Predictors of medicinal cannabis users' willingness to utilise a new prescription Medicinal Sannabis Scheme in New Zealand

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ABSTRACT

AIM: To investigate medicinal cannabis users' intentions to transition to the new prescription Medicinal Cannabis Scheme (MCS) in New Zealand.

METHOD: An online survey of 3,634 past-year medicinal cannabis users completed prior to implementation of the MCS in New Zealand in April 2020. Logistic regression models were fitted to identify predictors of intended future engagement with the MCS.

RESULTS: Seventy-eight percent of respondents were aware of the new MCS and 66% intended to use it. Higher income (OR=1.57), younger age (OR=1.02) and smoking cannabis (v. vaping (OR=2.0) or oral ingestion in edible form (OR=2.22)) predicted intention to engage with the MCS. Conversely, Māori (OR=0.63) and those who grew their own cannabis (OR=0.52) were less likely to intend to engage with the new prescription MCS.

CONCLUSION: The lower intended engagement with the MCS by Māori, lower income groups and those who home-grow cannabis may reflect their perceptions of the MCS as restrictive and expensive.

Many countries have liberalised access to cannabis for medical purposes in the past two decades or so, with considerable heterogeneity of regulatory approaches.[1–3] The new prescription regimes aim to provide consumers with the benefits of medical oversight and access to quality-assured products, while accepting the scarcity of high-quality scientific evidence for the efficacy of cannabis in medical treatment. [4,5] Some medicinal cannabis regimes, especially in the initial stages of their implementation, have suffered from poor engagement by patients and prescribers. In Canada, for example, even 10 years after their scheme was originally established in 2001, enrolments to the federal programme represented 5% of estimated medicinal cannabis users.[6] In Australia, two years after legalisation of medicinal cannabis in 2016, users' engagement with the legal access route was limited, with barriers including financial cost and lack of support from the medical profession.[7] Understanding consumers' intentions to transition to the new medicinal cannabis schemes is critical to informing their regulatory design and implementation.

New Zealand's Medicinal Cannabis Scheme (MCS) came into force on 1 April 2020. Under the MCS, medical professionals can prescribe cannabis-based products (including both cannabidiol (CBD) and tetrahydrocannabinol (THC)) for any patient suffering from any health complaint. Products allowed under this regime are accessed via pharmacies and must be either in pharmaceutical dosage forms (eg, pills, oils, lozenges) or sold as dried cannabis flower intended for vaporisation. Dried herbal cannabis for smoking is not allowed under the MCS. Products available under the

MCS must first be assessed by the Ministry of Health (MOH) as compliant with specified "minimum quality standards"[8] (yet, unlike other approved medicines, efficacy and safety data are *not* part of the pre-marketing assessment). At the time of writing, there were no domestically produced cannabis products approved for pharmacy sale under the MCS (10 cannabis-based products were under Medicinal Cannabis Agency assessment as of September 2020). Three products manufactured overseas (Tilray™ CBD and CBD:THC oral solutions) were approved under the MCS in March 2021.

Although patients in New Zealand have been able to access imported CBD products on prescription since September 2017, their financial cost has remained prohibitive. For example, the price for Tilray 25mL bottle ranges from NZ$150 to NZ$350 (excluding pharmacy mark-up).[9] The new MCS aims to improve access and reduce the price of cannabis-based products for medicinal use in New Zealand by allowing domestic cultivation and production, introducing new product forms (ie, dry cannabis flower for vaping) and eliminating bureaucratic processes for prescribing THC (including MOH sign-off for individual patients).

It has been estimated that around 5% of New Zealand's adult population uses illegally sourced cannabis for medicinal purposes, with pain, anxiety and depression being the leading reasons for self-medicating.[10,11] The extent to which these medicinal cannabis users will transition to the legal prescribed medicinal cannabis regime will depend on a range of factors, including the perceived affordability and availability of prescriptions (dependent on regulatory design and policy communication), support and advice from medical professionals, connection to the illegal cannabis market and wider social norms about the legitimacy of medicinal cannabis use. The influence of these factors may vary significantly between different types of users.[12]

This study aimed to explore existing medicinal cannabis users' intentions to engage with the new prescription MCS in New Zealand, including what demographic characteristics predict users' intended engagement and whether different patterns of use (eg, routes of administration, co-use of cannabis for recreational purposes) and experiences with different sources of supply (eg, from a drug dealer, friend or family, growing your own) predict intended engagement with the MCS.

Methods

An online survey of adults (16+) who self-reported using cannabis for medicinal purposes in the past 12 months in New Zealand (NZ Medicinal Cannabis Survey) was promoted via paid advertising on Facebook™ (targeting users living in New Zealand aged 16 years or older) between May and August 2019 (ie, approximately 9–11 months before the MCS entered into force). The survey preamble defined "medicinal cannabis" as the "use of cannabis or cannabis-based products to treat a medical condition or alleviate a symptom." The questionnaire was developed based on a number of overseas surveys of medicinal cannabis users,[13,14] including the recent study in Australia.[15] We collected a range of data on patterns of medicinal cannabis use and supply, which have previously been reported, alongside a more detailed description of the method.[11] Ethical approval was obtained from Massey University Human Ethics Committee (SOA19/19).

Measures

Demographics: Age, gender, ethnicity, educational achievement, employment status, household income, social welfare status, region of residence and community size (i.e., rural, small town or city).

Medical conditions treated with cannabis in the past 12 months: A multiple choice question listing 50 conditions grouped into seven categories: (1) pain, (2) sleep, (3) mental health, (4) gastrointestinal, (5) neurological (6) cancer and (7) other.

Main source of medicinal cannabis supply in the past 12 months: Participants were presented with a list of 15 sources of supply (Table 1).

Time of using medicinal cannabis: Number of months.

Main route of administering (ROA) medicinal cannabis in the past 12 months: Participants chose one answer from a list of 13 ROAs (Table 1).

Discussions with health provider and access via prescription: Participants were asked whether they had discussed the use

Table 1: Main sources of supply and routes of administering cannabis for medicinal reasons.

Main source of supply of cannabis in the past 12 months (n=2,825)	**%**
Purchase from an illegal recreational drug dealer	27.7
I grow my own	12.6
I buy it from friends or family	12.2
Gift from friends or family	10
Purchased from a green fairy	8.6
I buy it from a friend who grows it for me	7.4
From a green fairy (for free)	5.9
A friend grows it for me for free	5.6
Purchase from an online supplier	4.5
Prescribed by a New Zealand medical practitioner and dispensed from a pharmacy	2.5
Bought while living/travelling overseas	1.5
Other	1.4
From an informal club/cooperative	0.4
Free by participating in a clinical trial	0.2
Purchase from the darknet	0.1
Main route of administration of cannabis in the past 12 months (n=3,564)	**%**
Smoked through a water pipe/bong	27.9
Rolled into a joint	22.5
Smoked though a dry pipe (glass/metal/plastic)	15.7
Taken by mouth: as a liquid (eg, tincture, oil)	13.0
Inhaled through a vaporiser	6.5
Eaten as a cookie (or other baked form)	4.4
Applied to skin (eg, cream)	4.4
Tablet/capsule	2.6
Eaten in a raw form (fresh juice, smoothie)	0.8
Other	1.7
Taken by mouth: in a spray form	0.3
Gummy bears	0.1
Nasal application	0

of cannabis for medicinal reasons with a health provider and accessed cannabis-based products via doctor's prescription in the past 12 months.

Use of recreational drugs in the past 12 months: Participants were asked whether they used alcohol, tobacco, cannabis for *recreational* purposes and other illegal drugs in the past 12 months.

Awareness of the new MCS and anticipated engagement with the new MCS: Participants were first asked: "Are you aware that the government is currently developing a scheme to improve access to domestically-produced medicinal cannabis products, which will be finalised by the end of 2019?". Those who answered "yes" were then asked, "How likely are you to use the new medicinal cannabis scheme once it is implemented?" and asked to answer either "very unlikely", "unlikely", "likely", "very unlikely" or "don't know."

Analysis

For the purposes of analysis, sources of supply were grouped into six categories: (1) illegal recreational drug dealer; (2) friends or family (includes "gifts from friends or family" and "I buy it from friends or family"); (3) grow-your-own ("I grow my own cannabis," "a friend grows it for me for free" and "I buy it from a friend who grows it for me"); (4) from a "green fairy," which includes free and paid-for cannabis ("green fairy" is a term used to described compassionate illegal suppliers of home-made cannabis products focussed primarily on medicinal users; (5) online supplier; and (6) prescribed and dispensed from a pharmacy. ROAs were grouped into five categories (1) smoking (includes smoking in a joint, "smoking through a water pipe/bong" and "smoking though a dry pipe"); (2) vaping; (3) oral administration (includes "taken as a liquid (eg, oils, tinctures)" and sprays); (4) eaten (ie, oral ingestion of edibles, which includes "eaten as a cookie," "eaten in a raw form (fresh juice, smoothie)", gummy bears and tablets/capsules); and (5) other ROAs (includes topical, nasal application).

Logistic regression models were fitted to identify independent predictors of intended future engagement with the MCS. Participants who said they were "very likely" and "likely" to engage in the new MCS were grouped together, as were those who responded "very unlikely" and "unlikely". The following predictors were included in the model: the demographic variables (ethnicity was not prioritised, meaning that primary ethnicity was included in the model); conditions treated with cannabis; main source of medicinal cannabis supply in the past year; main route of medicinal-cannabis administration; number of months of using medicinal cannabis; use of recreational drugs (eg, alcohol, tobacco, cannabis for recreational use, other illegal drugs) in the past year; discussions about medicinal cannabis with health professionals (yes/no); and accessing cannabis via prescription in the past 12 months (yes/no). Models including all variables were first run, followed by variable selection using a stepwise method to pick variables, and retaining those with p-values less than 0.1. All analysis was conducted in R version 4.0[16] and results were deemed significant at $p \leq 0.05$

Results

A total of 3,634 people completed the survey. Fifty percent of the sample was female, median age was 38 years, 18% were Māori (the indigenous population of New Zealand), 31% had only achieved high-school education, 28% lived a small town and 18% in a rural area, 17% were on a sickness benefit and 35% received a combined household income of $30,000 or less per year (Table 2).

Seventy-eight per cent were aware the government was developing a scheme to improve access to medicinal cannabis. Sixty-six per cent of those said they were "very likely" or "likely" to use the new MCS (Table 2).

Statistically significant predictors of reporting future engagement in the MCS are included in Table 3. Higher household income (OR=1.40–1.57) and younger age (OR=1.02) predicted greater intention to engage with the MCS. Conversely, Māori (OR=0.63) and those who mainly accessed cannabis by growing their own (v. those who mainly bought cannabis from a recreational drug dealer, OR=0.52) were less likely to express intention to engage in the new MCS. Those who smoked cannabis were more

Table 2: Sample demographics and intentions to use the new MCS regime.

Age (n=3,634)	Mean: 39.3 (SD 15.2), Median: 38, range: 16–90	
Gender (n=3,613)	Male	48.4%
	Female	50%
	Gender diverse	1.6%
Ethnicity (n=3,557)	New Zealand European	75.9%
	Māori	17.8%
	Pacific	1.0%
	Asian	1.8%
	Middle Eastern/Latin American/African	1.5%
	Other	2.1%
Highest level of education (n=3,508)	None	1.4%
	Primary/intermediate	1.1%
	High school	31.1%
	Polytech/technical/trade school	38.3%
	University	27.9%
	Other	0.2%
Main occupation (n=3,514)	Work (includes self-employed)	56.2% (41.4% full time, 14.8% part time)
	A student	9.3%
	Retired	6.8%
	On sickness benefit	17.3%
	Unemployed	4.3%
	Parenting/unpaid work	6.1%
Region of residence (n=3,590)	North Island of New Zealand	72.9%
	South Island of New Zealand	27.1%
Type of residence location (n=3,508)	City	54.0%
	Small town	28.3%
	Rural area	17.7%
Household's combined annual income (before tax) (n=2,519)	$30,000 or less	34.7%
	$30,001 to 100,000	48.1%
	Over $100,0000	17.1%
Financial benefit related to medical condition (n= 2,445)	None	72.4%
	Yes (mostly Supported Living Payment from Work and Income NZ)	27.6%
Awareness of the new MCS regime (n=2,632)	Yes	78.2%
	No	21.8%
Likelihood of using the new MCS (n=2,056)	Very unlikely	10.6%
	Unlikely	6.5%
	Likely	20.2%
	Very likely	45.8%
	Don't know	16.9%

Table 3: Statistically significant ($p \leq 0.05$) predictors of future engagement with the MCS

Model variables	N	p	OR	95% confidence interval
Age (per additional year of age)	1,536	<0.0001	0.98	0.97–0.99
Ethnicity		0.0061		
Other (includes New Zealand European) (reference)	1,195		-	-
Māori	341		0.63	0.45–0.87
Income		0.0500		
$30,000 or less (reference)	518		-	-
$30,001–$10,000	726		1.40	1.02–1.93
over $100,000	292		1.57	1.03–2.42
Main sources of supply in the past 12 months		0.0007		
Illegal recreational drug dealer (reference)	423		-	-
Via friends or family	336		1.01	0.64–1.60
Via a green fairy	215		0.96	0.57–1.62
Growing your own	437		0.52	0.35–0.77
Online supplier	81		1.71	0.72–4.56
Prescribed by a doctor and dispensed from a pharmacy	44		0.72	0.30–1.93
Main route of administration in the past 12 months		0.0034		
Smoked	988		-	-
Smoked vs Eaten	135		2.22	1.41–3.45
Smoked vs inhaled through a vaporiser	91		2.00	1.11–3.45
Smoked vs taken by mouth (as a liquid)	234		1.11	0.68–1.82
Smoked vs other ROAs	88		1.54	0.84–2.70

likely to engage in the MCS than participants whose main route of administration was via vaping (OR=2.0) or oral ingestion in edible form (OR=2.22).

Use of other recreational drugs in the past year, including use of cannabis for recreational purposes, was not associated with participants' intention to engage in the MCS.

Discussion and conclusions

We found that some types of current medicinal cannabis users are more likely to want to transition to the new legal MCS. Demographic predictors of intended engagement were non-Māori ethnicity and higher household income. This suggests that, despite the stated objective of broadening access to cannabis-based products, existing health inequities related to ethnicity and income are likely to remain a factor.[17] We previously reported that anticipation of high financial costs for prescribed cannabis was the leading reason for not intending to engage with the MCS, followed by the perception that prescriptions will be difficult to obtain, even though the new scheme does not restrict eligible health conditions or prescriber types.[18] Additional support and information on the advantages of transitioning to the new MCS (ie, medical oversight and access to quality-assured products) may be justified for Māori and low socioeconomic groups to improve their engagement with the *legal* regime as a source of supply of cannabis-based products for medicinal purposes.

The lower likelihood of engagement from Māori and lower socioeconomic groups may also reflect challenges in discussing medicinal uses of cannabis in a clinical setting. Integration of cannabis into clinical practice remains a highly contested issue, primary due to the limited scientific evidence on the therapeutic efficacy of cannabis as a medicine.[19] Indeed, there is "conclusive or substantial evidence"[5] for use of cannabis preparations in improving patient-reported multiple sclerosis spasticity symptoms, chemotherapy-induced nausea and vomiting and chronic pain (with methodological limitations in clinical trials noted[20]), and there is insufficient evidence for many other medical uses, including sleep disorders, irritable bowel syndrome, depression and social anxiety disorders, with research and evidence on medical applications of cannabis still in its founding stages.[4,5] Studies of medicinal cannabis users found patients may conceal their cannabis use to avoid moral judgements in the provider–patient relationship,[21] and this may be a factor for Māori, who already face ethnic biases in the healthcare system.[22] As a result of those tensions, prescribing in Australia (and often in New Zealand) increasingly takes place via specialised private "cannabis clinics".[23] While access via specialised clinics overcomes the immediate barriers caused by the scepticism from the health profession, it also adds to the cost of accessing medicinal cannabis legally and results in separating patients from their regular health providers, including both GPs and specialists.

We found that medicinal cannabis users' sources of illegal supply have implications for their reported future engagement with the MCS. Namely, patients who grew their own cannabis were less likely to intend to engage with the new MCS. This may reflect the financial costs of transitioning to the prescription and pharmacy supply as well as these users' general satisfaction with existing sources of home supply and/or their ideological view of cannabis as herbal medicine separate from mainstream medicine. Previous research found that those growing cannabis for medicinal reasons form a heterogenous group covering a range of intentions, habits and norms.[3,24] It may be that they view the MCS prescription regime as too restrictive and narrowly focused to accommodate their needs. This suggests the MCS may need to be made more attractive to these patients, such as by allowing home cultivation (as allowed under the Canadian medicinal regime and recommended in a recent Senate review in Australia[25]) or allowing retail availability of some products beyond pharmacy and prescription (as is done in some US and European jurisdictions[2,26]). We previously suggested that non-intoxicating CBD products could be sold over the counter, provided an appropriate quality-assurance framework is implemented.[27]

Administering cannabis via smoking was a strong predictor of likely engagement with the new MCS, with medicinal cannabis

users who smoked twice as likely to intend to engage in the MCS than those who vaped (OR=2.0) or ingested cannabis orally in edible forms (OR=2.22). This may reflect users' awareness of the health risks of smoking and that the new medicinal scheme will offer lower-risk means of administration, such as oral preparations (eg, tinctures, oils and lozenges) and cannabis vaping products.

Limitations

We acknowledge a number of limitations with this study. First, our question referred to current medicinal cannabis users' *future* intentions to utilise the MCS, and respondents may or may not act on their intentions. Second, the survey was a convenience sample of current medicinal cannabis users. The financial cost of recruiting a representative sample of a small, hidden population of medicinal cannabis users is likely to be prohibitively high. In addition, representative household surveys have their own issues contacting this hidden population, including low response rates, particularly with regard to hard-to-reach, stigmatised groups involved in illegal activities.[28] Although our online sample broadly resembles the demographic profile of the New Zealand population (particularly with regard to gender and Māori representation), there were also important differences (eg, our online sample was better educated and reported higher support from government benefits).

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