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# 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].

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

 

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].

**Declaration of interests**

Wilkins and Rychert provided feedback on the first draft of the CLCB to the New Zealand Ministry of Justice Cannabis Referendum Team, along with a number of other anonymous experts and public commentators. The authors received no financial or non-financial remuneration for these comments.

**Author contributions**

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

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