Inquiry into the use of Cannabis in Victoria

Associate Professor Chris Wilkins

Organisation Name:
Your position or role:

SURVEY QUESTIONS

Drag the statements below to reorder them. In order of priority, please rank the themes you believe are most important for this Inquiry into the use of Cannabis in Victoria to consider::
Public health,Young people and children,Mental health,Social impacts,Criminal activity,Accessing and using cannabis,Education,Public safety

What best describes your interest in our Inquiry? (select all that apply) :
Academic and research

Are there any additional themes we should consider?
Taxation, allocation of taxation to drug help services, social equity (proportionate penalties, compensating affected communities, expungement of criminal record)

Select all that apply. Do you think there should be restrictions on the use of cannabis? :
Personal use of cannabis should be legal. ,Sale of cannabis should be legal and regulated. ,Cultivation of cannabis for personal use should be legal.

YOUR SUBMISSION

Submission:
What can be learned from cannabis law reform around the world

Chris Wilkins (Massey University), Simon Lenton (NDRI, Curtin University), Tom Decorte (Ghent University)

The New Zealand national referendum to decide if recreational cannabis use should be legal is less than 8 weeks away, and there are now active pro and anti-advocacy campaigns underway, a number of expert reports released, and a range of town hall style meetings being held around the country. A question commonly raised in these forums is, what can learned from other countries that have already legalised or reformed their cannabis laws? An international group of leading drug policy experts recently collaborated on a book on cannabis legalization to answer this very question [Legalising Cannabis: Experiences, Lessons and Scenarios(2020) - Decorte, Lenton, Willkins (ed) Routledge pub.

International experience
There has been a range of cannabis law reforms implemented around the world over a number of decades, including cannabis coffee shops in the Netherlands, cannabis decriminalisation in Australia, cannabis social clubs which began in Spain, as well as the recent high profile cases of full cannabis legalisation in 11 states of the U.S. and Canada, and the often overlooked Uruguay.

The first U.S. states to legalise recreational cannabis (i.e. Colorado, Washington) implemented fully commercial, largely 'alcohol-style', reforms.12 Canada has allowed its provinces/territories to decide on the model of legal cannabis distribution, and these range from government stores in Quebec to private retail outlets in Alberta.13 In Uruguay, cannabis is legally available via home cultivation, social clubs and

purchase from pharmacies, with government control of production. Cannabis social clubs are government registered, non-profit organisations that produce cannabis exclusively for their members' personal consumption.

Researchers have concluded that it may take 10 years to fully understand the outcomes of cannabis legalisation, due to the significant time lags between law change, establishing legalized cannabis markets, and time for the impacts on cannabis use, dependency and mental illness to be apparent.

Emerging evidence from profit-driven markets

Preliminary evaluations of commercial cannabis legalisation to date suggest there has been a reduction in arrests and significant tax earned from sales. However, there is emerging evidence of increasing adult use and dependency, and industry influence over regulatory development. There is mixed evidence to date on whether legalisation has increased youth use, and further research is needed to understand impacts on drug driving, emergency hospital admissions, and treatment demand.

One rationale for legalization is it will eliminate the illegal market and provide products of known purity and potency. However, the experience in the U.S. legal cannabis states clearly demonstrates the challenges of developing regulatory controls of pesticides, fertilizers and product potency. Early experience suggests legalization can substantially reduce, but not eliminate, the black market. Legal production and competition also drives down the price of legal cannabis, and that daily cannabis users are responsible for the majority of sales.

The legalization of cannabis does provide opportunities to address social equity issues related to cannabis enforcement, including discrimination against minorities and disproportionate penalties. This can be extended to include expungement of previous convictions, and supporting cannabis business and employment in affected communities.

Middle ground options

Drug policy scholars note that there are a number of 'middle ground' policy options for cannabis law reform between strict prohibition on one extreme and a profit-driven markets on the other. However, these options have received much less media and research attention. Non-commercial modes of legal cannabis supply, such as home cultivation and Cannabis Social Clubs, have proven to be popular in Uruguay and Spain, but questions remain whether they will be attractive to all types of consumers. Community trusts in New Zealand offer an alternative approach to reduce commercialization and provide funding to local community services, although rules will be needed to prevent cannabis companies from using community funding to enhance their public image and political influence.

Lessons from other legal drug markets

Finally, researchers are keen to point out that many of the key learnings from regulatory responses to alcohol and tobacco harm are highly relevant to the regulation of legal cannabis, including minimum pricing, restrictions on the density of retail outlets, plain packaging, smoke-free policies and restrictions on advertising. State or not-for-profit monopolies for alcohol have been found to be effective at achieving key public health outcomes, and could be considered for legal cannabis sales. The recent attempt to regulate the "legal high" market in New Zealand also highlights the importance of adequately resourcing of regulatory agencies and enforcement, engaging with key health stakeholders, and ongoing communication of policy aims to the public.

Public Health over Private profit

While much is yet to be known about the full consequences of cannabis legalization, there is a strong case for a conservative regulatory approach that seeks to limit the adverse impacts of the new market and curtails industry power. This makes more sense than allowing profit-driven commercialisation and then struggling for decades to roll back the consequences.

Do you have any additional comments or suggestions?:

FILE ATTACHMENTS
File1: 5f483b981c499-CannabislegalisationNZ.pdf
File2: 5f483b981ccd1-Wilkins & Rychert cannabis editorial.pdf
File3:

Signature:
Chris Wilkins

The Government's proposal to legalise cannabis in New Zealand: 10 key questions

Chris Wilkins, Marta Rychert

A national referendum on the legal status of recreational cannabis use and supply in New Zealand will be held at the next general election in September 2020.[1] The referendum will involve voting to support or oppose the Coalition Government's recently released final draft of the Cannabis Legalisation and Control Bill (CLCB).[2,3] The Government has indicated that they will conduct a public education campaign in the months leading up to the referendum to inform voters about the details of the proposal.[2,3] The aim of this editorial is to highlight a number of key questions arising from the final CLCB release, and to raise wider issues relating to the regulation and enforcement of the proposed legal cannabis market that go beyond the Bill. Our purpose is to stimulate public discussion and inform the upcoming public education campaign. We believe the questions raised will be of interest to readers regardless of whether they currently support or oppose cannabis legalisation.

Overview of the Cannabis Legalisation and Control Bill

As proposed by the CLCB, the purchase and use of cannabis will be restricted to those 20 years or older (two years older than the alcohol purchase age). There will be a daily purchase and possession limit of 14 grams of cannabis per user. Sales of cannabis will be restricted to licensed physical stores only (ie, no mail order or internet sales), and there will also be separate licensed public consumption premises for those who cannot consume at home (eg, people in shared living arrangements or renters). Advertising will be banned except for the provision of objective information (eg, price, product range) and "advice and recommendations" about products from within retail outlets. There will be a home cultivation limit of two cannabis plants per person or four plants per household. Social sharing of up to 14 grams of cannabis will be permitted. The CLCB will prohibit the public consumption of cannabis; the sale of cannabis products with alcohol and tobacco; and any importation of cannabis.

1. What will be the price of legal cannabis?

Alcohol and tobacco research has shown that price is a particularly strong influence on level of consumption and related harm, and, contrary to popular belief, heavy and younger users are particularly sensitive to price.[4–6] Cannabis is essentially a basic agricultural crop, and drug policy analysts have suggested that under legal production conditions its price could conceivably fall to a fraction of the current black market price.[7] The price of legal cannabis in US states has declined by as much as 50% since legalisation, reflecting economies of scale of legal production and growing market competition.[7–9] The CLCB includes a provision to set an excise tax on different cannabis products based on weight and THC content, but no indication of the level of the respective product excise rate (cl269(2)). The key question is will the cannabis excise be similar to beer (approx. 10% retail price) and wine (15%), or more like the excise rate on spirits (38%) or tobacco (76%)? A high legal price for cannabis will reduce legal consumption and harm, and may make non-commercial legal home growing more attractive. Conversely, high legal prices

may encourage purchasing from the black market. Yet, the legal cannabis market will provide a range of advantages beyond strictly price, including convenience, safety and the absence of legal risk. Legal cannabis regimes that place too high a priority on reducing the black market will encourage weak regulatory regimes that generate high health costs.[10]

One way to address declining prices in legal cannabis markets is to mandate a set minimum price per unit, as has been implemented in some countries for alcohol. The CLCB includes a provision to raise the excise for cannabis for a maximum period of 12 months if the price falls too much (cl263(2)). However, the power is discretionary, time limited, and has no set minimum price for when it would be activated.

2. What will be the maximum potency of products?

Historically, the THC level of cannabis plant material from the black market has been around 5–10%, but enhanced hydroponic cultivation techniques have produced potencies as high as 15–20%.[11,12] In US legal cannabis markets, new cannabis concentrate products with THC levels of over 50–60% have become increasingly popular.[9,14] Studies of higher potency cannabis, including concentrates, have found higher risk of psychosis, psychosis relapse and dependency.[13,14] The CLCB includes a maximum THC potency of cannabis plant of 15% THC (Schedule 8). This cap appears to be at the higher end of the levels currently found in the black market. The CLCB also includes provision for the sale of cannabis edibles and extracts (concentrates), but indicates these products will initially not be approved (Schedule 7). The CLCB includes potency levels for these products (Schedule 8), but they are expressed as milligrams "per unit" and "per package", and these terms are not defined. Furthermore, the potency caps outlined in the CLCB do not appear to apply to home grown cannabis, creating the potential for social sharing of higher potency products and leakage to the black market. The possibility of future concentrate and edible sales raises the question of what will be the cap on potency on these product types. Furthermore, given the evidence of cannabis concentrates overseas, are these products consistent with the harm reduction objectives of the CLCB?

3. How strictly will retail outlets be regulated?

Alcohol and tobacco research has shown that higher outlet density and longer opening hours are associated with higher levels of consumption and harm.[5,15,16] Similar results have been found for proximity to medicinal cannabis dispensaries.[15,17,18] New Zealand's recent attempt to establish a regulated commercial market for so-called "legal highs" under the *Psychoactive Substances Act* 2013 (PSA) highlighted a number of issues with retail outlets.[19] The PSA required the development of Local Approved Products Policies (LAPP) that set minimum physical distances between stores and sensitive sites such as schools (often 500 metres), but the PSA did not include any limits on the number of outlets or opening hours.[19] As a consequence, some central Auckland legal high stores operated on a near 24-hour basis.[20]

Under the CLCB, the central government Cannabis Regulatory Authority is tasked with developing local license premise policies for *every* district and city council in the country (ie, 67 territorial authorities in total). These policies will provide guidance with respect to the location and opening hours of retail outlets (cl16(2)) and must take into account the characteristics of the territory, location of sensitive sites (eg, schools, churches, sports facilities) and whether a retail outlet will reduce the "amenity and good order" of the territory (cl16(3)). The Authority is required to "consult" with "local persons and groups who may be affected" and local government authorities (cl16(6)(7)), but it is not clear what role local government will play and the influence these local groups will have. During the PSA, there were a number of instances where there was a clear disconnect between central government licensing of legal high outlets and local government and community concerns about these outlets, indicating the need for early engagement and communication of policy aims between central and local government.[19,21,22]

4. Which government agency will administer the new sector?

The CLCB establishes the Cannabis Regulatory Authority to regulate the new regime but does not state which government agency will administer the new legal recreational cannabis sector. This will be key to how the sector is perceived and regulated.[23] Government agencies with any kind of economic development mission (ie, business, innovation or tourism agencies) will place greater emphasis on facilitating cannabis business growth and jobs. For example, the gaming machine regime is regulated by the Ministry of Internal Affairs and they have shown a willingness to respond to the needs of the gaming industry.[24] Alternatively, a health agency is more likely to focus on the adverse health outcomes from cannabis use.

5. How will the cannabis infringement scheme be operated?

The CLCB includes provisions for civil infringement fees of $200–$500 (NZD) for exceeding the 14-gram personal possession or purchase limit, exceeding the personal plant cultivation limit, and for public use and public cultivation (Part 3). Higher court fines of up to $1,000 are also included for these offences. Criminal penalties remain for supplying cannabis to underage people (ie, 19 years or younger in this case) (maximum four years imprisonment), selling without a license (up to two years imprisonment), cultivating 10 or more plants (up to three months imprisonment), importing more than 14 grams (up to two years imprisonment), and "dangerous" production of cannabis concentrates without a license (up to two years imprisonment).

The CLCB could thus potentially contribute to the Government's wider aspirations to reduce conviction and imprisonment rates, particularly among Māori.[2] Progress towards this objective will crucially depend on how the infringement scheme is applied, and the willingness of offenders to pay infringements and thereby avoid further punishment through the courts.

In Australia, the introduction of infringement schemes for minor cannabis offences initially resulted in a counterintuitive "net widening effect" where police actually penalised *more* rather than less cannabis users as it was easier for police to issue an infringement notice than proceed with an arrest under the previous approach.[25] Cannabis users were also continued to be convicted and imprisoned for non-payment of infringement notices.[26,27] One way the CLCB could improve the likelihood of payment of infringement fees is to lower the fees set for infringements and/or provide non-financial resolution options, such as attending a cannabis education session or completing community work.

6. How will purchase and possession limits be enforced?

The CLCB proposes a daily cannabis purchase limit of 14 grams per day (considered by officials to be sufficient for a week of regular use) (cl29). It is not clear how such a daily purchasing limit will be enforced in practice without a real-time retail system that includes all retail outlets and collects personal identifying information from buyers to prevent them purchasing the maximum daily quantity from multiple retail outlets. In Uruguay, a biometric system requires registered buyers to submit a thumbprint before making a purchase.[28,29] In New Zealand, police already give cannabis use and possession offences a very low priority,[30] and following cannabis legalisation it is likely that the monitoring of purchase limits will likewise receive low police priority.

7. How will home cultivation be monitored?

The limits outlined in the CLCB on number of plants permitted for home cultivation have been established to prevent exploitation of home-grown production for resale on the black market. In South Australia, organised crime groups sponsored individuals to grow the maximum home grow limit and then combined the crop for sale on the black market.[26,27] The CLCB home plant restrictions will only be credible with some plan of enforcement, but it is not clear what is planned or what agency will carry out this enforcement. Enforcement does not have to be as intrusive as routine home inspections and could involve responding to evidence of syndication and selling of combined crops on the black market. Enforcement of home plant limits also needs to be flexible enough to take account of the requirement for seedlings to maintain two adult plants over the longer term.[31]

8. What health warnings will be required?

The CLCB requires all cannabis products to include mandated health warnings (cl172(1)a). Tobacco research has shown these health warnings can reduce initiation and encourage smoking cessation.[6] The size, text and graphics of the health warnings have been found to be key to their effectiveness for tobacco products.[6] The question is will the same effective standards be applied for legal cannabis products.

9. How will production be monitored?

A key objective of cannabis legalisation is to shrink or even eliminate the black market. One component of this effort is to ensure legal cannabis production is not leaking into the black market and vice-versa.[29] Significant black markets for cannabis have persisted in jurisdictions that have legalised cannabis. For example, in Canada, 40% of cannabis users report purchasing from the illegal market.[32] The most effective way to monitor legal cannabis production is a seed-to-sale system, as established in many US states, which tracks each cannabis plant from seedling to retail sale. This system also provides excellent data to measure total production, illicit diversion, project tax revenue, and track prices and product types.[29] Uruguay has taken this further by requiring users to register and then monitoring their purchases.[29,33] Given the limited data available on cannabis use and markets in New Zealand,[34] these options could be considered, with the appropriate privacy protections, to provide important data to refine regulatory responses. The CLCB includes provisions for a "tracking and recall" system (cl265(h)), but it is not clear whether this will be as comprehensive as a "seed to sale" system that involves tracking individual plants or will be routinely used to monitor production and illicit diversion.

10. What will be the role for non-commercial suppliers?

Experience from the alcohol, tobacco, gambling and most recently, "legal high" sectors indicates commercial operators will focus on expanding sales and targeting key demographics, including youth and heavy users.[5,6,15,35] Commercial cannabis companies in the US have already recognised that daily users are the "backbone" of the industry.[36] There are examples of alternatives to commercial supply of legal cannabis around the world including government monopoly at some level of the market,[33,37] not-for-profit trusts operating retail outlets[24,38] and even cannabis social clubs providing both production and consumption places.[39,40] The advantages of non-commercial suppliers is that they are not focused on expanding the market and have wider social aspirations.

The CLCB largely outlines a "commercial", albeit highly regulated, cannabis sector, but does include options for non-commercial and not-for-profit supply options. These including home cultivation for personal use (cl. 23–28); separate licensing for "micro-cultivation" producers (referred to as "small scale cultivation") (cl58 and cl64); prioritising licensing for cultivators who partner with communities disproportionately harmed by cannabis to generate social benefit and employment (cl85(2)(a-c)); and prioritising, "where practicable", licensing retail distributors who are "not-for-profit applicants that can demonstrate a commitment to delivering social benefit to the community" (cl88(a)). However, it is not clear at this stage what priority and support these social benefit operators will actually receive, and consequently, what the proportion of the larger market they will supply.

It appears the CLCB would not permit cannabis social clubs similar to those that operate in Uruguay, Spain and Belgium.[33,39,40] The CLCB allows home cultivation for personal use and social sharing of up to 14 grams of cannabis with others, but restricts home cultivation to a maximum of four plants per household, seemingly preventing the larger communal crops required for a cannabis social club. New Zealand has a longstanding sub-culture of hobbyist cannabis growers[31] who, as has been seen in Uruguay and Spain,[33] will likely embrace cannabis social clubs, and in doing so, will assist in the transition from black market to legal regime.

Conclusions

This editorial has identified a range of issues related to the CLCB on which the Government could provide further information, including the level of the cannabis excise tax, maximum potency of edibles and concentrates, the government agency to be tasked with administration of the new sector, the proposed production monitoring system, product labeling requirements, and the priority and support that will be given to non-commercial and social benefit suppliers. We recommend the inclusion of a formal minimum price for cannabis, the lowering of the cap on the THC potency of cannabis plant products, a set proportion of licenses for social benefit operators, and a framework to allow the emergence of cannabis social clubs.

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ADDICTION

ADDICTION OPINION AND DEBATE

Assessing New Zealand's Cannabis Legalization and Control Bill: prospects and challenges

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ABSTRACT

Background Few countries have developed detailed legislative proposals for legalizing cannabis. New Zealand recently released the Cannabis Legalization and Control Bill (CLCB) that will be the subject of a referendum in September 2020. **Aims** To assess the CLCB, drawing on emerging evidence from cannabis legalization overseas, public health research on alcohol and tobacco and the attempt to establish a regulated market for 'legal highs' in New Zealand. **Discussion** The CLCB proposes a strictly regulated commercial cannabis market that resembles the Canadian approach, but notably without on-line sales or regional heterogeneity in retail distribution. The objective of the CLCB of lowering cannabis use over time appears at odds with the largely commercial cannabis sector that will focus on expanding sales. The CLCB includes provision for home cultivation and social benefit operators, but it is not clear what priority these operators will receive. A potency cap of 15% tetrahydrocannabinol (THC) for cannabis plants is included, and this is at the high end of black-market cannabis. The proposed progressive product tax based on THC will be challenging to implement. There is no formal minimum price, but rather discretionary powers to raise the excise if the price drops too much. The CLCB includes a comprehensive ban on advertising, but non-conventional on-line promotion will be difficult to suppress. The central government cannabis authority is tasked with developing local retail outlet policies. We caution against the temptation to employ an interim regulatory regime following a positive referendum result, because a partially regulated market will expose users to health risks and undermine public support. **Conclusions** New Zealand's Cannabis Legalization and Control Bill's objective of reducing cannabis use via a commercial market will be challenging to achieve. The bill could be strengthened with formal minimum pricing, lower potency cap and greater clarity concerning social benefit operators and the role of local government.

Keywords Cannabis legalization, cannabis taxation, enforcement, implementation, 'not-for-profit' supply, referendum.

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BACKGROUND

The legalization of cannabis in Uruguay, Canada and 11 US States has re-ignited the international debate about the best policy approach to cannabis use [1,2]. However, few countries have developed detailed legislative proposals of how a legal market for cannabis would operate and be regulated.

In New Zealand, the current government coalition agreed to hold a national referendum on the legal status of recreational cannabis use before the next general election in September 2020 [3]. Referenda are only occasionally held in New Zealand (only 10 have been held in the entire history of the country), and in this instance holding a referendum probably reflects the controversial nature of the issue and disparate views held by the political parties that form the coalition government. In May 2019, the Government proactively released a cabinet paper discussing the overarching policy settings for a regulatory model for cannabis, and announced that the referendum would involve voting on a draft Bill, which would be released publicly ahead of the referendum [4,5]. The New Zealand referendum vote will be the first time a country will have the opportunity to vote on a comprehensive regulatory framework to legalize cannabis rather than a general question asking whether or not cannabis should be legal.

On 3 December 2019, the government released the first draft of the Cannabis Legalization and Control Bill (CLCB)

[6]. This was followed by a confidential engagement process with a range of experts (including the authors of this article and others unknown to the authors—see Declaration of interests statement) to obtain feedback on the initial draft CLCB [7]. On 1 May 2020, a much longer and more detailed final version of the CLCB was released [8].

This Addiction Debate article aims to assess the CLCB, drawing on the emerging evidence from cannabis legalization overseas, accumulated public health research on effective alcohol and tobacco regulation and our own research on the ultimately failed attempt to establish a legal regulated market for new psychoactive substances (so-called 'legal highs') in New Zealand [via the *Psychoactive Substances Act 2013* (PSA)]. The paper focuses on key aspects of the CLCB rather than systematically covering all sections of the Bill. We draw on public health law theory which emphasizes that law (on the books), its implementation and the environment in which regulation and law-making processes take place all affect public health outcomes [9]. The specific topics of the paper are also informed by previous analyses of the key design considerations for a legal cannabis market, including the role of private enterprise, price and taxation, potency and promotion and advertising [2,10,11]. Our previous research of the PSA reforms in New Zealand highlighted the importance of policy implementation, in particular the role of local government in local outlet regulation, and the capacity of central government agencies in developing regulatory frameworks to support a legal market.

OVERVIEW OF THE CLCB

The CLCB proposes a strictly regulated commercial market for cannabis that most closely resembles the tightly regulated sale and marketing of tobacco products in New Zealand. From an international perspective, the CLCB most closely resembles the Canadian approach to cannabis legalization, but notably without provision for national on-line sales distribution or regional heterogeneity in physical retail distribution and home cultivation provisions. The CLCB proposes restricting the purchase and use of cannabis to those aged 20 years or older (i.e. 2 years older than the purchase age for alcohol in New Zealand); a daily purchase and possession limit of 14 g; sales from licensed physical stores only (i.e. no mail order or internet sales); separate licensed consumption premises; no advertising or promotion; a personal home cultivation limit of two plants (four plants per household); social sharing of up to 14 g of cannabis; no industry sponsorship or free giveaways; limits on the potency of products; an excise tax based on the potency and weight of products; and the mandatory inclusion of health warnings on products and displayed at licensed premises. The CLCB prohibits the public consumption of cannabis; the sale of cannabis products with alcohol, tobacco or any other product (although licensed consumption premises must provide food and non-alcoholic beverage for sale at the venue); and any importation of cannabis.

THE OBJECTIVE OF REDUCING USE OVER TIME

The CLCB proposes the establishment of a new central government regulatory agency, the Cannabis Regulatory Authority, to oversee the new legal cannabis regime (cl10). One of the three 'main objectives' of the proposed Authority, in addition to 'promoting the wellbeing of New Zealanders' [cl11(1)a] and reducing 'the multiple harms associated with cannabis use' [cl11(1)b], will be to 'reduce the overall use of cannabis over time' [cl11(1)(c)]. The authority will seek to achieve the objective of reducing use over time principally by setting an annual cannabis cultivation production cap, which will determine the total quantity of cannabis available for legal processing and retail sale by license holders [cl12(a) and cl22]. Uruguay has implemented a similar state-controlled approach to legal cannabis production, where the government determines the total amount of cannabis to be grown and commissions private growers to cultivate this amount. This approach caused some issues in Uruguay when government-mandated production of cannabis was not sufficient to meet demand. This was due to difficulties in predicting total consumer demand for cannabis for an emerging legal market (i.e. growth in consumption can occur quickly while changes in cultivation can take months to adjust) and some commissioned growers were not able to meet the government's testing standards [7]. The resulting shortfall in legal production caused queuing at retail outlets and reports of users returning to the black market [12].

There is currently only a limited number of studies examining the impact of legalization on cannabis use to inform understanding of the likelihood that the CLCB authority can achieve the objective of reduced cannabis consumption over time [1,13,14]. All the studies are from US states that have largely regulated cannabis in a similar way to alcohol [15–17], and even in the first states to legalize (i.e. Colorado and Washington State), commercial retail outlets have only been established relatively recently. In addition, people take time to adapt to the new legal environment, many harm measures are time-lagged, legalization occurred in a context where cannabis use was increasing in the United States as a whole, there are important substate differences in retail availability within legal cannabis states, the cannabis industry is still in an early stage of development and is restricted by the US federal prohibition and there is a need to account for the influence of pre-existing state cannabis, alcohol and other drug policies, particularly with

regard to prior medicinal cannabis access and cannabis decriminalization [1,13,14,18].

Preliminary findings concerning the impact of legalization on youth use in the United States have been mixed, with rates increasing in Washington State, while there was no significant change in Colorado [18–20]. More recent analysis of US data from 2008 to 2016 suggests that following cannabis legalization there may have been a small increase in cannabis dependence among those aged 12–17 years, no change in past-month use, past-month frequent use or dependency among 18–25-year-olds, but an increase in past-month use, past-month frequency of use and dependency among adults aged 26 years or older [21]. The authors were cautious in interpreting the findings with regard to 12–17-year-olds, because they estimated that the small increases could be due to unmeasured confounders [21]. It has also been noted that only three states (i.e. Colorado, Washington and Oregon) had established cannabis retail outlets during this study period, and those had only been open for a relatively short period of time [1], suggesting that the full impact of commercial legalization is yet to be examined. Most recently, a study found that in US states that enacted recreational cannabis legalization there is evidence of a general trend towards greater increase in cannabis use by college students from 2008 to 2018 [22]. Data from the same study also found, in the context of increases in college students' cannabis use following state cannabis legalization, there were decreases in binge drinking and increases in sedative use by college students [23].

While the empirical question of the impact of legalizing cannabis on levels of use is yet to be answered, there are theoretical reasons to question whether the commercial, albeit heavily regulated, cannabis sector proposed in the CLCB will lead to lower cannabis consumption over time. The over-riding imperative of commercial enterprise is to expand sales and profits to reward private owners and investors. Entrepreneurs rarely establish businesses with the idea of reducing customers and sales over time. In addition, the commercial sale of cannabis is likely to lead to normalization of use, wider availability and declining prices, all of which are likely to contribute to increasing consumption [1].

Studies of alcohol, tobacco and both illegal and legal cannabis markets have shown that the top 20% of heavy users consume 80% of total production [24–26]. Profit-driven cannabis firms will therefore seek to expand the heavy-user base to achieve profitability, with implications for rates of dependency and other public health impacts [2,27]. The fledgling commercial cannabis industry in the United States has already recognized that 'daily cannabis users' are the 'backbone of the industry' [28].

THE ROLE OF THE INDUSTRY IN REGULATION-MAKING

The public health literature on alcohol and tobacco control has also illustrated how the industry relentlessly works to push back on effective regulatory controls in favour of a host of ineffectual ones, such as industry self-regulation, public education campaigns and individual responsibility, and seeks out 'partnerships' with government agencies and non-governmental organizations (NGOs) to influence the regulatory environment in their favour [29,30]. The stated purposes of the CLCB to provide 'access to legal and quality controlled supply of cannabis for adults who choose to use cannabis' [cl4(e)] and for 'eliminating the illegal supply of cannabis' [cl4 (a)] provide shared aspirations that the cannabis industry can readily exploit. For example, the industry can propose a partnership approach with government agencies and NGOs to achieve these shared objectives, and also refer to these objectives when opposing higher cannabis taxes and retail restrictions on the basis that they reduce the ability of the legal industry to compete with the black market. The legal cannabis industry will probably actively lobby against any attempt to lower the cap on total cannabis production, again by invoking the stated purposes of the CLCB to ensure supply to all adults who want to use and eliminate the black market. The industry is likely to receive strong support for this opposition to a lower cannabis production cap from an expanding cannabis consumer base and NGOs in favour of legalization.

In Colorado, the 'collaborative approach' to regulation making involving partnership with the cannabis industry resulted in 'regulatory paralysis' and weaker regulation as the industry sought to protect profits [31]. The CLCB seemingly rules out any such direct collaborative approach to regulation making by prohibiting anyone with 'direct interest in the cannabis industry' from being a member of the Cannabis Advisory Committee that provides expert advice on the annual production cap and other aspects of the regulatory regime to the Cannabis Regulatory Authority [cl19(3)(4)]. However, the industry can still be consulted and provide submissions on regulatory development, as was the case with the PSA, where the legal high industry was involved in a targeted stakeholder consultation process [32].

The nascent medicinal cannabis industry in New Zealand has already publicly lamented the high regulatory controls they face compared to the alcohol industry [33]. There is also precedent for government partnership with the cannabis industry in New Zealand, where two companies with a financial stake in the new medicinal cannabis market are members of the Government's Medicinal Cannabis Advisory Group (i.e. a cannabis-growing company and a private consultancy specializing in commercialization of pharmaceutical products) [34]. Global alcohol and

tobacco companies have recently invested billions in cannabis companies in Canada and will bring with them mature strategies to influence government policy and regulation [14,29,35].

OPPORTUNITIES FOR NON-COMMERCIAL SUPPLY

The CLCB largely proposes a commercial, albeit strictly regulated cannabis market, but includes options for non-commercial and not-for-profit supply, including home cultivation for personal use (cl. 23–28); separate licensing for 'micro-cultivation' producers (referred to as 'small scale cultivation') (cl58 and cl64); prioritizing licensing for cultivators who partner with communities disproportionately harmed by cannabis to generate social benefit and employment [cl85(2)(a-c)]; and prioritizing, 'where practicable', licensing retail distributors who are 'not-for-profit applicants that can demonstrate a commitment to delivering social benefit to the community' [cl88(a)]. The weight the Cannabis Regulatory Authority will give to the above social benefit criteria is not clear at this stage.

The benefit of non-commercial or not-for-profit operators is they can provide legal access to cannabis while avoiding profit-driven commercial companies focused on expanding sales. A number of jurisdictions have adopted largely non-commercial models for legal cannabis supply, including Uruguay, Vermont and Washington DC [1,2,12,36,37]. In Canada, decisions about retail distribution were delegated to individual provinces and territories, and this has resulted in regional heterogeneity in retail approaches (e.g. government shops in Quebec, mixed public and private retail in British Columbia) [38].

Research of alcohol sold from government shops has shown that they ensure greater control over supply, including by limiting the number of retail outlets, opening hours, reducing advertising and enhanced staff training to enable them to identify problematic users and enforce age restrictions [39–41]. A systematic review of studies of the privatization of former government monopoly alcohol sales found strong evidence that privatization leads to an increase in excessive alcohol consumption and related harm [42]. In New Zealand, not-for-profit trusts have been utilized to operate gaming machine gambling and retail alcohol sales for decades, and these trusts have provided significant funding for local community sports, education, arts and health services [43,44].

It appears that the CLCB would not permit cannabis social clubs similar to those that operate in Uruguay, Spain and Belgium [36,45]. The CLCB allows home cultivation for personal use and social sharing of up to 14 g of cannabis with others, but restricts home cultivation to a maximum of four plants per household, seemingly preventing the larger communal crops required for a cannabis social club.

The micro-cultivation license provision could potentially fill this role, but its application to a social club context would appear to require applying and paying for multiple licenses and meeting the other regulatory, testing and security requirements. This may be beyond the expertise and financial resources of a typical group of cannabis users.

There is reason to believe that cannabis social clubs could encourage users to transition to the legal market, provide a forum to communicate health information and help to address equity issues related to the practicality of cannabis growing (e.g. for renters) [36,46,47], particularly if clubs were supported with an appropriate regulatory framework [37,48]. In Uruguay, despite the controversial user registration requirement, both home cultivation and cannabis social clubs have proved to be popular cannabis supply options [12]. As of September 2019, there are 7286 registered home cannabis growers and 126 cannabis social clubs in Uruguay [12].

POTENCY LEVELS

The CLCB includes provisions to set maximum limits on the THC potency for different cannabis products (i.e. plant, edibles, extracts and topicals). The cap on cannabis plants has been set at 15% THC (Schedule 8). The THC level of cannabis plant material has increased significantly during the past several decades in both the United States and Europe from approximately 5% to more than 15% [9]. In New Zealand, cannabis seized by the police has been found to have an average potency of 10.9% THC (range = 4.2–18.1%) [49]. The maximum potency levels for cannabis plant included in the CLCB thus appear to be at the higher end of the levels currently found in the black market, and may not be consistent with the wider objectives of a harm reduction market. Given that the Authority has the power to adjust potency limits under the regime [cl 202(1)(g)], it would be prudent to start with a lower potency cap at the outset.

The CLCB also includes provision for the sale of cannabis edibles and extracts (concentrates). but indicates that these products will initially not be approved for sale (Schedule 7). The CLCB includes potency levels for these products (Schedule 8), but they are expressed as milligrams 'per unit' and 'per package', and these terms are not defined. Consequently, it is not clear how these traditionally higher potency product types will be incorporated into the proposed market. Furthermore, the potency caps outlined in the CLCB do not appear to apply to cannabis products produced from home growing, creating the potential for social sharing of higher potency products and leakage to the black market.

High-potency cannabis has been found to be associated with increasing first-time cannabis treatment admissions, transition to daily use, cannabis dependence and higher risk of psychosis and psychosis relapse [50–55]. In the

United States, new cannabis concentrate products with THC levels of more than 50–60% have become increasingly popular in legal cannabis markets [50,56]. Associations have been found between these high-potency concentrates and a higher risk of dependency [50].

Higher-potency cannabis also poses a greater risk to children, youth and novice users, and can contribute to impaired driving and accidents [52]. Naturalistic studies have suggested that cannabis users only partially adjust the quantity of cannabis they consume when using higher potency cannabis, and thus users of higher potency cannabis are often exposed to greater levels of THC [57,58].

LEGAL PRICE AND TAXATION PLAN

The price of legal cannabis will be a key determinant of the level of legal consumption and related harm. Alcohol and tobacco research has shown that, contrary to popular belief, heavy and younger users are particularly sensitive to price [41,52]. There have been substantial declines in the legal price of cannabis in the United States as legal producers exploit efficiency gains and are exposed to market competition [16]. For example, the average price of a pound of high-potency cannabis in Colorado has declined more than 60% since 2015 [2].

The CLCB proposes a progressive product excise tax based on THC potency and weight [cl263(1)(b)], but there are no details for what the excise level will be, apart from suggesting that the rate will be different for different types of cannabis product [cl269(b)]. A tax on potency is justified on the basis of growing sales of high THC cannabis flower and extracts for inhalation in US legal cannabis markets [2,56,59]. For example, the share of cannabis sales in Washington from high THC extracts (more than 60%THC) increased from 9% in October 2015 to 26% in October 2017 [60], and the share of flower products with more than 20% THC increased by 48% from October 2014 to October 2016 [56]. The proposed tax on THC potency is theoretically more effective than taxes imposed on value and weight. A progressive tax on THC also has the added health benefits of encouraging consumers to use lower-potency products [2]. When taxes are levied on the value of a product, as is the approach in a number of US states where cannabis is now legal, any decline in cannabis price flows through to lower tax revenue.

However, considerable work will be required upfront to successfully implement a tax on THC, including consistent sampling procedures, certified testing facilities and effective auditing to prevent producers gaming the system by selecting low potency samples to avoid taxation [10]. One approach that has been proposed is to require sellers to clearly label the THC potency of their products and thus incentivize them to provide accurate estimates of potency as under-reporting of THC content to avoid higher tax would

make their products less attractive to consumers [11]. The reliability and replicability of testing THC remains problematic, especially for the raw plant, and there can be considerable variation in THC between cannabis flowers from the same cannabis plant [49,61,62]. Given these technological and measurement limitations, it has been recommended that a weight-based tax (similar to the taxation of tobacco) is a more practical alternative for the present [62]. A weight-based tax could be supplemented with different rates for different potency parts of the plant; for example, flower versus trim [11,61,62].

The substantial declines in the legal price of cannabis overseas also raises the question of whether a minimum price for legal cannabis be considered to support the CLCB objective of reducing consumption over time. The CLCB does not include a formal minimum price for cannabis, but does include a discretionary power to raise the excise for cannabis for a maximum period of 12 months 'if the price of cannabis drops below the level consistent with purposes of this Act, owing to an oversupply of cannabis or the availability of less expensive cannabis' [cl263(2)]. This discretionary time-limited power does not include any clear objective criteria for when it would be activated, and thus falls short of a clear minimum price provision. The CLCB may also be able to address declining legal cannabis prices by limiting competition; for example, by restricting licenses in a geographical area or level of the market (e.g. wholesale), by levying additional taxes and fees, and by imposing other costly regulation such as product testing and labelling [2].

PROMOTION AND ADVERTISING

The advertising and promotion restrictions in the CLCB [cl157(1)] are more comprehensive than the US and Canadian regulations. They extend to all media [cl6(1)] and all age groups, not just youth as in the United States and Canada, and also prohibit sponsorship and provision of free giveaways. Retailers are only permitted to provide information and 'advice and recommendations' within licensed retail outlets, and this information is limited to the products available, price and THC content and the required health warnings (cl158 and cl159).

However, experience in legal cannabis jurisdictions to date suggests that non-conventional online promotion will be difficult to control. The Canadian cannabis industry has been observed to exploit loopholes in promotion restrictions focused on youth by employing nominally age-gated online forums (e.g. Instagram™), social media influencers and by promoting brands and logos without conventional advertising content [63]. Similarly, in Colorado there has been a proliferation of online cannabis strain reviews, forums and celebrity endorsements surreptitiously promoting cannabis products [26].

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Experience with the alcohol, tobacco and 'legal high' commercial sector has shown young people are the natural target demographic for promoting sales of psychoactive products [15,32,41,64], reflecting their lower perceptions of risk and higher leisure time and disposable income. This age demographic also has the highest internet usage. A recent study found that 79% of adolescents (aged 15–19 years) from four legal recreational cannabis states in the United States (i.e. Colorado, California, Nevada and Washington) were exposed to cannabis marketing on social media platforms, and this exposure increased their likelihood of past-year cannabis use [65].

THE ROLE OF LOCAL GOVERNMENT

One of the many functions of the Cannabis Regulatory Authority is to develop local licensed premise policies for each district and city council in the country (i.e. 67 territorial authorities in total) to provide guidance with respect to the location and opening hours of retail outlets (cl16). The local licensed premises policy must take into account the characteristics of the territory, location of sensitive sites (e.g. schools, churches, sports facilities) and whether a retail outlet will reduce the 'amenity and good order' of the territory [cl16(3)]. The Authority is required to 'consult' with 'local persons and groups who may be affected' and local government authorities [cl16(6)(7)], but it is not clear what influence these local groups will have.

The failed implementation of the PSA illustrates the risks of not involving local government authorities at an early stage in local outlet policy development. The Psychoactive Substances Bill initially did not include any local government powers to regulate 'legal high' outlets, and these were only belatedly included in the legislation (known as Local Approved Product Policies, or LAPP). By the end of the 9-month interim PSA regime, only five of 67 local councils had developed a LAPP, citing a lack of early consultation, funding to conduct public consultations and growing community opposition to the reforms [66].

Higher alcohol outlet density and longer hours of trading have been found to be associated with increasing rates of alcohol use and related harm [41,51], and similar associations have also been found between density of medicinal cannabis dispensaries and cannabis-related harm [67,68]. Alcohol and tobacco retail outlets, and more recently medicinal cannabis dispensaries, have also been found to be concentrated in neighbourhoods with higher rates of poverty, ethnic minorities and young people [64]. Local zoning regulations (stipulating outlet density, distance of outlets from sensitive sites, e.g. schools) will be important to address youth access, normalization and impacts on vulnerable communities [51].

Local government authorities have historically played important roles in developing appropriate cannabis regulation for local communities, notably in the Netherlands (cannabis 'coffee shops'), Denmark, Germany and Switzerland [69]. Local customization has also played a part in US legal cannabis states by allowing counties to opt out of some aspects of the legal market supply; for example, not allowing retail outlets [70]. In Colorado, local government has developed public health regulation of the legal cannabis market, including with respect to external signage, opening hours, outlet density and the utilization of chemical pesticides [26].

IMPLEMENTING THE NEW REGULATORY REGIME

Under the CLCB, the newly established Cannabis Regulatory Authority is tasked with a wide range of functions, including setting the national cannabis production cap, issuing licenses, setting the criteria and conditions for licenses, setting the THC levels of products, monitoring and enforcing compliance of production standards and retail and consumption premises, administering and collecting excise taxes, implementing appeal decisions, monitoring and enforcing compliance of home grows, developing good practice guidelines for home grows, conducting public education campaigns, raising public awareness of the new law, collecting and analysing statistics on supply and demand, promoting and supporting research, regulation production and marketing, regulating cannabis accessories and facilitating a whole-government approach to non-compliance, in particular in relation to young people [cl12(a-o)]. The Authority is also required to develop a 'national plan' within 6 months of enactment that outlines public health, drug education and treatment services strategies, and deliver an annual report to the Minister on progress with the plan (cl13).

A majority result in the New Zealand cannabis referendum will generate enormous public pressure to immediately legalize the use and sale of cannabis. A key lesson from the failed PSA implementation is that allowing a partially regulated interim regime to operate while regulation is developed exposes users to potentially unsafe products and inappropriate retail environments that undermine stakeholder and public support for reform [66].

Experience from the US legal cannabis states shows that it can take years to develop regulation for product testing, cultivation standards (e.g. allowable pesticides, fertilizers and impurities), retail outlets and taxation regimes. In the case of the New Zealand PSA, developing only the draft product approval guidelines took 16 months [66].

A central issue with the implementation of the PSA was the lack of regulatory agency resources to develop the required regulation and enforce existing regulation [66]. One reason for the lack of resources for the PSA authority was that funding was intended to come from product and

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industry license fees that only accumulate after the full market was established [71]. A similar issue has been identified in Colorado, where funding for youth prevention and education programmes were only available in the second year of tax appropriations from legal cannabis sales, whereas such initiatives should ideally have been operational at the onset of legalization [26].

CONCLUSIONS

The CLCB proposes a tightly regulated largely commercial cannabis market with wider public health objectives. This paper has highlighted several areas where the proposed regulatory regime could be strengthened, including introducing a formal minimum price for cannabis, committing to a high excise tax for cannabis products and lower potency caps for cannabis products. It has also identified instances where the stated public health objectives of the CLCB will be challenging to achieve, notably with respect to reducing cannabis use over time via a commercial market, and taxing cannabis products by THC potency. We also highlight the lack of clarity with respect to the priority to be given to social benefit and not-for-profit operators, level of engagement with local government authorities in regard to local retail outlet regulation and the absence of a framework to support cannabis social clubs that could assist the transition of users to the legal market.

The CLCB stipulates that the new regime is to be 'independently' reviewed after 5 years (cl267), and the Authority must 'promote and support research' to develop 'evidence-based' approaches to prevention and harm reduction activities [cl16(l)]. Evaluation of the reforms will require the systematic collection of baseline data on cannabis use and harm before any legislative change. The range of evaluation data required demands more than a traditional general population survey, and must include on-line surveys to reach heavier users, student surveys, qualitative research, emergency department surveys and cannabis tracking systems (i.e. seed to-sale systems) [1]. At present, there is very limited population-level, youth- and frequent-user data on cannabis use and harm in New Zealand to provide any such baseline [72]. Many US states that legalized cannabis via referendum were also left with limited pre-change data on cannabis use to inform subsequent evaluation [1]. In contrast, Canada fielded new surveys and created new data collection programmes in anticipation of legalization [1]. Ongoing research on cannabis use and related harm will also be needed in New Zealand once the new regime is established to refine the new regulatory regime and respond to community and stakeholder feedback. The experience from the PSA is that without this engagement and refinement of regulatory frameworks, initial public support for reform can quickly be replaced by opposition [73].

Author contributions

Chris wilkins: Conceptualization; investigation. **Marta Rychert:** Conceptualization; investigation.

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