

COMPREHENSIVE REVIEW

Facing the option for the legalisation of cannabis use and supply in New Zealand: An overview of relevant evidence, concepts and considerations

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Abstract

Issues. Non-medical cannabis policies are changing, including towards legalisation-with-regulation frameworks. New Zealand will hold a public referendum on cannabis legalisation in 2020. We reviewed data on cannabis use and health/social harms; policy reform options; experiences with and outcomes of reforms elsewhere; and other relevant considerations towards informing policy choices in the upcoming referendum. **Approach.** Relevant epidemiological, health, social, criminal justice and policy studies and data were identified and comprehensively reviewed. **Key Findings.** Cannabis use is common (including in New Zealand) and associated with risks for health and social harms, mainly concentrated in young users; key harms are attributable to criminalisation. ‘Decriminalisation’ reforms have produced ambivalent results. Existing cannabis legalisation frameworks vary considerably in main parameters. Legalisation offers some distinct advantages, for example regulated use, products and user education, yet outcomes depend on essential regulation parameters, including commercialisation, and policy ecologies. While major changes in use are not observed, legalisation experiences are inconclusive to date, including mixed health and social outcomes, with select harms increasing and resilient illegal markets. It is unclear whether legalisation reduces cannabis exposure or social harms (e.g. from enforcement) for youth. **Implications/Conclusions.** No conclusive overall evidence on the outcomes of legalisation elsewhere exists, nor is evidence easily transferable to other settings. Legalisation offers direct social justice benefits for adults, yet overall public health impacts are uncertain. Legalisation may not categorically improve health or social outcomes for youth. Legalisation remains a well-intended, while experimental policy option towards more measured and sensible cannabis control and overall greater policy coherence, requiring close monitoring and possible adjustments depending on setting-specific outcomes. [Fischer B, Daldegan-Bueno D, Boden JM. Facing the option for the legalisation of cannabis use and supply in New Zealand: An overview of relevant evidence, concepts and considerations. *Drug Alcohol Rev* 2020;39:555–567]

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Introduction

In late 2020, New Zealand’s general voting population will decide in a public referendum on a possible fundamental change in the country’s control approach to

non-medical use and supply of cannabis. Concretely, the referendum will be a vote for or against a ‘legalisation with regulation’ regime for non-medical cannabis to replace the current, decades-old framework of prohibition. While key details for the proposed legalisation regime have only

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gradually emerged, or remain to be defined [1,2], and several other jurisdictions—mostly in the Americas—have implemented cannabis legalisation recently, the issue remains controversial. This article, with a primary view to public health and welfare policy considerations, will review essential concepts, facts and experiences relevant to the upcoming New Zealand referendum on cannabis policy options. It aims to provide essential, science-based information for making a well-informed decision—whichever way—in the referendum and its given choice options.

The 2020 referendum is neither about whether cannabis will be available for use nor whether cannabis use comes with risks for harms in New Zealand—both questions are answered by well-established facts and are not the subject of popular decision in the referendum. The referendum decision, rather, is about whether to approach non-medical cannabis use and supply control more principally as a health and social welfare issue, rather than a criminal one. For this decision, it is relevant to also consider the ways and experiences with which other psychoactive substances or behaviours with potential for harm are governed. Moreover, it needs emphasis that a decision on cannabis legalisation ought to thoroughly consider empirical facts, but neither should nor can be based on them alone, mainly because cannabis legalisation is a relatively novel and inconclusive phenomenon, an ongoing ‘social experiment’. Legalisation initiatives implemented elsewhere vary in key aspects, with their design or outcomes not simply transferable to other policy ecologies. Hence, while experiences with outcomes of prohibition as well as recent policy reforms in other contexts ought to be considered, the choice options and decisions for New Zealand’s referendum need to be informed by evidence and insights from other fields, as well as by fundamental value judgments.

Cannabis Use

Despite its widely prohibited status, cannabis is the most commonly used illegal drug globally; some 200–250 million people are estimated to be active (i.e. past year) users [3–5]. New Zealand, together with North America and Australia, belongs to a global group of ‘high use’ countries: some 8–14% of the general population report current (e.g. past year) use, and the majority of those reporting any use have tried cannabis in their teens—although there are reports of recent declines in youth use [6–9]. Despite these declines, and the fact that use rates are generally lower than for alcohol or tobacco, cannabis use is mostly concentrated among youth and young adults (i.e. aged 15–29 years [3]). In terms of

both current use (25%–40%) and lifetime exposure rates, this is, thus, the main sub-population for use and concern regarding cannabis-related risks or adverse outcomes. In other words, the overarching task for effective cannabis control, crucially, is about designing policy that best protects the fundamental health and wellbeing of young people – including possible exposure to cannabis use – over the life course in New Zealand, as much as elsewhere [10–12].

Cannabis-related health and social consequences

Use of cannabis, like all psychoactive substances, comes with risks for a range of adverse health and social consequences, as are well documented by recent seminal reviews [13–17]. Main adverse consequences associated with cannabis use include the following: acute cognitive, psychomotor control and memory impairment, as well as hallucinations (including an extreme of acute psychotic episodes, with possible hospitalisations); a moderately (e.g. 1.5- to 2.5-fold) increased risk for impairment-related traffic accidents with possible injury/death; cannabis use disorder/dependence (found to occur in ~10–25% of users); moderate associations with chronic mental health problems, primarily schizophrenia and depression (with however multi-directional causality, and only a minority of cases directly attributable to cannabis use); chronic bronchitis or other pulmonary problems (including possibly increased risk for lung cancer) among those who ‘smoke’ cannabis products (and particularly smoking cannabis combined with tobacco); adverse reproductive/maternal health outcomes (e.g. lower foetal birthweight) among women using cannabis during pregnancy; and possible cardio-vascular problems (including some case reports of deaths) specifically among users of high-potency cannabinoid products or extracts. Though there are cannabis-impaired driving fatalities and a small number of cardiovascular (death) cases, there are virtually no other reported directly attributable (e.g. acute overdose) deaths from cannabis [13–17]).

The risks for adverse cannabis-associated health outcomes require both intrinsic and extrinsic contextualisation. Most instances of cannabis use occur with little to no serious adverse consequences; rather, risks for severe adverse outcomes are starkly stratified and predominantly materialise in a minority sub-group—an estimated 25–30%—of users [10,11,16,18–20]. Data suggest that users at high risk for severe adverse outcomes are commonly characterised by a small set of distinct risk factors, chiefly including cannabis use initiation at an early age (i.e. as a young teenager); high frequency/

intensity use (e.g. daily/near daily use); and use of high-potency (high-tetrahydrocannabinol content) cannabis products [12,20–24]. Probably facilitated by developments related to the above risk factors, a number of jurisdictions, including New Zealand, have witnessed recent increases in select key cannabis-related problem indicators, specifically including cannabis-impaired driving, hospitalisations and/or treatment seeking [25–30].

The adverse outcomes for cannabis use are limited, and relatively moderate in population-level impact, compared with those for other psychoactive substances, both legal and illegal [31]. Concretely, the formally measured cannabis-related ‘burden of disease’ is substantially less than that for the legal substances alcohol and tobacco, or for other illegal drugs such as stimulants and opioids [3,4,32,33]. While differences in population-level exposure contribute to the differences, they reflect substantially lesser cannabis-attributable chronic morbidity and mortality [34,35]. Notably, and contrary to much popular discourse, the majority of cannabis-attributable disease burden has been estimated to arise from cannabis-impaired driving and from use disorders (e.g. dependence), which far outweigh cannabis-attributable mental health problems (e.g. psychosis) in disease burden impact [3,36,37].

Moreover, there is a growing body of evidence on the medical or therapeutic benefits of cannabis. While many of these claims are questionable, the evidence for benefits is reasonably substantial and growing for several indications, for example for neuropathic pain, anti-spasticity or anti-nausea care [38–41]. In several jurisdictions, the evidence for medical benefits of cannabis has been translated into ‘medical cannabis access’ provisions or programs. In addition, substantial proportions (e.g. 20–50%) of overall cannabis users claim their use—whether formally endorsed by a doctor or not—to be for ‘therapeutic’ reasons or purposes [42–45]. Regardless of whether further pending benefit claims for medical cannabis will be confirmed, this creates a distinct constellation for assessing cannabis’ overall health impacts, requiring consideration of both possible ‘harms’ and ‘benefits’ on the population level. This is a complex task that has not been well accomplished for other substances, even for (the possibly simpler case of) alcohol, where debates on the balance of health harms and benefits remain unsettled [46,47].

Besides adverse health outcomes, cannabis use has been observed to result in a variety of social harms. For example, especially intensive, chronic cannabis use in developing (i.e. teenage) years is associated with compromised educational attainment (e.g. premature school dropout), presumably related to both possible cognition/memory problems [48–51]. Importantly, the mechanics of prohibition have extensive adverse social consequences for users. While the illegal status of cannabis and its

punitive consequences under prohibition are intended to bring general deterrent effects, and probably prevent some people from use, whether this is a generally valid effect has been controversial, and specific deterrence effects on users have been refuted [4,52–54]. As actually applied, criminal enforcement focusing on cannabis use and supply has decreased in New Zealand (as in many other places) in recent years, yet commonly involves systemic discretionary practices; overall, cannabis enforcement only effectively reaches small proportions of users, and the related criminal justice system processing is costly in terms of resources [55–59]. Importantly for social equity, cannabis enforcement is typically selective and skewed to target specific sub-groups, and it entails extensive collateral harms mainly through criminalisation, stigma or secondary deviance. Commonly, cannabis use-related enforcement is disproportionately executed against young, male and socio-economically vulnerable and/or racially visible minority groups (e.g. Maori/Pacific Islanders in New Zealand) [54,60–64]. Moreover, under current provisions, criminal enforcement for being in possession of just a small amount of cannabis for personal use can result in small fines or ‘alternative’ sanctions only, yet may still entail a criminal arrest or record entry, and therefore can significantly undermine or harm a person’s long-term educational, professional and mobility prospects [58,65–67].

Contextualising cannabis policy reform

The criminal prohibition of cannabis, as currently enshrined in New Zealand’s drug law, the *Misuse of Drugs Act* [59], and the corresponding laws of other countries, has arisen historically as a requirement of decades-old international drug control treaties (adopted mainly at the insistence of the United States, notably the 1961 ‘Single Convention’) [68,69]. The international treaties, essentially, require signatory states to prohibit and criminalise cannabis use and supply, except for medical or scientific purposes [70,71]. While there has been ample controversy, and numerous national initiatives over time towards cannabis law reform at both international and national levels, including New Zealand, rather little tangible policy change actually occurred until the 21st century [1,68,69,72]. Yet, the frameworks of cannabis policy reform that have materialised in different jurisdictions are rather diverse; they can, essentially, be grouped into two major clusters: (i) ‘decriminalisation’; and (ii) ‘legalisation’ [64,69].

While these types of reform are commonly seen as similar, or as interchangeable, there are fundamental differences in both design and effects that warrant brief elaboration. ‘Decriminalisation’ typically refers to changes in either the law, or law enforcement practice,

involving primarily a reduction in the severity of punishments, typically for personal cannabis use and sometimes also for personal supply [64,73]. This can occur, for example, by changes from criminal to non-criminal (e.g. civil penalty/'ticketing') sanctioning approaches, or the referral ('diversion') of offenders to alternative measures, for example education or treatment interventions, or systematic 'sparing' of violators through discretion-based 'tolerance' or non-enforcement [64]. A main distinction is whether decriminalisation is enacted on a *de facto* or a *de jure* basis, that is whether by a change in practice or in legal provisions. However, in essentially all 'decriminalisation' models, the use and supply of cannabis, formally, remain illegal as defined by law. Examples of different decriminalisation frameworks include the 'misdemeanour' provisions in select US states implemented in the 1980s and onward, the Dutch 'coffee-shop' model, the Australian state-based civil expiation notice frameworks and the rather varied 'decriminalisation' approaches in European countries (e.g. Italy, Spain, Czech Republic) in recent years [71,74–76].

'Legalisation' is a paradigmatically different and rarer approach. In a legalisation framework, non-medical cannabis use and various supply matters (e.g. production and distribution) are formally redefined as 'legal' (i.e. similar to legal substances such as alcohol and tobacco) while being subject to regulations or other limitations, for example on legal age or places of cannabis use, production and products, and retail distribution [68,73,77–79]. An initial wave of cannabis legalisation frameworks was implemented post-2010 in a select but growing number of US states from 2012 onward, starting with Colorado and Washington, in the South American country of Uruguay (2014), and most recently (2018) in Canada [80–84]. While the fundamental provisions of 'legalisation' apply to all of the above cannabis reform regimes, each of them differs considerably in the scope and nature of the regulations that define key parameters of use, production and distribution [84]. It should also be noted that cannabis legalisation came into existence as a top-down policy reform project in both Uruguay and Canada, whereas it arose from public ballot initiatives in most US states (where cannabis remains criminalised by federal law).

The case for prohibition reform

Advocacy for reform of cannabis prohibition—which, specifically in New Zealand's case, includes reasons tabled by main protagonists behind the upcoming legalisation referendum—suggests that prohibition

is a failed endeavour part of the global, century-old 'anti-drug' crusade driven by the international drug control regime. There are three main arguments as to why cannabis prohibition should be considered a failed policy warranting replacement with more health, social justice or evidence-based governance frameworks [85]: (i) it is *disproportionate* when considering the general legality of availability and use of substances like alcohol and tobacco, shown to cause substantially more health harms on a population level; (ii) it is *ineffective*, in that it overall fails to deter large parts of the population, and especially young people, from cannabis use; and (iii) it is *counterproductive*, in that many of the use-related health or social harms currently experienced by users and society-at-large (e.g. illegal markets and related profits/crime, increasingly potent/toxic products, arbitrary criminalisation of population minority groups) are either directly attributable to or amplified by criminalisation itself [58,64,85]. On this general basis, comprising fundamental principles of good public policy, social justice and public health, advocates have made a persistent case for reform away from prohibition towards more effective and appropriate frameworks for cannabis control, a case that has gained increasing traction in different settings in the 21st century.

Assessments of 'decriminalisation' as a policy alternative

As mentioned, 'decriminalisation' regimes for cannabis have been implemented in different iterations, with the general objective being to 'de-penalise' the punitive sanctions for cannabis use and, in some instances, supply for personal use. The available evidence suggests, overall, that there have been no discernible increases in cannabis use or related major health harms attributable to 'decriminalisation' reforms [64]. At the same time, 'decriminalisation' measures have been found to provide ambivalent outcomes on several fronts, raising important questions about their net benefits in terms of overall improved public policy [58,86–95]. For example, while the severity of punitive sanctions for cannabis use may be reduced (or temporarily suspended) under 'decriminalisation' approaches use—typically a frequently recurring activity among users—continues to be 'illegal'. Use therefore remains an ongoing target for enforcement, which is commonly much simplified under 'decriminalisation' practices, for example, by administering 'ticketing' sanctions rather than more onerous criminal arrests. On this basis, shifting conventional cannabis control practice to 'decriminalisation': (i) resulted in systemic 'net-

widening' effects where large numbers of offenders—disproportionately involving marginalised populations—ended up entangled with law enforcement and related consequences; (ii) as use continued to be formally illegal, the public messaging for cannabis use remained ambiguous and unclear; furthermore, many forms of useful interventions—e.g. education towards 'safer use' among users—remained hindered or impossible for key settings (e.g. schools) or audiences, as technically they would condone an illegal activity; (iii) many decriminalisation measures have formalised or expanded 'discretion' (e.g. through 'diversion' to alternative—education or treatment—measures, or informal 'warnings') at different levels of enforcement, which tend to be arbitrarily applied; (iv) due to continued illegality, key aspects of cannabis use and essential determinants for health outcomes (e.g. product characteristics, retail distribution/production) cannot be directly regulated (with the Dutch 'backdoor problem' as the iconic example) [64,76,96]. Even recent 'decriminalisation' arrangements for personal cannabis supply, including 'cannabis clubs' or 'home growing' (e.g. as exist in different European countries), have largely emerged in a 'grey zone' of illegality subject to discretionary enforcement, while at the same time comprehensive regulations for public health and safety benefits, as are standard for other popular consumption products, have been limited. Hence, there is a distinctly mixed and questionable balance sheet on the ability of 'decriminalisation' approaches to consistently improve the situation for cannabis-related public health and social justice objectives. In fact, decriminalisation has been challenged as a 'from-a-rock-to-a-hard-place' alternative for fundamentally sound and meaningful cannabis control reform [58].

The case for 'legalisation' and existing implementation models

While the case for 'legalisation' reform has been promoted based on libertarian arguments, its 'pragmatic' case rests on the core premise that in order to more effectively reduce key harms, cannabis use, products and distribution ought to be made legal to allow possible regulation and improved control [73,78]. In this respect, the fundamental case for cannabis legalisation for improved public health and safety is similar to those for legal control and regulation of abortion, sex work or gambling [97–99].

While many legalisation initiatives in the United States have referred to 'rights' discourses, and to some extent economic (i.e. tax revenue) arguments, public health and safety interests have been the more primary

drivers behind the legalisation initiatives in Uruguay and Canada [80,85,100,101]. But, within these general frames, the existing legalisation regimes considerably differ in essential design and regulation aspects, and cannot be viewed as homogeneous [84,102]. To begin with, many of the US state-based legalisation models (e.g. Colorado) are defined by rather liberal commercialisation features, including extensive for-profit cannabis production, sales and advertising [103–105]. Uruguay features a more restrictive approach, including the requirement for user registration with government; cannabis production and distribution is centrally regulated, with only a limited product menu available through a small number of retail pharmacies (and with licensed 'cannabis clubs' and 'home-growing' as additional source options) [80,106]. Canada may best be described as a 'hybrid' model of both distinct public health and commercialisation features: While regulations focusing on use (e.g. age and locations of use provisions) and retail distribution are rather restrictive (yet heterogeneous by province), product availability is rather diversified both in composition, potency and use modes, and products are legally available from several types of supply sources, varying by province, including provincial monopoly retail systems, mail order-sourcing (directly from licensed producers) as well as 'home-growing' or self-production [84,107]. Commercial production rests mostly with large- and small-scale licensed commercial producers—now more than 260, many connected with publicly listed and internationally owned corporations associated with other 'consumption' industries, for example, of alcohol, tobacco or soft-drinks [84]. While advertisement and promotion are theoretically prohibited, 'lifestyle' branding or indirect promotions—much of it referencing the therapeutic nature or benefits of cannabis—are rather ubiquitous, also facilitated by extensive overlap of discourses or provisions for 'medical' and 'non-medical' cannabis use and availability in Canada [103,108–111].

Legalisation: evidence of outcomes to date

As cannabis legalisation in reality has existed only in a few jurisdictions and for a relatively short time, conclusive assessments of its health, social or other impacts are not available and will not be so for a while—some have suggested for at least a decade [14,112–115]. To date, some select, short-term observations on specific outcomes of interest exist. In terms of overall feasibility, the majority of 'legalisation' projects have been rolled out without apparent major or 'catastrophic' consequences, although with some basic operational challenges. Uruguay, for example, faced considerable

challenges with providing sufficient cannabis supply for retail distribution for some time; some Canadian jurisdictions initially dealt with similar issues [107,116,117]. In terms of levels of public support, while most US legalisation projects were enacted by public ballot initiatives, yet public opinion remains split about evenly in many US states. In contrast, recent polls showed that general population support for cannabis legalisation in Canada has doubled, from about 35% pre-legalisation support (2014) to 70% in 2019 [118–120]. Conversely, legalisation in Uruguay continues to be supported by only a minority of the population [121,122].

As legalisation, by definition, has removed criminal enforcement and related adverse consequences against now-legal users, these benefits are generally direct and immediate. For example, cannabis possession arrests in US legalisation states decreased substantially after implementation of legalisation [123–125]. Moreover, several legalisation jurisdictions have initiated the retroactive correction of socio-legal harms from criminalisation, for example through pardons or expungements for criminal records related to past cannabis use-related convictions, although concerns exist regarding the limited scope of these efforts [125–127]. A crucial point for observation is how enforcement of cannabis-related violations—for example, involving under-age use, inter-personal sharing or ‘home production’—under ‘legalisation’ will evolve. In Canada, simple cannabis possession by underage users may result in charges under the *Youth Criminal Justice Act* [114]. Recent US data suggest that cannabis enforcement against under-age—the socially most vulnerable—users has not consistently decreased in liberalisation compared to prohibition states, but actually increased in legalising (and neighbouring) state jurisdictions [123,128,129]. The overall impacts of legalisation on criminal justice system expenditures are also not clear yet [130]. While resources required for enforcing prohibition of cannabis use or supply are expected to decline, these may be shifted to other areas (e.g. cannabis-impaired driving, illegal sales/production, border controls), and so net fiscal impacts remain unpredictable. Furthermore, legalising cannabis seems to have brought no changes or, in some instances, slight decreases in property and violent crime rates in the US jurisdictions that have legalised recreational cannabis, at least suggesting no adverse effects in this area [131–134].

For health-related outcomes, several analyses have concluded that—contrary to popular concerns—cannabis use rates especially among young people have not increased in US jurisdictions with increased legal availability; rather, some increases in use among middle- and older-aged groups have been observed [135–138]. Recent Canadian data are inconsistent, with some

reporting increases (in 2019) across various age groups post-legalisation [139–141]. With legalisation, there may be a lowering of risk-perceptions or intention barriers (‘normalisation’) for cannabis use, especially among youth [142–145]. For legal cannabis sales, trends towards increasing demand for non-smoked (e.g. vaping, edibles) and higher-potency cannabis products have been documented [146–151].

While the evidence is inconsistent and commonly without a controlled comparison, there is some evidence for increases in adverse health outcome indicators post-legalisation in select US states; these involve increases in cannabis-related hospitalisations, including emergency or urgent care (e.g. for poisonings), trauma incidents, calls to poison-control-centres, including cases involving children, as well as increases in levels of cannabis use disorders or treatment-seeking [113,136–138,152–157]. Canadian data suggest that as many as one in five cannabis users continue to drive under the acute influence of use in 2019, with 20% of these under the influence of alcohol [140]. Data on cannabis-related motor-vehicle crashes, and specifically fatalities, in the United States are inconsistent, suggesting an overall higher prevalence in cities, yet either no changes or slight increases in legalisation compared to non-legalisation states [158–162]. For Uruguay, time-series data suggested substantial increases in overall motor-vehicle crashes in urban settings following legalisation, yet without examining the substance-specific contribution [163]. Several US-based analyses suggested possible substitution effects for other psychoactive substances (e.g. opioids) from increased legal availability of cannabis in terms of misuse or harms (e.g. accidents/injuries, overdose deaths); however, such association analyses have been the subject of controversy or have not been shown for other jurisdictions [138,145,164–167]. In Canada, an accelerated decrease in beer sales volumes has been observed following cannabis legalisation [168].

For cannabis supply and markets, there have been indications of an increasing preference for legal cannabis products by consumers with legalisation, as well as increasing utilisation of legal cannabis sources, yet illegal markets have remained active and competitively resilient [169–171]. In the United States, floating prices for both legal and illegal cannabis products have substantially decreased [126,146,169,172]. In Canada, about 50% of users reported utilising legal cannabis product sources (but only one in three exclusively so) in 2019 [140]. Probably reflecting expanding legal cannabis production, prices for illegal cannabis products have steadily dropped in North American black market contexts, creating a price advantage over price-regulated and taxed legal products [107,173–176]. Beyond this, there is little systematic information to date as to how illicit cannabis production or

market dynamics have been evolving in the wake of legalisation.

While the reported post-legalisation outcomes—some of which suggest increases in key cannabis-related risk or harm outcomes—may be related to increased availability of or opportunity for use of cannabis, they need to be interpreted with caution and appropriate context. Several may mainly reflect short-term or policy transition outcomes, rather than sustained effects [14,112,140]. Furthermore, depending on the analytical approach, they may not necessarily represent significant changes from pre-legalisation trends or differences that are relevant for an overall evaluation. But based on the evidence so far available, no major detrimental effects from legalisation have been observed, but neither have substantive benefits for public health evidently materialised, and the implications for social justice outcomes appear to be inconsistent—especially when considering the welfare of adolescents and teenagers.

Discussion and Conclusions

There are several good reasons why prohibition control of non-medical cannabis may be considered ineffective and outdated, and should be replaced with a more measured and effective control policy aiming for public health and welfare in New Zealand as well as elsewhere [1,64]. Recognising the various health risks but limited population health burden of cannabis use, as well as the questionable outcomes of decriminalisation efforts, legalisation with strict regulation appears to offer an improved public policy option, specifically by: actively regulating cannabis products, availability and distribution; directly educating and informing potential/actual users about key risks; and removing cannabis use, products and supply from the realms of illegality and crime.

As emphasised earlier, cannabis use is concentrated mostly among youth and young adults, and risks for severe health or social adverse outcomes, whether acute or chronic, are limited to a minority sub-group of users. On this basis, achieving improved cannabis policy should primarily focus on better protection for young people's cannabis-related health and social welfare [29]. This implication ought to centrally take into account the reality of large proportions of teenagers (i.e. <20 years-of-age) being actively involved in cannabis use—and most likely will continue to be so following legalisation.

Initial cannabis legalisation experiments (e.g. in select jurisdictions across the Americas) are still in relatively early stages, yet also differ considerably in key operational design and regulatory parameters. They range

from generally 'restrictive' (Uruguay) to 'hybrid' (Canada) to 'liberal-commercial' (most US states), with even considerable intra-system heterogeneity [14,84]. There are no blueprints for generalisably optimal legalisation framework designs, even if there was full agreement on the principal policy objectives. Furthermore, cannabis legalisation policies occur in distinct and complex sociocultural ecologies, where even basic policy mechanics cannot simply be transferred and assumed to work elsewhere just the same. While certain policy principles and lessons can surely be cross-applied on informed grounds, each jurisdictional 'legalisation' project will be a distinctly new 'experiment', with outcomes that can be empirically assessed only *post-hoc* [1,177,178]. This is true for New Zealand as much as all other jurisdictions considering legalisation policy reform.

A main challenge for sensible cannabis legalisation policy is to achieve reasonable policy coherence, both intrinsically and in terms of its relation to other policies. For instance, in several current legalisation frameworks, cannabis use, product and availability regulations are designed to be more restrictive than those for substances like alcohol or tobacco [107,111,179–181]. This seems questionable, and not well supported by relevant evidence, but presumably is still driven by remnants of prohibition. However, despite multiple use-oriented restrictions under legalisation, cannabis production and distribution, at least in North America, has been handed to a rapidly expanding, commercialised, for-profit industry that not only resembles but is quickly aligning itself with other major, commercial consumption goods industries, including alcohol and tobacco corporations [57,182,183]. As case studies from North America clearly show, the dynamics of commercialisation have been major drivers of both use and harms (especially involving young people) of legal psychoactive substances that should have been avoided as far as possible in the supply provisions for cannabis legalisation [79,83,184].

While current evidence on health and social impacts from legalisation is still limited and does not allow for definite conclusions, it does not appear that legalisation has brought discernably substantial improvements in public health outcomes to date. Cannabis use levels have remained largely level, with some increases in select sub-groups. While there are trends towards increasing use of non-smoking products, it appears that some key risk behaviours (e.g. high-potency use) or problem indicators (e.g. hospitalisations, disorders, impaired driving/accidents, mainly based on US data) may have been increasing somewhat [14,136,140]. These effects, however, may relate to various dynamics and do not necessarily imply major changes in comparison with pre-legalisation trends. While there has been a partial shift towards

increased legal cannabis sourcing and product utilisation, illegal markets and products continue to exist and appear to be adapting resiliently and competitively (e.g. regarding price). A crucial variable for legalisation's future success as a public health and safety initiative will hence be whether these supply dynamics can more effectively be tipped in favour of the 'legal' market side; this will presumably require major regulatory adjustments and other intervention (including targeted enforcement) efforts. The findings so far also imply that legalisation politically has been promoted with likely risky and inflated (e.g. political) promises in some settings, for example envisaging reductions in cannabis use by youth or elimination of black markets for cannabis, which are most unlikely to be achievable.

There is evidence that select social harms, for example criminal arrests or for cannabis use and their collateral consequences (e.g. criminal records), have declined as expected in legalisation contexts—at least for legal-age users. Yet, it is very uncertain how the enforcement of remaining or new cannabis offenses under legalisation will evolve, and whether such enforcement will involve systemic biases or social skewing similar to those that occurred under prohibition [57,114,123]. Furthermore, current legalisation provisions not only exclude young (i.e. under-age) users from legal use and access but continue to entail potentially severe provisions for punishment for this 'vulnerable' sub-population which features high levels of cannabis use and exposure. Given these realities, it is a wide-open question at this juncture whether young people, overall, will tangibly benefit from legalisation, or 'fall through the cracks' of an idea primarily geared towards and for the benefit of adult users and a legal and commercial supply industry.

New Zealand's population will face the opportunity to vote on major cannabis policy reform, and specifically the legalisation-with-regulation of non-medical cannabis use and supply, in late 2020. There are no clear-cut ideological or empirical reasons, either in New Zealand or elsewhere, that categorically imply or necessitate a 'yes' or 'no' vote for this decision. Rather, each of the main anchor points for the proposed reform involves aspects or evidence from multiple angles for consideration. The first concerns individual rights and freedoms. New Zealand can be described as a rather socio-liberal and open-minded society, where individuals are generally free to consume (harmful) substance like alcohol and tobacco, as well as legally to engage in individual choice matters like commercial sex, same-sex-marriage or (soon, probably) medically-assisted dying, as regulated by the state. On this basis, an overall argument can be made that recreational cannabis use, as an individual choice already actively

embraced by many New Zealanders, with comparably limited harm to others, should be proportionally added to the menu of legitimate personal freedoms. Second, cannabis legalisation offers to better protect a large number of young, and primarily socio-economically marginalised (e.g. Māori) adult members of New Zealand society from exposure to and the potentially severe and longlasting adverse consequences of arbitrary, if not systemically racist, cannabis enforcement and criminal justice involvement. Thus, in critical ways cannabis legalisation offers a small, but tangible step towards improved social justice. However, it is hard to predict—also based on related experiences elsewhere to date—what this will mean, and whether this will indeed and consistently be true for young people (and specifically young Maori), and in particular those aged under 20 years who, by law, will be excluded from legal cannabis use and access [1,114].

Third, there is the general argument and objective that cannabis legalisation will facilitate and further public health outcomes related to cannabis. The main premise for this is that with legalisation, cannabis products, distribution and use can be directly regulated, and targeted by education and informed user guidance, and thus that risks for adverse health outcomes for users (and others, e.g. in the context of cannabis-impaired driving) can be reduced. Evidence from other jurisdictions suggests that these desired positive effects have not yet consistently materialised alongside legalisation, at least in the short term [14]; however empirical analyses and comparisons in regard to legalisation's impact are complex, require additional monitoring and time, and are not reliably transferable from other settings. Several key (and mostly user-facing) regulation features of New Zealand's proposed legalisation model are ambitious—and perhaps overly and unrealistically so—in their striving to protect public health. On this basis, they somewhat resemble more the Canadian or Uruguayan frameworks for legalisation, rather than those in select US states (e.g. Colorado) [84]. For example, the restriction to allow use only in private homes appears questionable, as both alcohol and tobacco are allowed for use in public, while cannabis use in private spaces may inevitably put others (e.g. family members, children) at risk for harm. At the same time, it is not clear how the provisions for 'home production' are meaningfully aligned or consistent with rather tight proposed public health-oriented restrictions for use and access of cannabis products.

There is one aspect of New Zealand's roadmap for cannabis legalisation where it appears that a fundamental choice has been made that may crucially undermine or counteract public health outcomes: the plan

provides for commercialised cannabis production and distribution, rather than alternative and more restrictive models (e.g. government monopolies, community trusts) available for these components [184–186]. Based on experiences from other psychoactive substance policy fields, it is most likely that, in both direct and indirect ways, this will contribute to a markedly increased cannabis-related adverse health and social harm burden in New Zealand under legalisation. For example, it has long been argued that alcohol controls in New Zealand are overly commercialised and too lax, and hence have contributed to excessive alcohol-related harms, and especially harm involving young people [187–189]. This is not a necessary, but rather a freely chosen policy design option and path for the concrete legalisation plans that yet allows for different choices; it furthermore provides the wider opportunity to create greater policy coherence in reference to regulations and control for other psychoactive substances with potential for public health harm [190,191].

There is a widespread and understandable keenness to examine experiences with cannabis legalisation elsewhere, and to speculatively transfer and predict what these imply for the impacts of legalisation in other settings (e.g. New Zealand). While desirable, the potential for meaningfully doing so is rather limited, since each setting represents a distinct sociocultural-behavioural ecology in which things inevitably play out in their own ways; thus, such exercises push the limits of empirical science—for New Zealand as well as elsewhere. It is impossible to forecast what exact effects cannabis legalisation will have—for example, whether it will bring about a reversal of recent decreases in youth cannabis use, or reduce or accelerate recent increases in cannabis-related hospitalisations or similar indicators—or whether it will amount to overall benefit or harm for the public's health and welfare. Eligible voters considering their choice options for New Zealand's referendum on legalisation should weigh the perceived importance of the various empirical data and information and expected implications of the different policy options for cannabis on offer to inform their decision. Some of that will inevitably involve subjective value judgments and choices. Beyond that, cannabis legalisation—if it indeed receives the required majority support to become reality in New Zealand—will unfold as a major 'social experiment', the specific outcomes of which will need to be closely monitored, assessed and possibly adjusted there, just like everywhere else where such an experiment has been initiated.

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Conflict of Interest

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