

Assessing Drug Prohibition and Its Alternatives: A Guide for Agnostics

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Abstract

For decades, the debate over the merits of ending drug prohibition has carried on with little consequence. The recent near success of a cannabis legalization initiative in California suggests that citizens and politicians alike are more receptive to calls for change. We review basic research on deterrence and prices as well as emerging evidence on the potential empirical consequences of various alternatives to full prohibition, including depenalization, tolerated home cultivation, prescription regimes for cannabis and heroin, and retail sales of cannabis in Dutch coffee shops. The results are encouraging for advocates of these specific reforms, but the cases are inadequate for addressing the potentially more dramatic effects of full-scale commercial markets. The fundamental dilemma is that full legalization will probably reduce average harm per use but increase total consumption; the net effect of these two changes is difficult to project.

INTRODUCTION

A decade ago, our book *Drug War Heresies: Learning from Other Vices, Times, and Places* (MacCoun & Reuter 2001) offered a comprehensive and critical review of various lines of evidence on the empirical question: What would happen if drugs were legalized in the United States? Since 2001, prospects for the legalization of cocaine or heroin seem at least as remote, yet a statewide ballot proposition nearly legalized cannabis in California in 2010. There is now a great deal more evidence on some case studies we examined in that book: Dutch retail cannabis sales, Australian and Alaskan home cultivation, and European heroin maintenance. Most of this new evidence, which we review here, suggests that these changes have produced little or no increase in drug consumption, with probable reductions in drug-related harm. This is encouraging for those of us who believe that there are less costly, less intrusive, and more humane ways of conducting U.S. drug control policy.

Then why do we subtitle this essay “A Guide for Agnostics”? Many readers complained that the title of our 2001 book, *Drug War Heresies*, promised more radical views than it delivered. What we failed to convey was that the title referred to our view that the legalization debate was conducted like a holy war, with true believers on each side denouncing anything that challenged their received dogma. Our own position, then and now, was agnosticism. At least one survey (Thornton 1995) showed that most professional economists endorse legalization as a superior alternative to prohibition, and in our experience this is also the view of many if not most sociolegal scholars we meet. Some readers may hold a strict deontological position mandating prohibition (legal moralism) or legalization (libertarianism), but we suspect most of our readers (like most commentators in the debate) are consequentialists, for whom the merits of legalization hinge on empirical questions. And our challenge in this review is to convince the reader that the question is genuinely hard, that it is hard in

intellectually interesting ways, and that the limited innovations we examine fall well short of allowing projections of what would happen under a full-scale legal commercial market for cannabis, cocaine, or heroin. The possibility that legalization would worsen global well-being is not one that can be dismissed.

WHY THE LEGALIZATION QUESTION IS GENUINELY HARD

There is a vast literature—indeed, many different literatures—on psychoactive drugs and their consequences. Yet remarkably little empirical work directly informs the legalization question. Critics of prohibition who are quick to appeal to John Stuart Mill’s “harm principle” (counseling against the legislation of harms to self) are far less likely to recognize the importance of his “method of difference” (the notion that induction requires comparison across cases with and without the putative cause). Evidence on the costs and follies of drug prohibition tells us little about what life would be like in its absence; a counterfactual is needed. Empirical analysis of the policy choice requires variance in the independent variable, yet most drug studies hold policies constant or at best examine marginal changes in the intensity of prohibition’s enforcement (e.g., Benson & Rasmussen 1991). In a series of previous publications (MacCoun 1998, MacCoun & Reuter 2001, MacCoun et al. 1996), we developed a set of analytic principles for assessing and comparing drug prohibition and its alternatives. These are not methodological desiderata—though appropriate measurement and causal identification are obviously important—but rather theoretical arguments about the plausible policy space and the complex interplay between policies, consumption, and drug-related harms.

The Policy Space

The policy space for alternative legal regimes is far larger and more multidimensional than categorical terms such as “decriminalization” and “legalization” imply (MacCoun et al. 1996).

Law can determine what is prohibited (consumption versus possession versus sales and manufacture), who is exempt from the prohibition (adults, patients, license holders), where and when drugs may be sold or used, and what form those drugs may take. The severity of statutory penalties and the intensity of law enforcement form two dimensions of the policy space, but we argue that they are not the most crucial factors. More consequential is the spectrum of alternative ways of permitting access to a drug, ranging from strict prohibition to medical and prescription regimes to licensing schemes, home cultivation, or retail sales. How the drug is produced (regulated private cultivation and refining or state monopoly) is yet another important dimension of variation. In recent decades, industrial nations have only tested small corners of this large, multidimensional surface, including depenalization, medical marijuana, government heroin maintenance, tolerated home cultivation, and the de facto legalization of retail sales. No country has created a regime that allows ready access to a general user population and legal production of any of the major drugs, except, of course, for tobacco and alcohol. We discuss the latter cases in more detail in our 2001 book and draw on them in a limited way here.

The Trade-Off Between Controlling Use and Controlling Harms

In the United States, drug-war rhetoric has been preoccupied with prevalence; until recently, the national drug control strategy of the Office of National Drug Control Policy was framed almost exclusively in terms of reducing the prevalence of use (number of past-year users, number of past-month users, etc.) (e.g., ONDCP 2007, p. 1). Yet a content analysis (MacCoun & Reuter 2001) shows that both sides in the legalization debate defend their positions by appealing to the enormous social and economic costs associated with psychoactive drugs. One side attributes drug-related harm to the drugs themselves; the other emphasizes the ways in which prohibition

makes drugs more harmful. Both sides are correct. The mere fact of a drug's legal status has symbolic consequences: The very existence of prohibition violates the value of personal liberty, whereas the very existence of legal drug sales offends other people's sensibilities. But in general, most of the harms of drug use, and of drug prohibition, vary with the prevalence, frequency, and intensity of drug consumption, which highlights the fundamental dilemma of drug policy: Total drug-related harm = Harmfulness (average harm per dose) × Prevalence (number of users) × Intensity (number of doses per user). This in turn suggests three distinct goals for drug policy: prevalence reduction (reducing the number of users), quantity reduction (reducing the amount users consume), and harm reduction (reducing the harmfulness of each incident of use). American drug policy—in its rhetoric, budgeting, and implementation—prioritizes prevalence reduction over quantity reduction and quantity reduction over harm reduction. (Alcohol policy nearly reverses these priorities.) European drug policy offers a more balanced mix. These policy goals are not mutually exclusive; analytically, they are best seen as components of an overarching goal of reducing total drug-related harm. But as we discuss below, the components can definitely come into conflict. And therein lies the case for agnosticism about drug legalization: Legalization of cannabis, cocaine, or heroin is likely to substantially reduce the average harm per dose of the drug. But legalization is also likely to significantly increase the number of those doses. And there is no firm basis for projecting the net effect on total drug-related harm because of the complexity of the policy-use-harm nexus. Ultimately, each of us will differ in how we weigh these various harms and their distributions, as well as our standard of proof and our sense of which side—the status quo or the reform movement—bears the burden of proof.

Harms and Their Sources

MacCoun et al. (1996) offered a lengthy taxonomy of types of drug-related harms, including

health, social functioning, public safety, criminal justice, and more abstract symbolic concerns. Only some are routinely measured; some would be difficult to quantify, even in principle. The taxonomy classified each harm by whether (in the authors' collective judgment) it is primarily caused by the psychoactive properties of a drug versus the consequences of the drug's prohibited status. Those judgments are suggestive, not conclusive, but in many cases there is relevant evidence. One example is Goldstein et al.'s (1992) careful analysis of drug- and alcohol-related homicides in New York City in 1984 and 1988; they showed that although psychopharmacological violence due to the substance itself played a significant role in alcohol incidents, a sizeable fraction of cocaine-related deaths was more plausibly attributable to either economic-compulsive violence (when addicts committed income-generating crimes to finance their use) or systemic violence involving disputes among dealers and/or customers. (See MacCoun et al. 2003 for a review of additional evidence.) Another example is the sizeable empirical literature linking syringe illegality (Riley et al. 2010) and drug enforcement itself (Friedman et al. 2006) to needle sharing and HIV transmission.

The Distributions of Consumption and Harms

Further complications arise because of the statistical properties of consumption and associated harms. As for many behavioral outcomes, the distribution of total consumption across users is lognormal with considerable positive skew, so even if most users are modest users, a disproportionate share of all consumption is due to the heavy users in the right tail (see Manski et al. 2001, Skog 2006). Whether these users account for the majority of total harm is a trickier question: They may be disproportionately hazardous in their behavior, but they are also outnumbered by moderate users. We have hypothesized that, at the margin, those who would initiate drug use under legalization but not under prohibition are likely to be

more cautious than the typical user. Thus, the average user under legalization seems likely to be a safer user. But it also depends on the shape of the dose-response functions for various harms (e.g., the risk of dependence, overdose, or a fatal traffic accident). They are probably nonlinear and S-shaped, so the contribution of moderate users to total harm will be greater when the inflection point occurs at modest doses than when it occurs at high doses.

Other distributional issues involve social rather than behavioral metrics. For some types of harms, the primary bearers of the harm are the users themselves, but other types of harms pose considerable externalities for users' intimates (family, neighbors), bystanders, or taxpayers at large. The harms of drug use under drug prohibition are also disproportionately borne by the poor and by people of color—far more so than one might predict based on the minimal differences across ethnic groups in the prevalence of use. Although racism, on the part of both police and legislators, may play some role (see Mauer & King 2007, Tonry 1995), the problem seems overdetermined, with other factors playing a significant role, including limited social capital, neighborhood disorganization, and path dependence (see Sampson et al. 2005, Saxe et al. 2001).

EFFECTS OF LEGAL SANCTIONS

Considerable research has focused on the effects of arrests and incarceration on drug use and availability. For both methodological and data availability reasons, such research is inconclusive.

Deterrence and Incapacitation

In theory, drug law enforcement should reduce consumption through multiple mechanisms. One is deterrence. Intense enforcement can increase the certainty of sanctioning as well as its severity. A now-sizeable body of research using various aggregate- and individual-level methods converges on conclusions that would

hardly surprise Jeremy Bentham or Cesare Beccaria: The certainty of sanctions has a modest but reliable effect on offending, and any effects of the severity of sanctioning are fleeting and unreliable (Durlauf & Nagin 2011). A meta-analysis by Pratt and colleagues (2006) estimated average effects on self-reporting of use of -0.171 for certainty ($n = 107$ estimates) and -0.049 for severity ($n = 47$ estimates), respectively.

The effectiveness of deterrence is weakened by various cognitive biases (MacCoun 1993), “enforcement swamping” (the reduced per-crime police capacity as crime rates rise; Kleiman 1993), and “stigma swamping” (the reduction in shaming that occurs when more people have been sanctioned; Caulkins & MacCoun 2003). MacCoun (1993) cautioned that modest marginal deterrent effects within a prohibition regime may understate the deterrent impact at the boundary between prohibition and legality.

In theory, drug enforcement can also reduce crime through the incapacitating effects of prison. Incapacitation effects seem most plausible for economic-compulsive crimes committed by addicts to finance their drug use; incarcerating a frequent drug user does not create a niche for another. But incapacitation is notoriously ineffective at stopping drug use within prisons, and it fails to eliminate drug selling because of an apparent replacement effect in which others take over the convicted seller’s market niche (Piquero & Blumstein 2007, Saner et al. 1995).

Effects of Enforcement Intensity

Benson & Rasmussen (1991) found that drug arrest rates in Florida counties were associated with increases in property crime, which they attributed to the reallocation of traditional enforcement resources toward drug crimes. Shepard & Blackley (2005) reported similar findings for New York State. Miron (1999) regressed U.S. homicide rates for the years 1900 to 1995 onto a vector of control variables (the age composition of the population, unemployment, per capita income, execution

and incarceration rates, and gun ownership), as well as an index representing alcohol and drug enforcement expenditures. He found that enforcement was associated with greater violence, concluding that “the homicide rate is currently 25%–75% higher than it would be in the absence of drug prohibition” (Miron 1999, p. 79). In contrast, Kuziemko & Levitt (2004) attempted to estimate the effects of the 15-fold increase in state and federal incarceration for drug offenses between 1980 and 2000. They concluded that it probably reduced property and violent crime by 1–3%. Nevertheless, they argued that this massive intervention would probably fail a serious cost-benefit test. Like Benson & Rasmussen (1991), Kuziemko & Levitt argued that drug enforcement probably crowds out enforcement aimed at violence and property crimes. Despite heroic efforts by these authors, all four studies suffer from daunting causal identification problems, and none of them is truly convincing. But as Miron (1999) argued, at the very least such evidence challenges the government’s presumption that aggressive drug enforcement is crucial for public safety.

Cannabis Decriminalization

Between 1973 and 1978, a dozen states eliminated prison as a possible sanction for the first-time possession of small quantities of cannabis. Various cross-sectional and longitudinal studies in the 1970s and 1980s were unable to detect any reliable association between this policy change and self-report measures of cannabis use (see Johnston et al. 1981, Single 1989). Studies of similar policy changes in Australia (e.g., Donnelly et al. 2000) and Western Europe (e.g., Schafer & Paoli 2006 for Germany; Hughes & Stevenson 2010 for Portugal) raised similar doubts about the impact of marijuana sanctions (see MacCoun & Reuter 1997, 2001; Pacula et al. 2005). But several more elaborate econometric analyses, using data from the 1980s and 1990s, suggested that these laws were associated with small but significant increases in use (for a review, see Pacula et al. 2005).

Two more recent lines of evidence raise serious questions about the nature of these effects, and indeed about the very meaning of the term “decriminalization.” First, Pacula and colleagues (2005) showed that between 1991 and 2000, a dichotomous “decriminalization” indicator failed to accurately characterize actual differences in sanctioning across states; many so-called decriminalization states had arrest rates above the national average, and few possession arrests in nondecriminalization states resulted in terms of incarceration. Indeed, Caulkins & Sevigny (2005) found that there were only between 800 and 2,300 inmates in prison for marijuana possession in the nation; there are probably substantially larger numbers serving short sentences in local jails, often pretrial. Across all substances, Caulkins & Sevigny estimated that “[f]or only 2% of imprisoned drug-law violators was there no reason whatsoever to suspect possible involvement in distribution” (p. 411).

Second, MacCoun et al. (2009) examined citizens’ beliefs about the maximum penalty for marijuana possession in their state, from national surveys conducted in 1977, 1980, and the years 2001–2003. The early surveys suggest that citizens were well aware of their state’s decriminalization status. Citizens in nondecriminalization states were considerably more likely to believe that a jail sentence was a possible sanction, and this belief became significantly less common in states that decriminalized between 1977 and 1980. But in the 2001–2003 surveys, citizens in decriminalization states were only about 29% more likely to know that the maximum penalty for first-time possession is a fine or probation rather than jail. About one-third of citizens in each type of state believed that the maximum penalty is a jail sentence, and another third said “don’t know.” MacCoun et al. concluded that “[p]eople are not oblivious to their marijuana laws, but the average citizen’s awareness is pretty tenuous” (p. 367).

PRICES AND SUPPLY

Legal markets obviously facilitate ease of access to a product. The alcohol literature

establishes clearly that geographic proximity to alcohol outlets is a powerful predictor of consumption (Babor et al. 2010a). But prices play a powerful independent role in alcohol consumption (Cook 2007) and in shaping drug use. The mid-twentieth-century stereotype of the dope fiend enslaved to the drug has given way to a much more nuanced view of addictive drug use. First, of course, not all users can be characterized as addicts—there are “chippers” who dabble in occasional use. Second, even heavy regular users are far from routine in their dosage patterns, and they will adjust their use in response to environmental constraints and incentives (Degenhardt et al. 2005, Higgins et al. 2000, Hser et al. 2001). Thus, drug consumption (like most commodities) is sensitive to variations in price. The price elasticity of demand—the percentage reduction in demand for a 1% increase in price—is about -0.5 for alcohol, tobacco, and marijuana (Gallet 2007, Gallet & List 2003, Kilmer et al. 2010, Wagenaar et al. 2009). For cocaine and heroin, where estimation is more problematic because of the hidden nature of the user population (Manski et al. 2001), the estimates show great range. Caulkins (2001) reported elasticities in the -0.8 to -1.5 range, whereas Dave (2008), using data on drug use among arrestees, estimated short-run elasticities of -0.17 for cocaine and of -0.09 for heroin, with long-run elasticities about twice as large.

These latter estimates show less price sensitivity than we see for typical legal consumer products but enough that price is likely to be an important determinant of drug consumption. Prices may have more influence on users than do sanctions because they are certain to be incurred (short of gifts and thefts) and they must be paid before the drug is obtained.

Street-level enforcement, border interdiction, and source-country controls are all intended to raise drug prices in order to discourage use. They appear to be spectacularly ineffective at achieving this goal (Rydell & Everingham 1994, Weatherburn & Lind 1997). Between 1981 and 2000, U.S. cocaine and heroin prices dropped by 76% and 91%,

respectively (Fries et al. 2008), while the number of people incarcerated for drug law offenses more than doubled (Caulkins & Reuter 2010). (Prices also dropped in other countries with no comparable incarceration boom; Costa Storti & De Grauwe 2009.) But to assess the legalization question, the relevant parameter is not the average price or the marginal effect of enforcement on price, but rather the likely price under a plausible legally regulated market. Here, the standard prediction (Reuter & Kleiman 1986) is that drug prohibition drives up the price due to production inefficiencies and the premium that sellers demand for incurring the risks of incarceration, asset forfeitures, and violence. Miron (2003) disputes this logic, arguing that legal heroin or cocaine would be more analogous to high-end Starbucks espresso (with its enormous price markup) than to beans bought in a grocery store. But consider the market for bootleg rock records, a far less risky enterprise than drug supply. A bootleg 1975 Paris concert by Robert Fripp and Brian Eno sold for \$59.95 in the pre-Napster 1990s and in vinyl sells today for 136.26€ (approximately \$195.00); the same concert is now available legitimately in a professionally remastered format for just \$12.95.¹

Technology is one way of greatly reducing production costs; legalization is another—and it facilitates technological advances. Kilmer et al. (2010) estimated that the legalization of cannabis under California's Proposition 19 would have reduced the pretax retail price by 80% or more. This projection partly reflects reduced legal risks, but also the enormous economies of scale that are possible if cannabis is produced in the kinds of greenhouse operations that legalization would permit. And this is conservative because it assumes continued federal risk from the Drug Enforcement Administration; even greater economies would be realized if producers could engage in open farming.

With price elasticities for cannabis of -0.50 or greater, legalization could clearly lead to steep increases in consumption. But the sheer magnitude of the price drop makes forecasting difficult. We know little about the properties of the demand curve for illicit drugs. Under modest price variations, it is difficult to empirically distinguish two very different models: a linear model ($Y = a + bX$, where Y is demand and X is price), or a power-law model that implies constant elasticity at all price levels ($Y = aX^b$). But under a price swing of 80%, these models make starkly different predictions. Under a base-case set of assumptions, Kilmer et al. (2010) estimated that cannabis legalization could increase consumption by 75% under the linear model but 150–200% under the constant-elasticity-of-demand model. It can be difficult to conclusively distinguish such models even in controlled psychophysics experiments, and it is even more difficult to do so for a real-world policy intervention in which price sensitivity is only one of a host of factors influencing response. For example, Mäkelä and colleagues (2008) examined changes in alcohol consumption after steep price reductions (due to changing tax and import policies) in Denmark, Finland, and Sweden circa 2004. They found much less of an impact than either model would have predicted using recent elasticity estimates. They speculate that social norms and lifestyles created a saturation effect that dampened responses to the new prices.

In theory, any drop in prices under legalization might be offset by appropriately calibrated taxes on the newly legal sales. MacCoun & Reuter (2001) review evidence for the difficulty of sustaining such “sin taxes” in the face of highly organized tobacco and alcohol industries. Kilmer et al. (2010) discuss the enormous difficulty of using taxes to offset an 80% price drop, especially if local jurisdictions engage in a “race to the bottom” in an attempt to attract tax revenues. (This is less likely to be a problem under a statewide or federal taxation scheme.) And if a tax is sufficiently steep, the illicit market can possibly undercut it and still remain profitable. Indeed, the California Board of Equalization

¹See <http://www.cdandlp.com/artist/0-0-0/2/1/fripp-eno.html> and <http://www.dgmlive.com/archive.htm?artist=20&show=1340>, accessed January 15, 2011.

(1999) estimated that as much as one-quarter of all tobacco sales in California evade taxes. When Canada raised its cigarette taxes to \$3 per pack in the early 1990s, smuggling was so pervasive that the government reversed itself and drastically reduced the tax rate (Joossens & Raw 2000).

EFFECTS OF LEGAL ACCESS TO PSYCHOACTIVE DRUGS

Not only is legalization likely to lead to large reductions in price of cocaine, heroin, and marijuana, but it also changes availability in important ways. Much can be learned from alcohol, legally available in Western countries, and from the limited experience with regimes that have minimal penalties for home cultivation of cannabis.

Alcohol Prohibition and Changes in the Drinking Age

The alcohol literature is vast and is a potent resource for understanding the effects of various regulatory schemes for influencing alcohol consumption and drinking behaviors (see Babor et al. 2010a, Cook 2007). These topics are well documented elsewhere, and we merely summarize the punch lines and point the reader toward relevant sources. Data on alcohol consumption and its effects under the U.S. prohibition of alcohol, and the early days following its repeal, are scarce, and recent discussions differ in nuance but concur on the key point: Prohibition almost certainly reduced alcohol consumption, at least in its early years, and it promoted organized crime (Dills et al. 2005, Hall 2010, Miron & Zweibel 1991).

A more recent case of changing legal access involves increases in the legal minimum drinking age (usually from 18 to 21 years). These are a form of partial prohibition because those who were once able to purchase legally can no longer do so. Although the effects of creating a prohibition and ending a prohibition may not be symmetrical, the drinking age

literature provides another real-world check on our order-of-magnitude estimates. Estimates of the effect of the raised age requirement on consumption and traffic fatalities are each in the 5% to 30% range (see Carpenter & Dobkin 2009, Wagenaar & Toomey's 2002).

Decriminalized Home Cultivation of Cannabis

Decriminalized home cultivation of cannabis for personal use but not sale is partially analogous to full-scale legalization; it increases the potential access to cannabis, reduces legal risks, and probably reduces stigma and forbidden fruit effects. It conceivably has lowered prices, though the effect may be modest for the small quantities permitted in the cases examined here.

Owing to a complicated string of political events and legal decisions, Alaska has had two separate periods in which home cultivation of small numbers of plants was decriminalized. From 1975 to 1990, court and legislative rulings effectively prevented arrests for possession of less than 4 oz. in private settings; that included home-grown marijuana. From 1990 to 2003, the status was uncertain. Then the earlier regime was reestablished.

The available data are too sparse to adequately assess the earlier period. Examining 1988 data on 12–17 year olds and high school seniors, MacCoun & Reuter (2001) noted that Alaska was well above average in cannabis prevalence—more so than for tobacco or alcohol. But Alaska exceeded other states by a much greater margin for cocaine, a pattern that seems difficult to explain via a gateway mechanism. The data are barely more informative for the more recent period. Alaska had higher rates of cannabis and other drug use prior to the late 2003 decision that redcriminalized home cultivation, but if anything, the difference between Alaska and the United States has shrunk somewhat since the 2003 decision; for example, past-month use in Alaska has fluctuated between 140% and 180% of the national rate between 2002 and 2009, with no clear

trend (SAMHSA 2010, appendix B, tables B3 and B6).

South Australia's 1987 Cannabis Expiation Notice (CEN) policy also depenalized home cultivation, although it created a system of modest monetary fines that rise with the quantity in possession or if the plants are "artificially enhanced." The initial CEN scheme allowed for up to ten plants. This was later reduced to three plants in 1999 and is down to only one plant today. Although there are no stated limits on the size of the plant, a single plant is probably sufficient to supply one to three regular users for a year. Although the policy change is more subtle than the Alaska model, we know more about its effects due to numerous cross-sectional and longitudinal analyses.

Analyzing survey data for 1985 to 1995, Donnelly et al. (2000) showed that the lifetime prevalence of cannabis rose in South Australia from 26% to 36%. But they concluded that it was unlikely that CEN caused this increase because there were similar increases in other jurisdictions without CEN and because South Australia did not differ from the rest of the country in the rate of weekly cannabis use.

Data from the 2007 National Drug Strategy Household Survey (Aust. Inst. Health Welfare 2008) suggest that by 2008 South Australia looked quite similar to the rest of Australia with respect to past-year cannabis use (10.2% versus 10.0%) and recent use by 14–24 year olds (17.5% versus 18.1%). The ratio of cannabis users to cocaine users did not differ (7.8% versus 7.9%), suggesting that although the CEN policy did not amplify the gateway association, it also failed to weaken it, as might have been hoped for under the "separate the markets" theory favored by the Dutch (see below).

Williams (2004) analyzed data from the same household survey (for the years 1988, 1991, 1993, 1995, and 1998) using a more ambitious econometric analysis and concluded that "no evidence is found that either participation or frequency of use is sensitive to the criminal status of marijuana" (p. 135) in the sample as

a whole, although there was an increase in use among males over age 25.

Could the parallel increases have been attributable to increases in the distribution of South Australian cannabis to other states and territories, due to increased supply and/or a decrease in price? This does seem possible. Our calculations (using data from Clements 2004, tables 1 and 2) suggest that the price of cannabis did drop in South Australia in 1991–1992, a period that roughly coincides with the increases in use. Prices for the rest of the nation did dip soon thereafter, and their declines were lagged somewhat and were smaller than the South Australia decline—two features that one would expect if the South Australian effect was diffusing to other states and territories. This was several years after the CEN policy was adopted, and if it was due to the scheme, the effect appears to have been short-lived.

Another factor to consider in interpreting the CEN experience is that, at least in the short run, it still involved considerable criminal justice sanctioning by the state. Using data on yearly CEN issuances and prosecutions, Christie & Ali (2000) showed that the CEN scheme actually had a "net-widening" effect—an increase in prosecutions and incarcerations for minor cannabis offenses, apparently caused by the large fraction of fines that went unpaid.

Retail Cannabis Sales in the Netherlands

In 1976, the Netherlands adopted a formal written policy of nonenforcement for violations involving possession or sale of up to 30 g of cannabis. Rather than seeing an inexorable psychopharmacological link between marijuana and hard drugs, the Dutch hypothesized that the gateway was socioeconomic, reasoning that separating the markets would keep soft drug users out of contact with hard drug addicts and dealers.

There are currently around 700 retail cannabis outlets in the Netherlands—about one per 29,000 citizens (one per 3,000 in

Amsterdam; Bieleman et al. 2009). In 1995, the 30-g limit was reduced to 5 g, and a 500-g limit was set for coffee shop stocks. Since the late 1970s, a set of guidelines has evolved for regulating the technically illicit retail sales in open commercial establishments (Van Laar et al. 2010). Enforcement of the governing rules did not have real teeth until 1997 when officials began closing coffee shops for noncompliance. Between 1997 and 2007, the number of retail cannabis outlets dropped 40%, from 1,179 to 702 (Bieleman et al. 2009).

There are comparable data for 15- to 16-year-old students in the Netherlands and the United States (Hibell et al. 2009, Johnston et al. 2008). Comparing the rates, three features are noteworthy. First, the U.S. and Dutch rates are fairly close—indeed roughly equivalent within sampling and measurement error. Second, both the United States and the Netherlands rank high relative to most other nations, but geography seems to play a big role; nations in Eastern Europe and Scandinavia tend to have lower levels of use than most countries in Western Europe. And third, in recent years many European countries have rates of student marijuana use that either match or exceed the Dutch rate, including Italy, Belgium, Ireland, the UK, France, and Switzerland.

Are Dutch youth more likely to try cannabis than they might be without the coffee shop system? One way of addressing this question is to compare how Dutch youth rank relative to other European nations with respect to the use of other substances. Dutch students do indeed rank higher for lifetime prevalence of cannabis than for tobacco use, getting drunk, or use of other illicit drugs.

By facilitating relatively easy access to cannabis, the Dutch system could increase the length and intensity of a person's cannabis-using "career." There is surprisingly little evidence for such effects. For example, a comparison of regular users in Amsterdam and San Francisco found quite similar rates of self-reported use (Reinarman et al. 2004). One might expect that the ready availability would serve to extend the length of a using

career. MacCoun (2011) examined this issue using several different lines of survey evidence from 2001 and 2005, finding that Dutch users appear to "mature out" of cannabis use at a faster rate than their American counterparts.

MacCoun & Reuter (1997) presented data suggesting that there were no detectable effects on cannabis use among Dutch citizens in the first six or seven years, which we characterized as the "depenalization era." But during what we called the emergence of "commercialization" (roughly 1984–1992), the prevalence of cannabis in Holland increased sharply, a trend not paralleled in other nations. The increase in cannabis use coincided with a steep increase in the number (and visibility) of cannabis coffee shops. Since 1997, this commercialization thesis has been debated in the literature, and several scholars have disputed it (Abraham et al. 2001, de Zwart & Van Laar 2001, Korf 2002). But recent declines in Dutch use have coincided with the closing of a significant fraction of coffee shops, providing further circumstantial evidence (MacCoun 2011).

Perhaps the most distinctive feature of Dutch cannabis use is that citizens seem to have a higher likelihood of being admitted to treatment for cannabis use than is true for most countries in Europe. MacCoun (2011) estimated that on a per capita basis, the United States has about four marijuana treatment admissions for every Dutch admission; on a per past-month user basis, the ratio is 1.8:1. About half the U.S. admissions are criminal justice referrals (TEDS 2007) compared with 10% of Dutch admissions (Ouweland et al. 2006). Excluding these referrals, there are 6 admissions per 1,000 past-month users in each country. Thus, users are more likely to find their way into treatment in the United States than in the Netherlands, but the difference is probably attributable to the much greater use of criminal justice referrals in the United States.

The Dutch experience may seem like the ideal case study for projecting the effects of U.S. cannabis legalization, but it has limitations. MacCoun (2011) calculates that in 2005 U.S. and Dutch cannabis prices were

roughly comparable, adjusted for weight and potency. Why are the Dutch prices so high in a quasi-legalization regime? First, the Dutch prices include retailer markups to cover the costs the owners incur in operating retail outlets in commercial neighborhoods. Second, prices in the Netherlands are likely elevated by their unusual hybrid regime that approximates legalization at the user level but imposes European-style prohibition at the level of the growers and traffickers, with coffee shop owners in a gray area somewhere between.

Prescription Regimes: Medical Marijuana and Heroin Maintenance

Fifteen U.S. states have legalized medical marijuana since 1996; state registry data suggest that there were nearly 600,000 patients in 2009, which is probably an undercount (see ProCon.org 2009). This legal change has had no apparent effect on total use, as assessed by arrestee urinalysis and emergency room data (Gorman & Huber 2007) and self-reported national survey data (O'Keefe & Earleywine 2011). But drawing broader policy conclusions would be premature. The probability that a suitably discrete patient would get arrested for marijuana use in the other 35 states is quite small (for probabilities of arrest conditional on use in past year in various countries, see Room et al. 2010, ch. 3). Only two states (California and Colorado) have sizeable medical marijuana distribution systems, and the California system is changing so rapidly that its ultimate effects on the total market are still difficult to predict; for a description of the chaotic form that the California market took in recent years see Samuels (2008).

Heroin maintenance is a less familiar case, but it is perhaps more informative. Heroin addicts have high rates of risky behaviors of many kinds; they share needles, frequently suffer the effects of unexpectedly high doses, and commit extraordinarily large numbers of crimes (Bennett et al. 2008). Even when they enter methadone programs, in which they receive another opiate that reduces the craving for heroin

and blocks its effects, they continue to be criminally active, albeit less than when they are not in methadone treatment (Amato et al. 2005).

The government of Switzerland, increasingly unhappy with the AIDS, crime, and disorder surrounding the heroin scene in its cities, particularly Zurich, in 1994 experimented with providing addicts with heroin itself. Under this option [which they strategically named Heroin Assisted Therapy (HAT)], heroin users who have tried and failed in other kinds of treatment, including methadone maintenance, are provided heroin in the context of a medically supervised facility (for a detailed description of what heroin maintenance involves, see Stimson & Metrebian 2003). The assumption is that if an addict has cheap access to heroin in safe conditions, many of the harms of the drug will disappear. The risk of overdose will become minimal, while the addict no longer has to commit numerous property crimes or sell to other users in order to finance an extremely expensive habit.

A decision to allow addicts to choose their own dose was critical. It removed any incentive to supplement the clinic provision with black-market purchases, as had occurred in the classic trial of heroin prescribing in Britain in the 1970s (Hartnoll et al. 1980). A patient could receive heroin three times daily, 365 days a year. The average daily dose stabilized at 500 to 600 mg of pure heroin, a massive amount by the standards of U.S. street addicts, who consume an average of less than 100 mg per day (ONDCP 2001).

The Swiss programs, by design, offer a sterile, indeed clinical, environment. Operators make every effort to reduce this experience to medicine rather than recreation. Patients must turn up on time, take the drug promptly, and leave the premises. There is to be no congregating or socializing. For example, in one facility there are few chairs in the waiting room; the aim is to move patients on as soon as they have recovered from their dose. They are expected, here and elsewhere, to leave within 20 minutes of taking their heroin.

The Swiss undertook extensive observational research on HAT starting in 1994

(Uchtenhagen et al. 1999). The most significant evaluation of the Swiss experience followed 2,000 addicts admitted to HAT over a six-year period (Rehm et al. 2001). One thousand were discharged during this time, but the retention rate was high; even at the six-year mark, nearly 30% remained in the program. Health outcomes improved, crime rates fell, and employment increased markedly.

Of particular note were the reasons for discharge; more than 60% of those who left HAT did so in order to take up another treatment option. Most of those seeking other treatment went into a methadone maintenance program (60%), but almost 40% went into an abstinence program. This suggests that heroin maintenance is not a terminal state, as most critics have (plausibly) alleged, but that it is mostly a transitional state. The transition might take a few years, and some will stay in HAT. Nonetheless, it does potentially change assessments of the desirability of the program if perhaps one-third of those who enter have transitioned to other treatment within a few years.

Since the Swiss launched their experiment in 1994, a small but growing number of Western nations have also experimented with heroin maintenance (Fischer et al. 2007). The results of the various trials, methodologically much stronger than the Swiss studies, have also consistently reported positive results; none shows negative results (Haasen et al. 2007, Strang et al. 2010, Van den Brink et al. 2003). The Netherlands has now joined Switzerland in making heroin maintenance a routine treatment option, available to most heroin addicts. Germany, the UK, and Spain are seriously considering the option. Canada has experimented with heroin maintenance in two cities, Vancouver and Montreal (Oviedo-Joekes et al. 2009).

Switzerland has gone furthest. As of 2008, there were 23 facilities in Switzerland providing HAT; two were located in prisons. The total number of clients in treatment had stabilized at about 1,200, constituting less than 5% of the estimated heroin-addicted population. This seems to be the total demand; there is no indication of substantial waiting lines. In the

Netherlands, total enrollment in heroin maintenance is estimated to eventually be between 1,000 and 1,500, with a heroin-addicted population of about 22,000 (Reuter 2009).

For those interested in legalization, there are two contradictory lessons from the experiences with heroin maintenance so far. First, the underlying theory of the intervention has held up. The provision of heroin can be done safely, and it has positive effects on those enrolled in the program and on the community; there is no evidence that it increases the number of those who experiment with heroin, although the evaluations are not designed to pick up such an effect. Second, for reasons that scholars have hardly explored, this is not an attractive option to experienced addicts. There is more to heroin addiction than a craving for the drug.

ASSESSING THE AVAILABLE EVIDENCE

Clearly there is little evidence available for making projections as to what would happen if drugs were legalized. The range of innovations that have been tried is narrow. Most of the controversial innovations, such as cannabis decriminalization over which culture wars are waged in many countries, turn out to represent quite minor changes in the conditions faced by drug users. The Dutch coffee shops are perhaps most helpful in assessing the effect of increased access to cannabis without any penalties; the results strongly suggest that such access does not lead to substantial increases in prevalence or in the intensity of use. However, the fact that cannabis in the coffee shops is so expensive limits the utility of the experience for legalization projections.

Only HAT comes close to creating the conditions of legalization: easy access to cheap drugs. However, that is such a narrowly targeted intervention, targeting a population of heroin addicts that has failed in other forms of treatment, that it is difficult to see HAT as providing more than a hint at the response in the general population to cheap and available drugs. The fact that so few of those who are eligible to

obtain the drug take up the opportunity makes it even harder to interpret. HAT also stands out in that it is the only legal innovation that has been tested in a controlled trial.

We argued in *Drug War Heresies* that crime and drug-related mortality and morbidity would almost certainly decline with legalization, even if some crimes due to intoxication would increase. However, there might be large increases not only in prevalence of use but also in addiction. Studies in the health economics field suggest that addiction itself has high costs to individual users, as measured by reductions in quality-adjusted life years. Nicosia et al. (2009) estimated that, of the social costs of methamphetamine abuse in the United States in 2005, fully half is associated with the costs of addiction itself. Because addiction makes the individual a poorer parent, worker, and community member, the increased prevalence of addiction, even with the reductions in crime and mortality, may generate a reduction in national well-being.

The fact that it is impossible to show that legalization will benefit the nation makes it urgent to find ways of making prohibition work better, by which we mean keeping drug dependence low, ensuring that drug dependence does not lead to unnecessarily high risks of premature mortality or incarceration, and lowering the costs to society of associated crime and disorder. We conclude with a brief summary of innovations that seem to us important to achieving those goals.

Harm Reduction

Harm reduction is the term that has been adopted for a set of programs that aim not at reducing the number of drug users or the quantity that they use but specifically at the adverse effects of the drugs themselves. The iconic program is needle exchange, which has been widely adopted in the rest of the Western world but has been uniquely controversial in the United States. There is a large evaluation literature (e.g., Hurley et al. 1997) showing that the intervention inhibits the spread of HIV/AIDS (cf. Amundsen 2006). Important as needle

exchange is, like HAT it targets a small share of the population with drug problems. However, harm reduction does offer an important way of thinking about drug choices because it brings the unintended consequences of interventions into the decision making (see Ritter & Cameron 2006 for a review of harm reduction broadly construed).

Less Incarceration, More Treatment

The United States has relied primarily on punishment to reduce drug use, with massive increases in incarceration for drug offenses over the past 30 years; there are now approximately 500,000 drug offenders imprisoned on a given day, including local jails with state and federal prisons; most are involved in distribution (Seigny & Caulkins 2004), and the share that are African American is even higher than for the prison population generally (Mauer & King 2007). As shown above, there is no empirical support for this harsh investment. There is, however, a large literature showing that treatment, even of the relatively low quality that is characteristically available in many countries, does substantially reduce both drug consumption and associated harms (see Babor et al. 2010b, ch. 9, for a recent review). In the United States, about 25% of heroin addicts are in treatment, compared with more than 50% in countries such as Australia, the Netherlands, and Switzerland. Increasing the share of dependent users in treatment could reduce the social and health costs of drug use.

Smarter Enforcement

Mark Kleiman (2009, Hawken & Kleiman 2009, Kleiman & Kilmer 2009) has offered two important innovations for enforcement of drug prohibition, both intended to reduce the number of individuals locked up for either possession or sale. Mandated desistance (or coerced abstinence) is based on Kleiman's insight that a large fraction of all cocaine, heroin, and methamphetamine is consumed by individuals under the supervision of the criminal justice

system, whether in pretrial release, probation, or parole. Mandated desistance simply requires that such individuals be frequently tested for use of illegal drugs and subject to short but immediate sanctions if they fail the test or fail to appear. The experimental results for the whole probation population of Hawaii have shown that this reduces drug use substantially, with few having to be incarcerated for any length of time (Hawken & Kleiman 2009). This relatively simple program has the prospect of substantially reducing the number of drug users incarcerated for drug-related crimes and also reducing the number of frequent users of cocaine, heroin, and methamphetamine.

Kleiman also argues that the police and other criminal justice actors could use more strategic targeting that would reduce the number of dealers that need to be incarcerated. As articulated in Kleiman (2009) and Kleiman & Kilmer (2009), this builds on a model of feedback between offense frequency and expected punishment that suggests that there are

multiple equilibria. The United States now appears to be in a high incarceration/high offense equilibrium with respect to crime generally and specifically with respect to drugs. In Kleiman's model, deploying limited sanctions in a highly prioritized way (rather than random or equal opportunity sanctioning) can tip the system into a low incarceration/low offense equilibrium. There are examples of targeted deterrence programs that have worked (e.g., Kennedy 2008), but it is still largely a theoretical argument.

Thus, ideas have been proposed that, if implemented, might make prohibition less ineffective and less damaging than it is currently in the United States. However, the prospects for seeing these ideas implemented are uncertain. Legalization will remain a seductive and plausible alternative. But given the modest range of currently implemented interventions, neither the available research nor any plausible expansion of that research is likely to provide a compelling basis for agnostics to join the believers or the skeptics.

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RELATED RESOURCES

European Monitoring Centre for Drugs and Drug Addiction, <http://www.emcdda.europa.eu/data>

European School Survey Project on Alcohol and Other Drugs, <http://www.espad.org>

Monitoring the Future: A Continuing Study of American Youth, <http://monitoringthefuture.org>

National Survey of Drug Use and Health, <http://oas.samhsa.gov/NSDUH>

Treatment Episode Data Set, <http://oas.samhsa.gov/dasis.htm#teds2>



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