

Tools for Debate: US Federal Government Data on Cannabis Prohibition

A report of the International Centre for Science in Drug Policy

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The International Centre for Science in Drug Policy (ICSDP) is an international volunteer network of scientists and academic physicians committed to improving the health of communities and individuals affected by illicit drugs. The network consists of leading public health and drug policy experts from around the globe who have come together in an effort to reduce drug-related harms by informing international drug policies with the best available scientific evidence. The ICSDP seeks to meaningfully reduce the harms of drugs by working collaboratively with communities, policy makers, law enforcement organizations and other stakeholders to guide effective and evidence-based policy responses to the many problems associated with the use of illegal drugs. The primary objective of the ICSDP is to conduct and disseminate original scientific research, including systematic reviews and evidence-based drug policy guidelines.

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Cover: Operation Alesia. US Forest Service work with Shasta County Sheriff's Office and other partners to eradicate illegal marijuana grow sites in Shasta-Trinity National Forest, California. July 13, 2007. (Photo courtesy USFS Region 5)

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"Alcohol and tobacco are far more dangerous drugs than cannabis, but no one is being killed in an alcohol or cigarette black market because those drugs are legal, regulated and taxed."

Joseph D. McNamara Retired Chief of Police for San Jose, California



Soldiers stand in formation as a pile of marijuana is incinerated at a military base in the border city of Ciudad Juarez September 9, 2009. More than a ton of narcotics, including marijuana, various illegal pills and cocaine, were incinerated as part of the Chihuahua joint operation, in which the federal government sent thousands of soldiers to curb drug violence in Mexico's bloodiest city on the US border. (Reuters/Alejandro Bringas)

EXECUTIVE SUMMARY

Several initiatives in the state of California, including Bill 2254 and the *Regulate*, *Control and Tax Cannabis* proposition, have fuelled the international discussion about the known impacts of cannabis prohibition and the potential impacts of a regulated (i.e., legal) market.

Surprisingly, to date, an impact assessment of cannabis prohibition based on data derived through US federal government surveillance systems has been largely absent from this debate. Drawing upon cannabis surveillance systems funded by the US government, this report summarizes information about the impacts of US cannabis prohibition on cannabis seizures and arrests. The report also tests the assumption that increased funding for the enforcement of cannabis prohibition and subsequent increased seizures and arrests reduce cannabis-related harms, by evaluating US federally funded surveillance systems examining cannabis potency, price, availability and rates of use.

In the last several decades there has been a remarkable increase in US federal and state funding for anti-drug efforts, with the annual overall federal anti-drug budget as reported by the US Office of National Drug Control Policy increasing by more than 600% (inflation adjusted), from approximately \$1.5 billion in 1981 to more than \$18 billion in 2002 (the last year the budget was consistently reported).* While only a portion of this budget funded programs specific to cannabis prohibition, increased federal and state funding nevertheless coincided with a greater than 150% increase in cannabis-related arrests and a greater than 420% increase in cannabis-related seizures between 1990 and 2006.

*All dollar figures are USD.

The limitations of cannabis prohibition in the US, however, are demonstrated by federally funded surveillance systems which show an approximate increase of 145% in estimated cannabis delta-9-tetrahydrocannabinol (THC) content between 1990 and 2007, despite the dramatic increase in funding to anti-drug efforts. Furthermore, evidence of prohibition's failure to reduce the supply of cannabis is demonstrated by the estimated decrease of approximately 58% (inflation adjusted) in the retail price of US cannabis between 1990 and 2007.

The limitations of US cannabis prohibition are further evidenced by the ease with which American youth report being able to obtain the drug. According to US drug use surveillance systems funded by the US National Institutes on Drug Abuse, over the last 30 years of cannabis prohibition the drug has remained "almost universally available to American 12th graders," with approximately 80-90% saying the drug is "very easy" or "fairly easy" to obtain. The failure of prohibition to reduce cannabis supply is also demonstrated by the fact that roughly 60% of school-aged US youth who use cannabis report having obtained their most recently used cannabis for free or having shared someone else's. Interestingly, rates of cannabis use among American youth do not inversely correlate with levels of funding for cannabis prohibition. Instead, the estimated annual prevalence of cannabis use among US grade 12 students rose from 27% in 1990 to 32% in 2008, whereas among 19- to 28-year-olds it went from 26% in 1990 to 29% in 2008.

While it has been argued that rates of cannabis use would be higher if strict criminal penalties were not in place, this argument is inconsistent with available scientific evidence which indicates that patterns of drug law enforcement are not strongly correlated with rates of cannabis use. Nevertheless, theoretical models have suggested that, if enacted, the proposals in California could increase cannabis use, and this report also describes a range of evidence-based regulatory tools that should be given consideration in any locality debating cannabis legalization.

Increased funding for cannabis prohibition has increased cannabis seizures and arrests, but the assumption that this reduces cannabis potency,

increases price or meaningfully reduces availability or use is inconsistent with surveillance data the US federal government itself collects. In light of the widespread and often free availability of cannabis that exists despite extremely costly criminal justice measures, successfully reducing rates of cannabis-related harm will likely require the implementation of strict regulatory measures which are associated with reducing the harms of other legal substances and are too commonly underutilized in the areas of tobacco and alcohol control.

"The drug war encourages violence. Government violence against nonviolent users is notorious and has led to the unnecessary prison overpopulation. Innocent taxpayers are forced to pay for all this socalled justice."

Ron Paul

American physician and Republican Congressman in Texas

INTRODUCTION

An estimated 155 to 250 million people worldwide use illegal substances annually, and of these cannabis is by far the most commonly used drug.¹ Global estimates suggest that cannabis is used annually by approximately 129 to 190 million people.¹

The health effects of cannabis have been described in detail elsewhere.2 In brief, conflicting data from observational studies make the adverse health effects of cannabis the subject of ongoing debate and study.3, 4 While this debate will certainly continue, 5 there is nevertheless accumulating evidence that cannabis can have some adverse effects in susceptible individuals, particularly those who initiate use at a young age and longstanding high-intensity users.6 The major potential adverse effects of acute intoxication include its known short-term psychological effects and motor impairment, which create potential for accidental injury, including injury caused by motor vehicle accidents. As well, cannabis use may be a contributory cause of respiratory diseases from chronic smoke exposure.^{7,8-11} It is important to put these health concerns into a comparative context, as was recently done by a panel of scientific experts from the United Kingdom who, using a nine-category matrix of harm spanning physical and social harms, ranked cannabis as less harmful than alcohol and tobacco.12

Cannabis is produced in almost all countries of the world, with Mexico, Paraguay, Afghanistan, Columbia, the US, Canada and Bolivia identified as major source countries. In contrast to a worldwide trend of primarily domestic production, the US prohibition on cannabis, coupled with its high demand, has boosted production in neighbouring countries in the Americas.

It has recently been estimated that Mexico produces more than 20,000 metric tons of cannabis for export to the United States, which, together with cocaine and heroin trafficking, generates billions of dollars of revenue for Mexican drug trafficking organizations and has led to widespread corruption among police and judiciary in that country. 13, 14 Canada has also been a major exporter of cannabis to the US along its northern border.15 In addition, in recent years there has been a shift towards increased domestic cannabis production in the US, coupled with the development of a large illegal market and associated harms. A 2003 report prepared by the Federal Research Division of the Library of Congress estimated that the total 2002 US cannabis domestic supply (domestically produced and imported cannabis) was about 22,000 metric tons, or 48 million pounds.¹⁶

While public service announcements such as the US's National Youth Anti-Drug Media Campaign have sought to dissuade youth from using cannabis, a \$42.7 million federal government funded evaluation concluded that the \$1.4 billion advertising campaign was ineffective and may actually have had the negative effect of inflating the perception that drug use among American youth is widespread. Negative effects of these advertisements have been reported elsewhere. He most widely implemented school-based prevention program, known as Drug Abuse Resistance Education (DARE), has also proven to be ineffective at reducing rates of illicit drug use.

"As a nation, we have been responsible for the murder of literally hundreds of thousands of people at home and abroad by fighting a war that should never have been started and can be won, if at all, only by converting the United States into a police state."

Milton Friedman
US economist and Nobel laureate

At the same time, there has emerged widespread criticism of the "war on drugs," with a range of prominent individuals and scientific bodies calling for more evidence-based approaches to drug control. On this context, in 2009 California's Governor Arnold Schwarzenegger indicated that he welcomed a debate on cannabis legalization, and several initiatives in the state of California, including Bill 2254 and the *Regulate*, *Control and Tax Cannabis* proposition, have fuelled debate about the impacts of cannabis prohibition and the potential impacts of a regulated (i.e., legal) market in both the US and internationally.

Surprisingly, to date, an impact assessment of cannabis prohibition using data derived through the US federal government surveillance systems has been largely absent from this debate. Therefore, drawing upon data derived from cannabis surveillance systems funded by the US

federal government, this report seeks to summarize information on the impacts of US cannabis prohibition on cannabis seizures and arrests. The report also tests the widely held assumption that increased funding for cannabis prohibition and subsequent increased seizures and arrests reduce cannabis-related harms, by evaluating historical US federally funded surveillance systems examining markers of cannabis potency, price, availability and rates of use. The report concludes by describing regulatory tools that may be highly effective at reducing cannabis-related harm within a legal cannabis model.

PROHIBITION FUNDING, CANNABIS SEIZURES AND ARRESTS

In the last several decades, there has been a remarkable increase in US federal and state funding for the nation's anti-drug efforts. The pattern of federal funding is shown in **Figure 1**, which shows that the annual overall federal anti-drug budget reported by the US Office of National Drug Control Policy increased by more than 600% (inflation adjusted), from approximately \$1.5 billion in 1981 to over \$18 billion in 2002 (the last year this budget was consistently reported). While only a portion of this budget funded programs specific to cannabis prohibition,

according to the US Bureau of Justice Statistics, this funding nevertheless coincided with a greater than 150% increase in cannabis-related arrests for cannabis possession, sale or production (**Figure 2**) and a greater than 420% increase in cannabis-related seizures (**Figure 3**) between 1990 and 2006. Although annualized data are not freely available, the enforcement of cannabis prohibition in California alone is estimated to cost taxpayers anywhere between \$200 million and \$1.9 billion each year.²²

Figure 1. United States federal drug control budget, 1981-2002

Source: US Office of National Drug Control Policy

1,000,000 900,000 800,000 600,000 400,000 200,000 100,000 100,000

Figure 2. Cannabis-related arrests in the United States, 1990–2007*

*Includes arrests for possession, sale or production of cannabis Source: US Bureau of Justice Statistics

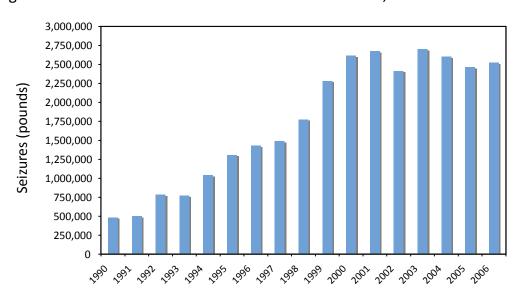


Figure 3. Annual cannabis seizures in the United States, 1990–2006

Source: US Bureau of Justice Statistics; US National Drug Threat Assessment

CANNABIS PRICE, POTENCY, USE AND AVAILABILITY

We tested the assumption that increased funding for cannabis prohibition reduces the drug's availability by evaluating US federally funded surveillance systems examining markers of cannabis potency, price, availability and rates of use. As above, unless otherwise noted, the data presented in figures have been restricted to 1990 onwards to reflect the patterns observed over approximately the last two decades.

The limitations of cannabis prohibition in the US are demonstrated by the substantial increase in cannabis potency that has been observed over

the last several decades despite increasing funding to drug law enforcement efforts (**Figure 4**). According to the University of Mississippi Cannabis Potency Monitoring Project, which is funded by the US National Institutes of Health, scientific monitoring of cannabis potency shows that the estimated delta-9-tetrahydrocannabinol (THC) content of US cannabis has risen by approximately 145%, from 3.5% in 1990 to over 8.5% in 2007.²³

Evidence of prohibition's failure to reduce the supply of cannabis is demonstrated by estimates

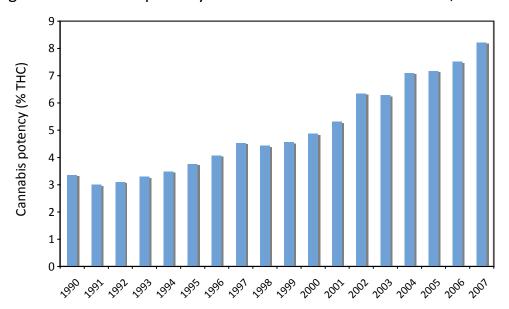


Figure 4. Estimated potency of cannabis in the United States, 1990-2007

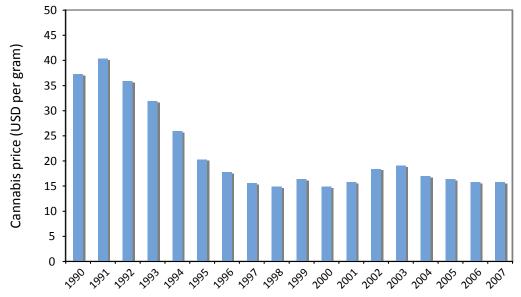
Source: University of Mississippi Cannabis Potency Monitoring Project

derived from the US Drug Enforcement Agency which show a decrease of about 58% in the retail price of US cannabis, from an inflation-adjusted retail price of \$37 per gram in 1990 to \$15 per gram in 2007 (**Figure 5**).²⁴

The limitations of US cannabis prohibition are also demonstrated by the ease with which American youth report being able to obtain the drug. According to the US drug use surveillance systems funded by the US National Institutes on

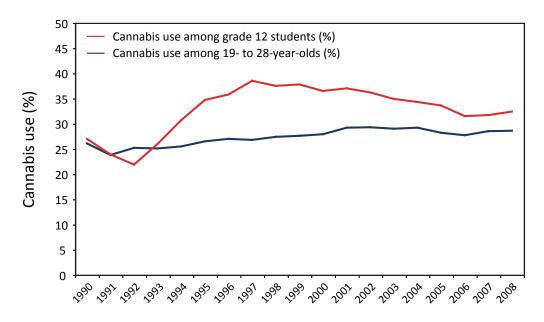
Drug Abuse, over the last 30 years of cannabis prohibition the drug has remained "almost universally available to American 12th graders," with 80–90% over this period saying the drug is "very easy" or "fairly easy" to obtain. ²⁵ The failure of prohibition to reduce cannabis supply is also evidenced by estimates from the US Substance Abuse and Mental Health Services Administration that about 60% of school-aged US youth who use cannabis either obtained their most recently

Figure 5. Estimated price of cannabis in the United States, 1990–2007*



*Prices adjusted for CPI and expressed in 2007 USD Source: US Drug Enforcement Agency STRIDE surveillance system

Figure 6. Annual prevalence of cannabis use among grade 12 students and 19- to 28-year-olds in the United States, 1990–2008



Source: Monitoring the Future Study

used cannabis for free or shared someone else's. 26 Interestingly, rates of cannabis use among American youth do not inversely correlate with levels of funding for cannabis prohibition. Instead, the estimated annual prevalence of cannabis use

among US grade 12 students rose from 27% in 1990 to 32% in 2008, and among 19- to 28-year-olds prevalence of use rose from 26% in 1990 to 29% in 2008 (**Figure 6**).²⁷

"We should consider legalizing the production, distribution and sale of drugs ... [W]e have to see it as a strategy to strike and break the economic structure that allows the mafias to generate huge profits in their business"

Vicente Fox Former President of Mexico



Afghan and US Drug Enforcement Administration (DEA) special agents destroying hashish bunkers as part of Operation Albatross. Spin Boldak, Kandahar province, Afghanistan; June 9, 2008. (Photo courtesy DEA)

UNINTENDED CONSEQUENCES OF CANNABIS PROHIBITION

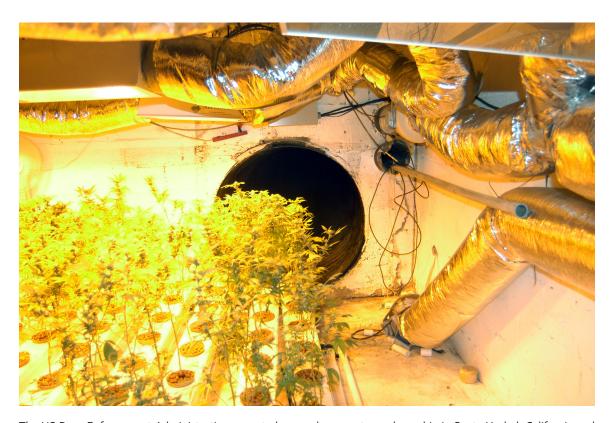
The unintended consequences of cannabis prohibition have been reviewed in detail elsewhere, 28-30 but several points are worthy of reiteration. First, economists have long argued that a key unintended consequence of drug prohibition is its enrichment of organized crime groups. As US economist and Nobel laureate Milton Friedman observed in a 1991 interview on the public television program America's Drug Forum: "If you look at the drug war from a purely economic point of view, the role of the government is to protect the drug cartel." From a global perspective, prohibitions on all presently illegal drugs have resulted in a massive illegal market that the United Nations has estimated is worth \$320 billion. These profits remain entirely outside the control of governments. They fuel crime, violence and corruption in countless communities and have destabilized entire countries such as Colombia, Mexico and Afghanistan. 31, 32 The role of the cannabis trade in these cycles of violence should not be discounted. Afghanistan, for instance, is the globe's largest producer of cannabis resin, and the illegal market for cannabis has an estimated worth of about \$14 billion per year in California alone.³⁰

Similarly, since 2006 when Mexican president Felipe Calderón launched a crackdown on drug trafficking gangs, a drug war has emerged in that nation which has to date resulted in the deaths of approximately 28,000 people.³³ Again, the role of cannabis revenues fuelling this violence should not be discounted. For instance, a US government report once estimated that Mexican drug trafficking organizations derive 60% of their revenue from cannabis transactions.³⁴ Regarding the link between drug law enforcement and violence, a recent systematic review of English language research papers that evaluated the association between drug law enforcement and violence demonstrated that, rather than improving community health and safety, drug prohibition contributes to violence in communities by empowering organized crime groups that use violence to gain or maintain market share of the lucrative drug market.³⁵ This review described a literature indicating that successful law enforcement interventions appear to have the perverse effect of making it more profitable for new suppliers to get involved in the market by removing key players. This may explain why both countries bordering the US—Mexico

"We need at least to consider and examine forms of controlled legalization of drugs."

George Shultz Secretary of State under US President Ronald Reagan and Canada—are experiencing gang violence between groups that supply cannabis to the US market, despite increased emphasis on drug law enforcement.³⁶

The enforcement of cannabis prohibition also contributes to massive social inequity in the US, with Latino and African American communities most adversely affected. According to a recent report,²⁹ the cannabis possession arrest rate for African Americans in Los Angeles county is more than 300% higher than it is for whites. This disparity exists despite government studies suggesting that African Americans use cannabis at lower rates than whites.³⁷



The US Drug Enforcement Administration executed a search warrant on a log cabin in Santa Ysabel, California and discovered a sophisticated indoor marijuana operation consisting of 454 plants that were concealed underground and only accessible by a makeshift elevator and a 65-foot tunnel. Four individuals were arrested and each faced up to 40 years in prison if convicted. April 3, 2007. (Photo courtesy DEA)

DRUG POLICIES' RELATION TO RATES OF CANNABIS USE

While it has been argued that rates of cannabis use would be higher if law enforcement measures were not in place,³⁸ this claim is inconsistent with available scientific evidence indicating that patterns of drug law enforcement are not strongly correlated with rates of cannabis use, and is further refuted by the data presented in this report.³⁹⁻⁴¹ For instance, comparisons between the US and the Netherlands, where cannabis use is *de facto* legalized, indicate that despite the US's record rates of anti-drug enforcement expenditures, the lifetime rate of cannabis use in the US is more than double that observed in the Netherlands (42% compared to 20%).⁴⁰

Similarly, a recent World Health Organization report indicated that country level rates of drug law enforcement and patterns of drug use demonstrate no correlation between the resources devoted to enforcement of drug laws and rates of drug use. 40 It is worth noting that similar patterns exist with respect to other illicit drugs. For instance, despite an estimated \$2.5 trillion spent on the US war on drugs in the last 40 years, the US also has one of the highest lifetime incidences of cocaine use, which, at 16%, is approximately four or more times that of any of the other countries surveyed, including Colombia, Mexico, Belgium, France, Germany, Italy, Netherlands, Spain, Ukraine, Israel, Lebanon, Nigeria, South Africa, Japan, People's Republic of China and New Zealand. 40

Cannabis Decriminalization: In response to the ineffectiveness and recognized harms of strict drug prohibition, several countries, including Portugal, Mexico, Peru, Brazil, Paraguay and Argentina, have instituted varying levels of drug decriminalization. While data are limited, evaluations of decriminalization models suggest that illicit drug use decriminalization is not associated with substantially increased drug use. ^{28, 42, 43} Portugal, for instance, decriminalized all drug use in 2001, and its rates of cannabis use are among the lowest in the European Union. ^{44, 45} However, a limitation of decriminalization models is that, without regulatory controls allowing for limited distribution—as employed for other psychoactive substances such as alcohol and tobacco—organized crime groups continue to exercise control over the cannabis market. ⁴⁶

Cannabis Legalization: There is very little evidence examining the impacts of cannabis legalization on rates of cannabis use or related harm. As noted above, in the Netherlands, where cannabis is de facto legalized and amounts for personal consumption are distributed through licensed coffee shops, rates of cannabis use are lower than in the US.40 However, as has been noted by others,⁴⁷ the proposals for cannabis law reform in California extend beyond the Dutch model, which is limited to regulated distribution to the end consumer (i.e., production remains illegal). Although the authors were cautious to note that there are major uncertainties about the actual impacts if proposed law reforms are passed, a recent hypothetical modelling exercise by the RAND Corporation concluded that cannabis use could increase in California under the proposed legislative changes.⁴⁷

The actual effect of cannabis legalization on rates of use will likely depend on the regulatory mechanisms devised to control both use and availability, as well as the subsequent cultural norms that emerge under a legal framework. 46, 48

While there is limited empirical evidence to draw upon from the cannabis literature, there has been a vast amount of study of the regulatory tools to effectively reduce the harms and rates of use of other substances such as alcohol and tobacco. The potential benefits and types of these regulatory mechanisms for cannabis control have been fully described elsewhere and are briefly summarized in **Tables 1 and 2.**^{46, 49, 50}

In brief, while not all of these regulatory tools may be directly applicable to a regulated market for cannabis, a number of important regulatory mechanisms should be given serious consideration in any locality considering legalizing cannabis sale or use. These include policies in place at some medical cannabis dispensaries and could include permit systems for cannabis users and conditional licensing systems for cannabis dispensaries based

upon adherence to regulatory guidelines. 46,50 Regulations could also include age restrictions, restricting driving or operating machinery while intoxicated, limiting hours of sale and outlet density, restricting bulk sales and limiting potency of legal cannabis. 46, 49-55 Additional regulatory policies worthy of consideration include policies that affect the location or circumstances of use, similar to both tobacco and alcohol regulation as well as the Dutch coffee shop model for cannabis, which are designed to reduce public use.⁵⁰ Strict prohibitions on marketing and product branding could also be used to avoid promotion of cannabis use, 46, 53 and evidence has confirmed the utility of tamper-proof packaging, standard labelling on content and factual health warnings for licit substances.46 Since taxation (i.e., increasing consumer price) has been shown to affect levels

Table 1: Potential benefits of a regulated market for cannabis	
Availability	Regulatory tools can be used in an effort to control availability.50
Drug market violence	By limiting the illegal cannabis market, violence arising from conflict among those involved in cannabis supply will likely be reduced. ³⁵
Organized crime	Limiting the illegal market will reduce a key source of revenue for organized crime groups. ⁵⁹
Law enforcement resources	A regulated market for cannabis creates opportunities for enforcement resources to be redeployed towards improving and maintaining community health and safety. Estimates suggest that national regulation of cannabis in the United States would result in savings of \$44.1 billion per year on enforcement expenditures alone. ³⁰
Tax revenue	Regulating cannabis could create new sources of revenue for governments. The potential new revenue for the state of California is estimated to be between approximately \$990 million and \$1.4 billion annually.60

Table 2: Models and mechanisms for reducing cannabis harms in a regulated market		
Prescription or permit system	Prescriptions or permits could be issued to individual purchasers, similar to systems in place at some medical cannabis dispensaries. 50	
Licensing system	Cannabis dispensaries could be issued conditional licences requiring compliance with regulatory guidelines. 46, 50	
Purchasing controls	Taxation (i.e., increasing consumer price barriers) has been shown to affect levels of alcohol and tobacco use and could be applicable to cannabis. 50-52, 54, 55, 61	
Sales restrictions	Implementing age restrictions, similar to tobacco and alcohol regulations, could limit access to cannabis among youth. 46,51	
	Limiting days and hours of sale of alcohol has been shown to affect levels of alcohol use and could affect rates of cannabis use. 50, 52, 61	
	Alcohol outlet density has been associated with rates of alcohol use and hence limiting cannabis outlet density could limit rates of use. ^{52, 61}	
	Restrictions on bulk sales as employed in the Netherlands, where purchases are restricted to 5 grams, could help restrict diversion to minors. ^{46,50}	
Restrictions on use	Regulatory policies that affect the location or circumstances of use and allow for limited use in designated places, such as the Dutch coffee shop model for cannabis, could limit uncontrolled and "public nuisance" use. 46,50	
	Strict regulations would prohibit driving or operating machinery while impaired. ^{46,61}	
Marketing	Strict regulations on marketing and product branding would reduce exposure to advertising, which is known to affect rates of alcohol and tobacco use. ^{46,53}	
Packaging	Tamper-proof packaging, standard labelling on content, factual health warnings, and no on-pack branding or marketing would help regulate cannabis use. 46	
Reducing harm	Regulated and controlled availability of lesser-strength substances reduces the illegal market for and use of higher potency substances, as has occurred with the regulation of alcohol. ⁵⁰	
	Opportunities should be explored to change patterns of use towards non- smoked cannabis. 62, 63	

of alcohol and tobacco use, the price of cannabis could also be kept as high as possible to limit use, but low enough to avoid incentivizing an illegal market. 49-55

While comparisons to the regulated supply of alcohol and tobacco are useful, it is important to stress that the regulatory controls placed on these substances vary widely in different regions, and most US states - based on best available evidence - do not implement optimally health focussed systems for alcohol and tobacco regulation. Instead, the interests of the tobacco and alcohol industries have commonly trumped the public health interests of maintaining high prices, reducing advertising and promotion, and fully incorporating the effective regulatory controls described above.^{53, 56}

Given the clear ineffectiveness of US cannabis prohibition, as evidenced by data collected by the US federal government, some consideration must be given as to why these policies have remained in place. One barrier to reform may be public support for cannabis prohibition, which makes debate about alternative regulatory frameworks very controversial.⁵⁷ In this respect, it is noteworthy that the substantial US federal anti-drug budget has allowed for a longstanding public education campaign targeted towards maintaining public support for cannabis prohibition. Of concern, the United States Government Accountability Office has reported that some of the media produced by the Office of National Drug Control Policy violated US domestic propaganda prohibitions for several years.⁵⁸ Prohibition is also in the interest of law enforcement agencies involved in executing prohibition schemes, as it provides them with massive and increasing resource flows. Obviously, optimizing cannabis control policies will require that the public have access to factual information about the limitations and harms of cannabis prohibition. This report seeks to serve that purpose.

"A Prohibition law strikes a blow at the very principles upon which our government was founded."

> US President Abraham Lincoln Speaking to the Illinois House of Representatives December 18, 1840

LIMITATIONS

While some data in this report (e.g., arrest and seizures) accurately reflect the relevant law enforcement statistics, other data are based on estimates derived from non-random samples (e.g., price and potency estimates) and therefore may not perfectly reflect annual averages, which are likely to vary from state to state. Further, while there is a body of scientific evidence demonstrating many potential harms of cannabis use, there is

also an emerging literature documenting various medicinal applications of cannabis. This literature is beyond the scope of this report which is focussed on policies related to recreational cannabis use. Finally, the data for the US federal anti-drug budget as reported by the US Office of National Drug Control Policy were truncated at 2002 because of changes in reporting of the budget.

"[M]arijuana prohibition has done far more harm to far more people than marijuana ever could."

William F. Buckley, Jr. US conservative author and commentator

SUMMARY

Increased funding for cannabis prohibition has increased cannabis seizures and arrests, but the assumption that this reduces cannabis potency, increases price or meaningfully reduces availability or use is inconsistent with surveillance data the US federal government has itself collected. On the contrary, the falling prices imply that supply is increasing faster than demand. Given that cannabis prohibition has clearly failed to achieve its stated objectives and has also resulted in a range of serious unintended harms, regulatory models should be given urgent consideration, both in the United States and in other settings. In light of the widespread and often free availability of cannabis that exists despite aggressive criminal justice

measures, it may be incorrect to assume that the legal regulation of cannabis production supply and use—if responsibly developed, implemented and enforced by appropriate authorities—will result in increased cannabis use or an overall increase in cannabis-related harms, since there are a range of mechanisms that could contribute to reduced cannabis use in this context. However, successfully reducing rates of cannabis-related harm will likely require the implementation of strict regulatory mechanisms which are associated with reducing the harms of other legal substances and are too commonly underutilized in the areas of tobacco and alcohol control.

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REFERENCES

- United Nations Office on Drugs and Crime. World Drug Report 2010 (United Nations publication, sales no. E.10.XI.13). 2010.
- Hall W, Degenhardt L. Adverse health effects of non-medical cannabis use. Lancet. 2009; 374(9698): 1383-91.
- 3. McLaren JA, Silins E, Hutchinson D, Mattick RP, Hall W. Assessing evidence for a causal link between cannabis and psychosis: a review of cohort studies. International Journal of Drug Policy. 2010; 21(1): 10-9.
- 4. Tan WC, Lo C, Jong A, Xing L, FitzGerald MJ, Vollmer WM, et al. Marijuana and chronic obstructive lung disease: a population-based study. Canadian Medical Association Journal. 2009; 180(8): 814.
- 5. Hart CL, Ilan AB, Gevins A, Gunderson EW, Role K, Colley J, et al. Neurophysiological and cognitive effects of smoked marijuana in frequent users. Pharmacology, Biochemistry, and Behavior. 2010; 96(3): 333-41.
- Hall W. The adverse health effects of cannabis use: what are they, and what are their implications for policy? International Journal of Drug Policy. 2009; 20(6): 458-66.
- 7. Taylor DR, Poulton R, Moffitt TE, Ramankutty P, Sears MR. The respiratory effects of cannabis dependence in young adults. Addiction. 2000; 95(11): 1669-77.
- 8. Aldington S, Williams M, Nowitz M, Weatherall M, Pritchard A, McNaughton A, et al. Effects of cannabis on pulmonary structure, function and symptoms. Thorax. 2007; 62(12): 1058-63. Erratum in: Thorax. 2008; 63(4): 385.
- Han B, Gfroerer JC, Colliver JD. Associations between duration of illicit drug use and health conditions: results from the 2005–2007 national surveys on drug use and health. Annals of Epidemiology. 2010; 20(4): 289-97.
- 10. Moore THM, Zammit S, Lingford-Hughes A, Barnes TRE, Jones PB, Burke M, et al. Cannabis use and risk of psychotic or affective mental health outcomes: a systematic review. Lancet. 2007; 370(9584): 319-28.

- 11. Cheung JTW, Mann RE, Ialomiteanu A, Stoduto G, Chan V, Ala-Leppilampi K, et al. Anxiety and mood disorders and cannabis use. American Journal of Drug and Alcohol Abuse. 2010; 36(2): 118-22.
- 12. Nutt D, King LA, Saulsbury W, Blakemore C. Development of a rational scale to assess the harm of drugs of potential misuse. Lancet. 2007; 369(9566): 1047-53.
- Ellingwood K. Mexico death toll in drug war higher than previously reported. Los Angeles Times. April 14, 2010.
- 14. Castaneda JG. What's Spanish for quagmire? Five myths that caused the failed war next door. Foreign Policy. Jan/Feb 2010. http://www.foreignpolicy.com/articles/2010/01/04/whats_spanish_for_quagmire
- 15. Royal Canadian Mounted Police. Drug Situation in Canada 1998–2003. http://www.rcmp-grc.gc.ca/drugs-drogues/index-eng.htm.
- Library of Congress. Marijuana availability in the United States and its associated territories. http:// www.loc.gov/rr/frd/pdf-files/MarAvail.pdf.
- 17. United States Government Accountability Office. Contractor's national evaluation did not find that the youth anti-drug media campaign was effective in reducing youth drug use. http://www.gao.gov/new.items/d06818.pdf.
- 18. Fishbein M, Hall-Jamieson K, Zimmer E, von Haeften I, Nabi R. Avoiding the boomerang: testing the relative effectiveness of antidrug public service announcements before a national campaign. American Journal of Public Health. 2002; 92(2): 238-45.
- 19. West SL, O'Neal KK. Project D.A.R.E. outcome effectiveness revisited. American Journal of Public Health. 2004; 94(6): 1027-9.
- Borland S. Legalize heroin and cocaine to cut crime and improve health, top doctor says. Daily Mail. August 17, 2010.
- 21. Wood E, Werb D, Kazatchkine M, Kerr T, Hankins C, Gorna R, et al. Vienna Declaration: a call for evidence-based drug policies. Lancet. 2010; 376(9738): 310-2.

- Kilmer B, Caulkins JP, Pacula RL, MacCoun R, Reuter PH. Altered state? Assessing how marijuana legalization in California could influence marijuana consumption and public budgets. Santa Monica: RAND Corporation; 2010.
- 23. US National Institutes on Drug Abuse. Quarterly Report. Potency Monitoring Project Report 104. December 16, 2008 thru March 15, 2009. http://www.whitehousedrugpolicy.gov/publications/pdf/mpmp_report_104.pdf.
- 24. Institute for Defence Analysis. The price and purity of illicit drugs: 1981–2007. http://www.whitehousedrugpolicy.gov/publications/price_purity/price_purity07.pdf.
- Johnston LD, O'Malley PM, Bachman JG, Schulenberg JE. Monitoring the future: national survey results on drug use, 1975-2005. Volume I. Secondary school students (NIH publication no. 06-5883). Bethesda, MD: National Institute on Drug Abuse.
- 26. Office of Applied Studies. Results from the 2002 national survey on drug use and health: national findings (DHHS publication no. SMA 03–3836, NHSDA series H–22). Rockville, MD: Substance Abuse and Mental Health Services Administration; 2003. http://www.oas.samhsa.gov/2k4/MJsource/MJsource.htm.
- Monitoring the future: a continuing study of American youth. http://monitoringthefuture.org/ data/data.html.
- 28. MacCoun R, Reuter P. Evaluating alternative cannabis regimes. British Journal of Psychiatry. 2001; 178(2): 123.
- 29. Levine HG, Gettman JB, Siegel L. Targeting blacks for marijuana: possession arrests of African Americans in California, 2004–2008. Drug Policy Alliance, LA. June 2010.
- Miron JA. The budgetary implications of marijuana prohibition. Cambridge: Harvard University; 2008.
- 31. World Drug Report 2005. Vienna: United Nations Office on Drugs and Crime; 2005.
- Thoumi FE. Illegal drugs, economy, and society in the Andes. Washington, DC: Woodrow Wilson Center Press; 2003.

- Tuckman J. Mexico looks to legalization as drug war murders hit 28,000. The Guardian. August 4, 2010. http://www.guardian.co.uk/ world/2010/aug/04/mexico-legalisation-debatedrug-war.
- 34. Office of National Drug Control Policy. ONDCP statement on Mexican drug trafficking organization profits from marijuana. http://www.ondcp.gov/news/press10/MJrevenue.pdf.
- Werb D, Rowell G, Guyatt G, Kerr T, Montaner J, Wood E. Effect of drug law enforcement on drug related violence: evidence from a scientific review. Vancouver: International Centre for Science in Drug Policy; 2010.
- Diebel L. How Mexico's drug war washed up on Canada's West Coast. Toronto Star. March 4, 2009.
- 37. United States Department of Health and Human Services, Office of Applied Studies. National survey on drug use and health, 2002–2007.
- 38. Administration UDE. Fact 6: Legalization of drugs will lead to increased use and increased levels of addiction. Legalization has been tried before, and failed miserably.
- Korf DJ. Dutch coffee shops and trends in cannabis use. Addictive Behaviors. 2002; 27(6): 851-66.
- Degenhardt L, Chiu WT, Sampson N, Kessler RC, Anthony JC, Angermeyer M, et al. Toward a global view of alcohol, tobacco, cannabis, and cocaine use: findings from the WHO World Mental Health Surveys. PLoS Medicine. 2008; 5(7): e141.
- 41. Basov S, Jacobson M, Miron JA. Prohibition and the market for illegal drugs. World Economics. 2001; 2(4): 133-57.
- 42. Simons-Morton B, Pickett W, Boyce W, ter Bogt TFM, Vollebergh W. Cross-national comparison of adolescent drinking and cannabis use in the United States, Canada, and the Netherlands. International Journal of Drug Policy. 2010; 21(1): 64-9.
- 43. van den Brink W. Forum: Decriminalization of cannabis. Current Opinion in Psychiatry. 2008; 21(2): 122-6.

- 44. Hughes C, Stevens A. What can we learn from the Portuguese decriminalization of illicit drugs? British Journal of Criminology. http://bjc.oxfordjournals.org/content/early/2010/07/21/bjc.azq038.
- Vale de Andrade P, Carapinha L. Drug decriminalisation in Portugal. British Medical Journal. 2010; 341: c4554.
- Rolles S. After the war on drugs: blueprint for regulation. Transform Drug Policy Foundation. 2009.
- Kilmer B, Caulkins JP, Pacula RL, MacCoun RJ, Reuter PH. Altered state? Assessing how marijuana legalization in California could influence marijuana consumption and public budgets. RAND Drug Policy Research Centre. 2009.
- 48. Reuter P. Ten years after the United Nations General Assembly Special Session (UNGASS): assessing drug problems, policies and reform proposals. Addiction. 2009; 104(4): 510-7.
- Room R, Fischer B, Hall W, Lenton S, Reuter P. Cannabis policy: moving beyond stalemate. Oxford: Oxford University Press; 2010.
- 50. Room R. In thinking about cannabis policy, what can be learned from alcohol and tobacco? In: A cannabis reader: global issues and local experiences, Monograph series 8, Volume 1, European Monitoring Centre for Drugs and Drug Addiction, Lisbon. 2008.
- 51. Lewit E, Hyland A, Kerrebrock N, Cummings K. Price, public policy, and smoking in young people. Tobacco Control. 1997; 6 Suppl 2: S17-24.
- 52. Room R, Babor T, Rehm J. Alcohol and public health. Lancet. 2005; 365: 519-30.
- 53. Anderson P, De Bruijn A, Angus K, Gordon R, Hastings G. Impact of alcohol advertising and media exposure on adolescent alcohol use: a systematic review of longitudinal studies. Alcohol and Alcoholism. 2009; 44(3): 229-43.
- 54. Emont S, Choi W, Novotny T, Giovino G. Clean indoor air legislation, taxation and smoking behaviour in the United States: an ecological analysis. Tobacco Control. 1992;2: 13-7.

- 55. Levy D, Chaloupka F, Gitchell J. The effects of tobacco control policies on smoking rates: a tobacco control scorecard. Journal of Public Health Management and Practice. 2004; 10(4): 338-53.
- 56. Wellman RJ, Sugarman DB, DiFranza JR, Winickoff JP. The extent to which tobacco marketing and tobacco use in films contribute to children's use of tobacco: a meta-analysis. Archives of Pediatrics & Adolescent Medicine. 2006; 160(12): 1285-96.
- Schwarzenegger welcomes debate over legalizing pot. Reuters News. May 6, 2008. http://www. reuters.com/article/idUSTRE54503R20090506.
- US Government Accountability Office. B-30349. January 4, 2005. http://www.gao.gov/decisions/appro/303495.htm.
- 59. Levitt SD, Venkatesh SA. An economic analysis of a drug-selling gang's finances. Quarterly Journal of Economics. 2000; 115(3): 755-89.
- Ingenito R. Prepared testimony of Robert Ingenito. Sacramento: California State Board of Equalization; 2009.
- 61. Anderson PW, Chisholm D, Fuhr DC. Effectiveness and cost-effectiveness of policies and programmes to reduce the harm caused by alcohol. Lancet. 2009; 373(9682): 2234-46.
- 62. Abrams DI, Vizoso HP, Shade SB, Jay C, Kelly ME, Benowitz NL. Vaporization as a smokeless cannabis delivery system: a pilot study. Clinical Pharmacology and Therapeutics. 2007; 82(5): 572-8.
- 63. Van Dam NT, Earleywine M. Pulmonary function in cannabis users: support for a clinical trial of the vaporizer. International Journal of Drug Policy. 2010 May 5 [Epub ahead of print].