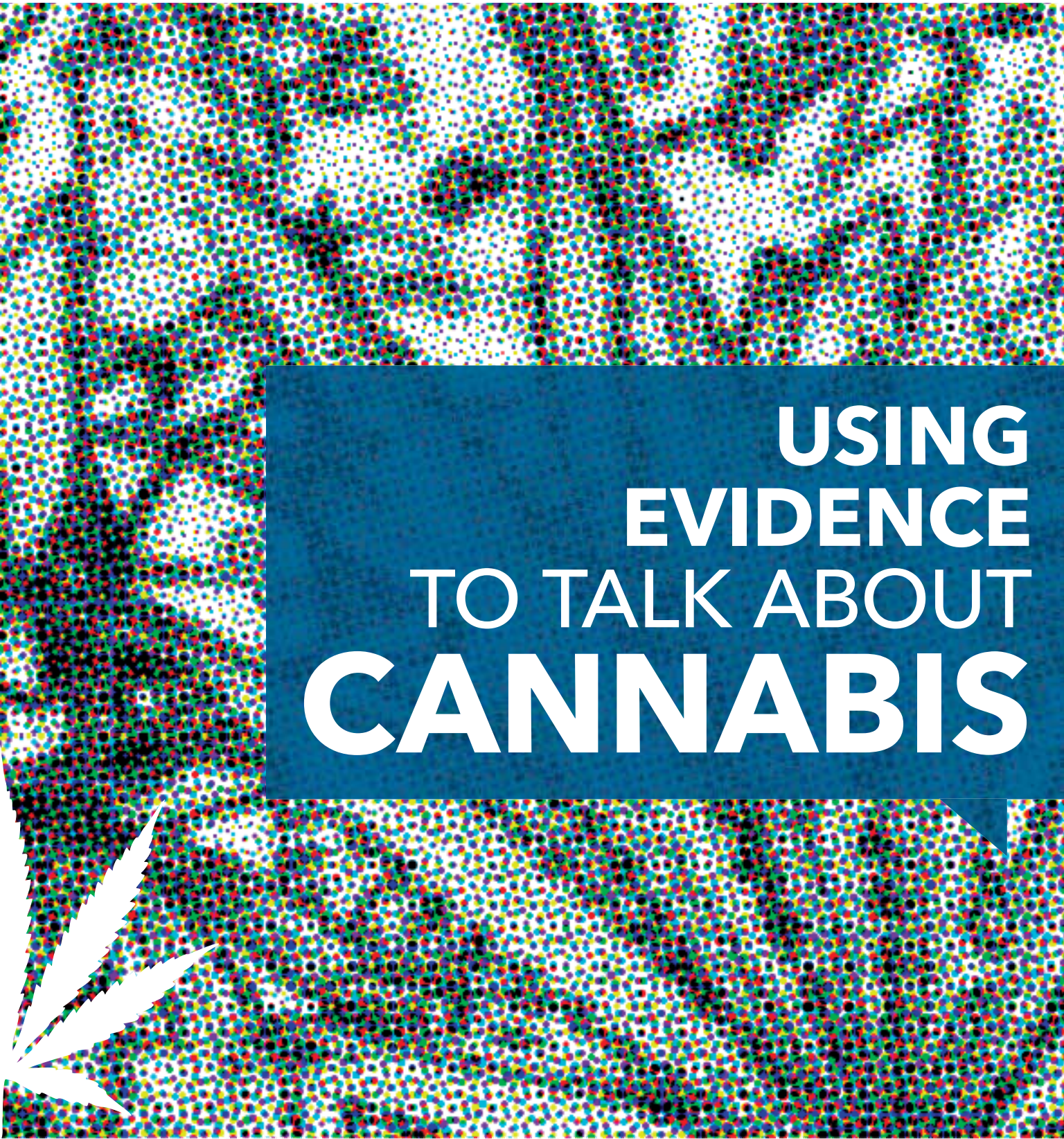
International Centre
for Science in Drug Policy



USING EVIDENCE TO TALK ABOUT CANNABIS

ABOUT THE INTERNATIONAL CENTRE FOR SCIENCE IN DRUG POLICY

The International Centre for Science in Drug Policy (ICSDP) is a network of scientists and academics from all global hemispheres committed to improving the health and safety of communities and individuals affected by illicit drugs by working to inform illicit drug policies with the best available scientific evidence. By conducting research and public education on best practices in drug policy while working collaboratively with communities, policy makers, law enforcement and other stakeholders, the ICSDP seeks to help guide effective and evidence-based policy responses to the many problems posed by illicit drugs.

The ICSDP strives to be a primary source for rigorous scientific evidence on the impacts of illicit drug policy on community health and safety. To this end, the ICSDP produces publications which adhere to the highest standards of peer-reviewed scientific research. The ICSDP also conducts public education campaigns about the need for evidence-based drug policies. The objective of these campaigns is to inform policymakers, affected communities, key stakeholders, and the general public on pressing current issues surrounding illicit drugs and drug policy.

To learn more about the ICSDP and how your support can help improve the health and safety of communities and individuals affected by illicit drugs, please visit www.icsdp.org.

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This report reflects the current evidence on cannabis up to its release in August 2015.

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ACKNOWLEDGEMENTS

We thank Tara Marie Watson, PhD and the ICSDP Technical Advisors and Membership for their ongoing guidance and support.

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INTRODUCTION

Since its inception, the International Centre for Science in Drug Policy (ICSDP) has sought to ensure that policy responses to the many problems posed by illicit drugs are informed by the best available scientific evidence.

Given the robust global conversation around the regulation of recreational cannabis markets, claims about the impact of cannabis use and regulation are increasingly part of the public discourse. Unfortunately, though, these claims are often unsupported by the available scientific evidence.

Using Evidence to Talk About Cannabis is the ICSDP's contribution to the growing global conversation on cannabis. The response guides in this report will equip readers with quick, easy, and evidence-based responses to commonly heard cannabis claims.

Using Evidence to Talk About Cannabis is comprised of two sections: *Common Claims on Cannabis Use* and *Common Claims on Cannabis Regulation*.

Common Claims on Cannabis Use presents response guides with evidence on frequently heard claims about cannabis use, including claims on the addictive potential of cannabis, cannabis as a "gateway" drug, the potency of cannabis, and the impact of cannabis use on the lungs, heart, and brain (in terms of IQ, cognitive functioning, and risk of schizophrenia).

Common Claims on Cannabis Regulation presents response guides with evidence on frequently heard claims about the impacts of cannabis regulation, including the impact of regulation on cannabis availability and use, drug crime, impaired driving, drug tourism, and "Big Marijuana."

These response guides should be read in tandem with *State of the Evidence: Cannabis Use and Regulation*, a longer report that more fully details the scientific evidence on cannabis use and regulation.

Readers of these response guides will notice three repeating themes emerge through the discussion of the scientific evidence on common cannabis claims.

First, many of the claims confuse correlation and causation. Although scientific evidence may find associations between two events, this does not indicate that one necessarily caused the other. Put simply, correlation does not equal causation.

Second, for several of these claims, the inability to control for a range of variables ("confounders") means that we often cannot conclude that a particular outcome was caused by cannabis use or regulation.

Third, many of the claims cannot be made conclusively as there is insufficient evidence to support them. This is especially true of claims related to cannabis regulation, as not enough time has passed since the regulation of recreational cannabis in Colorado, Washington State, and Uruguay to examine many of the impacts of these policy changes.

These three common pitfalls are important to take into account when reading media reports and advocacy materials that suggest scientists have conclusively made some finding related to cannabis use or regulation.

We hope that the evidence contained in these response guides meaningfully contributes to the global conversation around cannabis policy and helps policymakers, as well as general readers, separate scientific evidence from conjecture.

COMMON CLAIMS ON CANNABIS USE

CLAIM	RESPONSE
"Cannabis [is] as addictive as heroin." *– Daily Telegraph (Fox, 2014)*	• There is no scientific evidence to suggest that cannabis has the same addictive potential as heroin. Scientific research has found that less than 1 in 10 people who use cannabis across their lifetime will progress to cannabis dependence, meaning that more than 90% do not become addicted (Anthony et al., 1994). The lifetime probability of becoming heroin-dependent, meanwhile, has been estimated at 23.1% (Anthony et al., 1994). Interestingly, the addictive potential of cannabis is also significantly lower than other legal and illegal drugs, as 20.9% of lifetime cocaine users, 22.7% of lifetime alcohol users, and 67.5% of lifetime nicotine users are estimated to become dependent (Lopez-Quintero et al., 2011). • The addictive potentials of cannabis after one year and ten years of use are even lower than the lifetime probability. For those that use cannabis for one year and for those that use cannabis for ten years, 98% and 94%, respectively, do not become dependent (Lopez-Quintero et al., 2011). • These findings reinforce the need to avoid making general claims about drugs and addiction. Many illegal and legal drugs, and many activities (i.e., gambling), have an addictive potential. As with the use of all drugs, cannabis use should be conceived along a spectrum ranging from non-problematic to problematic use. To that end, over 90% of cannabis users fall on the non-problematic side (Anthony et al., 1994). • Moreover, addiction to different substances is not necessarily related to equivalent harms. The negative consequences associated with cannabis dependence are far less than those associated with addiction to alcohol, cocaine, or heroin. • Criminalization accentuates the health harms associated with drug dependence. By stigmatizing people with addictions, a punitive policy environment limits people's accessibility to the public health services they may need to stay healthy (Wood et al., 2010). • By contrast, it is likely that cannabis users will be more likely to interact with trained public health officials under a regulatory system, which could foster an increase in the uptake of health services for those facing dependence, as has been seen in some settings that have decriminalized drug use like Portugal and Switzerland (Dubois-Arber et al., 2008; Hughes & Stevens, 2007; Nordt & Stohler, 2006).

BOTTOM LINE: A lifetime of cannabis use carries a low risk of dependence (9%), while the risk of cannabis dependence is very low among those who report using it for one year (2%) or even 10 years (5.9%). This is much lower than the estimated lifetime risk of dependence to heroin (23.1%).

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CLAIM	RESPONSE
"[D]id you know that marijuana is on average 300 to 400 percent stronger than it was thirty years ago?" *– Health Canada advertisement (Daro, 2014)*	• Scientific evidence suggests that cannabis potency, as measured by levels of THC, has increased in recent decades in some jurisdictions. In the United States, recent studies have cited average increases of 3% to 12% in THC content over the past three decades (El Sohly, 2014), which is equivalent to a 300% increase. Significant increases have not been detected for European countries other than the United Kingdom and the Netherlands (McLaren, Swift, Dillon, & Allsop, 2008). • THC levels alone paint an incomplete picture of the impacts of cannabis potency. Other factors, such as the preparation and method of consumption, complicate our understanding of the effect of cannabis potency. For example, the common practice of mixing cannabis with tobacco effectively dilutes potency to levels below what would be experienced if it were smoked pure. • Concerns over increases in cannabis potency are rooted in the assumption that higher levels of THC are harmful to health. However, the harms of increased cannabis potency are not yet fully understood by scientists. Perhaps counterintuitively, some research suggests that higher cannabis potency may actually lead to a reduction in health harms (especially related to smoking), as consumers might reduce the volume they consume (Van der Pol et al., 2014). • It is important to remember that increases in cannabis potency in the United States have taken place despite increased efforts in reducing the illegal cannabis supply (Werb et al., 2013). Moreover, because stronger strains provide higher profits per unit weight, trends towards increasing potency are primarily a result of criminal-market economics. Prohibition has not been able to keep cannabis potency down, and has arguably contributed to driving it up. • Importantly, under prohibition, illegal cannabis markets face zero quality control requirements. A strict, legally regulated market for cannabis would put the regulation of THC levels in the hands of governments and public health officials, not criminal entrepreneurs. In the case that cannabis potency is found to be associated with greater health harms, the regulation of cannabis markets by governments becomes even more vital.

BOTTOM LINE: Although this claim overstates the existing evidence, studies do suggest that there have been increases in THC potency over time in some jurisdictions.

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CLAIM	RESPONSE
"I'm opposed to legalizing marijuana because it acts as a gateway drug." *– Enrique Peña Nieto, President of Mexico (Khazan, 2013)*	• Scientific evidence suggests that cannabis use often precedes the use of "harder" illicit drugs, such as cocaine and heroin (W. Hall, 2014). However, there is no evidence to suggest that the use of cannabis causes or increases the risk that an individual will move on to use other drugs. • Scientists have explored alternative explanations for why cannabis use tends to take place before the use of "harder" substances. For instance, people who use cannabis may be more likely to use other drugs because they have entered an illicit drug market that features cannabis alongside other drugs, or because of personality traits (e.g., sensation seeking, impulsivity) that make them more likely to try drugs in general (W. D. Hall & Lynskey, 2005). Regardless of the reason, studies have not been able to convincingly remove these and other possible major explanations and thereby prove that cannabis acts as a "gateway" drug. • Interestingly, in some countries, use of alcohol and tobacco use has been shown to be more strongly linked than cannabis to the later use of other illicit drugs (Degenhardt et al., 2010).

BOTTOM LINE: Evidence to date does not support the claim that cannabis use causes subsequent use of "harder" drugs.

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CLAIM	RESPONSE
Cannabis use "can cause potentially lethal damage to the heart and arteries." *– World Federation Against Drugs (World Federation Against Drugs, 2015)*	• Claims asserting that cannabis use causes "lethal damage" to the heart are overstating the existing scientific research. Given major gaps in the evidence, research is needed to understand the potential cardiovascular harms of cannabis use. • The impact of cannabis use on heart health is currently not well understood (Volkow et al., 2014). Cannabis use has been found to be associated with acute effects that can trigger events like heart attack or stroke (Jouanjus, Lapeyre-Mestre, & Micallef, 2014; Thomas, Kloner, & Rezkalla, 2014), particularly among older adults (W. Hall, 2014). However, clear causal linkages have not been established. • With respect to the broader impact of cannabis use on physical health, studies have found that low, occasional cannabis use does not adversely affect the lungs (Pletcher et al., 2012). However, the impact of long-term cannabis smoking on respiratory function is less clear (W. Hall, 2014). Some studies have reported that smoking cannabis is associated with various respiratory-related problems (Gordon, Conley, & Gordon, 2013; Tashkin, 2013; Tashkin, Baldwin, Sarafian, Dubinett, & Roth, 2002), whereas others have found no strong association with several lung conditions (Tashkin, 2013). The impact of cannabis smoking on lung cancer, in particular, remains unclear (Hashibe et al., 2006). • It is worth noting that the risks of illness and death associated with the use of tobacco and alcohol are much higher than those associated with cannabis. For example, evidence has found far greater risk of lung problems among tobacco users compared to regular cannabis users (Tashkin, 2013). Hence, the legal status of a drug should not be interpreted as meaning that it poses lower health risks than illegal drugs. This is useful to remember given that calls to sustain the prohibition of illegal drugs, like cannabis, are often accompanied with assertions about their health harms. • Harm reduction strategies that substitute smoking cannabis with other routes of administration can be effective at decreasing the negative health consequences of cannabis use, particularly on the lungs. Compared to what is possible under prohibition, a regulated market in which cannabis is purchased from licensed dispensers can allow for a greater range of harm reduction strategies such as "vaping" or edible consumption.

BOTTOM LINE: There is little evidence to suggest that cannabis use can cause lethal damage to the heart, nor is there clear evidence of an association between cannabis use and cancer.

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CLAIM	RESPONSE
Cannabis use lowers IQ by up to 8 points.	• There is little scientific evidence suggesting that cannabis use lowers general intelligence, as measured by IQ. A single study (Meier et al., 2012) is frequently cited to support the claim that cannabis use is associated with declines in IQ of 8 points. Basing any general claim on one study is problematic, especially when the 8-point drop in IQ was found only among a very small subsample of participants (i.e., 38 participants), representing 3.7% of the total sample. Additionally, a more recent review of this same data suggests that the findings linking cannabis use to IQ declines may actually be the result of unmeasured socioeconomic factors (Rogeberg, 2013). • Interestingly, a more recent (and larger) study found that alcohol use was associated with declines in IQ rather than cannabis use (Mokrysz et al., 2014). The scientists also suggested that early-onset substance use more generally, rather than cannabis use specifically, may lead to lower IQ. In short, the evidence that cannabis use is associated with declines in IQ is very weak. • It is worth highlighting that different people are impacted by cannabis use differently. Research suggesting that cannabis use can have certain impacts on the brain will not apply to all cannabis users in all situations.

BOTTOM LINE: There is little scientific evidence suggesting that cannabis use is associated with declines in IQ.

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CLAIM	RESPONSE
Cannabis use impairs cognitive function.	• While there is moderate evidence that early-onset and sustained cannabis use is associated with impairments in cognitive function, there are gaps in the scientific evidence on the full range of effects and their reversibility. Hence, this general claim requires clarification, as well as further research. Moreover, even where research suggests that cannabis use can have certain impacts on the brain, this will not be the case for every cannabis user in every situation. • Unsurprisingly, evidence has shown that during intoxication, cannabis use has acute effects on cognitive functions, such as learning and memory (Crane, Schuster, Fusar-Poli, & Gonzalez, 2013). Some scientific studies have found associations between heavier, long-term cannabis use and impairments in cognitive areas such as memory, attention, and verbal learning, particularly when use is initiated during adolescence (W. Hall, 2014; Volkow, Baler, Compton, & Weiss, 2014). However, these studies have reported different outcomes with respect to the permanence of these impairments. Given the current state of the scientific research, the simple assertion that cannabis leads to reduced cognitive function is misleading. • Claims about the impact of cannabis use on cognitive functioning are at times accompanied by assertions that use leads to school failure, later unemployment, problems with life satisfaction, and other poor outcomes or psychosocial harms. However, scientists have not been able to remove all other possible explanations, and as such the evidence is weak in clearly establishing associations between cannabis use and these outcomes (Fergusson & Boden, 2008; Townsend, Flisher, & King, 2007). It's also noteworthy that a systematic review of all longitudinal scientific studies on this topic found that the evidence did not support a causal relationship between cannabis use by young people and various psychosocial harms (Macleod et al., 2004).

BOTTOM LINE: While the evidence suggests that cannabis use (particularly among youth) likely impacts cognitive function, the evidence to date remains inconsistent regarding the severity, persistence, and reversibility of these cognitive effects.

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CLAIM	RESPONSE
[Cannabis] is a drug that can result [in] serious, long-term consequences, like schizophrenia." *– Kevin Sabet, Smart Approaches to Marijuana (Baca, 2015)*	• While some studies point to a link between cannabis use and an increased risk of symptoms associated with schizophrenia (Fergusson, Horwood, & Ridder, 2005; Zammit, Allebeck, Andreasson, Lundberg, & Lewis, 2002), a recent study concluded that cannabis use by itself did not increase the risk of schizophrenia (Proal et al., 2014). Scientists have repeatedly noted the difficulty of establishing causality in studies about cannabis use and mental illness (Moore et al., 2007; Volkow et al., 2014). This means that while people who develop schizophrenia may have previously used cannabis, it is difficult to unequivocally state that this use is what caused them to develop the condition (Pierre, 2011). • If cannabis use caused schizophrenia, we would expect to see increases in incidence as rates of cannabis use have increased, but this trend has not been observed (Hall, 2014). One UK-based study reported that, given that cannabis use has increased fourfold among the UK population between the early 1970s and 2002, there should be a corresponding 29% increase in cases of schizophrenia among men, and 12% increase among women between 1990 and 2010 (Hickman et al., 2007). Instead, during this time period (1996-2005), it was found that annual cases of schizophrenia in the UK were either stable or declining (Frisher et al., 2009). These findings strongly suggest that cannabis use does not cause schizophrenia. • Scientific research has suggested that young people who are genetically predisposed to schizophrenia may have their risk of developing this condition increased by using cannabis (Caspi et al., 2005). However, scientific findings are inconsistent on the magnitude of risk posed by cannabis use, as well as the frequency of use that is associated with mental illness (Andréasson, Engström, Allebeck, & Rydberg, 1987; Caspi et al., 2005; Moore et al., 2007).

BOTTOM LINE: While scientific evidence supports an association between cannabis use and schizophrenia, a causal relationship has not been established.

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COMMON CLAIMS ON CANNABIS REGULATION

CLAIM	RESPONSE
Legalization / regulation increases the availability of cannabis.	• Evidence suggests that prohibition has been generally unsuccessful in reducing the availability of cannabis. In the United States, research indicates that since 1990, the price of cannabis has decreased while potency has increased, despite increasing investments in enforcement-based supply reduction efforts (Werb et al., 2013). Given that we can't measure the underground market directly, these indicators act as proxy markers, suggesting that the supply – and by extension the availability – of cannabis has likely increased. • The perceived availability of cannabis among young people has remained high, notwithstanding increases in drug control budgets. For the past 39 years, between 81% and 90% of twelfth graders in the United States have reported that they could obtain cannabis "fairly easily" or "very easily" (Monitoring the Future, 2014). Similarly, in the European Union, research from 2014 indicates that 58% of young people aged 15 to 24 believe it would be either very easy or fairly easy to obtain cannabis within 24 hours (European Commission, 2014). • By allowing governments to set legal age restrictions, the strict legal regulation of cannabis markets could actually be more effective than prohibition at restricting the availability of cannabis to young people (Rolles, 2009), as has occurred with tobacco regulation (Johnston, O'Malley, Bachman, & Schulenberg, 2012).

BOTTOM LINE: Evidence suggests that the supply of illegal cannabis has increased under a prohibition model, and that availability has remained high among youth. Evidence does not suggest that cannabis availability among youth has increased under regulatory systems.

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CLAIM	RESPONSE
"[I]f marijuana was legalized, the increase in users would be both large and rapid..." *– (DuPont, 2010)*	• The assertion has been made that the higher prevalence of alcohol and tobacco use under a regulated market implies that cannabis use would also increase if regulated. However, World Health Organization data suggests that countries with more punitive drug policies do not exhibit lower levels of drug use compared to countries with more liberal policies (i.e., regulation) (Degenhardt et al., 2008). Hence, causal claims between the prevalence of drug use and the policy environment are misguided. Simply put, the evidence suggests that prohibition has at most a marginal impact on the use of illicit drugs. • Comparing the prevalence rates of cannabis use before and after legal changes in several European countries over the past decade or so indicates that no simple association was observed between legal changes and changes in cannabis use prevalence. Countries where penalties were increased did not experience lower levels of use, and higher rates of use did not transpire in countries where penalties were decreased (EMCDDA, 2015). • At the same time, a large 15-year research study found that the presence of medical marijuana systems has not led to increases in recreational adolescent cannabis use in the United States (Hasin et al., 2015). With respect to new recreational cannabis markets (such as in Colorado, Washington State, and Uruguay), it is likely too soon to adequately evaluate the long-term impact of policy changes on cannabis use trends. • Given that legal regulation necessarily opens up new sources of drug availability, the way these sources are managed is essential to constraining any sizeable changes in prevalence of use. Nevertheless, strict legal regulation can allow for quality control (to control potency or use of adulterants), legal age restrictions (to keep cannabis out of the hands of youth), greater contact between health care systems and consumers (to better address addiction), and collection of tax revenues to reinvest into social goods, such as education, prevention, and treatment. These are likely more relevant to community health and safety concerns than prevalence of cannabis use given that over 90% of use is unproblematic (Anthony, Warner, & Kessler, 1994).

BOTTOM LINE: Evidence suggests that the policy environment (specifically legal status and enforcement policy) has at most a marginal impact on the prevalence of drug use, thereby suggesting that regulating cannabis markets will not inevitably cause higher levels of cannabis use.

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CLAIM	RESPONSE
Regulation will not reduce drug crime.	• A commonly heard argument is that the regulation of cannabis markets will not reduce drug crime. However, there is a lack of scientific research on how much drug crime supposedly thrives under regulated markets, and it is still too early to adequately assess this effect in Colorado, Washington State, and Uruguay. • It is worth recalling the high levels of drug crime and violence under prohibition. Plenty of scientific evidence has demonstrated the failure of prohibition in reducing the size of underground drug markets and trafficking or the violence associated with illegal drug markets (Werb et al., 2013; Werb et al., 2011). Given the inability of prohibition to reduce drug crime and violence, regulation remains a viable alternative. • Regulated cannabis markets directly reduce some drug crime by removing the illegal nature of some forms of cannabis production, distribution, and consumption. Although illegal drug crime is still likely to continue under a regulated market (i.e., underage purchasing, continued supply from a criminal market, etc.), if regulatory laws are appropriately constructed, cannabis regulation will transfer the vast majority of demand for cannabis from the criminal market to the legal market. Cannabis regulation in Colorado, Washington State, and Uruguay has diverted a substantial proportion (and likely the vast majority) of revenue from cannabis sales from the criminal market to licit sellers, thereby decreasing the total share of the criminal market. Even a modest contraction in criminal opportunities and cartel profits can be viewed as a positive.

BOTTOM LINE: Given that the prohibition of cannabis has not been shown to reduce illegal supply, it is likely that cannabis regulation is more effective at minimizing criminal markets for cannabis, despite the fact that criminal markets will continue to represent a proportion of the total market.

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CLAIM	RESPONSE
"We are going to have a lot more people stoned on the highway and there will be consequences." *– Rep. John Mica (R-Fla.) (Balko, 2014)*	• While evidence shows that the risk of motor vehicle collisions increases for drivers during acute intoxication from cannabis use (Asbridge, Hayden, & Cartwright, 2012; M. C. Li et al., 2012), evidence does not suggest that cannabis regulation leads to increases in the number of impaired drivers on the road. In the case of Colorado, Washington State, and Uruguay, it is too early to determine what long-term impacts might be. • However, raw data from the Colorado Department of Transportation found that total traffic fatalities were down in the state for 2014 compared to 2013 and the average since 2002 (Balko, 2014). Of course, such counts may not tell us about the specific role of cannabis use in car crashes. However, they do provide reason to question any general claims that cannabis regulation will necessarily lead to less safety on the road at the population-level. • This claim seems to be rooted in the assumption that impaired driving will increase because cannabis use will increase under a regulatory scheme. It is therefore worth emphasizing that scientific evidence has not found an association between levels of drug use and national drug policies (Degenhardt et al., 2008). • It is important to note that responsible regulatory schemes would not legalize driving under the influence of cannabis. It remains an offence in Colorado, and indeed the law has arguably been tightened – with new THC blood limits introduced, increased enforcement efforts, and a public education drive funded in part by cannabis tax revenue (Colorado Department of Transportation, 2015). Importantly, compared to prohibition, cannabis regulation allows for detailed public education and awareness campaigns to prevent risky behaviours, such as impaired driving, as has occurred with drunk driving (Hingson & Winter, 2003). • Interestingly, experts agree that the risk of motor vehicle collisions is much lower for cannabis use compared to the risk associated with alcohol use. The impact of alcohol intoxication on driving therefore remains a far greater public health concern (Li, Brady, & Chen, 2013).

BOTTOM LINE: While experimental studies suggest that cannabis intoxication reduces motor skills and likely increases the risk of motor vehicle collisions, there is not sufficient data to suggest that cannabis regulation would increase impaired driving, and thereby traffic fatalities.

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CLAIM	RESPONSE
Regulation promotes drug tourism.	• There is some evidence to suggest that the regulation of cannabis markets attracts tourists. Although not systematically collected, data from the Netherlands has indicated that 25% of tourists who visit Amsterdam visit a coffee shop, and 10% say that this was their reason for visiting the city (Kilmer, 2010). Early evidence from Colorado indicates that 44% percent of revenue from cannabis sales in metropolitan areas, and 90% of sales in rural communities, occurred from buyers residing out of state (Light et al., 2014). • The potential for cannabis tourism is related to the size and distance of neighboring populations where recreational cannabis use has not been regulated (Caulkins et al., 2015), meaning that regulation in certain jurisdictions is likely to see more drug tourists compared with other settings. This also means that cannabis tourism diminishes as an issue of concern the more jurisdictions legally regulate the cannabis market. • Importantly, drug tourism is by no means an inevitable consequence of a regulated recreational cannabis market (i.e., evidence does not suggest regulation in and of itself promotes drug tourism). By allowing governments to control the conditions under which cannabis is sold, regulatory models that do not permit drug tourism can be employed. Restricting sales of cannabis to home country residents is one example of a possible regulatory control to reduce drug tourism. Uruguay is an example of this, as the law permits only residents to grow and purchase cannabis (Gutierrez & Pardo, 2015). • Given the significant economic benefits of all types of tourism, drug tourism is not necessarily a negative side effect of regulation (Caulkins et al., 2015). However, drug tourism may also have drawbacks, such as in the form of public disorder. Overall, there is little evidence suggesting that drug tourism has contributed to widespread negative health or social outcomes.

BOTTOM LINE: While evidence suggests that, depending on the use of regulatory controls and geographic setting, regulation may in some cases lead to an increase in drug tourism, the data do not suggest that this is an inevitable consequence of regulation.

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CLAIM	RESPONSE
Regulation leads to a "Big Marijuana" scenario.	• The emergence of regulated recreational cannabis markets has been accompanied with claims that these policy changes will lead to large, for-profit cannabis industries with little oversight and a lack of concern about public health and safety, sometimes referred to as a "Big Marijuana" scenario. In addition to being unsupported by scientific evidence and based on speculation, this claim implies a weaker level of government control than is possible under cannabis regulation. • Concerns that regulation will lead to a massive commercialized industry are rooted in the assumption that cannabis will follow a similar trajectory as tobacco (T. Hughes, 2015). In previous decades in North America, the tobacco industry engaged in heavy advertising (especially to youth) and industry deception about the health risks associated with use. As a result, tobacco use increased and became a major source of preventable health conditions and mortality (Richter & Levy, 2014). Assuming that the cannabis industry will follow in the footsteps of tobacco is, however, mere speculation and is not supported by scientific evidence. It is equally, if not more, likely that given the previous experience with tobacco, governments will take greater steps towards ensuring that regulations foster a responsible cannabis industry. • A "Big Marijuana" scenario is in no way an inevitable consequence of a regulated recreational cannabis market. By allowing governments to control the conditions under which cannabis is sold, regulatory models that avoid such an outcome can be employed. This could entail limits on the size of individual market players, or the use of a state monopoly. Restrictions on advertising, requirements for product labelling on health harms, and investments in public education are regulatory controls that do not foster a large commercialized industry and can be adopted. • It is still too early to determine whether recently regulated cannabis markets in Colorado, Washington State, and Uruguay will experience a "Big Marijuana" scenario. However, these jurisdictions have employed stricter regulatory controls than those used for tobacco in previous decades, including restrictions on retail quantities and advertising and promotion (Gutierrez & Pardo, 2015; Pardo, 2014). Uruguay, for example, has prohibited cannabis advertising (Gutierrez & Pardo, 2015; Pardo, 2014). The use of strict regulatory controls like these diminishes the likelihood of a "Big Marijuana" scenario.

BOTTOM LINE: Available evidence regarding "Big Marijuana" is currently lacking, though regulatory controls can be introduced within regulatory systems to reduce the potential of profit maximization by cannabis retailers.

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