimates reported in the column.

a marijuana law with a legal, operational dispensary provision – the estimates imply a statistically significant (at the 5% level) decline in overdose death rates of about 25%. Results that include heroin deaths in the outcome (the last 4 columns of [Table 3](#)) are again similar (with a p -value of 0.06 when using the full sample and including covariates). Results are similar when we use Poisson regression models (see [Appendix A Table A2](#)). When we population-weight the regressions (see [Appendix A Table A3](#)), we estimate statistically significant reductions at the 5% level (when all covariates are included)

for both prescription opioid deaths and prescriptions opioids plus heroin.

Our focus on legal and operational dispensaries is motivated by the possible inadequacy of simply adopting a medical marijuana law without addressing the delivery of medicinal marijuana to patients. We can go a step further and study whether the simple act of legalization (at the state-level) of medical marijuana dispensaries is able to reduce overdose deaths, regardless of whether there are operational dispensaries. We present these estimates in [Appendix A Table A4](#). The impact of simply having a dispensary allowance in

Table 4
Log Opioid Related Treatment Admission Rate.

Years	Prescription Opioids Only				Prescription Opioids and Heroin			
	1999–2010		1999–2013		1999–2010		1999–2013	
MML	−0.051 (0.124)	−0.091 (0.108)	0.038 (0.119)	0.07 (0.135)	−0.167 (0.184)	−0.146 (0.119)	−0.215 (0.161)	−0.126 (0.119)
Active + Legal Dispensaries	−0.316** (0.120)	−0.364*** (0.122)	−0.161 (0.176)	−0.238 (0.166)	−0.681** (0.265)	−0.577*** (0.129)	−0.351 (0.286)	−0.374* (0.214)
Time-varying covariates	No	Yes	No	Yes	No	Yes	No	Yes
Observations	591	591	686	686	591	591	686	686
P-value for sum	0.02	0.00	0.57	0.44	0.01	0.00	0.06	0.05

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

All regressions include state and year fixed effects. Regressions in the second column for each sample also include a set of time-varying state-specific covariates: share of the population that is male; share that is white; age distribution, state unemployment rate, state alcohol tax rate, an indicator for state-level “must access” prescription drug monitoring program, and an indicator for a state pill mill law. Active + legal dispensaries means that the state allows dispensaries to operate in the state and any regulatory hurdles to do so have been overcome. Standard errors allow for clustering at the state level. P-value for sum is the statistical significance of the sum of the two estimates reported in the column.

the law is small and statistically indistinguishable from zero when using the full time period (including the post-Ogden memo period). When compared to the results presented in Table 3, it is clear that operational dispensaries are critical, implying significant heterogeneity across states that are often coded uniformly as having a medical marijuana law.

Finally, it is also informative to study whether dispensaries differentially reduce “natural and semisynthetic opioid” deaths (e.g., oxycodone), synthetic opioid deaths (e.g., fentanyl), or heroin deaths.¹⁶ We present these estimates in Appendix A Table A5. We estimate Poisson regression models for these outcomes because some state-years have no heroin deaths. As such, the appropriate comparisons are the results shown in Appendix A Table A2. We find large and statistically significant reductions for overdoses involving natural and semisynthetic opioids but less evidence for synthetic opioids or heroin. This pattern of results makes sense if medical marijuana is more often used as a substitute for pain relievers such as oxycodone instead of fentanyl and heroin. It is also possible that the any effects for synthetic opioids and heroin occur with a lag that is not appropriately modelled in Appendix A Table A4.

In Table 4, we present our analysis of treatment admissions from the TEDS data. We find no statistically significant relationship between simply having a medical marijuana law and pain reliever substance abuse treatment admissions, when separately accounting for states with active and legally-protected dispensaries. Estimates that do not include heroin are small and flip sign, from negative to positive, when we consider the whole time period. Estimates with heroin are larger in magnitude – implying reductions of about 11–13% – but are not statistically distinguishable from zero. In contrast, we find more support for an impact of dispensary allowances on admissions, particularly, when we include heroin in the outcome. The admission rate for opioids and heroin declines by about 38% as a result of operational dispensaries, above and beyond just having a law. The sum of the estimates for having a medical marijuana law and operational legal dispensaries is statistically distinguishable from zero at the 5% level. As we found for mortality, estimates of the effects of legal and active dispensaries on treatment admissions are similar when we use Poisson regression models (see Appendix A Table A6) or population-weighted regressions (see Appendix A Table A7). The findings for treatment admissions lend further support to the idea that access to marijuana through dispensaries curtailed the misuse of opioids.

We also provide evidence about the potential for systematic reporting issues in Appendix A Table A8. Instead of using the log

of per capita opioid treatment admissions as the outcome, we use the log of the number of opioid treatment admissions divided by the total number of admissions in the state. If reporting issues or changes in treatment access are driving our results, then these should affect all types of treatment admissions and we should not observe similar effects when we scale opioid admissions by all admissions. Our results are generally similar to those in Table 4 using this alternative outcome, suggesting that we are estimating true changes in state-level abuse rates and not changes in the reporting of abuse. Though not shown here, the Appendix A Table A8 results are also similar if we exclude treatment admissions for marijuana from the denominator.

4.2. Medical marijuana laws and nonmedical use of prescription opioids

The findings above suggest that medical marijuana laws reduce the misuse of prescription opioids, as reflected in treatment admissions and overdose deaths, primarily through the allowance and opening of dispensaries. It is unclear however whether these reductions occur at the extensive or intensive margins. To more directly assess the impact of medical marijuana laws on the extensive margin (i.e., any use), we study the relationship between medical marijuana laws and self-reported measures of nonmedical use of pain relievers (in the past year) in the NSDUH. There are several known limitations of these data – they are self-reported, the “non-medical” qualifier is subject to interpretation, they exclude heroin and other non-prescription opiates, and they are constructed estimates from pooling two years of data to overcome small sampling areas. Nonetheless, they are the only direct measures of nonmedical use of opioids we have available at this time.

Table 5 presents the NSDUH estimates. These results are qualitatively consistent with the opioid misuse estimates above. Prior to 2011, we find a negative relationship between dispensary allowances and self-reported nonmedical use of pain relievers in the past year when compared to all states with any type of medical marijuana law. The sum of the effects for having a medical marijuana law and having legally-protected and operational dispensaries are, however, never statistically significant. Estimates that include data through 2012 are even more imprecise and often positive. Appendix A Table A9 includes the same estimates but weighted by the NSDUH sample size.¹⁷ There is slightly stronger evidence of reductions in nonmedical pain reliever use, but we cannot reject that there is no effect.

¹⁶ These categories are not mutually exclusive as overdoses can involve multiple substances. These results are similar if we select on overdoses involving only natural and semisynthetic opiates, only synthetic opioids, or only heroin.

¹⁷ The NSDUH often relies on a small number of respondents to generate estimates for a given state and wave. Our motivation for weighting by the NSDUH sample size is to place more weight on state-wave observations with more data.

Table 5
Log Nonmedical Use of Prescription Opioids.

Years	2002–2010		2002–2012	
MML	0.101 (0.079)	0.073 (0.081)	0.055 (0.068)	0.025 (0.059)
Active + Legal Dispensaries	−0.118* (0.066)	−0.123 (0.085)	−0.024 (0.046)	−0.007 (0.063)
Time-varying covariates	No	Yes	No	Yes
Observations	255	255	306	306
P-value for sum	0.83	0.60	0.69	0.82

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

All regressions include state and year fixed effects. Regressions in the second column for each sample also include a set of time-varying state-specific covariates: share of the population that is male; share that is white; age distribution, state unemployment rate, state alcohol tax rate, an indicator for state-level “must access” prescription drug monitoring program, and an indicator for a state pill mill law. Active + legal dispensaries means that the state allows dispensaries to operate in the state and any regulatory hurdles to do so have been overcome. Standard errors allow for clustering at the state level. P-value for sum is the statistical significance of the sum of the two estimates reported in the column.

At best, the NSDUH evidence is somewhat suggestive of the possibility that the legal protection of medical marijuana dispensaries is associated with a reduction in nonmedical pain reliever use (i.e., use on the extensive margin). More realistically, they suggest little to no relationship between medical marijuana laws with active dispensaries and self-reported non-medical use of pain relievers. Given the limitations of the NSDUH measures discussed above, we caution against over-interpreting these results.

4.3. Medical marijuana laws on measures of opioid distribution

While we have found evidence that medical marijuana dispensaries reduce opioid misuse, as measured by opioid overdose deaths and treatment admissions, the mechanism driving this result remains unclear. To shed further light on this, we consider the distribution of opioid analgesic medications to legal medical markets using the ARCOS data. Table 6 presents the results for morphine equivalent doses per capita of our 8 primary opioids of abuse pooled together. Across models and samples, we find little evidence that either marijuana laws per se or dispensaries reduce legal distribution at the state-level. Indeed, adopting a medical marijuana law is associated with an increase in legal distribution of opioids over the 1999–2010 time period, the same years in which we see this policy reduce mortality and treatment admissions. Results through 2013 are much smaller in magnitude and never statistically distinguishable from zero. Likewise, over the full period, the combined estimate for marijuana laws and dispensary provisions are not significantly different from zero. These results indicate that our findings for overdose deaths and treatment admissions are not driven by a decrease in the legal supply of opioids. This implies that access to medical marijuana through dispensaries must decrease the harm from opioids (overdoses and addiction), but not necessarily the medical use of opioids and, given the results above, not necessarily misuse on the extensive margin.

4.4. Event studies

Previous work has rarely explored whether medical marijuana law policy is endogenously related to trends in opioid harm. We use event study analysis to test for pre-existing trends as well as to understand whether medical marijuana access has immediate or lagged effects on opioid-related harm.

In Fig. 2, we jointly estimate event studies for adoption of a medical marijuana law and for presence of legal and active dispensaries on per capita opioid-related mortality. For medical marijuana adoption (figure on the left), we see little pre- or post-adoption

relationship with mortality rates, consistent with our aggregated findings presented above. On the right, we present the estimates for active and legal dispensaries. We find large and statistically significant reductions in opioid-related mortality after full implementation of legal and active dispensaries. This effect persists for the remainder of the post-adoption period. Further, the sum of the MML estimate and the dispensary estimate for the same time period (relative to adoption) is statistically significant at the 5% level in each post-adoption time period. These sums are never statistically significant in the pre-period. Overall, we observe little evidence that this reduction is driven by pre-existing trends.

Fig. 3 presents the corresponding event studies for opioid-involved treatment admissions. Here, we observe suggestive evidence of long-term reductions in admissions associated with the adoption of any medical marijuana law. For legal and active dispensaries, we observe a downward trend beginning in the adoption years and continuing to 3–4 years post-adoption. The estimates in the post-period are statistically significant at the 5% level. When testing the significance of the sum of the MML estimates and the dispensary estimates in the same period, we can statistically reject (at the 5% level) that there is no effect in each period after adoption. As before, there is little evidence of pre-existing trends driving the results and we can never statistically reject that the sum of the parameters is equal to zero. While we previously noted concerns with reporting issues in the TEDS, it is unlikely that these would be so closely correlated with medical marijuana adoption and dispensary openings. Combined with our Appendix A Table A8 results as previously-discussed, we find little evidence that any reporting issues in the TEDS are systematically affecting our results.

Finally, we study per capita morphine equivalent doses and present the results in Fig. 4. These estimates are consistent with a possible rise in opioid supply after adoption of a medical marijuana law. There is no differential effect in states with active and legal dispensaries as all of the estimates are statistically insignificant from zero.

5. Discussion and conclusions

Considerable attention has been paid in the literature to the potential unintended consequences of medical marijuana laws, with people examining impacts of these policies on youth initiation, recreational marijuana use and abuse as well as drunk driving (Wen et al., 2015; Choi, 2014; Lynne-Landsman et al., 2013; Anderson et al., 2013, Anderson et al., 2015; Pacula et al., 2015). In this paper we consider a potential unintended benefit of these laws: a reduction in the misuse of prescription opioids. While other work has considered this question, previous analyses (e.g., Bradford and Bradford, 2017; Bachhuber et al., 2014) have ignored the substantial heterogeneity in medical marijuana laws. In particular, they have not taken into account medical marijuana dispensary provisions, which enable access to marijuana through retail sales nor the changes in these provisions over time, as newly adopting states more tightly regulate dispensaries in response to Federal-state conflict over marijuana policy (Pacula and Smart, 2017; Smart, 2016).

We find fairly strong and consistent evidence using difference-in-differences and event study methods that states providing legal access to marijuana through dispensaries reduce deaths due to opioid overdoses, particularly prior to the October 2009 Ogden memo when dispensary systems were not tightly regulated by the states. We provide complementary evidence that dispensary provisions lower treatment admissions for addiction to pain medications. We find in all cases that the effectiveness of having any medical marijuana law completely disappears when data after 2010 are included. Furthermore, while we show that legally protected and active dispensaries remain an important factor in reduced opi-

Table 6
Log Per Capita Prescription Opioid Distribution.

Years	2000–2010				2000–2013			
MML	0.057** (0.025)	0.071** (0.027)	0.056** (0.025)	0.071** (0.028)	0.015 (0.033)	0.027 (0.026)	0.016 (0.031)	0.03 (0.024)
Active + Legal Dispensaries			0.005 (0.016)	-0.002 (0.023)			-0.007 (0.023)	-0.024 (0.026)
Time-varying covariates	No	Yes	No	Yes	No	Yes	No	Yes
Observations	561	561	561	561	714	714	714	714
P-value for sum	N/A	N/A	0.03	0.05	N/A	N/A	0.84	0.88

Notes: * p < 0.10, ** p < 0.05, *** p < 0.01.

All regressions include state and year fixed effects. Regressions in the second column for each sample also include a set of time-varying state-specific covariates: share of the population that is male; share that is white; age distribution, state unemployment rate, state alcohol tax rate, an indicator for state-level “must access” prescription drug monitoring program, and an indicator for a state pill mill law. Active + legal dispensaries means that the state allows dispensaries to operate in the state and any regulatory hurdles to do so have been overcome. Standard errors allow for clustering at the state level. P-value for sum is the statistical significance of the sum of the two estimates reported in the column.

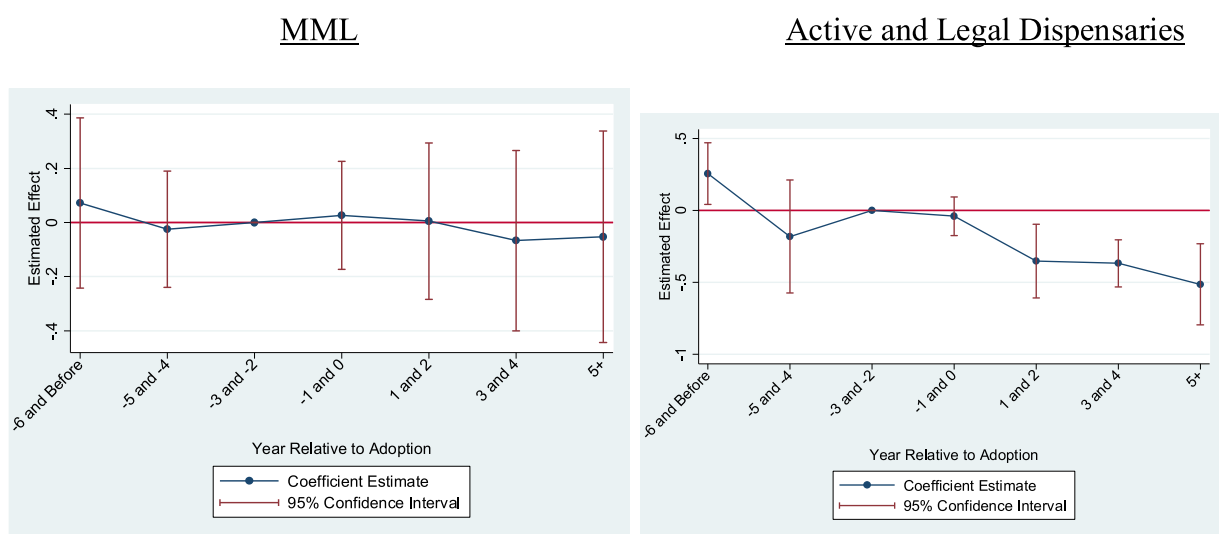


Fig. 2. Event Studies for Per Capita Mortality.

Notes: All estimates in both figures estimated jointly. Outcome is log of per capita opioid-related overdoses. Confidence intervals adjusted for within-state clustering. All time-varying covariates discussed in text included in regression.

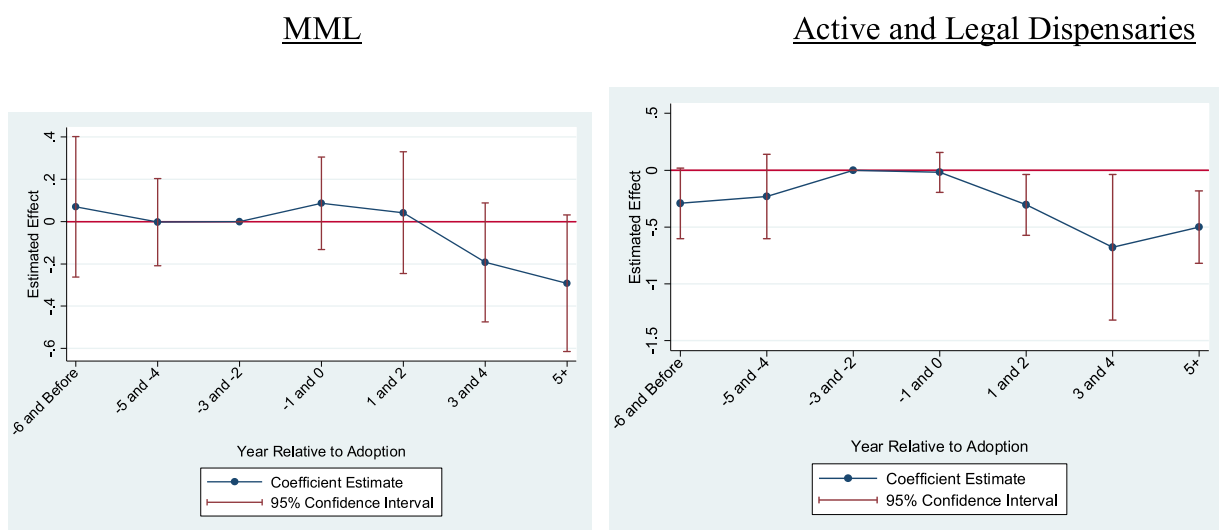


Fig. 3. Event Studies for Per Capita Substance Abuse Treatment Admissions.

Notes: All estimates in both figures estimated jointly. Outcome is log of per capita opioid-related substance abuse treatment admissions. Confidence intervals adjusted for within-state clustering. All time-varying covariates discussed in text included in regression.

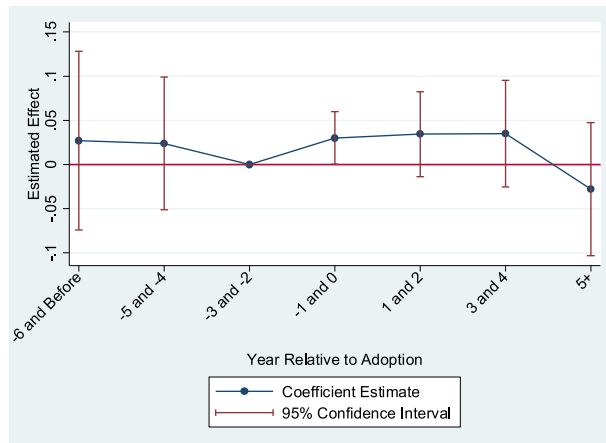
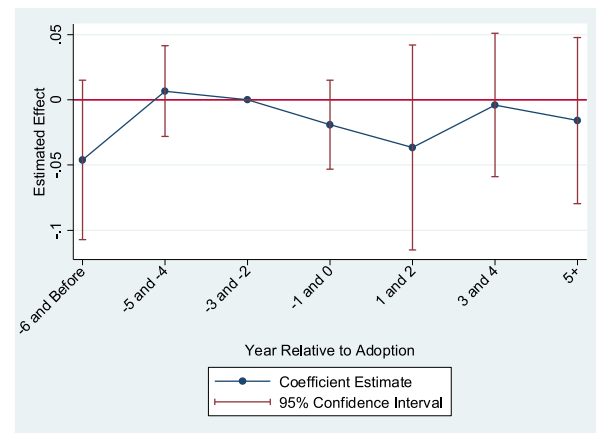
MMLActive and Legal Dispensaries

Fig. 4. Event Studies for Per Capita Morphine Equivalent Doses.

Notes: All estimates in both figures estimated jointly. Outcome is log of per capita morphine equivalent doses distributed to the state. Confidence intervals adjusted for within-state clustering. All time-varying covariates discussed in text included in regression.

oid harm, the magnitude of even this component of the policy has changed since 2010, when states more actively and tightly regulated marijuana dispensaries and as the opioid epidemic has shifted toward heroin consumption.

While these findings are broadly consistent with prior studies (Bradford and Bradford, 2017, 2016; Shi, 2017; Bachhuber et al., 2014), our study differs in a few important ways. First, we consider the evolving nature of the medical marijuana policies in terms of the extent to which they provide broad or narrow access to patients. By simply adding 3 years of data to analyses similar to Bachhuber et al. (2014), we show previously unrecognized changes in the impact of having any medical marijuana law on opioid harm over time. Second, we demonstrate that the primary driver of the previous relationship was the presence of legally protected and operational dispensaries, which continue to have an impact on opioid related harm even with the inclusion of years of data after 2010. Our supplemental results confirm that legally protecting dispensaries alone, without accounting for whether they are operational, is not sufficient for identifying a relationship with opioid related harm. This evidence is consistent with the need for a clear and legal supply chain for medical marijuana policy to have an effect. Third, we thoroughly test the robustness of our findings by examining the consistency in our findings across several measures of harm (e.g., treatment admissions and mortality), functional form assumptions (log-linear and Poisson), and time periods (Pre-Ogden memo and post-Ogden memo). We also consider the influence of pre-policy trend differences in biasing the results by using event study methods.

Our paper augments the analysis of opioid-related harms with data on nonmedical use and distribution of prescription opioids. Analysis of self-reported nonmedical use in the NSDUH suggests little impact of dispensary provisions on the extensive margin of

opioid misuse. We make this conclusion very cautiously given the sparseness and aggregate nature of the data, the non-medical qualifier to the survey question, and the self-reporting. Analysis of the effects of legally protected and operational dispensaries on the distribution of opioids to states (ARCOS) show no impact on the aggregate supply of prescription opioids. This suggests that pharmacies may stockpile or be generally slow to adjust their inventory or that there may be less illegal diversion when individuals can access marijuana through dispensaries. In short, our findings that legally protected and operating medical marijuana dispensaries reduce opioid-related harms suggests that some individuals may be substituting towards marijuana, reducing the quantity of opioids they consume or forgoing initiation of opiates altogether. With the current data, we are unable to disentangle the relative contribution of each effect.

Nonetheless, the fact that opioid harms decline in response to these policies raises some interesting questions as to whether marijuana liberalization may be beneficial for public health. Marijuana is a far less addictive substance than opioids and the potential for overdosing is nearly zero (Hall and Pacula, 2003). However, it remains unclear from our current analysis whether the findings we observe are short term or will persist. In addition, we ultimately need to weigh any potential indirect benefits from medical marijuana dispensary provisions in terms of its implied reductions in opioid misuse (or other positive outcomes) against any potential negative impacts of these provisions on other factors, such as tobacco use and drugged driving. At a minimum, however, our results suggest a potential overlooked positive effect of medical marijuana laws that support meaningful retail sales.

Appendix A.

Table A1
Medical Marijuana Enactment and Active Dispensary Dates During Study Period.

State	Medical MJ Enactment Date	Medical MJ Effective Date	MJ Dispensary Legally Protected? (Date Dispensaries Became Legally Protected)	First Year MJ Dispensary Legally Protected & Active	Year MJ Dispensary is Known to be Active
Alaska	11/3/1998	3/4/1999	No		
Arizona	11/2/2010	11/29/2010	Yes (12/14/2010)	Dec 2012	2012
California	11/5/1996	11/6/1996	Yes (10/8/2003)	Jan 2004	1996
Colorado	11/7/2000	12/28/2000	Yes (6/7/2010)	June 2010	2005
Connecticut	5/31/2012	10/1/2012	Yes(10/1/2012)	Aug 2014	2014
Delaware	5/13/2011	5/13/2011	Yes (5/13/2011)		
Washington DC	5/21/2010	7/27/2010	Yes (7/27/2010)	Apr 2013	2013
Hawaii	6/16/2000	6/16/2000	No		
Illinois	8/1/2013	1/1/2014	Yes(1/1/2014)		
Maine	11/2/1999	12/23/1999	Yes(12/4/2009)	Mar 2011	2011
Maryland**	5/22/2003	10/2/2003	Yes(6/1/2014)		
Massachusetts	11/6/2012	1/1/2013	Yes(5/24/2013)		
Michigan	11/4/2008	12/4/2008	No		2009
Minnesota	5/29/2014	5/30/2014	Yes(5/30/2014)		
Montana	11/2/2004	11/2/2004	No		2009
Nevada	6/14/2001	10/1/2001	Yes(7/1/2013)	Mar 2015	2009
New Hampshire	7/23/2013	7/23/2013	Yes(7/23/2013)		
New Jersey	1/18/2010	6/1/2010	Yes(7/1/2010)	Dec 2012	2012
New Mexico	4/3/2007	7/1/2007	Yes(7/1/2007)	July 2009	2009
New York	7/5/2014	7/5/2014	Yes(7/5/2014)		
Oregon	12/3/1998	12/3/1998	Yes(8/14/2013)	Mar 2014	2009
Rhode Island	1/3/2006	1/3/2006	Yes(6/16/2009)	Apr 2013	2013
Vermont	5/26/2004	7/1/2004	Yes (6/2/2011)	June 2013	2013
Washington	11/3/1998	12/3/1998	No		2009

Notes: **Although Maryland passed a law on 5/22/2003 (effective10/2/2003) that provided legal protections to patients for possession/use of marijuana, no supply source was identified in the law. Therefore, most studies do not recognize this first law, and do not code MD as having a medical marijuana law until the June 2014 law passed, which did specify a supply source. As previous studies have not recognized the earlier law and one goal in this paper is to replicate results from the prior literature, we do not code Maryland as having a medical marijuana law during our study period.

States that adopted medical MJ policies outside of our time period are treated as “control states”: IL (2013), New York (2014) and Maryland (2014). In some instances, dispensaries were legally allowed in subsequent state policies that fell outside of our evaluation window (e.g. Oregon). In other cases, the state policy that passed medical marijuana did not provide immediate legal protection for dispensaries (as they had to go through a particular process (e.g. DC), or they emerged in subsequent law (e.g. CA).

Table A2
Poisson Regression Models of Opioid Related Mortality.

Years	Prescription Opioids Only				Prescription Opioids and Heroin			
	1999–2010		1999–2013		1999–2010		1999–2013	
MML	0.040	0.018	0.133	0.058	0.119	0.057	0.159	0.068
	(0.157)	(0.137)	(0.098)	(0.087)	(0.175)	(0.166)	(0.098)	(0.100)
Active + Legal	–0.478***	–0.420***	–0.348***	–0.291***	–0.410***	–0.349***	–0.316***	–0.241***
Dispensaries	(0.051)	(0.073)	(0.098)	(0.075)	(0.071)	(0.093)	(0.101)	(0.086)
Time-varying covariates	No	Yes	No	Yes	No	Yes	No	Yes
Observations	612	612	765	765	612	612	765	765
P-value for sum	0.00	0.00	0.08	0.02	0.12	0.10	0.24	0.15

Notes: * p < 0.10, ** p < 0.05, *** p < 0.01.

All regressions include state and year fixed effects. Regressions in the second column for each sample also include a set of time-varying state-specific covariates: share of the population that is male; share that is white; age distribution, state unemployment rate, state alcohol tax rate, an indicator for state-level “must access” prescription drug monitoring program, and an indicator for a state pill mill law. The log of the population is used as an offset. Active + legal dispensaries means that the state allows dispensaries to operate in the state and any regulatory hurdles to do so have been overcome. Standard errors allow for clustering at the state level. P-value for sum is the statistical significance of the sum of the two estimates reported in the column.

Table A3
Log Opioid Related Mortality Rate (Population-Weighted Regressions).

Years	Prescription Opioids Only				Prescription Opioids and Heroin			
	1999–2010		All		1999–2010		All	
MML	–0.062	–0.198**	0.137	–0.022	–0.057	–0.248**	0.088	–0.092
	(0.150)	(0.093)	(0.104)	(0.076)	(0.151)	(0.109)	(0.095)	(0.077)
Active + Legal	–0.484***	–0.399***	–0.404***	–0.317***	–0.420***	–0.349**	–0.379***	–0.275**
Dispensaries	(0.062)	(0.116)	(0.105)	(0.100)	(0.077)	(0.133)	(0.109)	(0.116)
Time-varying covariates	No	Yes	No	Yes	No	Yes	No	Yes
Observations	612	612	765	765	612	612	765	765
P-value for sum	0.00	0.00	0.10	0.03	0.02	0.00	0.07	0.03

Notes: * p < 0.10, ** p < 0.05, *** p < 0.01.

All regressions include state and year fixed effects. Regressions in the second column for each sample also include a set of time-varying state-specific covariates: share of the population that is male; share that is white; age distribution, state unemployment rate, state alcohol tax rate, an indicator for state-level “must access” prescription drug monitoring program, and an indicator for a state pill mill law. Active + legal dispensaries means that the state allows dispensaries to operate in the state and any regulatory hurdles to do so have been overcome. Standard errors allow for clustering at the state level. P-value for sum is the statistical significance of the sum of the two estimates reported in the column.

Table A4
Any Dispensary Law and Log Opioid Related Mortality Rate.

Years	Prescription Opioids Only				Prescription Opioids and Heroin			
	1999–2010		1999–2013		1999–2010		1999–2013	
MML	–0.177*	–0.137	–0.075	–0.046	–0.153	–0.179	–0.062	–0.064
	(0.103)	(0.111)	(0.109)	(0.101)	(0.110)	(0.118)	(0.113)	(0.112)
Dispensary law	–0.405***	–0.379***	–0.097	–0.105	–0.371***	–0.371***	–0.098	–0.116
	(0.111)	(0.104)	(0.141)	(0.125)	(0.105)	(0.116)	(0.136)	(0.130)
Time-varying covariates	No	Yes	No	Yes	No	Yes	No	Yes
Observations	612	612	765	765	612	612	765	765
P-value for sum	0.00	0.00	0.25	0.34	0.00	0.00	0.29	0.28

Notes: * p < 0.10, ** p < 0.05, *** p < 0.01.

All regressions include state and year fixed effects. Regressions in the second column for each sample also include a set of time-varying state-specific covariates: share of the population that is male; share that is white; age distribution, state unemployment rate, state alcohol tax rate, an indicator for state-level “must access” prescription drug monitoring program, and an indicator for a state pill mill law. Active + legal dispensaries means that the state allows dispensaries to operate in the state and any regulatory hurdles to do so have been overcome. Standard errors allow for clustering at the state level. P-value for sum is the statistical significance of the sum of the two estimates reported in the column.

Table A5
Effects by Opioid Category.

	Natural Opioids	Synthetic Opioids	Heroin
MML	0.025	–0.092	0.053
	(0.096)	(0.127)	(0.204)
Active + Legal Dispensaries	–0.407***	–0.035	–0.192
	(0.088)	(0.103)	(0.149)
Time-varying covariates	Yes	Yes	Yes
Observations	765	765	765
P-value for sum	0.00	0.41	0.54

Notes: * p < 0.10, ** p < 0.05, *** p < 0.01.

All regressions include state and year fixed effects. Regressions in the second column for each sample also include a set of time-varying state-specific covariates: share of the population that is male; share that is white; age distribution, state unemployment rate, state alcohol tax rate, an indicator for state-level “must access” prescription drug monitoring program, and an indicator for a state pill mill law. Active + legal dispensaries means that the state allows dispensaries to operate in the state and any regulatory hurdles to do so have been overcome. Standard errors allow for clustering at the state level. P-value for sum is the statistical significance of the sum of the two estimates reported in the column.

Table A6
Poisson Regression Models of Opioid Treatment Admissions.

Years	Prescription Opioids Only				Prescription Opioids and Heroin			
	1999–2010		1999–2012		1999–2010		1999–2012	
MML	0.013	–0.076	0.093	0.014	–0.077	–0.037	–0.052	–0.077
	(0.071)	(0.084)	(0.091)	(0.109)	(0.107)	(0.073)	(0.092)	(0.055)
Active + Legal Dispensaries	–0.322***	–0.336***	–0.173	–0.253**	–0.688***	–0.507***	–0.604***	–0.468***
	(0.048)	(0.066)	(0.123)	(0.114)	(0.060)	(0.058)	(0.148)	(0.076)
Time-varying covariates	No	Yes	No	Yes	No	Yes	No	Yes
Observations	612	612	765	765	612	612	765	765
P-value for sum	0.00	0.00	0.63	0.19	0.00	0.00	0.00	0.00

Notes: * p < 0.10, ** p < 0.05, *** p < 0.01.

All regressions include state and year fixed effects. Regressions in the second column for each sample also include a set of time-varying state-specific covariates: share of the population that is male; share that is white; age distribution, state unemployment rate, state alcohol tax rate, an indicator for state-level “must access” prescription drug monitoring program, and an indicator for a state pill mill law. The log of the population is used as an offset. Active + legal dispensaries means that the state allows dispensaries to operate in the state and any regulatory hurdles to do so have been overcome. Standard errors allow for clustering at the state level. P-value for sum is the statistical significance of the sum of the two estimates reported in the column.

Table A7
Log Opioid Treatment Admission Rate (Population-Weighted Regressions).

Years	Prescription Opioids Only				Prescription Opioids and Heroin			
	1999–2010		1999–2012		1999–2010		1999–2012	
MML	–0.078	–0.225**	0.166	0.054	–0.085	–0.185	0.026	–0.057
	(0.086)	(0.103)	(0.171)	(0.182)	(0.136)	(0.115)	(0.168)	(0.158)
Active + Legal Dispensaries	–0.387***	–0.409***	–0.305***	–0.331***	–0.842***	–0.594***	–0.747***	–0.526***
	(0.058)	(0.062)	(0.113)	(0.078)	(0.075)	(0.073)	(0.185)	(0.100)
Time-varying covariates	No	Yes	No	Yes	No	Yes	No	Yes
Observations	591	591	686	686	591	591	686	686
P-value for sum	0.00	0.00	0.53	0.18	0.00	0.00	0.00	0.00

Notes: * p < 0.10, ** p < 0.05, *** p < 0.01.

All regressions include state and year fixed effects. Regressions in the second column for each sample also include a set of time-varying state-specific covariates: share of the population that is male; share that is white; age distribution, state unemployment rate, state alcohol tax rate, an indicator for state-level “must access” prescription drug monitoring program, and an indicator for a state pill mill law. The log of the population is used as an offset. Active + legal dispensaries means that the state allows dispensaries to operate in the state and any regulatory hurdles to do so have been overcome. Standard errors allow for clustering at the state level. P-value for sum is the statistical significance of the sum of the two estimates reported in the column.

Table A8
Log (Opioid Related Treatment Admissions/All Treatment Admissions).

Years	Prescription Opioids Only				Prescription Opioids and Heroin			
	1999–2010		All		1999–2010		All	
MML	–0.042 (0.106)	–0.081 (0.093)	0.016 (0.102)	0.034 (0.118)	–0.159 (0.144)	–0.135 (0.099)	–0.237* (0.137)	–0.161 (0.103)
Active + Legal Dispensaries	–0.226** (0.095)	–0.282** (0.124)	–0.139 (0.135)	–0.206 (0.125)	–0.591** (0.238)	–0.495*** (0.130)	–0.330 (0.234)	–0.342** (0.164)
Time-varying covariates	No	Yes	No	Yes	No	Yes	No	Yes
Observations	591	591	686	686	591	591	686	686
P-value for sum	0.03	0.01	0.51	0.35	0.01	0.00	0.02	0.02

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

All regressions include state and year fixed effects. Regressions in the second column for each sample also include a set of time-varying state-specific covariates: share of the population that is male; share that is white; age distribution, state unemployment rate, state alcohol tax rate, an indicator for state-level “must access” prescription drug monitoring program, and an indicator for a state pill mill law. The log of the population is used as an offset. Active + legal dispensaries means that the state allows dispensaries to operate in the state and any regulatory hurdles to do so have been overcome. Standard errors allow for clustering at the state level. P-value for sum is the statistical significance of the sum of the two estimates reported in the column.

Table A9
Log Nonmedical Use of Prescription Opioids (Weighted).

Years	2002–2010		2002–2012	
	MML	0.145* (0.080)	0.082 (0.093)	0.050 (0.080)
Active + Legal Dispensaries	–0.142*** (0.034)	–0.157*** (0.042)	–0.079 (0.048)	–0.109 (0.070)
Time-varying covariates	No	Yes	No	Yes
Observations	255	255	306	306
P-value for sum	0.97	0.46	0.75	0.48

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

All regressions include state and year fixed effects. Regressions in the second column for each sample also include a set of time-varying state-specific covariates: share of the population that is male; share that is white; age distribution, state unemployment rate, state alcohol tax rate, an indicator for state-level “must access” prescription drug monitoring program, and an indicator for a state pill mill law. Active + legal dispensaries means that the state allows dispensaries to operate in the state and any regulatory hurdles to do so have been overcome. Standard errors allow for clustering at the state level. P-value for sum is the statistical significance of the sum of the two estimates reported in the column.

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Original Study

Effects of Legal Access to Cannabis on Scheduled II–V Drug Prescriptions

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A B S T R A C T

Keywords:

Marijuana
cannabis
opioids
Prescription Monitoring Program
scheduled medications
substitution

Background: Co-prescribing of scheduled drugs is endemic in the United States, increasing health risks to patients and the burden on healthcare systems.

Purpose: We conducted a pragmatic historical cohort study to measure the effect of enrollment in a state-authorized United States' Medical Cannabis Program (MCP) on scheduled II–V drug prescription patterns.

Procedures: Eighty-three chronic pain patients, who enrolled in the New Mexico MCP between April 1, 2010 and October 3, 2015, were compared with 42 nonenrolled patients over a 24-month period (starting 6 months before enrollment for the MCP patients) using the Prescription Monitoring Program. The outcome variables include baseline levels and pre- and postenrollment monthly trends in the number of drug prescriptions, distinct drug classes, dates prescription drugs were filled, and prescribing providers.

Findings: Twenty-eight MCP patients (34%) and 1 comparison group patient (2%) ceased the use of all scheduled prescription medications by the last 6 months of the observation period. Age- and sex-adjusted regressions show that, although no statistically significant differences existed in pre-enrollment levels and trends, the postenrollment trend among MCP patients is statistically significantly negative for all 4 measures (decreases in counts of -0.02 to -0.04 , P values between $<.001$ and $.017$), whereas the postenrollment trend is 0 among the comparison group. Controlling for time-invariant patient characteristics suggested that MCP patients showed statistically significantly lower levels across all 4 measures by 10 months postenrollment.

Conclusions: Legal access to cannabis may reduce the use of multiple classes of dangerous prescription medications in certain patient populations.

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The potential for addiction and health risks associated with using multiple scheduled drugs places additional direct monetary and health costs on patients and healthcare systems because of an increased number of side effects, risky drug interactions, dependency, and overdose.¹ For example, co-prescription of opioids and benzodiazepines in combination with drugs of abuse contribute to an estimated 144 American deaths every day.^{2–6} Despite their existence in 29 states, it remains unknown how enrollment in state-authorized Medical Cannabis Programs (MCPs) affect scheduled II–V prescription drug use and the associated burden on health system resources.

This work was partially funded by the Medical Cannabis Research fund (<http://mcrf.unm.edu/>).

The authors declare no conflicts of interest.

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<http://dx.doi.org/10.1016/j.jamda.2017.07.017>

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Increased patient access to MCPs could impact prescription drug activity in a variety of ways. Potentially, MCPs might drive increased prescribing of medications as a result of side effects of cannabis use (eg, agitation or somnolence). Alternatively, access to cannabis could lead to a reduction in scheduled prescription drug use, if it treats patients' underlying condition(s) more effectively than scheduled drugs requiring a prescription. Studying the relationship using randomized control trials is not legally feasible because of cannabis' schedule I status. However, an observational study of Medicare Part D claims across states with and without MCPs showed that prescription medication use declined following medical cannabis legalization.⁷ Similar results were found in a recent prospective open-label study conducted in Israel.⁸ Medical cannabis laws have also been associated with reduced opioid-related deaths,^{9,10} suggesting that some people that would otherwise be using opioids (either legally or illegally), are using medical cannabis instead.^{11–13}

We conducted a pragmatic historical cohort study to test whether enrollment in the New Mexico MCP causes a reduction in schedule II–IV prescription drug use as measured by the number and types of prescriptions filled. Additional outcomes included the frequency of schedule II–V prescription fills and the number of prescribing providers, which may more directly reflect the intensity of healthcare utilization, drug dependency, or diversion issues.

Methods

Study Design

Patients with a variety of chronic, debilitating health conditions are eligible for enrollment in the New Mexico MCP, enabling these patients to legally obtain and self-administer cannabis in various forms (eg, strain of whole dried flower, edible, or extract). Once enrolled in the MCP, patients are provided the option to use cannabis in place of, or in conjunction with conventional pharmaceutical medication treatments. At the pain rehabilitation clinic where the present study was conducted, the primary physician, a board-certified pain specialist, regularly offers patients that meet the inclusionary criteria the option to enroll in the MCP; which approximately one-third of eligible patients ultimately decide to pursue.

As part of a larger study approved by the University of New Mexico Institutional Review Board, we originally queried 147 patients who had enrolled in the MCP between April 1, 2010 and October 3, 2015. All patients in the study group had a diagnosis of “severe chronic pain,” annually validated by 2 independent physicians, as required for MCP authorization. Throughout enrollment, patients received no direct medical supervision over their cannabis treatment, clinic visits were by patient request, and patients were not explicitly instructed to modify (eg, reduce) their prescription medication usage, in line with the clinic’s mission to promote palliative care through patient education and self-management of available treatment options.

To assess scheduled II–V prescription drug patterns, Prescription Monitoring Program (PMP) records were retrieved over a 24-month period spanning from 6 months pre-enrollment through 18 months postenrollment. To create a comparison group, the PMP records were retrieved for a random sample of 53 chronic pain patients, who were given the option but chose not to participate in the MCP (between 2010 and 2015). To be eligible for the comparison group, patients had to have no legal ability to use cannabis, show no traces of cannabis use (via random drug screening throughout the observation period), and have been diagnosed with 1 of the 3 most common chronic pain diagnoses; *International Statistical Classification of Diseases and Related Health Problems, 10th Revision* codes: M54.5 (chronic low back pain), M54.2 (cervicalgia, cervical spine pain), or M96.1 (postlaminectomy syndrome). PMP records dating from October 8, 2014 through October 8, 2016 were retrieved for the comparison group.

To identify changes in scheduled prescription patterns among people already using scheduled prescription medications, not patients newly seeking treatment, a second stage of sample filtering was conducted by excluding patients who did not fill any prescriptions in the first 6 months of the observation period (before enrollment in the MCP for the MCP patients). This resulted in a final sample of 83 MCP patients (63% male, $M_{\text{age}} = 51$ years, 65% chronic back pain, 26% other chronic musculoskeletal pain, 4% arthritis, 4% chronic headaches, 1% fibromyalgia) and 42 comparison group patients (69% male, $M_{\text{age}} = 58$ years, 100% chronic back pain).

Study Outcomes

To convert our patient-prescription level data into a patient-month level panel dataset, we aggregated by month the number of scheduled drug prescriptions (Rx), the number of distinct classes of scheduled

drugs (Rx classes), the number of dates on which prescriptions for the drugs were filled (dates), and the number of distinct providers who prescribed the drugs (providers), resulting in 2962 patient-month level observations.

Statistical Analysis

We used 2-sided *t*-tests for continuous variables and χ^2 tests to compare dichotomous variables across the 2 patient groups. For our longitudinal analysis, we used a Poisson regression model to predict the number of events for each outcome by group, which we then depict graphically. For ease of interpretation, we used a least squares model to generate the results in tables. Incident rate ratios from a Poisson model are reported in the [Table S1](#) of the [Supplementary Appendix](#) and follow the same pattern as the coefficients from the least squares model. We also perform a within-patient analysis of the effect of MCP enrollment, controlling for time-invariant patient characteristics through the use of individual dummy variables, which allow each patient to have a different intercept. Because group participation does not vary over time and pre-trends cannot be assumed to be parallel, we focus this analysis on the MCP patients. A placebo test using the same analysis within the comparison group is reported in the [Supplementary Appendix](#). In the longitudinal analyses, standard errors are clustered at the patient level to control for heteroskedasticity and arbitrary intrapatient correlation.

We perform 2 additional robustness checks to confirm that the same relationship between prescribing patterns and MCP enrollment existed for both prescriptions written by A.P.R. and those written by other doctors, as recorded in the PMP. Similar to the trend analysis for the overall sample, we regress the 2 outcomes (number of prescriptions written by A.P.R., number of prescriptions written by other providers) on a first period trend, a second period trend, age, sex, and individual fixed effects. We use the Zellner seemingly unrelated regression approach,¹⁴ adjusting for the small sample size, with the outcomes of number of Rx written by A.P.R. and number of Rx written by other providers. (The seemingly unrelated regression approach takes into account correlation in the error terms across the 2 regressions. A Breusch-Pagan test of independence allowed us to reject independence of the error terms with a *P* value of less than .001.) During our sample period, 62 MCP patients filled 1488 prescriptions written by A.P.R., whereas 113 MCP patients filled 1142 prescriptions written by other providers. Fifty-one patients received prescriptions from both A.P.R. and other providers. Postestimation, we test whether the coefficients are the same across the 2 regressions.

Although this reduces the overall size of the sample, we also performed our main trend analysis excluding non-back pain patients. This makes our MCP and comparison groups more comparable in both size and diagnosis with a sample of 42 chronic back pain patients in our comparison group and 54 MCP patients with a chronic back pain diagnosis or 65% of the MCP patients in the sample.

Statistical analyses were conducted using STATA/SE 13.1 (StataCorp LLC, College Station, TX).

Results

Across the 24-month observation period, the monthly average number of Rx ranged from 0 to 10 (mean \pm SD = 1.12 ± 1.26); distinct Rx Classes ranged from 0 to 4 (0.86 ± 0.86) with the 2 most frequent classes consisting of opioids (0.66 ± 0.82) and benzodiazepines (0.27 ± 0.63) respectively; dates prescription medications were filled ranged from October 29, 2009 to June 9, 2015 with monthly counts ranging between 0 and 9 (0.91 ± 0.98); and number of distinct providers ranged from 0 to 4 (0.70 ± 0.65).

[Table 1](#) compares the average number of Rx during the first 6 months (before enrollment for the MCP patients) with the last

Table 1
Descriptive Statistics Across Patient Groups

	Overall (N = 125)	MCP (N = 83)	Comparison (N = 42)	Difference (MCP-Comparison)	P Value
Mean monthly Rx (1st 6 mo)	1.24 ± 0.99	1.18 ± 0.96	1.36 ± 1.07	-0.18	.351
Mean monthly Rx (last 6 mo)	0.92 ± 0.97	0.70 ± 0.84	1.37 ± 1.05	-0.67	<.001
Rx in last 6 mo = 0	23% (29)	34% (28)	2% (1)	27	<.001
Rx in last 6mo < Rx in 1st 6 mo	62% (78)	71% (59)	43% (18)	41	.002
Change in Rx	-0.32 ± 0.97	-0.48 ± 0.90	0.00 ± 1.03	-0.48	.007
Change in Rx Classes	-0.2 ± 0.62	-0.31 ± 0.62	0.01 ± 0.56	-0.32	.006
Change in dates	-0.26 ± 0.72	-0.39 ± 0.69	-0.02 ± 0.71	-0.37	.007
Change in providers	-0.21 ± 0.44	-0.29 ± 0.44	-0.04 ± 0.41	-0.25	.003
Age	53.65 ± 12.35	51.39 ± 11.52	58.11 ± 12.86	-6.72	.004
Male	65% (81)	63% (52)	69% (29)	23	.479

All “changes” compare the monthly average in the first 6 months of observation with the monthly average in the last 6 months of observation. Only patients filling at least 1 prescription during the first 6 months of observation are included in the sample. *P* values are from 2-sided *t*-tests for continuous variables and χ^2 tests for categorical variables.

6 months of our 2-year sample period. During the first 6 months of observation, there was no statistically significant difference in schedule II–IV prescriptions across the 2 groups. However, by the last 6 months, 1.5 years later, our MCP group had decreased their *Rx* by approximately 0.5, whereas the comparison group showed no change in their number of prescriptions, resulting in a statistically significant difference between the 2 groups (*P* = .007). Twenty-eight MCP patients and 1 comparison group patient ceased filling prescriptions altogether by the last 6 months of observation. The other measures, the number of *Rx* classes, the number of prescription dates, and the number of distinct providers follow a similar pattern; the MCP patients decrease their value of all measures reported in the PMP, while the comparison group increases. Building on the simple tests in Table 1, we expand our analysis in Figure 1 and Table 2 to incorporate the longitudinal aspect of our data and to control for age and sex. Figure 1 shows the predicted number of events from the Poisson regression model by month with linear trend lines. We include a

scatter plot of the monthly raw means by group for reference. In all cases, the MCP group starts off at a lower level than the comparison group. For all 4 outcomes, the MCP group appeared to be either maintaining or increasing these counts before enrollment. No consistent pattern exists in the comparison group and any trend appears to be small. Postenrollment, the 2 trends clearly diverge, with the MCP group reducing by all measures while the comparison group increases or maintains activity for all measures.

Table 2 includes information on the statistical significance of the results in Figure 1. Each panel represents a separate regression. By construction, the intercepts across all 4 measures for the comparison group are all statistically significantly different from 0. The difference between the intercepts for the comparison group and the MCP patients is not statistically significant for any of the outcome measures. The first period trends are insignificant for both groups, perhaps partly because of the limited time period analyzed. The overall trend in the second period is statistically insignificant. The last

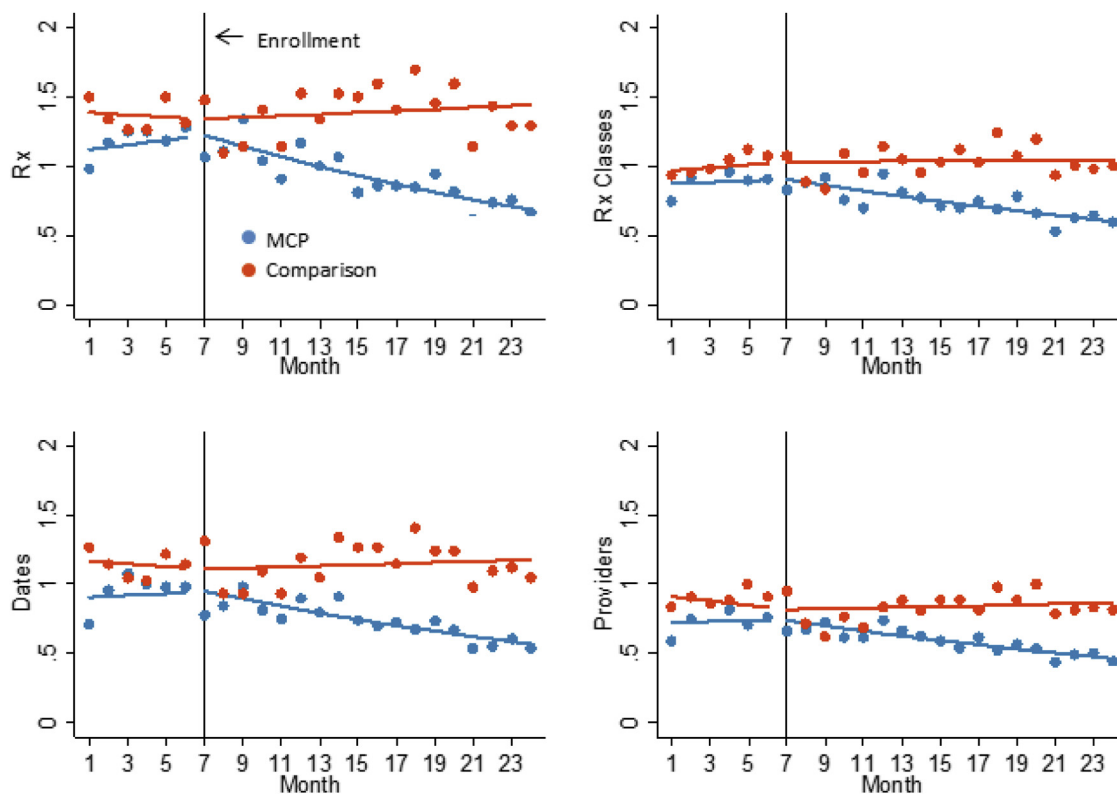


Fig. 1. Prescribing patterns of PMP data.

Table 2
Effect of MCP Enrollment on PMP Prescribing Patterns

Variables	Change in Rx (95% CI)	P Value
Comparison—intercept	1.46 (0.36–2.57)	.010
MCP—intercept	−0.29 (−0.80 to 0.23)	.276
Trend 1	−0.01 (−0.06 to 0.04)	.737
MCP*trend 1	0.02 (−0.04 to 0.08)	.503
Trend 2	0.01 (−0.01 to 0.02)	.502
MCP*trend 2	−0.04 (−0.06 to −0.02)	.001
Change in Rx Classes (95% CI)		
Comparison—intercept	0.86 (0.31–1.41)	.002
MCP—intercept	−0.08 (−0.35 to 0.20)	.587
Trend 1	0.01 (−0.02 to 0.04)	.508
MCP*trend 1	−0.01 (−0.05 to 0.03)	.749
Trend 2	0.00 (−0.01 to 0.01)	.835
MCP*trend 2	−0.02 (−0.04 to −0.00)	.017
Change in Dates (95% CI)		
Comparison—intercept	1.32 (0.50–2.14)	.002
MCP—intercept	−0.28 (−0.65 to 0.08)	.128
Trend 1	−0.01 (−0.05 to 0.03)	.663
MCP*trend 1	0.01 (−0.04 to 0.06)	.597
Trend 2	0.00 (−0.01 to 0.02)	.586
MCP*trend 2	−0.03 (−0.04 to −0.01)	.005
Change in Providers (95% CI)		
Comparison—intercept	0.84 (0.36–1.31)	.001
MCP—intercept	−0.18 (−0.41 to 0.04)	.107
Trend 1	−0.02 (−0.03 to 0.00)	.114
MCP*trend 1	0.02 (−0.01 to 0.04)	.275
Trend 2	0.00 (−0.00 to 0.01)	.442
MCP*trend 2	−0.02 (−0.03 to −0.01)	<.001

CI, confidence interval.

We use generalized least squares and report the age- and sex-adjusted coefficients above. Standard errors are clustered at the patient level to control for heteroskedasticity and arbitrary correlation among patients.

line of each panel in [Table 2](#) shows the differential trend in the second period among the MCP patients relative to the control group. In all cases, it is highly statistically significant and negative demonstrating that MCP enrollment is followed by reduction of all measures of PMP activity, in contrast to the lack of any change in PMP activity in the comparison group.

Finally, [Table 3](#) compares levels of PMP activity in the first 3 months of our sample period with subsequent 3-month groups, controlling for time-invariant patient-level factors that could be confounding the effect of the MCP program in the regressions comparing trends across the 2 patient groups. Because MCP enrollment does not vary over time, these regressions include only MCP patients. For all 4 measures, counts in months 4 through 12 are not statistically significantly different from those in months 1 through 3. Suggesting that the effect of the MCP is not immediate but rather that MCP participation takes time to reduce PMP activity, statistically significant effects exist for months 16 through 24, and these effects are increasing in size with time. In other words, patients did not appear to make a dichotomous choice between types of treatments but rather MCP enrollment seems to have gradually crowded out the use of schedule II–IV prescription drugs as recorded in the PMP. The placebo test of the effect of the MCP is reported for the comparison group in [Table S2](#) of the [Supplementary Appendix](#) and shows that, even after controlling for time-invariant patient characteristics, no statistically significant differences exist within the comparison group over the 2-year observation period.

Finally, the 2 follow-up analyses were performed to confirm the consistency of the results across doctors and when the sample is restricted to only those MCP patients with a diagnosis of chronic back pain, a group arguably more comparable to patients in the Comparison group, who all had diagnoses of chronic back pain. The comparison of the effect of MCP participation on prescriptions written by A.P.R.

with those written by other providers is reported in [Table 4](#). MCP patients do not experience a statistically significant change in the number of prescriptions filled by either provider before enrollment. Comparing across the regressions, the coefficients on the first 6-month trends are statistically significantly different from each other, although they are individually statistically insignificant. The coefficients on the second period trends are similar in magnitude, negative, and statistically significant. They are not statistically significantly different from each other, implying that the effect of enrollment reduces both prescriptions written by A.P.R. and prescriptions written by other providers at a similar rate.

[Table 5](#) reports the results restricting the sample to just patients with chronic back pain. This reduces the imbalance in numbers and diagnoses between the MCP group and the comparison group. Despite the smaller sample size, the magnitude and statistical significance of the effect of the MCP program on all 4 outcomes is the same or greater than in [Table 1](#).

Discussion

Our pragmatic preliminary study found that enrollment in the NM MCP was associated with significant reductions in scheduled II–V prescription drug activity and associated use of conventional

Table 3
Effect of MCP Enrollment on PMP Prescribing Patterns—Within Patient (MCP Only)

Variables	Change in Rx (95% CI)	P Value
Months		
4–6	0.10 (−0.06 to 0.26)	.196
7–9	0.04 (−0.18 to 0.25)	.742
10–12	−0.10 (−0.29 to 0.10)	.331
13–15	−0.18 (−0.34 to −0.01)	.034
16–18	−0.28 (−0.46 to −0.10)	.003
19–21	−0.33 (−0.54 to −0.12)	.002
22–24	−0.39 (−0.63 to −0.15)	.002
Change in Rx Classes (95% CI)		
Months		
4–6	0.04 (−0.06 to 0.14)	.475
7–9	−0.00 (−0.14 to 0.13)	.954
10–12	−0.08 (−0.23 to −0.07)	.286
13–15	−0.11 (−0.25 to 0.01)	.077
16–18	−0.17 (−0.32 to −0.02)	.025
19–21	−0.21 (−0.37 to −0.06)	.007
22–24	−0.25 (−0.44 to −0.06)	.009
Change in Dates (95% CI)		
Months		
4–6	0.07 (−0.05 to 0.19)	.227
7–9	−0.05 (−0.21 to 0.11)	.558
10–12	−0.10 (−0.25 to 0.05)	.208
13–15	−0.10 (−0.23 to 0.03)	.130
16–18	−0.21 (−0.36 to −0.06)	.005
19–21	−0.26 (−0.42 to −0.10)	.002
22–24	−0.34 (−0.53 to −0.15)	.001
Change in Providers (95% CI)		
Months		
4–6	0.03 (−0.06 to 0.12)	.523
7–9	−0.04 (−0.15 to 0.06)	.420
10–12	−0.08 (−0.19 to 0.04)	.199
13–15	−0.10 (−0.20 to −0.01)	.040
16–18	−0.17 (−0.28 to −0.07)	.001
19–21	−0.22 (−0.33 to −0.11)	<.001
22–24	−0.26 (−0.39 to −0.12)	<.001

CI, confidence interval.

The table above reports coefficients from 4 least squares regressions, one for each outcome variable. Only MCP patients are included in the sample analyzed. Individual dummy variables control for time-invariant patient characteristics. Standard errors are clustered at the patient level to control for heteroskedasticity and arbitrary correlation among patients.

Table 4
Effect of MCP Enrollment on PMP Prescribing Patterns Across Providers

Variables	A.P.R.		Other Providers		β A.P.R. = β Other
	Change in Rx (95% CI)	P Value	Change in Rx (95% CI)	P Value	P Value
Trend 1	0.02 (–0.00 to 0.03)	.051	–0.01 (–0.03 to 0.01)	.220	.039
Trend 2	–0.01 (–0.01 to –0.00)	.003	–0.01 (–0.02 to –0.01)	<.001	.333

CI, confidence interval.

The results of 2 separate regressions are reported with the outcomes of number of Rx filled that were written by A.P.R. and number of Rx written by other providers. The last column reports the *P* values from tests for whether a linear combination of the coefficients across the regressions is statistically significantly different from 0. We use generalized least squares and report the age-, sex-, and individual fixed effects-adjusted coefficients above. Standard errors are clustered at the patient level to control for heteroskedasticity and arbitrary correlation among patients.

pharmacies and prescribing providers. Co-prescribing of scheduled drugs is prevalent in modern medical practice but discouraged because of the risks of multiple side effects and interactions in the patient population. Interventions that can reduce polyprescription drug usage are worthwhile, both from a cost and patient health perspective. With the results showing a reduction across classes of drugs and the number of prescribing providers, it may be that cannabis is effective at treating multiple conditions currently treated by separate medications. Studies suggest that cannabis alone may be able to address comorbid health conditions typically concurrently treated by multiple scheduled prescription drugs [eg, chronic pain (opioids), PTSD (benzodiazepines), and muscle spasms (muscle relaxants)].^{15–18} However, the addition of medical cannabis should be taken into account. Although 34% of the MCP patients cease to exhibit any evidence of scheduled drug consumption and an additional 36% reduce the number of prescriptions filled for scheduled drugs by the last 6 months of our sample period, it may be that they are simply replacing scheduled prescription drugs with scheduled cannabis.

The relative safety and efficacy of cannabis in comparison to that of the other scheduled medications taken by the patients in our sample is beyond the scope of this paper. However, the vast majority of documented side effects of cannabis use reported by patients appear to be relatively non-serious,^{15,19} and cannabis is not associated with an increased risk of mortality in people with or without comorbid opioid, alcohol, or cocaine use disorders.^{20–22} In contrast, overdoses associated with opioids, the most common class of prescription medication filled by the patients in our sample, are the leading cause of preventable mortality nationwide.^{23,24} Benzodiazepines, the second most commonly filled prescription in our sample, are used by nearly 16% of the US population²⁵ and are also associated with an increased risk of death by suicide and accidental poisoning.^{26–28} Long-term use is associated with increased risk for cognitive impairment, dementia, Alzheimer disease, and malignancy.^{29–31}

This study had several limitations, especially with regard to sample selection and that we only observed MCP enrollment and scheduled prescription drug activity. The small convenience sample increased internal validity but likely decreased generalizability to other patient populations who might respond differentially to enrollment in the MCP. Individual-level cannabis use before and throughout the duration of the study in both the MCP and non-MCP groups was not collected. In addition, individual opioid use was not directly tested. It may be that some patients in the MCP group never used cannabis or switched to illegal sources of opioid medications. Another limitation is the PMP data do not track all prescription drug activity, prescriptions filled at Veterans Affairs and Indian Health Services clinics, out-of-state prescriptions, and methadone dispensed from methadone clinics. The PMP also did not allow us to control for time-varying individual level characteristics other than age, and important socioeconomic and health characteristics could have interacted with MCP enrollment and scheduled prescription drug usage patterns in dynamic ways.

Although he did not expressly instruct patients to reduce their prescription drug use, the referring physician might have

subconsciously encouraged a greater reduction in prescription use among MCP patients than among the comparison group. However, the likelihood that this alternative factor drove our results is reduced by our analyses showing that the effect of MCP enrollment was similar in both size and statistical significance for scheduled medications prescribed by the referring physician (A.P.R.) and for medications prescribed by other providers (unrelated to the research team).

Lastly, although some studies suggest a better risk profile, particularly than that of the opioids and benzodiazepines recorded in the PMP data, cannabis likely is psychologically addictive and may be associated with excessive health risks for some populations (eg, pregnant women and adolescents.).

In conclusion, a shift from prescriptions for other scheduled drugs to cannabis may result in less frequent interactions with our conventional healthcare system, and potentially improved patient health.

Table 5
Effect of MCP Enrollment on PMP Prescribing Patterns for Back Pain Patients

Variables	Change in Rx (95% CI)	P Value
Comparison–intercept	1.88 (0.63–3.12)	.003
MCP–intercept	–0.21 (–0.76 to 0.34)	.447
Trend 1	–0.01 (–0.06 to 0.04)	.738
MCP*trend 1	0.04 (–0.03 to 0.11)	.213
Trend 2	0.01 (–0.01 to 0.02)	.503
MCP*trend 2	–0.05 (–0.08 to –0.02)	<.001
Change in Rx Classes (95% CI)		
Comparison–intercept	1.09 (0.51–1.68)	<.000
MCP–intercept	0.00 (–0.30 to 0.31)	.982
Trend 1	0.01 (–0.02 to 0.04)	.509
MCP*trend 1	0.01 (–0.04 to 0.05)	.774
Trend 2	0.00 (–0.01 to 0.01)	.835
MCP*trend 2	–0.03 (–0.05 to –0.01)	.005
Change in Dates (95% CI)		
Comparison–intercept	1.62 (0.71–2.53)	.001
MCP–intercept	–0.26 (–0.65 to 0.13)	.187
Trend 1	–0.01 (–0.05 to 0.03)	.664
MCP*trend 1	0.03 (–0.02 to 0.09)	.209
Trend 2	0.00 (–0.01 to 0.02)	.586
MCP*trend 2	–0.04 (–0.06 to –0.01)	.002
Change in Providers (95% CI)		
Comparison–intercept	1.02 (0.51 to 1.53)	.000
MCP–intercept	–0.16 (–0.40 to 0.08)	.182
Trend 1	–0.02 (–0.03 to 0.00)	.116
MCP*trend 1	0.03 (–0.00 to 0.06)	.054
Trend 2	0.00 (–0.00 to 0.01)	.443
MCP*trend 2	–0.02 (–0.04 to –0.01)	<.001

CI, confidence interval.

Only backpain patients are included in these regressions, which reduces the sample size by 23.2%, leaving 2304 patient-month level observations. We use generalized least squares and report the age- and sex-adjusted coefficients above. Standard errors are clustered at the patient level to control for heteroskedasticity and arbitrary correlation among patients.

Acknowledgments

We thank Joe Alcock for comments on an earlier draft.

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Supplemental Appendix

Table S1
Poisson Regression Results

Variables	Incident Rate Ratios (95% CI)	P Value
Rx		
Comparison—intercept	1.48 (0.60–3.67)	.396
MCP	0.79 (0.53–1.17)	.237
Trend 1	0.99 (0.96–1.03)	.738
MCP*trend 1	1.02 (0.97–1.07)	.396
Trend 2	1.00 (0.99–1.02)	.500
MCP*trend 2	0.96 (0.94–0.98)	<.001
Rx Classes		
Comparison—intercept	0.86 (0.46–1.58)	.620
MCP	0.92 (0.68–1.23)	.557
Trend 1	1.01 (0.98–1.04)	.505
MCP*trend 1	0.97 (0.95–1.04)	.854
Trend 2	1.00 (0.99–1.01)	.835
MCP*trend 2	0.97 (0.96–0.99)	.007
Dates		
Comparison—intercept	1.37 (0.61–3.11)	.446
MCP	0.75 (0.53–1.06)	.102
Trend 1	0.99 (0.96–1.03)	.665
MCP*trend 1	1.02 (0.97–1.07)	.521
Trend 2	1.00 (0.99–1.02)	.589
MCP*trend 2	0.97 (0.95–0.99)	.001
Providers		
Comparison—intercept	0.81 (0.43–1.54)	.526
MCP	0.80 (0.61–1.04)	.098
Trend 1	0.98 (0.96–1.00)	.104
MCP*trend 1	1.02 (0.98–1.06)	.259
Trend 2	1.00 (0.99–1.01)	.439
MCP*trend 2	0.97 (0.95–0.99)	<.001

We use a Poisson regression model rather than a negative binomial model because of a lack of evidence of overdispersion in the latter 3 outcome variables. Negative binomial results look similar for the total number of prescriptions, so we report the incident rate ratios for the Poisson model for the sake of consistency across outcomes. Age- and sex-adjusted incident ratios are reported above. Standard errors are clustered at the patient level to control for heteroskedasticity and arbitrary correlation among patients.

Table S2
Within-Patient Regression for the Comparison Group

Comparison	Change in Rx (95% CI)	P Value
Months		
4–6	–0.01 (–0.21 to 0.19)	.936
7–9	–0.13 (–0.43 to 0.18)	.402
10–12	–0.01 (–0.30 to 0.28)	.957
13–15	0.09 (–0.24 to 0.41)	.589
16–18	0.20 (–0.15 to 0.54)	.252
19–21	0.03 (–0.32 to 0.38)	.857
22–24	–0.03 (–0.42 to 0.36)	.871
Variables	Change in Rx Classes (95% CI)	P Value
Months		
4–6	0.13 (–0.03 to 0.28)	.104
7–9	–0.02 (–0.23 to 0.18)	.818
10–12	0.11 (–0.07 to 0.30)	.235
13–15	0.06 (–0.12 to 0.24)	.538
16–18	0.17 (–0.04 to 0.40)	.116
19–21	0.11 (–0.09 to 0.31)	.263
22–24	0.04 (–0.19 to 0.27)	.724
Variables	Change in Dates (95% CI)	P Value
Months		
4–6	–0.02 (–0.20 to 0.14)	.775
7–9	–0.10 (–0.34 to 0.15)	.434
10–12	–0.08 (–0.32 to 0.16)	.503
13–15	0.06 (–0.20 to 0.33)	.633
16–18	0.12 (–0.15 to 0.39)	.382
19–21	–0.00 (–0.27 to 0.27)	1.000
22–24	–0.06 (–0.35 to 0.22)	.655
Variables	Change in Providers (95% CI)	P Value
Months		
4–6	0.06 (–0.05 to 0.18)	.264
7–9	–0.10 (–0.24 to 0.03)	.133
10–12	–0.10 (–0.23 to 0.02)	.104
13–15	–0.01 (–0.15 to 0.13)	.908
16–18	0.02 (–0.13 to 0.18)	.768
19–21	0.02 (–0.14 to 0.19)	.760
22–24	–0.05 (–0.21 to 0.12)	.568

CI, confidence interval.

The table above reports coefficients from 4 least squares regressions, one for each outcome variable. Only comparison group patients are included in the sample analyzed. Individual dummy variables control for time-invariant patient characteristics. Standard errors are clustered at the patient level to control for heteroskedasticity and arbitrary correlation among patients.