

THE ECONOMIC IMPACTS OF MARIJUANA LEGALIZATION

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This is the first of a series of papers exploring the economic and social costs of legalizing marijuana. The states of Washington and Colorado in the United States have legalized marijuana for recreational use. A number of other states have legalized crude marijuana for “medical” use. As these experiments go on, there will be more data to be recorded, analyzed and published. Our research will continue as to the impact of marijuana legalization and future papers will explore this new data. Future papers will focus on specific economic issues relating to marijuana legalization. For example, papers will be published that will explore in more detail the environmental, medical, criminal, spiritual, productivity and other social costs of legalization.

This paper will discuss the general economic and social arguments for legalizing marijuana then we will explore the general economic and social arguments against it. Finally, we will discuss the economic and social damage caused by “medical” marijuana. The “medical” marijuana argument is presented separately because some people, who do not favor legalization of marijuana for recreational purposes, favor its legal status as medicine.

While the public health, safety, and productivity implications of marijuana use are amply documented, their dollar value has not been completely assessed to date.

A. The pro-marijuana argument - the direct economic benefits of legalizing marijuana outweigh the costs

The marijuana legalization advocates have argued that whether the direct costs of legalization are outweighed by economic benefits depends on the following economic concerns: (a) estimated savings from reduced spending on the criminal justice costs of marijuana law enforcement and revenue losses from shifts in law enforcement policies; (b) projected revenues from additional taxes and streams of income; (c) immediate and projected expenditures to address the known harms of marijuana use and to implement and enforce policy reforms.

Budgetary savings

Criminal justice budgets typically do not list the costs of enforcing particular drugs laws, however, Harvard economist Jeffrey Miron has written a series of policy papers estimating various government expenditures associated with marijuana criminalization (1). According to Miron, legalization will reduce the need for prosecutorial, judicial, correctional, and police resource spending by approximately \$7.7 billion – \$13.7 billion per year, (2) even though some revenue from court fines and asset forfeitures would be lost (3). Miron claims his estimates can be verified empirically and his calculations are adjusted for economic inflation and growth in enforcement spending over the past decade (4). Accordingly, Miron is cited to argue for a cost-minimizing approach to criminal justice (5).

Revenue gains

Although marijuana advocates claim that marijuana taxation, licensing, and industry could generate more than \$8.7 billion in government revenue, (6) the value of gains cannot be gauged at this time because revenues from licensing and industry vary by state (7). Additionally, tax revenue projections are inherently uncertain because they rely on questionable assumptions about the unknown impact of black market supply on consumer demand in regulated markets.

Tax expert and attorney Pat Oglesby conducted an analysis of existing marijuana tax proposals (8).

Oglesby claims that Washington State's legalization proposal (Initiative 502), which includes restrictions on advertising and drugged driving and has three distinct excise taxes, could generate approximately \$500 million in state revenue (9). Oglesby also acknowledges the possibility that Colorado's taxation scheme could generate between \$47 million and \$100 million in revenue, (10) but he concludes the projections are completely unreliable because the state's regulatory framework is fundamentally flawed (11).

Finally, he finds Oregon's plan (Measure 80) created a conflict of interest because "medical" marijuana is sold privately at cost but under the legalization plan marijuana would be sold at a controlled cost, though he admits money can be made under a state-controlled marijuana monopoly (12). Voters in Oregon rejected the plan. Finally, Oglesby notes that the economic impact of legalization depends on various other factors that cannot be assessed at this time, including the possible emergence of new jobs, the likelihood of tax evasion, and legalization's probable impact on alcohol consumption (13).

New expenditures

Adding to the direct costs of implementing policy reforms, legalization will cause consumption of marijuana to increase, and this increase will have direct economic costs in terms of healthcare, social services and criminal justice (14). The magnitude and cost of increased consumption can be predicted by estimating supply and demand, but historical data from local marijuana markets does not exist, and data from foreign markets fails to reflect the influence of local mores and cultural norms on consumer behavior.

Existing projections of growth in marijuana demand are based on consumption patterns in the Netherlands and other regulated foreign markets, (15) where sufficient data exists to derive marijuana's "demand elasticity", e.g., the responsiveness of consumption rates to changes in price (16). To date, economists' best estimates of the increase in consumption range from 75%-289% but these estimates fail to account

for untested and novel pricing and taxation schemes, the underreporting of current marijuana use, or the impact of social influences on consumption (17).

While dependency is a known harm of marijuana consumption that will proliferate with increases in consumption, the costs of marijuana treatment admissions may decline with legalization since the vast majority of admissions have historically been referrals from the criminal justice system (18). National healthcare expenditures related to marijuana consumption are not known, but it is estimated that marijuana dependency accounts for approximately 1/5 of all addiction treatment center admissions (19).

Legalization will entail additional spending to update and enforce drugged driving regulations because there is evidence that consuming marijuana before driving doubles the chances of collision (20). In states with per se drugged driving laws, court costs may also increase on account of due process issues raised by the presumption that the presence of marijuana metabolites in one's blood stream are evidence of intoxication (21). Other court and law enforcement costs may also rise due to the shift in drug enforcement spending to tax enforcement spending (22).

Indirect Economic Benefits of Legalizing Marijuana Outweigh Costs?

Whether the indirect economic benefits of legalization will be great enough to offset the socioeconomic costs of current policies depends on the following financial, political and human capital factors: (a) productivity losses from workplace accidents and employee absenteeism related to marijuana dependency; (b) productivity gains from anticipated reductions in the rates of unemployment, employee turnover and absenteeism related to involvement with the criminal justice system; (c) value of improvements in family stability and socioeconomic mobility within underprivileged communities due to the reduction in incarcerations and disqualifying collateral consequences; (d) increases in addiction; (e) a rise in health care costs including mental health; (f) increases in crime due to expanded marijuana use; (g) increases in crime due to expanded marijuana use; (h)

reduction of learning capacity in students; (i) increases in drugged driving.

Productivity losses

The marijuana advocates claim that research regarding the impact of marijuana use on job performance is inconclusive, as marijuana's performance effects vary by job task and among users based on the setting and frequency of use as well as the user's personal characteristics and motivation to perform (23).

Similarly, they claim the connection between absenteeism or workplace accidents and marijuana use may be tenuous because research has not firmly established a causal nexus (24). Moreover, productivity losses may be negligible to the extent that the vast majority of marijuana consumers, like alcohol consumers, do not go to work intoxicated and instead reserve revelry for weeknights or weekends or other occasions that would not interfere with their work responsibilities.

Productivity gains

Crime statistics indicate that marijuana offenses account for almost half of the 1,531,251 drug arrests nationwide, and that nearly 9 out of every 10 marijuana arrests are for possession, not distribution (25). However, marijuana offenders convicted of possession account for only two-tenths of one percent (.2%) of federal inmates and just one-tenth of one percent (0.1%) of state prisoners without a prior criminal record (26). Often, incarceration is due to probation or parole violations or for possession of wholesale quantities where intent to distribute could not be proved (27). Reducing the number of marijuana-related arrests and incarcerations may cause marginal growth in aggregate productivity as fewer employees who already have jobs will need to miss work for required court appearances, and incarcerated offenders will be able to participate in the job market (28). Additional gains in productivity can be expected among workers who are raising children alone due to the incarceration of a spouse, whose return from prison will permit child-rearing responsibilities to be shared between both parents, reducing the number of work days missed (29).

Socioeconomic improvements

There is ample evidence of socioeconomic and racial disparities among those who are charged with marijuana crimes and those who are actually convicted (30). The effect of fines, asset seizures, legal fees, required court appearances and missed work days is especially burdensome for marijuana defendants from disadvantaged communities (31). Even if there is only a modest budgetary benefit from eliminating these features of our criminal justice system, (32) the marijuana advocates claim that it will help disadvantaged communities by reducing the criminalization of the underprivileged classes, mending broken homes, promoting upward social mobility, and reducing the collateral consequences of existing drug enforcement policies (33).

The arguments for legalization raise more questions than answers.

B. The economic and social arguments against legalization of marijuana

This report will now examine the efficacy of measures that legalize marijuana and the instances in which the present and long-term fiscal costs of legalization exceed tax revenue from marijuana.

Although it is not necessarily improper to tax goods and services that harm consumers, marijuana's legal status and social effects render taxation problematic. There may be significant and questionable disparities between projected and actual tax revenues due to variation in regional demand for marijuana, future demand for taxable marijuana, revenue allocation among levels of government, and regulatory compliance and enforcement. In many instances, the public expense of implementing and enforcing taxation compounds the aggregate cost of marijuana's negative effects on health, safety, and productivity. On the other hand, the research on legalization predicts a reduction in criminal justice costs, though law enforcement budgets are more likely to remain substantially intact.

A survey of available research regarding the fiscal impact of marijuana found a number of economic analyses that address the fiscal costs associated with existing laws but none that address the costs of legalization. Because the data required for a formal cost-benefit analysis is not available at this time, invoking fiscal rhetoric to advance the legalization agenda is not merely irresponsible, it is also deceitful. In effect, it defies transparency, misdirects public debate, and belies a corporate purpose to privatize profits and socialize losses, subordinating the interests of taxpayers to those of the marijuana industry.

Overview

Recent estimates of legalization's impact on government spending predict possible savings and revenues but do not reflect the economic costs of departing from current policy. The true fiscal impact will depend on the costs generated by repealing current laws, plus the costs of implementing and enforcing proposed reforms, minus any tax revenues and savings that might accrue.

Repealing current laws will generate additional costs due to consequences stemming from the increase in marijuana use, abuse, and dependence. Implementing and enforcing reforms will require up-front spending to establish a regulatory framework and on-going spending to collect taxes, regulate retailers and distributors, and protect users and non-users alike.

Even if it is not possible to estimate these additional costs at this time, it is remiss to ignore them.

Accordingly, the present and post-legalization effects of marijuana use must be examined to gain an understanding of their economic impact.

Known Harms of Marijuana Use

While the public health, safety, and productivity implications of marijuana use are amply documented,

their dollar value has not been completely assessed to date (34).

Impact on Public Health

A number of studies have noted significant correlations between marijuana use and many severe health and social problems (35). The negative impact of expanded marijuana use will have a severe and pervasive impact on public health from which there will be no turning back. Studies show impacts from marijuana use such as immune system damage, (36) birth defects, (37) infertility, (38) cardiovascular disease, (39) stroke, (40) and testicular cancer (41). Researchers have also found that chronic exposure to marijuana smoke can increase the risk of developing respiratory obstruction, emphysema, lung cancer, collapsed lungs, and bullous lung disease ("bong lung") (42). A recent study shows that marijuana smoke has ammonia levels 20 times higher than tobacco smoke. Marijuana has hydrogen cyanide, nitric oxide, and aromatic amines at 3-5 times higher than tobacco smoke (43).

Another study shows that that marijuana smokers face rapid lung destruction - as much as 20 years ahead of tobacco smokers (44). A recently released study shows that marijuana damages DNA and that it is toxic to the body (45).

Marijuana hurts the immune system

One of the earliest findings in marijuana research was the effect on various immune functions. Cellular immunity and pulmonary immunity are impaired, and an impaired ability to fight infection is now documented in humans. Researchers have found an inability to fight herpes infections and a blunted response to therapy for genital warts in patients who consume marijuana. Abnormal immune function is the cornerstone of problems with AIDS. This impairment leaves the patient unable to fight certain infections and fatal diseases. The potential for these complications exists in all forms of administration of marijuana (46).

Marijuana is addictive

Clinical dependence has been found to afflict roughly 10% of all marijuana users (47). Most are in their late teens and twenties (48).

The risk of dependence is higher among those who try marijuana at a young age (49). In 2009, individuals between the ages of 12 and 25 comprised 65.3% of all substance abuse treatment admissions for marijuana; daily use was reported by 49.6% of this group (50).

According to the 2010 National Survey on Drug Use and Health, the number of Americans who used marijuana increased from 14.4 million to 17.4 million between 2007 and 2010. The prevalence of past-year drug dependence or abuse among marijuana users (4.5 million) was found to exceed the combined total for users of pain relievers (1.9 million) or cocaine (1 million). More unemployed adults (17.5%) used marijuana than those who worked full-time (8.4%) or part-time (11.2%). Clinical dependence or abuse was also higher among unemployed adults (15.7%) than among part-time workers (10.9%) or full-time workers (8.9%). Lower rates of dependence and abuse were found among individuals who graduated from college (7.3%) than those who completed high school only (8%) or those who did not complete high school (10.2 percent) (51).

Marijuana is an addictive drug that poses significant health consequences to its users, including those who may be using it for “medical” purposes. More young people are being treated for marijuana dependence than for any other drug. Marijuana is far more powerful today than it was 30 years ago and it serves as an entry point for the use of other illegal drugs. This is known as the “gateway effect.” Despite arguments from the marijuana advocates to the contrary, marijuana is addictive. Unlike those addicted to many other drugs, the marijuana addict is exceptionally slow to recognize the addiction. This addiction has been well

described in the marijuana literature and it consists of both a physical dependence (tolerance and subsequent withdrawal) and a psychological habituation (52).

Mental health

Marijuana use may trigger psychiatric illnesses including mood disorder, latent schizophrenia, and clinical dependence. The American Psychiatric Association Position Statement on Marijuana as Medicine states: “There is no current scientific evidence that marijuana is in any way beneficial for the treatment of any psychiatric disorder. In contrast, current evidence supports, at minimum, a strong association of cannabis use with the onset of psychiatric disorders. Adolescents are particularly vulnerable to harm, given the effects of cannabis on neurological development.” (53)

Impact on Public Safety

Studies also shed light on marijuana’s implications for public safety. Short-term and long-term use are known to cause cognitive impairment affecting sensorimotor functioning, attention span, memory, self-control, learning, and educational attainment (54).

Sensorimotor and attentional deficits undermine users’ ability to safely engage in complex tasks like operating a motor vehicle or other heavy machinery. Studies have found that drivers under the influence of marijuana typically exhibit reduced reaction speed, frequent lane-weaving, and they are twice as likely as unimpaired drivers to be involved in traffic accidents (55). Using marijuana before driving has been found to increase the risk of fatal outcomes in motor vehicle collisions (56). Research on workplace injuries confirms these findings; employees who are impaired by the effects of marijuana are more likely to be involved in accidents at work (57).

In addition to its short-term effects on sensory perception, marijuana use can impair decision-making and

self-control during and long after intoxication. Known colloquially as ‘good judgment,’ self-control is generally believed to improve from youth into adulthood and to degenerate with substance abuse and dependence. Self control inhibits risk-seeking and impulsive behaviors that limit educational attainment and contribute to criminal conduct. Economists, criminologists, and medical researchers have studied and documented these effects (58). According to one study, “the probability of being arrested for a non-drug involved violent, property and income-producing crime” is greater for marijuana users than non-users (59).

Impact on Productivity

Marijuana-impaired workers contribute to a decrease in productivity due to employee turnover, absenteeism, and illness. While performance effects might vary according to job task, frequency of use, and users’ personal characteristics, studies have found marijuana and alcohol pose comparable risks to productivity (60).

Employees who tested positive for marijuana had 55% more industrial accidents and 85% more injuries compared to those that tested negative on a pre-employment exam and they had absenteeism rates 75% higher than those that tested negative (61).

Low-income groups and minorities may be particularly vulnerable to the unintended effects of legalization. According to one analysis, social stigma surrounding marijuana use could deepen the divide between managerial employees and rank-and-file workers:

“[Marijuana use] does impair them as far as managerial favor, raises, promotions, and the like. Indirect effects such as these could severely inhibit the workforce and overall production of minority groups, by stunting their ability to move up the chain of responsibility and command. Further complicating this is the

fact that with the legalization of marijuana, individuals would have less incentive to hide their habit, making it all the more easier to suffer remaining stigmatizing social consequences. Compounding the problem is that in the legalized world “[e]ach new user would be at some risk of progressing to heavy, chronic use” (62)

If the goal is to reduce marijuana’s destructive consequences, then systemic inequalities underscore the need for caution. Legalization may exacerbate fiscal woes and unjust law enforcement practices but it certainly will not eliminate them.

Impact on Public Budgets

In 2011, the National Drug Intelligence Center released a report that assessed \$193 billion in annual losses due to illnesses, accidents, lost productivity, and crime resulting from illicit drug use (63). While the report did not separate marijuana from other drugs, it attributed nearly two-thirds of the losses to the impact of drug use on productivity. The costs of property crime and homicides were roughly equivalent.

An earlier study conducted by the National Center on Addiction and Substance Abuse at Columbia University noted that “governmental spending is skewed toward shoveling up the burden of our continued failure to prevent and treat the problem rather than toward investing in cost effective approaches to prevent and minimize the disease and its consequences.” The study estimated that, in 2005, \$467.7 billion was spent on substance abuse addiction by federal (\$238.2 billion), state (\$135.8 billion), and local (\$93.8 billion) governments. It found less than 3% of spending was related to prevention but more than three-fifths was due to healthcare costs, including those attributable to alcohol and tobacco use (64).

Economic Consequences of Legalization

In effect, legalization endorses marijuana as socially acceptable. It eliminates criminal penalties, reducing

prices, increasing availability, and de-stigmatizing use (65). More likely than not, these consequences are irreversible:

“Legalization would reduce the costs of supplying drugs by more than taxes could offset, pushing retail prices into uncharted waters. We can be confident this would affect consumption; we just don’t know by how much. One might consider giving legalization a trial run, pledging to repeal it if consumption ended up rising more than anticipated. However, even temporary legalization could have permanent consequences. Society could certainly ‘unlegalize’ and reimpose prohibition, but that would not return matters to the status quo ex ante any more than putting toast in the freezer would change it back into fresh bread.” (66)

Economists estimate that marijuana use will increase by 75% - 289% once legalized, or more if advertising is permitted. However, the higher end of this range is probably more accurate because current usage is underreported by 20%-40%. (67). According to the 2010 National Survey on Drug Use and Health, 17.4 million Americans used marijuana in 2010. Legalization could thus invite between 13.05 million and 47.85 million new users (68).

Increase in Marijuana-related Healthcare Costs

Inevitably, the increase in use will correspond to an uptick in incidents of dependence and abuse. If the number of new users is between 13.05 million and 47.85 million, then treatment admissions would likely increase from 1.3 million to 4.8 million respectively. These estimates assume a dependence rate of only 10%.

Non-dependent users are still more prone to illnesses, accidents, and crime than non-users. Since legalization is expected to cut marijuana prices in half, making it more affordable, the drop in market

prices will compound risks for users who are young, poor, or already addicted (69). As a consequence, medical providers may need to adapt to the influx of new users who are involved in accidents or who report marijuana-induced panic attacks or dependence (70). While Medicaid and other public assistance programs currently pay for nearly two-thirds of all inpatient admissions, this share is expected to increase under the Affordable Care Act, with or without legalization (71).

Negative Impact on Youth

A study examined early initiation into marijuana use and found, “the negative impact of marijuana use in the tenth grade on educational attainment is similar in magnitude to the effect of living in a single parent family or living in a family with an income in the lowest quartile.” (72)

Legalization will increase marijuana use. This will apply to young people. Marijuana can cause disinterest in activities, lower grades and isolation from the family. It can permanently impair brain development. Problem solving, concentration, motivation and memory are negatively affected. Teens who use marijuana are more likely to engage in delinquent and dangerous behavior and experience increased risk of schizophrenia and depression including being three times more likely to have suicidal thoughts (73).

Our drug treatment facilities are full of young people dealing with marijuana related problems. One study of children in treatment showed that, 48% were admitted for abuse or addiction to marijuana, while only 19.3 % for alcohol and 2.9 % for cocaine, 2.4 % for methamphetamine and 2.3 % for heroin (74).

Marijuana use accounts for tens of thousands of marijuana related complaints at emergency rooms throughout the United States each year. Over 99,000 are young people (75).

As many as 13 % of high school seniors said they drove after using marijuana while only 10 % drove

after having five or more drinks. Vehicle accidents are the leading cause of death among those aged 15 to 20 (76).

A study of high school students showed that about 28,000 seniors each year admitted that they were in at least one accident after using marijuana (77).

Criminal Justice Costs

In spite of legalization, crime is endemic and will not diminish even though the kinds of crimes committed might change. In fact, under a heavily regulated legalization regime, police detentions for marijuana-related offenses may dwarf the current rate.

Legalization will increase drugged driving and more drugged driving will mean more dead and injured drivers and other innocent victims and all the cost related to these tragedies (78).

Marijuana significantly impairs the ability to safely operate a motor vehicle. Driving problems include: decreased handling performance, inability to maintain headway, impaired time and distance estimation, increased reaction times, sleepiness, impaired sustained vigilance and lack of motor coordination (79).

Marijuana is the most prevalent drug found in fatally injured drivers testing positive for drugs (80).

Under our current laws few offenders are in prison for marijuana possession. No more than two-tenths of one percent (.2%) of federal inmates are locked up for marijuana possession and, among state prisoners, only one-tenth of one percent (0.1%) are in for marijuana possession without a prior record (81).

Predictably, most of these prisoners are charged with probation or parole violations or with possession of wholesale quantities where intent to distribute could not be proved.

The proponents of legalization ignore the fact that legal sanctions deter or delay potential abusers, thereby limiting the growth of the illicit market. Law enforcement also leverages drug users/addicts into treatment through the use of drug courts that offer treatment as an alternative to incarceration.

According to a recent study by Colorado State University, Colorado's legalization experiment will require retailers of marijuana to charge 318% more than producers (82). The same study also found that current estimates of legalization's revenue potential are overblown by about 60% and that, in reality, legalization would raise revenue equal to only 1% of Colorado's budget.

Ultimately, this will push users into the black market and drive retailers into the tax-evading 'grey market.' Law enforcement resources will need to be re-marshaled to address problems caused by marijuana-impaired driving, underage purchases, and criminals who seek to undercut licensed marijuana retailers.

For a state to benefit from tax revenue, it must first collect the tax proceeds. States that have attempted to tax medical marijuana, a notoriously cash-only business, find this to be a problem. Of course, part of the reason why medical marijuana is cash-only is because banks have refused to do business with those who sell drugs in violation of federal law. States will need to spend exorbitant amounts of taxpayer money to monitor retailers, conduct investigations, and prosecute tax evaders.

Moreover, enforcement can cause marijuana markets to behave in surprising ways. For example, in California's Humboldt County, the wholesale price of marijuana fell when the federal government stepped up enforcement efforts (83). The explanation for this was simple – enforcement caused retailers to change their purchasing patterns so growers found themselves steeped in excess product which they began pushing off as quickly and cheaply as they could.

In other words, law enforcement spending would merely shift from one category of offense to another. Since enforcement costs would not be insubstantial, there are good reasons to question whether purported savings from legalization are achievable or meaningful.

Substantial Implementation Costs

Marijuana is unique from tobacco and alcohol as well as other drugs in that it can be grown with minimal effort and is presently illegal. There are costs associated with changing its legal status and then regulating it. The problem is that these costs cannot be priced into the market through taxation and licensing schemes.

Although Colorado recently legalized marijuana and is currently spending money to regulate it, little tax revenue has been earned. In fact, according to a recent report on the condition of Colorado's medical marijuana industry, "[in 2012] the State of Colorado collected \$5.4 million in sales tax on medical marijuana purchases . . . [and] experienced a \$5.7 million budget shortfall because of medical marijuana regulation." (84) However, nobody has any real idea about revenue (85).

Similarly, there will be costs related to implementing education and prevention programs to mitigate the increase in substance abuse and dependence. Government agencies involved in healthcare, social services, and law enforcement would incur the immediate brunt of economic costs in addressing the spike in medical complaints, accidental injuries, and crime. These are additional infrastructure costs.

Aggregate Burden Outweighs Benefit

Legalization will not only have devastating consequences for health, crime, and productivity, it is a waste of taxpayer dollars that could much more wisely be spent on more effective deficit-reducing measures.

Likewise, if the public buys marijuana, this diverts funds from the national economy that are available for more productive purposes like education, research, and prevention. Even if tobacco use has so far been shown to cause more health harms than marijuana it does not follow that legalization is a justifiable policy shift in light of its harms. Tobacco causes more harm because more people use it. If marijuana is legalized that situation may change, especially if a large marijuana industry arises as it did with tobacco.

The scholarly opinion and historical evidence are clear that if drugs are legalized, then the rates of drug use and addiction will climb. This will lead to misery, more deaths, social disorder and massive spending (86).

C. The economic and social damage that “medical” marijuana causes

The use of smoked or eaten crude marijuana in those states that have “medical” marijuana is not limited to those with designated serious medical conditions or elderly people with cancer. Proponents of “medical” marijuana even admit that it has become a bad joke. Rev. Scott Imler, who co-wrote Proposition 215, the California “medical” marijuana initiative, and who advocates for the limited use of “medical” marijuana, put it best recently when he said, "We created Prop. 215 so that patients would not have to deal with black market profiteers. But today it is all about the money. Most of the dispensaries operating in California are little more than dope dealers with store fronts." (87)

A recent study in 2007 examining California’s average “medical” marijuana patients found that the average “patient” was a 32-year-old white male with a history of drug and alcohol abuse and no history of a life-threatening disease. 88 Additionally, in Colorado, only 2% of users reported cancer, and less than 1% reported HIV/AIDS as their reason for “medical” marijuana. In Colorado, the average age of cardholders is 41 and 68% are male (89).

“Medical” marijuana advocates claim that there are the following benefits from “medical” marijuana legalization:

1. Teen tobacco smoking declines
2. DUI declines.
3. There are economic benefits of locally produced medicine and local jobs
4. Medical/prescription costs decline

“Medical” marijuana proponents have argued about the above “benefits” however, in reality university studies, medical reports, and policy experts have debunked these points. For instance, no evidence exists to argue that there is a strong correlation between “medical” marijuana dispensaries or “pot clubs” to a decline in teen tobacco smoking. In fact, a major study published in *Drug and Alcohol Dependence* by researchers at Columbia University found that states that legalized marijuana use for medical purposes have significantly higher rates, almost twice as high, of marijuana use and of marijuana abuse and dependence than states without such laws (90).

What social damage does “medical” marijuana cause?

In California, where “medical” marijuana has been sold since 2003, marijuana dispensary neighborhoods have attracted criminal acts of violence such as armed robbery, murder, and even increasingly organized crime involvement (91). Moreover, states where “medical marijuana” is available have experienced higher rates of marijuana use (92).

What medical damage does “medical” marijuana cause?

In terms of smoked marijuana, the Food and Drug Administration (FDA) concluded that there is “currently sound evidence that smoked marijuana is harmful” and that “no sound scientific studies

supported medical use of marijuana for treatment.” The FDA also concluded that: “There are alternative FDA-approved medications in existence for treatment of many of the proposed uses of smoked marijuana.” (93) Therefore, states that have “medical” marijuana damage public health by increasing marijuana usage and drug dependency rates (94).

What law enforcement damage does “medical” marijuana cause?

“Medical” marijuana dispensaries have posed a plethora of problems for the public as well as to law enforcement. Marijuana dispensaries are million dollar enterprises due to the amount of unjustified and fictitious physician recommendations for “medical” marijuana. Evidence shows that dispensaries are targets for violent crime as well as fronts for drug traffickers and money laundering for organized crime (95). Another issue that has risen due to “medical” marijuana is drugged driving. In California, drugged driving is more prevalent than drunk driving nowadays (96).

What damage to kids does “medical” marijuana cause?

“Medical” marijuana negatively effects public health especially in regards to our youth. Since the message that “marijuana is medicine” with no adverse effects has been popularized, perceived harm for smoking marijuana has steadily decreased (97). As a result, states with “medical” marijuana have marijuana abuse/dependence rates twice as high as other states (98).

What damage to drug treatment does “medical” marijuana cause?

Researchers at Columbia University found that states with “medical” marijuana had marijuana abuse/dependence rates almost twice as high as states without such laws. Treatment centers are likely to experience an influx in patients due to the increase in marijuana use and also marijuana related drugged driving (99).

What damage to drug prevention does “medical” marijuana cause?

Youth attitudes and beliefs that “marijuana is medicine” are adversely affecting drug prevention efforts to decrease the access, availability, and perceived harm of marijuana. Science tells us that smoking marijuana “is not recommended for medical use” and, therefore, we should base policy on science and not compromise public health and safety (100).

What damage to DUI enforcement does “medical” marijuana cause?

Drugged driving is a serious public health and safety concern. The greatly increased availability of “medical” marijuana adds a new dimension due to the need to inform and educate the public that driving under the influence of marijuana is extremely dangerous. The British Medical Journal recently published a study that found that marijuana impaired drivers were twice as likely to crash (101). Nowadays, in California, drugged drivers are more prevalent than drunken drivers (102). Marijuana testing needs to be standardized for law enforcement officers. Drugged driving laws, programs, and management centers also need to be updated.

What damage to employers/employees does “medical” marijuana cause?

“Medical” marijuana raises issues for employers such as job performance, lawful hiring practices, questions pertaining to drug use and drug test results.

Marijuana used for medical purposes has the same long term effect on the user as marijuana used for recreation. Marijuana use can cause impairment of short-term memory, attention, motor skills, reaction time, and the organization and integration of complex information. Marijuana use alters perceptions, creates time distortion and can cause drowsiness and lethargy. Heavy marijuana use can cause apathy, decreased motivation, impair cognitive performance. Employees who use marijuana off-duty are still affected by it; impaired cognition that can cause lapses in judgment can remain for a long period. Memory

defects can last as long as six weeks (103). Use of marijuana can cause, exacerbate or contribute to mental illness (104). This is especially true with adolescents (105). Employers may be liable for the actions of employees who use marijuana, especially those employees in safety sensitive positions. The more chronic the use of “medical” marijuana, the higher the risk.

We strive to be a compassionate society, but there must be a balance between alleviating or managing illness and creating a system that does more harm than good. Until there is FDA quality scientific proof that the use of crude marijuana as “medicine” is safe and effective, it appears that the use of marijuana as “medicine” is a risky venture for the public health and safety.

Conclusion

Not all the data is in about the economics of marijuana legalization, but on balance it would be a negative public policy for which our society will pay a great spiritual, medical, public safety and economic cost that we can ill afford.

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References

1. Miron's work was funded by organizations that seek to legalize marijuana. They are the Marijuana Policy Project 2005, the Cato Institute 2010, and the Criminal Justice Policy Foundation 2008 and 2010.

Jeffrey A. Miron, *The Budgetary Implications Of Marijuana Prohibition*, 1-29 (2005), available at <http://www.prohibitioncosts.org/MironReport.pdf> (last accessed 12/24/12) (Marijuana Policy Project); Jeffrey A. Miron, *The Budgetary Implications of Drug Prohibition*, 1-23 (2008), available at http://petermoskos.com/readings/miron_2008.pdf (last accessed 1/2/13) (Criminal Justice Policy Foundation); Jeffrey A. Miron, *The Budgetary Implications of Drug Prohibition*, 1-43 (2010), available at http://scholar.harvard.edu/files/budget_2010_final_0_0.pdf (last accessed 1/2/13) (Criminal Justice Policy Foundation); Jeffrey A. Miron and Katherine Waldo, *The Budgetary Impact of Ending Drug Prohibition*, 1-62 (2010), available at <http://www.cato.org/sites/cato.org/files/pubs/pdf/DrugProhibitionWP.pdf> (last accessed 12/28/12)(Cato Institute).

2. Miron and Waldo, *supra* note 1 at 1 (estimating \$8.7 billion in criminal justice savings, including \$3.4 billion in federal costs and \$5.4 billion in state and local government costs).

3. Miron and Waldo, *supra* note 1 at 6-7 (estimating \$2 billion in criminal justice revenues from fines and forfeitures, including \$1.5 billion in federal revenue and \$500 million in state and local revenues).

4. See Beau Kilmer, Jonathan P. Caulkins, Rosalie Liccardo Pacula, Robert J. MacCoun, Peter H. Reuter, *Altered State? Assessing How Marijuana Legalization in California Could Influence Marijuana Consumption and Public Budgets*, RAND, 1-84, 34-35 (2010), available at http://www.rand.org/content/dam/rand/pubs/occasional_papers/2010/RAND_OP315.pdf (last accessed 12/25/12) (arguing that Miron's methodology inflates the costs of law enforcement because it "prorates the entire policing budget in proportion to the number of arrests by type (marijuana versus other), but police do many things besides arrest people (e.g., emergency response, traffic control), and not all arrests are equally expensive").

5. See John J. Donohue III, *Rethinking America's Illegal Drug Policy*, Law and Economics Workshop, Berkeley Program in Law and Economics, UC Berkeley, 1-103, 31 (2011), available at <http://escholarship.org/uc/item/58n4z9g3> (last accessed 12/31/12) (noting that more than 500 economists have cited Miron's studies); Thomas J. Moran, *Just a Little Bit of History Repeating: The California Model of Marijuana Legalization and How it Might Affect Racial and Ethnic Minorities*, 17 Wash. & Lee J. Civ. Rts. & Soc. Just., Vol. 17:2, 557-90, 560 (2011), available at <http://scholarlycommons.law.wlu.edu/crsj/vol17/iss2/8> ("Adding even more weight to the criticisms against spending, law enforcement and interdiction against marijuana has proved largely inefficient").

6. Miron and Waldo, *supra* note 1 at 1 (estimating marijuana tax revenues of \$8.7 billion, assuming constant demand rather than growth).

7. For a description of marijuana licensing and registry laws and revenues by state, see Kate Zawadzki, *State Medical Marijuana Programs Financial Information*, Marijuana Policy Project, 1-12 (September 30, 2011), available at <http://www.mpp.org/assets/pdfs/library/State-Medical-Marijuana-Programs-Financial-Information.pdf> (last accessed 1/2/13).

8. Pat Oglesby, *Gangs, Ganjapreneurs, or Government: Marijuana Revenue Up for Grabs*, State Tax

Notes, Vol. 66:4, 255-69 (October 22, 2012), available at <http://ssrn.com/abstract=2165864> (last accessed 12/24/12); see also Pat Oglesby, *Laws to Tax Marijuana (How to Tax It)*, State Tax Notes, Vol. 59:4 (January 28, 2011), available at <http://ssrn.com/abstract=1741735> (last accessed 12/24/12) (explaining marijuana tax enforcement barriers and exploring possible frameworks for taxation).

9. Oglesby 2012, *supra* note 8 at 255.

10. *Id.* at 257 (citing an unofficial study by the Colorado Center on Law and Policy).

11. Pat Oglesby, *Colorado's Crazy Marijuana Tax Base*, Center for New Revue (November 7, 2013), available at <http://ssrn.com/abstract=2351399> (last accessed 12/9/13).

12. Oglesby 2012, *supra* note 8 at 258 (noting that in Oregon, medical marijuana is sold by private businesses at cost, but recreational users must buy marijuana directly from a state commission that establishes retail prices for marijuana which the commission resells to consumers, untaxed, after buying it from state-licensed growers who elect five of the commission's seven members).

13. *Id.* at 263-65; see Miron and Waldock, *supra* note 1 at 8-9 (noting that tax revenue from legalization is likely to be offset by a reduction in taxable alcohol purchases); Jonathan P. Caulkins, Beau Kilmer, Robert J. MacCoun, Rosalie Liccardo Pacula and Peter Reuter, *Design Considerations for Legalizing Cannabis: Lessons Inspired by Analysis of California's Proposition 19*, *Society for the Study of Addiction*, Vol. 107, 865-77, 71 (2012), available at conium.org/~maccoun/CaulkinsEtAl_DesignOptions_andCommentaries2012.pdf (last accessed 12/25/12) (noting that tax evasion is likely under any taxation scheme but how much is not certain).

14. See Miron and Waldock, *supra* note 1 at 8 (discussing reasons for the increase in consumption); Jonathan P. Caulkins, Anna Kasunic, Michael A. C. Lee, *Marijuana Legalization: Lessons from the 2012 State Proposals*, forthcoming in *World Medical & Health Policy*, 1-38, 24-27 (August 27, 2012), available at <http://appam.confex.com/appam/2012/webprogram/ExtendedAbstract/Paper3417/Caulkins,et%20al.%20submitted%20to%20APPAM.pdf> (last accessed 12/29/12) (attributing consumption growth to increased advertising and reduced social stigma).

15. See Miron and Waldock, *supra* note 1 at 9 (discussing the decline of marijuana prices in the Netherlands); Caulkins, Kilmer, MacCoun, Pacula and Reuter 2012, *supra* note 13 at 872-73 (identifying price declines in the Netherlands as the major driver of demand growth); Donohue 2011, *supra* note 5 at 37-39 (discussing marijuana policy in the Netherlands and Portugal).

16. See Miron and Waldock, *supra* note 1 at 10 (estimating a demand elasticity of between -0.5 and more than -1.0); Oglesby 2011, *supra* note 8 at 4 (noting that economists do not agree on the elasticity of demand for marijuana).

17. Jonathan P. Caulkins and Michael A. C. Lee, *The Drug-Policy Roulette*, *National Affairs*, 35-51, 42 (Summer 2012) ("increase with a linear demand model runs from 75% to 98%, whereas the comparable range with a bowed 'constant elasticity' demand curve is a 167-289% increase"); Caulkins, Kilmer, MacCoun, Pacula and Reuter 2012, *supra* note 13 at 868 ("... under one scenario the linear demand curve suggests price-driven consumption increases would probably be in the neighborhood of 75-100%, whereas the corresponding range with constant elasticity demand was 150-200% . . . but it is important to recognize that back in the late 1970s consumption was substantially higher than it is today, so it not certain consumption would rise beyond the historical peak").

18. Marijuana Policy Project, Treatment Episode Data Set (TEDS) Highlights – 2006, <http://www.mpp.org/reports/treatment-episode-data-set.html> (last accessed 12/25/12) (“58% of marijuana treatment admissions came from the criminal justice system, while only 15% were people checking themselves into treatment.”).

19. Caulkins, Kilmer, MacCoun, Pacula and Reuter, *supra* note 4 at 36-39 (discussing direct costs of new regulations, admissions increases in treatment centers and emergency rooms, and indirect costs of marijuana dependence like drugged driving and increased use of other restricted substances); Rosalie Liccardo Pacula, Examining the Impact of Marijuana Legalization on Harms, RAND Working Paper, WR-769-RC, 1-30, 9-12 (2010), available at http://rand.org/pubs/working_papers/2010/RAND_WR769.pdf (last accessed 12/29/12) (discussing the potential impact of legalization on the frequency and cost of marijuana-related emergency room visits and treatment center admissions as well as preventive education programming).

20. ScienceDaily, Cannabis Use Doubles Chances of Vehicle Crash, Review Finds, *British Medical Journal* (2/9/2012), available at <http://sciencedaily.com/releases/2012/02/120210111254.htm> (last accessed 12/24/12) (finding that drivers who consume marijuana within three hours of driving have double the risk of vehicle collision when compared with drivers who are not under the influence of drugs or alcohol); see Mark D. Anderson and Daniel I. Reese, Medical Marijuana Laws, Traffic Fatalities, and Alcohol Consumption, IZA Discussion Paper No. 6112, available at <http://ssrn.com/abstract=1965129> (last accessed 12/25/12) (“... legalization is associated with a nearly 9 percent decrease in traffic fatalities, most likely to due to its impact on alcohol consumption”).

21. See Stacy A. Hickox, Drug Testing of Medical Marijuana Users in the Workplace: An Inaccurate Test of Impairment, *Hofstra Labor & Employment Law Journal*, Vol. 29:2, 273-341, 314 (Spring 2012), available at: http://law.hofstra.edu/pdf/academics/journals/laborandemploymentlawjournal/labor_vol29no2_hickox_format.pdf (last accessed 12/31/12) (discussing “per se” drugged driving laws which presume guilt without determinative proof that a defendant operated a motor vehicle under the influence of intoxicants or in a manner that is unsafe due to impairment).

22. See Caulkins and Lee 2012, *supra* note 17 at 45 (“[R]eplacing drug arrests with tax-evasion arrests would defeat a primary purpose of legalization.”).

23. Hickox, *supra* note 21 at 289-93.

24. Hickox, *supra* note 21 at 298 (“[A]ccidents involving drug-using employees can be attributed to at least in part to deviant aspects such as social nonconformity, criminal behavior, and other behaviors indicating social maladjustment, rather than their drug use alone.”); *id.* at 293-96 (discussing absenteeism at work).

25. Federal Bureau of Investigation, Uniform Crime Reports, FBI—Persons Arrested (2011), <http://fbi.gov/about-us/cjis/ucr/crime-in-the-u.s/2011/crime-in-the-u.s.-2011/persons-arrested/persons-arrested> (last accessed 1/1/13); see Darby Beck, Law Enforcement Against Prohibition: One Marijuana Arrest Every 42 Seconds in U.S., (October 29, 2012), <http://copssaylegalize.blogspot.com/2012/10/one-marijuana-arrest-every-42-seconds.html> (last accessed 1/1/13) (analyzing marijuana arrest rates based on Uniform Crime Report statistics); see Donohue, *supra* note 5 at 26 (“[T]he greatest driver of . . . costs is crime systemic to criminalization, rather than crime motivated by toxicology.”).

26. Kevin Sabet, A New Direction? Yes. Legalization? No. Drawing on Evidence to Determine Where to Go in Drug Policy, 91 Or.L.Rev. 1153, 1154 (2013), available at <http://law.uoregon.edu/org/olr/volumes/91/2/documents/Sabet.pdf> (last accessed 6/12/13).

27. Learnaboutsam, Marijuana and Who's in Prison, Smart Approaches to Marijuana, available at learnaboutsam.com/the-issues/marijuana-and-whos-in-prison/ (last accessed 12/9/13).

28. See Donohue 2011, supra note 5 at 23-24 (noting that only 8% of the aggregate productivity costs of drug abuse are health-related and the vast majority is related to the incarceration of drug offenders).

29. See Caulkins and Lee 2012, supra note 17 at 49 (“Ultimately, legalizing marijuana would put about 10 million Americans ‘on the right side of the law’”).

30. See Katherine Beckett & Steve Herbert, The Consequences and Costs of Marijuana Prohibition, American Civil Liberties Union of Washington State, 1-60, 51 (December 12, 2011), available at http://aclu-wa.org/library_files/BeckettandHerbert.pdf (last accessed 1/2/13) (discussing the racial disparity in marijuana arrest rates and the severe overrepresentation of minorities as marijuana defendants); Scott Nakagawa, Why Legalizing Marijuana May Be A Good Idea, But Not A Racial Justice Strategy, DailyKos Blog, 1-4 (December 12, 2012), available at www.dailykos.com/story/2012/12/12/1169296/-Why-Legalizing-Marijuana-May-Be-A-Good-Idea-But-Not-A-Racial-Justice-Strategy (last accessed 12/24/12) (noting the racial disparity but arguing that marijuana prohibition is not the cause and legalization is not the solution).

31. See Beckett & Herbert, supra note 30 at 32-35.

32. Miron and Waldo, supra note 1 at 12 (arguing that the modest budgetary impact of legalizing marijuana in no way weakens the case for eliminating the “crime, corruption, and curtailment of civil liberties” that current enforcement policies have spawned).

33. But see Moran, supra note 5 at 578 (“While some studies debate marijuana’s general effect on productivity, minority groups’ overall lower income makes them more vulnerable in this area, largely negating the general conclusions of those arguments”).

34. See Plecas, Darryl, Jordan Diplock, and Len Garis. "An Updated Review of the Research on the Risks and Harms Associated to the Use of Marijuana." *The Journal of Global Drug Policy and Practice* (2012).

35. For an excellent paper on the negative consequences of the legalization of marijuana see: “White Paper on State-Level Proposals to Legalize Marijuana,” American Society of Addiction Medicine, Adopted by the ASAM Board of Director, July 25, 2012. Available at: <http://www.asam.org/policies/state-level-proposals-to-legalize-marijuana>

BIRTH DEFECTS

Risk of Selected Birth Defects with Prenatal Illicit Drug Use, Hawaii, 1986-2002, *Journal of Toxicology and Environmental Health, Part A*, 70: 7-18, 2007

PAIN

"Too Much Cannabis Worsens Pain" - BBC News, 24 October 2007

"Study Finds that Marijuana Won't Stop Multiple Sclerosis Pain" - Neurology, 2002; 58:1404-1407

"Deputy Director Madras Sheds Light on Controversial Medical Marijuana Study" - Pushing Back, pushingback.com

RESPIRATORY SYSTEM DAMAGE

Marijuana Smoke Contains Higher Levels of Certain Toxins Than Tobacco Smoke, Science Daily, December 18, 2007

Marijuana Smokers Face Rapid Lung Destruction - As Much as 20 Years Ahead of Tobacco Smokers, Science Daily, January 27, 2008

"One Cannabis Joint as Bad as Five Cigarettes" - Reuters UK, 31 July 2007

"Use of Marijuana Impairs Lung Function" - Addiction, 2002; 97:1055-1061

"Study: Smoking Cannabis Causes Damage to Lungs" - Reuters UK

"Respiratory and Immunologic Consequences of Marijuana Smoking" - Journal of Clinical Pharmacology, 2002; 42:71S-81S

"Respiratory Effects of Marijuana and Tobacco Use in a U.S. Sample" - J Gen Intern Med, 2004; 20:33-37

CANCER

"Association Between Marijuana Use and Transitional Cell Carcinoma" - Adult Urology, 2006; 100-104

AIDS/HIV

"Marijuana Component Opens The Door For Virus That Causes Kaposi's Sarcoma" - Science Daily, 2 August 2007

BRAIN DAMAGE

"Marijuana May Affect Blood Flow in Brain" - Reuters, 7 February 2005

STROKES

"More Evidence Ties Marijuana to Stroke Risk" - Reuters Health, 22 February 2005

"Pot Use Tied to Stroke in Three Teenagers" - Reuters Health, 26 April 2004

IMMUNE SYSTEM DAMAGE

"Immunological Changes Associated with Prolonged Marijuana Smoking" - American College of Allergy, Asthma and Immunology, 17 November 2004

MENTAL ILLNESS - SCHIZOPHRENIA, DEPRESSION

"Cannabis-Related Schizophrenia Set to Rise, Say Researchers" - Science Daily, 26 March 2007

"Report: Using Pot May Heighten Risk of Becoming Psychotic" - Associated Press, 26 July 2007

"Anterior Cingulate Grey-Matter Deficits and Cannabis Use in First-Episode Schizophrenia"
- The British Journal of Psychiatry, 2007; 190: 230-236

"Marijuana Increases the Risk of Both Psychosis In Non-Psychotic People As Well As Poor Prognosis For Those With Risk of Vulnerability to Psychoses" - American Journal of Epidemiology, 2002; 156:319-327

"Psychophysiological Evidence of Altered Neural Synchronization in Cannabis Use: Relationship to Schizotypy" - Am J Psychiatry, 2006; 163:1798-1805

"Marijuana Linked to Schizophrenia, Depression" - British Medical Journal, 21 November 2007

"Cannabis Shows Anti-Depression Benefits But Too Much Has Reverse Effect" -The Canadian Press, 24 October 2007

VIOLENCE

"Cannabis 'Linked to Aggression'" - Scotsman.com News, Press Association 2006

"Marijuana Had a Greater Effect on Increasing the Degree of Violent Behavior in Non-Delinquent Individuals Than in Delinquent Individuals" - J Addict. Dis. 2003; 22:63-78

DAMAGE TO YOUTH

"Cannabis Use and Educational Attainment" - VOX, 18 September 2007

"Differential Effects of Delta-9-THC On Learning in Adolescent and Adult Rats"- Pharmacology Biochemistry and Behavior, 2 May 2006

The Occurrence of Cannabis Use Disorders and Other Cannabis Related Problems Among First Year College Students, Addictive Behaviors 33(3):397-411, March 2008.

INFERTILITY

"Marijuana Firmly Linked to Infertility" - Scientific American, 22 December 2000

ADDICTION TO MARIJUANA AND GATEWAY EFFECT

The Occurrence of Cannabis Use Disorders and Other Cannabis Related Problems Among First Year College Students, Addictive Behaviors 33(3):397-411, March 2008.

"Regular or Heavy Use of Cannabis Was Associated with Increased Risk of Using Other Illicit Drugs" - Addiction, 2006; 101:556-569

"As Marijuana Use Rises, More People Are Seeking Treatment for Addiction" -Wall Street Journal, 2

May 2006

"Adolescent Cannabis Exposure Alters Opiate Intake and Opioid Limbic Neuronal Populations in Adult Rats" - *Neuropsychopharmacology*, 2006, 1-9

"Twenty-Five Year Longitudinal Study Affirms Link Between Marijuana Use and Other Illicit Drug Use" - Congress of the United States, 14 March 2006

"New Study Reveals Marijuana is Addictive and Users Who Quit Experience Withdrawal" - All Headline News, 6 February 2007

"Cannabis Withdrawal Among Non-Treatment-Seeking Adult Cannabis Users" - *The American Journal on Addiction*, 2006; 15:8-14

"Escalation of Drug Use in Early Onset Cannabis Users Vs. Co-twin Controls" - *Journal of the American Medical Association*, 2003; 289:4

36. Eisenstein, Toby K., et al. "Anandamide And Delta 9-Tetrahydrocannabinol Directly Inhibit Cells of the Immune System via CB2 Receptors." *Journal of Neuroimmunology* (2007).

37. El Marroun, Hanan, et al. "A Prospective Study on Intrauterine Cannabis Exposure and Fetal Blood Flow." *Early Human Development* (2010);

El Marroun, Hanan, et al. "Intrauterine Cannabis Exposure Affects Fetal Growth Trajectories: The Generation R Study." *Journal of the American Academy of Child & Adolescent Psychiatry* (2009);

Day, Nancy L., et al. "Effect Of Prenatal Marijuana Exposure on the Cognitive Development of Offspring at Age Three." *Neurotoxicology and Teratology* (1994).

38. Battista, Natalia, et al. "The Role of Endocannabinoids in Gonadal Function and Fertility along the Evolutionary Axis." *Molecular and Cellular Endocrinology* (2012).

39. Safaa, Ali M., et al. "Marijuana-Induced Recurrent Acute Coronary Syndrome with Normal Coronary Angiograms." *Drug and Alcohol Review* (2012).

40. Renard, Dimitri, et al. "Cannabis-Related Myocardial Infarction and Cardioembolic Stroke." *Journal of Stroke and Cerebrovascular Diseases* (2012).

41. Lacson, John Charles A., et al. "Population-Based Case-Control Study Of Recreational Drug Use and Testis Cancer Risk Confirms an Association Between Marijuana Use and Nonseminoma Risk." *Cancer* (2012).

42. Owen, et al. "Marijuana: Respiratory Tract Effects." *Clinical Reviews In Allergy & Immunology* (2013);

Hii SW, Tam J., Thompson B., Naughton M. "Bullous Lung Disease Due To Marijuana." *Respirology* (2008);

Aldington S., Harwood M., Cox B., Weatherall M., Beckert L., Hansell A., et al. "Cannabis Use and Risk Of Lung Cancer: A Case-Control Study." *European Respiratory Journal* (2008);

Beshay M., Kaiser H., Niedhart D., Reymond M., Schmid R. "Emphysema And Secondary Pneumothorax In Young Adults Smoking Cannabis." *European Journal of Cardiothoracic Surgery* (2007);

Gill A. "Bong Lung: Regular Smokers Of Cannabis Show Relatively Distinctive Histologic Changes That Predispose To Pneumothorax." *American Journal of Surgical Pathology* (2005);

Wu et al., Pulmonary hazards of smoking marijuana as compared with tobacco, *NEJM*, 1988:318:347-351; Barbers et al., Differential examination of bronchoalveolar lavage ceus in tobacco cigarette and marijuana smokers, *Am Rev Respir Dis* 1987:135:1271-1275; Fligiel et al., Bronchial pathology in chronic marijuana smokers: a light and electron microscopic study, *Journal of Psychoactive Drugs* 1988:20:33-42; Gong et al., Acute and subacute bronchial effects of oral cannabinoids, *Clin Pharmacol There.* 1984:35:26-32; Tashkin, Is frequent marijuana smoking harmful to health? *Western Journal of Medicine* 1993:158:635-637; Tashkin et al., Respiratory status of seventy-four habitual marijuana smokers, *Chest* 1980:78:699-706; Tashkin, Shapiro, Lee & Harper, Subacute effects of heavy marijuana smoking on pulmonary function in healthy men, *NEJM* 1976:294:125-129; Tashkin, Sirons & Clark, Effect of habitual smoking of marijuana alone and with tobacco on nonspecific airways hyperreactivity, *Journal of Psychoactive Drugs* 1988:20:21-25; Tilles et al., Marijuana smoking as cause of reduction in single-breath carbon monoxide diffusing capacity, *American Journal of Medicine* 1986:80:601-606; Barbers et al., Chemotaxis of peripheral blood and lung leukocytes obtained from tobacco and marijuana smokers, *Journal of Psychoactive Drugs* 1988:20:15-20; Bucklev, A case-control study of acute non-lymphoblastic leukemia: evidence for an association with marijuana exposure, *Cannabis: Physiopathology, Epidemiology, Detection* pp. 155-162 (CRC Press 1993); Murison et al., Cannabinoids induce incomplete maturation of cultured human leukemia cells, *Proc Natl Acad Sci USA* 1987:84:5414-5418; Marijuana Smokers Face Rapid Lung Destruction - As Much as 20 Years Ahead of Tobacco Smokers, *Science Daily*, January 27, 2008. Marijuana Smokers Face Rapid Lung Destruction -- As Much As 20 Years Ahead Of Tobacco Smokers <http://www.sciencedaily.com/releases/2008/01/080123104017.htm>.

43. Marijuana Smoke Contains Higher Levels of Certain Toxins Than Tobacco Smoke, *Science Daily*, December 18, 2007. <http://www.sciencedaily.com/releases/2007/12/071217110328.htm>; Impact On Lungs Of One Cannabis Joint Equal To Up To Five Cigarettes <http://www.sciencedaily.com/releases/2007/07/070731085550.htm>

44. Marijuana Smokers Face Rapid Lung Destruction - As Much as 20 Years Ahead of Tobacco Smokers, *Science Daily*, January 27, 2008. Marijuana Smokers Face Rapid Lung Destruction -- As Much As 20 Years Ahead Of Tobacco Smokers <http://www.sciencedaily.com/releases/2008/01/080123104017.htm>

45. Marijuana Damages DNA And May Cause Cancer, New Test Reveals <http://www.sciencedaily.com/releases/2009/06/090615095940.htm>

46. Cabral & Vasquez, Delta-9-Tetrahydrocannabinol suppresses macrophage extrinsic anti-herpes virus activity, *Cannabis: Physiopathology, Epidemiology, Detection* pp. 137-153 (CRC Press 1993); "Immunological Changes Associated with Prolonged Marijuana Smoking" -*American College of Allergy, Asthma and Immunology*, 17 November 2004; "Immunological Changes Associated with Prolonged Marijuana Smoking" -*American College of Allergy, Asthma and Immunology*, 17 November 2004; A recent study from Harvard Medical School shows that marijuana use in any form by people with HIV/AIDS opens the door for the virus that causes Kaposi's Sarcoma an often fatal form of cancer. In addition, contaminants of marijuana smoke contain bacteria and fungi. This puts those with impaired

immunity at risk such as those with HIV/AIDS. "Marijuana Component Opens The Door For Virus That Causes Kaposi's Sarcoma" -Science Daily, 2 August 2007; Fleisher, Winawer & Zauber, Aspergillosis and marijuana, *Annals of Internal Medicine* 1991;115:578-579; Ramirez, Acute pulmonary histoplasmosis: newly recognized hazard of marijuana plant hunters, *American Journal of Medicine* 1990;88:5-60N-5-62N; Taylor et al., Salmonellosis associated with marijuana: a multi state outbreak traced by plasmid fingerprinting, *NEJM* 1982;306:1249-1254.

47. Hall WD, Pacula RL. *Cannabis use and dependence: public health and public policy*. Cambridge, UK: Cambridge University Press, 2003.

48. See Donohue 2011, supra note 5 at 10-12 (2011).

49. National Institute on Drug Abuse, "Info Facts: Marijuana," available at <http://www.drugabuse.gov/publications/infofacts/marijuana> (last accessed 5/12/13).

50. Substance Abuse and Mental Health Services Administration, Center for Behavioral Health Statistics and Quality. "The TEDS Report: Marijuana Admissions Reporting Daily Use at Treatment Entry," 1-6, 2 (February 2, 2012), available at http://www.samhsa.gov/data/2k12/TEDS_SR_029_Marijuana_2012/TEDS_Short_Report_029_Marijuana_2012.pdf (last accessed 5/12/13).

51. Substance Abuse and Mental Health Services Administration, 2011. "Results from the 2010 National Survey on Drug Use and Health: Summary of National Findings," NSDUH Series H-41, HHS Publication No. (SMA) 11-4658. Rockville, MD: Substance Abuse and Mental Health Services Administration, available at <http://www.drugabuse.gov/news-events/nida-notes/2012/06/elevated-rates-drug-abuse-continue-second-year> (last accessed 5/12/13).

52. Compton, Dewey & Martin, Cannabis dependence and tolerance production, *Advances in Alcohol and Substance Abuse* 1990;9:129-147; Kaplan, Martin, Johnson & Robbins, Escalation of marijuana use: Application of a general theory of deviant behavior, *Journal of Health and Social Behavior* 1986;27:44-61; Kaufman et al., Committee on Drug Abuse of the Council on Psychiatric Services, Position statement on psychoactive substance use and dependence: update on marijuana and cocaine. *Am J Psychiatry* 1987;144:698-702; Miller & Gold, The diagnosis of marijuana (cannabis) dependence, *Journal of Substance Abuse Treatment* 1989;6:183-192; Miller, Gold & Pottash, A 12-step treatment approach for marijuana (cannabis) dependence, *Journal of Substance Abuse Treatment* 1989;6:241-250; Schwartz, Marijuana: an overview, *Pediatric clinics of North America* 1987;34:305-317; Clayton & Leukefeld, The prevention of drug use among youth: implications' of legalization, *Journal of Prevention* 1992;12:289-302; Kaplan, Martin, Johnson & Robbins, Escalation of marijuana use: Application of a general theory of deviant behavior, *Journal of Health and Social Behavior* 1986;27:44-61; Bailey, Flewelling & Rachal, Predicting continued use of marijuana among adolescents: the relative influence of drug-specific and social context factors, *Journal of Health and Social Behavior* 1992;33:51-66; "Regular or Heavy Use of Cannabis Was Associated with Increased Risk of Using Other Illicit Drugs" *Addiction*, 2006; 101:556-569; "As Marijuana Use Rises, More People Are Seeking Treatment for Addiction" -*Wall Street Journal*, 2 May 2006 ; "Adolescent Cannabis Exposure Alters Opiate Intake and Opioid Limbic Neuronal Populations in Adult Rats" - *Neuropsychopharmacology*, 2006, 1-9; "Twenty-Five Year Longitudinal Study Affirms Link Between Marijuana Use and Other Illicit Drug Use" - Congress of the United States, 14 March 2006; "New Study Reveals Marijuana is Addictive and Users Who Quit Experience Withdrawal"- All Headline News, 6 February 2007; "Cannabis Withdrawal Among Non-Treatment-Seeking Adult Cannabis Users" -*The American Journal on Addiction*, 2006; 15:8-14;

"Escalation of Drug Use in Early Onset Cannabis Users Vs. Co-twin Controls" - Journal of the American Medical Association, 2003; 289:4; Non-medical Marijuana: Rite of Passage or Russian Roulette?" July 1999 obtained at website www.casacolumbia.org

53. Subject: New APA Position Statement on Marijuana as Medicine, American Psychiatric Association, Date: November 18, 2013 at 12:12:28 CST

TITLE: Position Statement on Marijuana as Medicine ISSUE:

The medical use of marijuana has received considerable attention as several states have voted to remove civil and criminal penalties for patients with qualifying conditions. Yet, on a national level, marijuana remains a schedule I substance under the Controlled Substances Act (CSA), the most restrictive schedule enforced by the Drug Enforcement Administration (DEA) 1. The Food and Drug Administration (FDA), responsible for approving treatments after appropriate and rigorous study, additionally does not support the use of marijuana for medical purposes. This juxtaposition of practice and policy has prompted many professional medical organizations to issue official positions on the topic. This statement reflects the position of the American Psychiatric Association (APA) on the use of marijuana for psychiatric indications. It does not cover the use of synthetic cannabis-derived medications such as Dronabinol (Marinol), which has been studied and approved by the FDA for specific indications.

APA POSITION:

- There is no current scientific evidence that marijuana is in any way beneficial for the treatment of any psychiatric disorder. In contrast, current evidence supports, at minimum, a strong association of cannabis use with the onset of psychiatric disorders. Adolescents are particularly vulnerable to harm, given the effects of cannabis on neurological development.
- Further research on the use of cannabis-derived substances as medicine should be encouraged and facilitated by the federal government. The adverse effects of marijuana, including, but not limited to, the likelihood of addiction, must be simultaneously studied.
- Policy and practice surrounding cannabis-derived substances should not be altered until sufficient clinical evidence supports such changes.
- If scientific evidence supports the use of cannabis-derived substances to treat specific conditions, the medication should be subject to the approval process of the FDA.

Regarding state initiatives to authorize the use of marijuana for medical purposes:

- Medical treatment should be evidence-based and determined by professional standards of care; it should not be authorized by ballot initiatives.
- No medication approved by the FDA is smoked. Marijuana that is dispensed under a state-authorized program is not a specific product with controlled dosages. The buyer has no way of knowing the strength or purity of the product, as cannabis lacks the quality control of FDA-approved medicines.
- Prescribers and patients should be aware that the dosage administered by smoking is related to the depth and duration of the inhalation, and therefore difficult to standardize. The content and potency of various cannabinoids contained in marijuana can also vary, making dose standardization a challenging task.
- Physicians who recommend use of smoked marijuana for "medical" purposes should be fully aware of the risks and liabilities inherent in doing so.

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See also:

Malchow, Berend, et al. "Cannabis Abuse and Brain Morphology in Schizophrenia: a Review of the Available Evidence." *European Archives of Psychiatry and Clinical Neuroscience* (2013); Fratta, Walter, and Liana Fattore. "Molecular Mechanisms of Cannabinoid Addiction." *Current Opinion in Neurobiology* (2013); Taylor, Kate Wolitzky, et al. "Longitudinal Investigation of the Impact of Anxiety and Mood Disorders in Adolescence on Subsequent Substance Use Disorder Onset and Vice Versa." *Addictive Behaviors* (2012); Otten, Roy, et al. "Self-Control and Its Relation to Joint Developmental Trajectories of Cannabis Use and Depressive Mood Symptoms." *Drug and Alcohol Dependence* (2010); "Cannabis-Related Schizophrenia Set to Rise, Say Researchers" - *Science Daily*, 26 March 2007; "Report: Using Pot May Heighten Risk of Becoming Psychotic" - *Associated Press*, 26 July 2007; "Anterior Cingulate Grey-Matter Deficits and Cannabis Use in First-Episode Schizophrenia" - *The British Journal of Psychiatry*, 2007; 190: 230-236; "Marijuana Increases the Risk of Both Psychosis In Non-Psychotic People As Well As Poor Prognosis For Those With Risk of Vulnerability to Psychoses" - *American Journal of Epidemiology*, 2002; 156:319-327; "Psychophysiological Evidence of Altered Neural Synchronization in Cannabis Use: Relationship to Schizotypy" - *Am J Psychiatry*, 2006; 163:1798-1805; "Marijuana Linked to Schizophrenia, Depression" - *British Medical Journal*, 21 November 2007; "Cannabis Shows Anti-Depression Benefits But Too Much Has Reverse Effect" - *The Canadian Press*, 24 October 2007; A risk gene for cannabis psychosis, *Science Daily*, November 14, 2012 <http://www.sciencedaily.com/releases/2012/11/121114083928.htm>;

Cannabis Use Mimics Cognitive Weakness That Can Lead to Schizophrenia, fMRI Study Finds, *Science Daily*, November 2, 2012 <http://www.sciencedaily.com/releases/2012/11/121102084632.htm>;

Long-time cannabis use associated with psychosis, *Science Daily*, March 2, 2010 <http://www.sciencedaily.com/releases/2010/03/100301165726.htm>;

Daily Pot Smoking May Hasten Onset of Psychosis, *Science Daily*, December 21, 2009 <http://www.sciencedaily.com/releases/2009/12/091220144936.htm>;

Daily Consumption Of Cannabis Predisposes To Appearance Of Psychosis And Schizophrenia, Study Finds, *Science Daily*, March 26, 2009 <http://www.sciencedaily.com/releases/2009/03/090325132328.htm>;

How marijuana impairs memory, *Science Daily*, March 1, 2012 <http://www.sciencedaily.com/releases/2012/03/12030114424.htm>;

Mental Illness, Schizophrenia, Depression - Kearney, Simon. Cannabis is Worst Drug for Psychosis. *The Australian*. 21 November 2005; Curtis, John. Study Suggests Marijuana Induces Temporary Schizophrenia-Like Effects. *Yale Medicine*. Fall/Winter 2004; Cannabis use precedes the onset of psychotic symptoms in young people, study finds, *Science Daily*, March 3, 2011 <http://www.sciencedaily.com/releases/2011/03/110301184050.htm>;

Psychotic illness appears to begin at younger age among those who use cannabis, *Science Daily* February 8, 2011 <http://www.sciencedaily.com/releases/2011/02/110207165434.htm>;

Adolescent pot use leaves lasting mental deficits, Developing brain susceptible to lasting damage from exposure to marijuana. *Science Daily*, August 27, 2012 <http://www.sciencedaily.com/releases/2012/08/120827152039.htm>;

"Age at Initiation of Cannabis Use Predicts Age at Onset of Psychosis: The 7 to 8 year Trend," *Schizophrenia Bulletin*, vol. 39 no. 2 pp. 251-254, 2013

54. Zachariou, Margarita, et al. "A Biophysical Model of Endocannabinoid-Mediated Short Term Depression in Hippocampal Inhibition." *PloS One* (2013); Crean, Rebecca D., Natania A. Crane, and Barbara J. Mason. "An Evidence Based Review of Acute and Long-Term Effects of Cannabis Use on Executive Cognitive Functions." *Journal of Addiction Medicine* (2011); Van Ours, Jan C., and Jenny Williams. "Why Parents Worry: Initiation Into Cannabis Use by Youth and their Educational Attainment." *Journal of Health Economics* (2009); Lundqvist, Thomas. "Cognitive Consequences Of Cannabis Use: Comparison with Abuse of Stimulants

and Heroin with Regard to Attention, Memory and Executive Functions." *Pharmacology, Biochemistry and Behavior* (2005).

55. Hartman R. and Huestis R. "Cannabis Effects on Driving Skills." *Clin Chem.* (2012), available at <http://www.ncbi.nlm.nih.gov/pubmed/23220273> (last accessed 7/1/13).

56. Battistella G., et al. "Weed or Wheel! fMRI, Behavioural, and Toxicological Investigations of How Cannabis Smoking Affects Skills Necessary for Driving." *PLoS ONE* (2013); Asbridge, Mark, et al. "Acute Cannabis Consumption and Motor Vehicle Collision Risk: Systematic Review of Observational Studies and Meta-Analysis." *British Medical Journal* (2012); Bosker W., et al. "Medical Δ^9 -Tetrahydrocannabinol (Dronabinol) Impairs On-The-Road Driving Performance of Occasional and Heavy Cannabis Users but is not Detected in Standard Field Sobriety Tests." *Addiction* (2012).

57. Charles R. Schwenk & Susan L. Rhodes, *Marijuana And The Workplace: Interpreting Research On Complex Social Issues* (1999), available at http://php.scripts.psu.edu/users/j/m/jmd394/saw4/moyer/eval/bk/mdtbk2_frames.html (last accessed 7/1/13).

58. Rosalie Liccardo Pacula. *Marijuana Use and Policy: What We Know and Have Yet to Learn*, NBER Reporter: Research Summary (2005), available at <http://www.nber.org/reporter/winter05/pacula.html> (last accessed 6/15/13).

59. R. L. Pacula and B. Kilmer, "Marijuana and Crime: Is there a Connection beyond Prohibition?" NBER Working Paper No. 10046, October 2003.

60. Hickox, *supra* note 21 at 273-341.

61. Abbie Crites-Leoni, *Medicinal Use of Marijuana: Is the Debate a Smoke Screen for Movement Toward Legalization?* 19 *J. Legal Med.* 273, 280 (1998) (citing Schwartz, et al., *Short- Term Memory Impairment in Cannabis-Dependent Adolescents*, 143 *Am. J. Dis. Child.* 1214 (1989)).

62. Moran, *supra* note 5 at 560 (citing Schwenk & Rhodes (1999)).

63. US Department of Justice: National Drug Intelligence Centre. *The Economic Impact of Illicit Drug Use on American Society* (2011).

64. National Center on Addiction and Substance Abuse at Columbia University. *Shoveling Up II: The Impact of Substance Abuse on Federal, State, and Local Budgets* (2009), available at <http://www.casacolumbia.org/absolutenm/articlefiles/380ShovelingUpII.pdf> (last accessed 7/1/13).

65. Rosalie Liccardo Pacula, Beau Kilmer, Michael Grossman and Frank J. Chaloupka, *Risks and Prices: The Role of User Sanctions in Marijuana Markets*. NBER Working Paper 13415, 1-36 (2007), available at <http://www.nber.org/papers/w13415.pdf> (last accessed 7/1/13).

66. Jonathan P. Caulkins and Michael Lee, *Rethinking the 'War on Drugs' Through the US-Mexico Prism*. Yale Center for the Study of Globalization, 108-24, 115 (2012), available at <http://www.ycsg.yale.edu/center/forms/legalizing-drugs-us108-124.pdf> (last accessed 6/5/13).

67. Caulkins and Lee 2012, *supra* note 17 at 42.
68. See note 51 above; Beau Kilmer, Jonathan P. Caulkins, Rosalie Liccardo Pacula, Peter H. Reuter, Bringing Perspective to Illicit Markets: Estimating the Size of the U.S. Marijuana Market. *Drug and Alcohol Dependence*, 153–160, 158 (2011), available at <http://faculty.publicpolicy.umd.edu/sites/default/files/reuter/files/Kilmer%20et%20al%202011%20DAD.pdf> (last accessed 6/15/13).
69. Caulkins, Kilmer, MacCoun, Pacula and Reuter 2010, *supra* note 4 at 34-35.
70. Pacula 2010, *supra* note 19 at 10-12 (predicting that treatment centers, hospitals and emergency departments will incur tens of millions of dollars in costs to treat the influx of new patients who report anxiety and addiction from marijuana).
71. Levit K., et al., "Current and Future Funding Sources for Specialty Mental Health and Substance Abuse Treatment Providers." *Psychiatric Services* (2013), available at <http://psychiatryonline.org/article.aspx?articleID=1658077> (citing Substance Abuse and Mental Health Services Administration. *National Expenditures for Mental Health Services and Substance Abuse Treatment, 1986-2005*. DHHS Publication No. (SMA) 10-4612. Rockville, MD: Center for Mental Health Services and Center for Substance Abuse Treatment, Substance Abuse and Mental Health Services Administration (2010)).
72. Pinka Chatterji, *Illicit Drug Use and Educational Attainment*, NBER Working Paper No. 10045 (October 2003), available at <http://www.nber.org/papers/w10045.pdf> (last accessed 7/1/13).
73. U.S. Department of Justice, "DEA Position on Marijuana," Drug Enforcement Administration (DEA), Washington, DC U.S.A. July 2010, www.DEA.gov, pages 23-26 and 33-34; *Speaking Out Against Drug Legalization*, DEA, pages 51-53
74. "Non-medical Marijuana: Rite of Passage or Russian Roulette?" July 1999 obtained at website www.casacolumbia.org; Kaplan, H.B., Martin, S.S., Johnson, R.J., and Robbins, C.A., Escalation of marijuana use: Application of a general theory of deviant behavior. *Journal of Health and Social Behavior*.1986:27:44-61; Clayton, R.R., and Leukefeld, C.G., The prevention of drug use among youth; implications of "legalization" *Journal of Primary Prevention*. 1992:12:289-302
75. Drug Abuse Warning Network, 2004: National Estimates of Drug-Related Emergency Department Visits U.S. Department of Health and Human Services, Substance Abuse and Mental Health Services Administration <http://DAWNinfo.samhsa.gov/>
76. Drug-Impaired Driving by Youth Remains Serious Problem. NIDA News Release, October 29, 2007. <http://www.drugabuse.gov/newsroom/07/NR10-29.html>
77. O'Malley, Patrick and Johnston, Lloyd. "Unsafe Driving by High School Seniors: National Trends from 1976 to 2001 in Tickets and Accidents After Use of Alcohol, Marijuana and Other Illegal Drugs." *Journal of Studies on Alcohol*. May 2003; The DEA Position On Marijuana, DEA.gov
78. National Highway Traffic Safety Administration, *Use of Controlled Substances and Highway Safety; A Report to Congress* (U.S. Dept. of Transportation, Washington, D.C., 1988); O'Malley, Patrick and Johnston, Lloyd. "Unsafe Driving by High School Seniors: National Trends from 1976 to 2001 in Tickets and Accidents After Use of Alcohol, Marijuana and Other Illegal Drugs." *Journal of Studies on Alcohol*.

May 2003; DuPont, Robert. "National Survey Confirms that Drugged Driving is Significantly More Widespread than Drunk Driving." Commentary, Institute for Behavior and Health, July 17, 2009. page 1. <http://www.ibhinc.org>.

79. National Highway Traffic Safety Administration, Use of Controlled Substances and Highway Safety; A Report to Congress (U.S. Dept. of Transportation, Washington, D.C., 1988); "White House Drug Czar Launches Campaign to Stop Drugged Driving." Office of National Drug Control Policy Press Release. 19 November 2002

80. "One-third of Fatally Injured Drivers with Known Test Results Tested Positive for at Least one Drug in 2009.CESARFAX. Vol. 19, Issue 49. December 20, 2010. www.cesar.umd.edu.

81. Sabet 2013, supra note 26 at 1154.

82. Ritchie King. "How much tax Coloradans will actually have to pay on their marijuana." Quartz.com (May 12, 2013), available at <http://qz.com/83411/how-much-tax-coloradans-will-actually-have-to-pay-on-their-marijuana/> (last accessed 7/1/13);

Colorado Futures Center. "The Fiscal Impact of Amendment 64 on State Revenues." Colorado State University (2013), available at <https://webcom.colostate.edu/coloradofutures/files/2013/04/CFC-Amendment-64-Study-final2.pdf> (last accessed 7/1/13).

83. Dennis Romero. "Marijuana Prices in California Plummet Following Obama's Crackdowns," L.A. Weekly (May 7, 2012), available at blogs.laweekly.com/informer/2012/05/marijuana_prices_low_humboldt_county_obama.php (last accessed 7/1/13).

84. SMART Colorado, "Amendment 64: Promises vs. Reality," available at smartcolorado.org/wp-content/uploads/2013/04/Promises-vs.-Reality-4.11.13.pdf (last accessed 12/17/13).

85. Elaine Povtich, "Not So Fast: Tax Revenue Estimates from Legal Marijuana May Not Materialize," (May 14, 2013) available at <http://www.pewstates.org/projects/stateline/headlines/not-so-fast-tax-revenue-estimates-from-legal-marijuana-may-not-materialize-85899475843> (last accessed 7/1/13).

86. David T. Courtwright, Should We Legalize Drugs? History Answers, American Heritage, February/March 1993; Herbert D. Kleber, Our Current Approach to Drug Abuse - Progress, Problems, Proposals, The New England Journal of Medicine, February 1994; James Q. Wilson and John J. DiIulio, Jr., Crackdown, The New Republic, July 10, 1989, p.23

87. Rev. Imler quote (dispensaries are dope dealers with store fronts) found at: <http://www.utsandiego.com/news/2012/aug/18/tp-us-attorney-is-right-to-close-pot-shops/>

88. O'Connell, T and Bou-Matar, C.B. (2007). Long term cannabis users seeking medical cannabis in California (2001–2007): demographics, social characteristics, patterns of cannabis and other drug use of 4117 applicants. Harm Reduction Journal, <http://www.harmreductionjournal.com/content/4/1/16>

89. Colorado medical marijuana patient statistics, found at:
<http://www.colorado.gov/cs/Satellite/CDPHECHEIS/CBON/1251593017044>
90. Marijuana Rates (almost twice as high for states with medical marijuana) found at: “Drug and Alcohol Dependence: Medical marijuana laws in 50 states: investigating the relationship between state legalization of medical marijuana and marijuana use, abuse and dependence.” Found at:
<http://www.ncbi.nlm.nih.gov/pubmed/22099393>
91. Dispensary link to crime (statistics) found at: National Drug Intelligence Center, Domestic Cannabis Cultivation Assessment (2007); <http://www.justice.gov/archive/ndic/pubs37/37035/>
92. Monitoring the Future Study statistics (youth disapproval of marijuana) found at: Johnston, L. D., O'Malley, P. M., Bachman, J. G., & Schulenberg, J. E. (2012). "Monitoring the Future national results on adolescent drug use: Overview of key findings, 2011. Ann Arbor, MI: Institute for Social Research, University of Michigan. <http://ns.umich.edu/new/multimedia/9-videos/20124-marijuana-use-continues>
93. Inter-Agency Advisory Regarding Claims That Smoked Marijuana Is a Medicine. U.S. Food and Drug Administration, April 20, 2006.
<http://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/2006/ucm108643.htm>
94. See footnotes 73 and 90.
95. Memorandum from Chief David Livingston, Concord California Police Department, to the Mayor and Council Members, August 29, 2003; go to <http://www.californiapolicechiefs.org>, then click on Medical Marijuana Dispensary Information.
96. Drugged driving in California (drugged driving surpasses drunken driving) found at:
http://www.ots.ca.gov/Media_and_Research/Press_Room/2012/doc/Roadside_Drug_Use_Survey.pdf;
http://www.huffingtonpost.com/2012/11/26/drugged-driving_n_2194174.html
97. Social disapproval statistics (Monitoring the Future) found at: Johnston, L. D., O'Malley, P. M., Bachman, J. G., & Schulenberg, J. E. (2012). "Monitoring the Future national results on adolescent drug use: Overview of key findings, 2011. Ann Arbor, MI: Institute for Social Research, University of Michigan. Found at:
<http://ns.umich.edu/new/multimedia/9-videos/20124-marijuana-use-continues>
98. See footnotes 73 and 90.
99. See footnotes 73 and 90.
100. Smoking marijuana not medicinal (FDA and IOM) found at: Joy, J. E., Waston, S. J., & Benson, J. A. (Eds.). (1999). Marijuana and medicine: Assessing the science base. Washington, DC: National Academy Press.
101. Marijuana impaired driving twice as likely to crash (Britain Medical Journal) found at:
<http://www.insideline.com/car-news/study-shows-marijuana-impaired-drivers-twice-as-likely-to-crash.html>
102. Drugged driving in California (drugged driving surpasses drunken driving) found at:
http://www.ots.ca.gov/Media_and_Research/Press_Room/2012/doc/Roadside_Drug_Use_Survey.pdf

103. Abbie Crites-Leoni, Medicinal Use of Marijuana: Is the Debate a Smoke Screen for Movement Toward Legalization? 19 J. Legal Med. 273, 280 (1998) (citing Schwartz, et al., Short- Term Memory Impairment in Cannabis-Dependent Adolescents, 143 Am. J. Dis. Child. 1214 (1989)).

104. A risk gene for cannabis psychosis, Science Daily, November 14, 2012
<http://www.sciencedaily.com/releases/2012/11/121114083928.htm>

105. Cannabis use precedes the onset of psychotic symptoms in young people, study finds, Science Daily, March 3, 2011
<http://www.sciencedaily.com/releases/2011/03/110301184050.htm>

Psychotic illness appears to begin at younger age among those who use cannabis, Science Daily February 8, 2011; <http://www.sciencedaily.com/releases/2011/02/110207165434.htm>

Adolescent pot use leaves lasting mental deficits, Developing brain susceptible to lasting damage from exposure to marijuana. Science Daily, August 27, 2012
<http://www.sciencedaily.com/releases/2012/08/120827152039.htm>

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Conflict of Interest Statement:

I declare that I have no proprietary, financial, professional or other personal interest of any nature or kind in any product, service and/or company that could be construed as influencing the position presented in, or the review of, the manuscript entitled except for the following:

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