THE HEALTH EFFECTS OF MARIJUANA

Accurately measuring Canadians' baseline awareness of marijuana's health effects.

On October 17, 2018, Canada became the second country in the world to fully legalise marijuana, after Uruguay. Canadian news and analysis in advance of legalisation focused heavily on the new business opportunities legal marijuana may present, and on who will distribute marijuana and how. By contrast, Canadians' awareness of marijuana's health impacts received little attention.

Health Canada has issued warnings about marijuana's health impacts, based on government-funded longitudinal studies. The agency's 2016 marijuana consumer fact sheet[1] summarizes these warnings. We conducted a study to gauge baseline awareness of these health impacts prior to legalisation. Using RIWI technology, we surveyed over 1,100 randomly recruited Canadians aged 16 and over from 2 May to 12 May, 2018. RIWI simultaneously surveyed a similar number of Americans about their awareness of marijuana's health effects over the same time period, for comparison purposes. Cleartheairnow.org commissioned the survey, and RIWI gathered the data and analysed the results.

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One of the biggest hidden biases in traditional survey research is the self-selected pool of paid or otherwise compensated respondents who are routinely tapped for their opinions in the hopes that they can represent the broader population. We addressed this coverage bias by using RIWI's proprietary Random Domain Intercept Technology (RDIT). RIWI technology and machine-learning algorithms randomly access web respondents who land on registered but inactive websites. This forms a mirror of the web-using public in any country. This system allows us to capture truly random, and, therefore, more accurate sentiment.

This system allows for a vastly larger potential respondent pool than other methods that rely on survey-takers responding in order to access media or other digital content. There are no incentives offered to respondents to complete surveys. People can exit at any time. To date, we have received more than 1.3 billion responses globally. Why do people answer? The wide variety of reasons – curiosity, interest, anonymity, the opportunity to offer an opinion – increases respondent diversity and reach.

One other significant hidden bias in traditional survey research is the lack of true respondent anonymity, which introduces social desirability bias. Due to marijuana being historically illegal and carrying associated social stigma, we wanted to ensure that respondents could share their views safely and anonymously and did not collect personal data as defined by the EU's *General Data Protection Regulation*.

In this article, we share some overview findings comparing Health Canada's statements about marijuana to Canadians' awareness of the associated health impacts as defined by the same government introducing the law. Where possible, we checked how awareness of marijuana's health effects compared with awareness of the effects of cigarettes and alcohol.

HEALTH CANADA STATEMENT:
"Long term use may result in psychological dependence (addiction)."
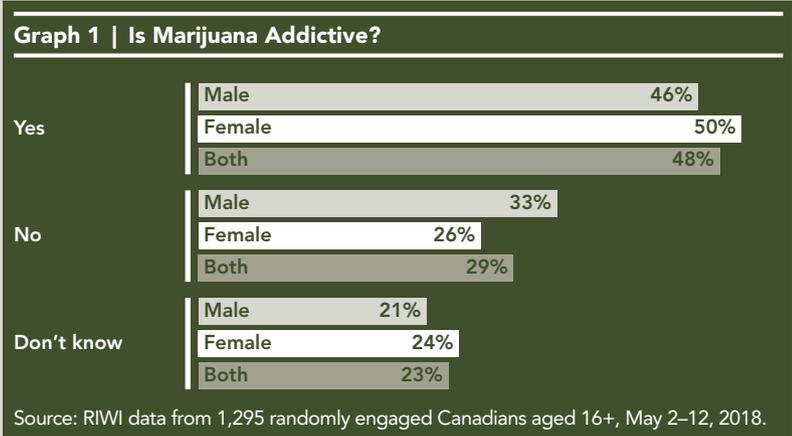*Finding: One in three Canadians do not think that marijuana is addictive.*

About half of respondents (48%) agreed that marijuana is addictive, as the chart shows. The rest either believe it is not (29%) or did not know (22%). Male respondents are less aware than females. About one in three male respondents (33%) think that marijuana is not addictive, compared with about one in four (26%) of female respondents (graph 1).

HEALTH CANADA STATEMENT:
"Marijuana should not be used if you are pregnant, are planning to get pregnant, or are breastfeeding."
Finding: One in five women aged 25–34 believe marijuana is safe during pregnancy, while trying to get pregnant, or breastfeeding.

Roughly two out of three (67%) females aged 16–44 agree that smoking marijuana is harmful when pregnant, planning to get pregnant, and breastfeeding. Of those in prime childbearing age (25–34), roughly one in five believe smoking marijuana is safe during pregnancy, planning to get pregnant, and breastfeeding. While 82% of women aged 16–44 believe that smoking cigarettes is "very harmful" during pregnancy, planning to get pregnant, and breastfeeding, only 67% of women in that age group

Graph 1 | Is Marijuana Addictive?

Yes	Male	46%
	Female	50%
	Both	48%
No	Male	33%
	Female	26%
	Both	29%
Don't know	Male	21%
	Female	24%
	Both	23%

Source: RIWI data from 1,295 randomly engaged Canadians aged 16+, May 2–12, 2018.

Roughly two out of three females aged 16–44 agree that smoking marijuana is harmful when pregnant

believe that consuming marijuana is "very harmful" during pregnancy, planning to get pregnant, and breastfeeding.

HEALTH CANADA STATEMENT:
"Marijuana should not be used if you are a man who wishes to start a family."
Finding: One in two males was unaware that marijuana could harm a man's fertility.

Roughly half of respondents (51%) agreed that taking marijuana poses health risks to a man's fertility, with the rest saying this was false. Among male respondents (under age 65), slightly fewer (47%) agreed.

HEALTH CANADA STATEMENT:
"Using cannabis can impair your concentration, your ability to make decisions, and your reaction time and coordination. This can affect your motor skills, including your ability to drive."
Finding: More than 40 percent of those under the age of 25 are unaware that marijuana impacts safe driving.

Roughly one fifth (21%) of respondents are not aware that marijuana can negatively impact one's ability to drive safely. (This is more than double those who are not aware that alcohol can negatively impact one's ability to drive safely.) Those under age 25 are less aware that marijuana affects one's ability to drive safely, with one-quarter (26%) saying it does not and 15% uncertain.

These data provide a pre-legalisation snapshot of where views and attitudes align or fail to align with the government's assessment of the scientific evidence. This snapshot allows policymakers and the health community to better target education efforts. And, as legalisation proceeds, it will be important to track, securely and anonymously, how awareness changes relative to this baseline data. The same approach could be used in other jurisdictions that are considering legalisation.

Moreover, the approach could also be used to accurately measure marijuana usage and marijuana's economic impacts, including pricing and market size. This could be done both in jurisdictions where it has been legalised and in those considering legalisation. In Canada, since statistical agencies do not include illegal activity in gross domestic product, marijuana-related economic activity was not measured historically, and it
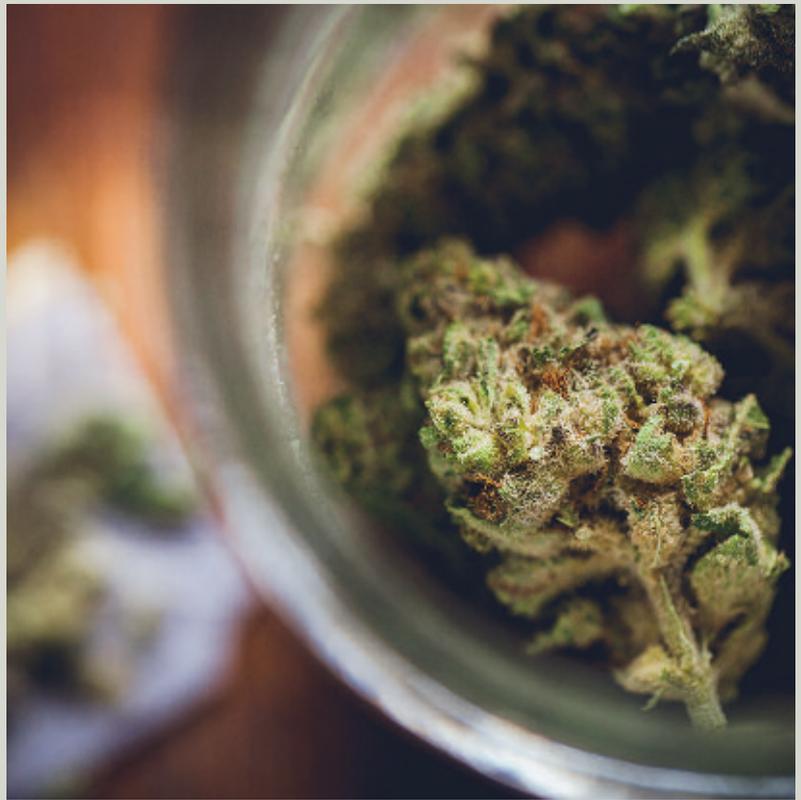
Voluntary surveys could yield overweight participation from heavy marijuana users

is now important to construct new, accurate measures of this activity. A randomised and anonymous approach could yield a vast respondent pool mirroring the Canadian population, and therefore provide a highly accurate measure of both economic activity and usage. Voluntary surveys, by contrast, could yield overweight participation from heavy marijuana users, and therefore risk inaccurate pricing data.

Understanding marijuana usage and awareness of its effects is just one application of the use of random, continuous and anonymous data capture on socially sensitive topics. The technology is already used globally on many other stigmatised or social sensitive topics including measuring the prevalence of mental health problems, changing views toward LGBT issues, and personal financial habits. It has also been applied to other topics where there is considerable online misinformation, such as vaccination, and could be applied to areas where there may be growing concerns, such as those related to artificial intelligence or automation. **RW**

Note
1   https://www.canada.ca/en/health-canada/services/drugs-medication/cannabis/licensed-producers/consumer-information-cannabis.html