

An Analysis of the Potential Effects of Legalizing Marijuana

Jhonette D. Balingit, Simon M. Dembiec, Elena R. Heinrich, Hailey R. Huisman, Cody

R. Santas

Department of Actuarial Science, University of Wisconsin - Milwaukee

Dr. Panos Skordi

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Abstract

The aim of this paper is to discuss both the effects involved with the legalization of marijuana and the different sides involved with the idea. From the weighing of pros and cons to ethical points of view, this has been an ongoing debate. This paper will piece together both the benefits and the harms of marijuana while introducing the medical, insurance, and tax impacts the legalization would have. It is an interesting idea that has many layers to dive into and unfold.

Keywords: Cannabis, Marijuana, CBD, THC, eCBs, Laced, Recreational, Medical, Insurance, Opioid, Alcohol, Tobacco

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The term marijuana refers to a psychoactive drug derived from plants of the genus *Cannabis*. There is some debate over how many species should be recognized, however, the genus is most commonly said to contain three species: *C. sativa*, *C. indica*, and *C. ruderalis*. All three species are easily recognizable to laypersons due to their unique leaves described by botanists as palmately compound with serrate leaflets (Armstrong, 2015). While cannabis can be bred specifically for its fiber content—in which case the plant is commonly referred to as hemp, which gives the false impression that it is a different species that is being cultivated—they are most commonly bred for high cannabinoid content (Colbert, 2015).

In the United States, marijuana was legal under both state and federal law until 1913. This is when California amended its 1907 Poison and Pharmacy Act which banned the sale of drugs such as morphine, opium, and cocaine except by prescription, and added marijuana to the list of prohibited narcotics. Several states followed suit. The idea was spurred on by “widespread anti-immigrant sentiments” and “racial prejudice against Mexican migrant workers who were often associated with the use of the drug” (Dills et. al., 2021). However, the push to ban marijuana at the federal level didn’t come until 1930 when Harry J. Anslinger was appointed the first commissioner of the newly-established Federal Bureau of Narcotics. Anslinger spent years arguing that marijuana caused “mental deterioration” and made people “...prone to commit violent crimes” (Anslinger & Oursler, 1961, par. 11). He also relied heavily on racism in his arguments in which he claimed “[r]eefer makes darkies think they’re as good as white men” (Schmidlin, 2008).

Anslinger eventually succeeded in convincing Congress to pass the 1937 Marijuana Tax Act. This levied a hefty excise tax on both marijuana and hemp, effectively outlawing them. It was eventually superseded by the 1952 Boggs Act, which amended the 1922 Narcotic Drugs Import and Export Act making possession of marijuana a crime with a minimum sentence of 2-10 years and a fine of up to \$20,000 (PBS, 2012). Currently, however, the most relevant federal legislation is the 1971 Controlled Substances Act which classifies marijuana as a Schedule I drug with “no currently accepted medical use and a high potential for abuse” (Drug Enforcement Administration [DEA], 2018).

While the Controlled Substances Act is still in effect and the federal government’s stance on marijuana has not changed, research has emerged in the past few decades which suggests that marijuana has legitimate medical applications; in response, 37 states plus the District of Columbia have passed laws legalizing marijuana for medical use, and 19 states have also legalized recreational use (National Conference of State Legislatures, 2022). Further, several attempts have been made to introduce legislation to the Senate to deschedule marijuana with the most recent being the Cannabis Administration and Opportunity Act which was introduced on July 21, 2022.

This paper aims to collect and analyze up-to-date literature on a number of topics that are relevant to the current discussion on marijuana. We will focus primarily on marijuana’s effects on human health using both its medical applications, and recreational use. Additionally, we will give specific consideration to the potential effects that legalization could have on the criminal justice system and the current tax system. We will discuss potential effects on tax laws and revenue, and how federal legalization

could affect both consumers and businesses. This paper will conclude with a summary of our findings and a discussion of how they could provide a useful perspective on how marijuana legalization and related policies could affect Americans going forward.

Literature Review

The Harms of Marijuana

While marijuana contains hundreds of known chemical compounds, its psychoactive effects are largely attributable to delta-9-tetrahydrocannabinol (THC); THC is believed to have evolved to protect the plant against ultraviolet light and insect predation (Lydon et. al, 1987; Pate, 1994). THC works by traveling through the bloodstream into the brain, from here it binds to endocannabinoid receptors and triggers the release of dopamine and norepinephrine causing euphoria. Unfortunately, the brain can adapt to long-term use of marijuana by reducing the production of its own cannabinoids and decreasing the sensitivity of the relevant receptors. This produces dependence on the drug that leads to withdrawal when use is discontinued.

The effects of marijuana go beyond euphoria. Due to the role of cannabinoids in the central nervous system, THC can have a wide array of effects: it can increase libido and stimulate appetite, induce drowsiness, impair short-term and working memory, psychomotor coordination, and to a certain degree the ability to feel pain (Aizpurua-Olaizola et al., 2017; Mathre, 1997; Riedel & Davies, 2005). The most serious effect of THC, however, seems to be psychosis; studies have shown that, even in people with no family history of psychosis, it can elicit transient psychotic symptoms such as paranoia and hallucinations which usually desist within six hours but sometimes last for multiple days (Barceloux, 2012; Freeman et al., 2014). Luckily, marijuana also

contains a compound called cannabidiol (CBD), which counteracts the effects of THC to a certain degree whilst also having no psychoactive effects (Hudson et al., 2019; Pisanti et al., 2017); this is especially notable as CBD accounts for up to 40% of a marijuana plant's extracts (Campos et al., 2012).

There is however significant evidence that, even in spite of these side effects, marijuana is still safer than a number of legal drugs. Tobacco, for example, has been causally linked to a number of cancers and causes significant lung damage which impairs respiratory functions. Comparatively, while marijuana can adversely affect lung health, studies are "...unable to demonstrate a cannabis smoke and lung cancer link, despite clearly demonstrating cannabis smoke-induced cellular damage" (Melamede, 2005, par. 3), and a later study by Pletcher et al. (2012) found that smoking marijuana also seems to cause less severe impairment of pulmonary function.

The above is not to say that smoking marijuana isn't bad for lung health. According to the National Institute on Drug Abuse (2021), studies show smoking marijuana can cause airway inflammation and increased airway resistance and is associated with "more outpatient medical visits for respiratory problems," as well as a reduction in the respiratory system's immune response which can lead to respiratory infections like pneumonia. Furthermore, marijuana smoke contains significantly higher concentrations of carcinogenic compounds like benzoprene and benzanthracene than tobacco smoke, and because marijuana smoke is often inhaled deeper and held in for longer, it also deposits four times more tar in the lungs. On the contrary, "[t]obacco users typically smoke ten to 20 cigarettes/day while some smoke much more than that. Marijuana users, on average, smoke only two to three times a month, so the typical

exposure to marijuana is much lower than that of tobacco” (Pletcher, as cited by Kim L., 2010). This is an argument for one of the reasons why marijuana seems to cause less damage to the lungs.

Marijuana is also significantly safer than alcohol. According to the Centers for Disease Control and Prevention (2020), more than 140,000 people died of “excessive alcohol use” in the United States each year between 2015–2019, but according to Renault (2021), there have been no recorded fatal marijuana overdoses to date. Further, according to Cancer Research UK (2018), alcohol is also linked to an increased risk of seven different types of cancer, including breast and bowel cancer, but a meta-analysis of 25 separate studies conducted by Ghasemiesfe et al. (2019) found little evidence that marijuana is associated with an increased risk of any cancers. Most notably, however, multiple studies have shown that driving under the influence of alcohol carries a greater risk of involvement in fatal crashes than driving while under the influence of marijuana, even after adjusting for outlying factors (Compton & Berning, 2015; Martin et al., 2017).

The most notable evidence of the relative safety of marijuana is a study by Lachenmeier & Rehm (2015). This study analyzed a number of drugs, both legal and illegal, using the Margin of Exposure (MOE) approach. Toxicological data for each drug was evaluated to determine “the ratio between the point on the dose response curve, which characterizes adverse effects in epidemiological or animal studies... and the estimated human intake of the same compound,” with lower MOE values signifying a “larger risk for humans” (p. 2). This study found that “THC or cannabis can be consistently found to have high MOE values” (p. 3), with values being consistently

greater than 100. This confirms that cannabis, and THC in particular, is a relatively safe recreational drug with low mortality risk.

Potential Medical Applications

The medical applications of marijuana focus on the CBD portion of the cannabis plant. Medical marijuana has a low concentration of THC, which gives intoxicating properties. Endocannabinoids (eCBs) in addition to their receptors are found in many places in the human body: the nervous system, internal organs, connective tissues, glands, and immune cells. The deficiency of eCBS has an important part in the pathology of disorders such as migraines, irritable bowel syndrome, and depression. In more recent studies, these deficiencies can worsen schizophrenia, anorexia, and many other disorders (Bridgeman et al., 2017). It is accepted that non-psychoactive strains of cannabis such as CBD can stimulate the eCBs receptors. CBD stimulates the eCBs in the human body, giving it “a high potential for therapeutic use, including antiepileptic, anxiolytic, antipsychotic, anti-inflammatory, and neuroprotective effects” (Bridgeman et al., 2017). The Federal Drug Administration (FDA) has not officially approved cannabis to treat any diseases. However, the FDA did approve two man-made cannabinoids: Dronabinol (Marinol) which is used to treat nausea and vomiting caused by chemotherapy and weight loss, and Nabilone (Cesamet) which is used to treat nausea and vomiting caused by chemotherapy for people who had not had relief from other treatments (Vorvick, 2021). These two cannabinoids can portion control the amount of CBD.

To obtain medical marijuana in a state that permits the use, one must prove that they need it or that marijuana can ease their symptoms. They would go to their primary

care physician and talk about the symptoms they face. A person can do this by having a certain disease or disorder such as cancer, epilepsy, chronic pain, HIV / AIDS, and depression. The person would then register to their marijuana state registry. The state will provide a list of approved dispensaries where the patient can legally purchase marijuana (Loconti, 2021). Once a medical ID is produced, the person can avoid the recreational taxes associated with the purchase. Typically medical marijuana is taken by smoking the flower of the plant. It can also be taken by eating, vaporizing, or as a liquid substance. CBD has a sedation effect which can help with neurological and physical pain. Some states have legalized the use of marijuana for certain disorders/diseases. The therapeutic effects of CBD can be used to treat epilepsy, insomnia, and social anxiety disorder.

Recently, the effects of CBD have been used to treat cancer patients. Due to chemotherapy, many patients experience nausea and vomiting. As previously stated, Marinol has been approved to lessen the severity of these two symptoms (Vorvik, 2021). Some cancer patients prefer using marijuana for their symptoms especially when the conventional methods did not work for them. Marijuana has also been proven to promote eating, especially in cancer patients who don't eat enough due to their condition. At some concentration of THC, it can stimulate appetite and slow down weight loss (Takeda Oncology, 2021). Nerve damage is also a common side effect of cancer. In history, this has been hard to treat. Patients have however looked to marijuana to ease their pain. Studies conducted on animals have shown that marijuana relieved, to some extent, their nerve damage pain. For normal pain, opioids are still considered the first effective treatment, but due to their addictive nature, some patients

turn to marijuana because of its pain-reducing nature and its anti-inflammatory properties (Takeda Oncology, 2021). Marijuana also doesn't have a direct substance to cause addiction.

Effects on Healthcare Expenditure

A natural consequence of the use of marijuana in a medical setting is the change in healthcare expenditures. A study by Bradford & Bradford (2016) found that, on average, the number of prescribed doses for a variety of medications in states with medical marijuana laws was significantly lower than the number of prescribed doses in states without such laws. Approximately 265 fewer doses of antidepressants and 562 fewer doses of anti-anxiety medications were prescribed, along with 541 fewer doses of nausea medication, 519 fewer doses of antipsychotics, 486 fewer doses of seizure medications, 362 fewer doses of sleeping pills, and an immense 1,826-dose reduction in painkiller prescriptions (Exhibit 3). As one would expect, from such reductions in prescription rates, their analysis also found that Medicare Part D spending was lower in states with medical marijuana—more than \$100 million lower, in fact—and that, if all states had adopted medical marijuana laws, spending would have decreased by an additional \$468.1 million (Exhibit 4).

A later study by Wen & Hockenberry (2018) specifically focused on the effects of medical marijuana laws on opioid prescriptions for Medicaid enrollees. In particular, it found a 5.88% decrease in opioid prescriptions in states with medical marijuana laws, and it also found a 6.38% decrease in opioid prescriptions in states which legalized recreational marijuana. Another study into the effects of marijuana on opioid use was conducted by Lucas et al. (2021) in Canada. Lucas et al. found “a 78% reduction in

mean opioid dosage.” This decrease in opioid use is notable because data suggests that almost 80 percent of heroin addicts previously used prescription pain relievers (Muhuri et al., 2013). As a result, medical marijuana has the potential to reduce heroin and opioid addiction rates, which could also decrease the number of fatal overdoses. However, research on this topic has mixed results; a study by Bachhuber et al. (2014) found that states with medical marijuana laws had an average of 24.8% fewer fatal opioid overdoses, while a later meta-analysis of similar studies found “a statistically non-significant 8% reduction in opioid overdose mortality...and a 7% reduction in prescription opioids dispensed” (Chihuri & Li, 2019).

It is important to note that medical professionals are still hesitant to prescribe medical marijuana, even in states where it is legal. One of the primary reasons for this is that marijuana is still a Schedule I controlled substance under federal law, which has stymied research efforts to a staggering degree—researchers must get the approval of the DEA, the Food and Drug Administration, and the National Institute on Drug Abuse (Schwartz, 2017), all of which spend 20 times more on research into the potential harms of marijuana than they do on research into its potential medical uses (O’Grady, 2020). As a result, much of the existing scientific literature on the topic of medical marijuana comes from abroad, such as in Israel or Canada. This also makes it difficult to evaluate the reproducibility of existing studies which is one of the most crucial components of the scientific method—in the absence of studies to confirm previous findings, physicians are forced to rely on existing studies, many of which have contradictory conclusions and lack in standardization, which makes it “hard to draw comparisons across studies” (Miller, 2017, par. 7).

Further, physicians can be reluctant to prescribe medical marijuana due to potential legal repercussions. The DEA requires medical professionals to “apply for and maintain a valid certificate of registration... this will allow them to prescribe certain types of drugs, distribute, or dispense controlled substances to patients” (Law Offices of Joseph J. Bogdan, LLC, 2020). Revocation of this registration would leave a physician unable to prescribe any controlled substances including opioids and several different anti-anxiety medications. Luckily, the DEA is not allowed to revoke this registration for simply recommending medical marijuana to patients (Di Forti et al., 2019). This however doesn’t stop state medical boards from revoking a physician’s medical license if they write too many recommendations (Ingold, 2016).

It is also important to note that the previously observed reduction in Medicare and Medicaid expenditure occurs because major health insurance companies provide no coverage for medical marijuana due to federal laws. This lack of insurance coverage means that users of medical marijuana are paying entirely out-of-pocket with average monthly costs of \$300 or more (Brown et al., 2021). While marijuana can be grown at home, one usually has to pay for both a license and an application fee, these can cost anywhere from \$600 to over \$500,000, depending on the state (Skodzinski, 2021). However, if marijuana were rescheduled on the federal level, it is possible that more doctors would recommend medical marijuana to their patients. It is also likely that insurance companies would begin adding coverage for medical marijuana. In this case, insurance spending on marijuana would increase, likely offsetting the decrease in expenditure presently observed, but the cost to individual consumers would likely decrease.

Effects on Criminal Justice Expenditures

The decriminalization movement of marijuana dates back to 1973 when a number of states reduced penalties for possession of marijuana. Certain local cities such as Milwaukee, WI, and also three cities in California modified their local ordinances and criminal justice practices to decriminalize weed. Despite its legality, states found that a high proportion of people were using marijuana. The main argument for the decriminalization of weed is the cost-saving effect it has on the expenditures used to prosecute, sentence, and incarcerate these individuals associated with weed (Austin, 2005).

The costs of national criminal justice expenditures for enforcing marijuana laws are estimated to be "\$7.6 billion per year with \$3.7 billion being allocated to police, \$853 million to the courts, and \$3.1 billion to corrections" (Austin, 2005). This does not include expenses incurred by the marijuana user. These costs can include license suspension, removal of public housing, loss of welfare payments, and denial of employment. In 2018, there were more than 608,000 arrests based on marijuana possession alone. Housing a single inmate for these crimes can cost between \$30,000 - \$35,000 per year. Some people view the possession of marijuana to be a not-so-serious offense, and some taxpayers are also concerned with the costs involved in arresting these people (Jorgenson, 2020). The studies on reducing these costs use a proportionate cost model that is recognized by the Office of Drug Control Policy. The methodology is that if marijuana-related arrests accounted for XX% of total crimes, legalizing marijuana would reduce law enforcement costs by XX% (Austin, 2005). This

argument does neglect the fact of fixed costs associated with running a law enforcement workplace.

Another big issue with the criminalization of marijuana is that its enforcement is racially biased. Across the country, the use of marijuana is equally distributed among races. Despite the equal distribution, black people are four times more likely to be arrested for marijuana than white people (Jorgenson, 2020). The ratio of marijuana arrests from black people to white people increases significantly depending on the state. States such as Iowa and Minnesota, are eight times more likely to arrest a black person than a white person for possession. Some argue that this racial bias links back to the “stop and frisk” era where black people were disproportionately and unfairly chosen. This promotes a divide between the police and the community which further drives the tension between the two. With this tension, the community is less likely to reach out to the police for assistance and has a less trusting idea of them. Racial bias despite being aware of it or not is damaging to this relationship. Police need the community to trust them in order to solve crimes as information from the community is integral to the solution (Jorgenson, 2020).

Increased Regulatory Ability

Along with evidence to connect marijuana usage leading people away from other substances, the recent trend shows that people are switching from alcohol to marijuana. Specifically, binge drinking rates are significantly lower in states where adults can legally buy recreational marijuana (Azer, 2018). The increase in marijuana users brings up the importance of states having the ability to regulate products in order to protect consumers, and decrease the prevalence of laced marijuana.

Lacing is a very common occurrence, particularly in drugs like marijuana and cocaine, which are often laced in order to bulk or increase the original product to earn a greater profit. There are various different drugs that marijuana can be laced with such as Heroin, Cocaine, LSD, Methamphetamine, and many other harmful substances. Marijuana lacing is more likely to occur in cases where people are selling a drug illicitly and are trying to enhance its psychoactive effects (Watkins, 2022). The legalization of cannabis would reduce the potential for violent drug interactions. Consumers would no longer be risking their safety to purchase illegal THC on the streets. The legalization would encourage consumers to purchase the product at a dispensary where the environment is safe and the marijuana is regulated.

CBD, or cannabidiol, is the second most prevalent active ingredient in marijuana (Grinspoon, 2021). While CBD is an essential component of medical marijuana. It stems directly from the hemp plant but does not cause a high on its own. Currently, all 50 states have different laws legalizing CBD with varying degrees of restriction. As of 2018, President Donald J. Trump signed the (AIA) Agriculture Improvement Act of 2018. Under this law, CBD products with less than 0.3 percent tetrahydrocannabinol, the compound that produces a “high,” are no longer considered a controlled substance that is illegal under federal law. Instead, the 2018 legislation authorizes FDA to regulate the sale of CBD products pursuant to the (FDCA) (Cass, 2021). The regulation of CBD sales is beneficial because there is evidence to conclude many health benefits such as alleviating insomnia, anxiety, chronic pain, and addiction to other substances. Thus, in turn, the regulation of CBD may push consumers to this product instead of other illegal harmful substances.

Although supporters of legalization advocate that it reduces crime, improves public health, increases traffic safety, and lowers criminal justice expenditures, critics argue that state legalization has had minor effects. More specifically, opponents of legalization believe that crime rates will increase. On the contrary, there are numerous counter-arguments that can be made as to why legalization is more harmful. Some examples would be the possibility of interference in youth academia and encouraging the possibility of smuggling drugs across the border. However, there is evidence to support that the ability of states to regulate cannabis will allow for easier accessibility, encourage consumers to purchase a safer product, and as result, decrease the prevalence of laced marijuana.

Effects on Insurance Plans and Premiums

“Marijuana is second to alcohol as the most common non-medical drug associated with impaired driving” (Cumming, 2015). There is also no accepted legal limit when it comes to marijuana. This is due to two factors: there isn’t a quick process in order to find how much someone has in their system, and it is unclear how much marijuana it takes to render someone incapable of driving safely. Unlike alcohol where the blood alcohol level declines relatively slowly throughout the hours after consumption, THC levels drop off by 80% - 90% in the following hours while their effects remain (Compton, 2017). This leaves only a field sobriety test, much like the one for alcohol, left to be feasible. However, research at this time has not found a test that is practical enough to be used and fully accepted. In controlled studies, a small amount of marijuana in one's system significantly increased the risk of motor vehicle collisions (Bondallaz et al., 2016; Compton et al., 2015). All of this information can only lead one

to believe that the legalization of marijuana would only raise insurance rates and cause our roads to be much less safe. Interestingly, in the states that have legalized medical marijuana, it has been found that auto insurance premiums decrease by \$5.20 per policy year with the effect being strong near dispensaries (Ellis et. al., 2019). The exact reason for this is unknown. The main link is that it is much less of a social drug. There aren't bars set up for smoking marijuana like there are for consuming alcohol. This means that most of the consumption takes place at home, where one is less likely to drive elsewhere.

Marijuana is also an interesting topic in terms of life insurance. It is likely that if marijuana becomes legalized, most insurance companies would end up treating it much like tobacco. Premiums would go up the more a person smokes marijuana. What insurance companies haven't figured out however is, how much is too much. Currently, there isn't enough long-term research on how marijuana affects people who have continued to smoke it for long periods. At this point, insurance companies would most likely have to play some sort of a guess and check game with their policyholders, trying to find the sweet spot in their life insurance rates.

If marijuana were legalized, insurance companies would most likely have to come up with new property plans or add to existing plans for recreational plants. These plans would likely mirror the existing ones for medicinal marijuana growers which are much like regular farming insurance. The coverages could include: "Fire or Lightning, explosion, riot or civil commotion, aircraft, vehicles not owned or operated by a resident of the 'resident premises', vandalism or malicious mischief, or theft" (Wells, 2014). A recreational grower of marijuana can have a large operation running, where they would

most likely want to get their grow lights, dehumidifiers, watering mechanisms, etc. covered for any possible damages. What insurance companies will need to figure out is how much they are willing to cover and at what cost. In the past, insurance companies have paid out sums of money for the loss of marijuana. In the case of *Barnett v. State Farm* (2001), Barnett asked State Farm to award him \$98,000 in repayment for the marijuana plants that were taken due to an unlawful search by the police. The state court eventually came to the conclusion that his plants should be returned to him, but the order came too late as the police had already burned his plants. Rulings like this are not uncommon, as there have been many like this across many different states in the United States. With courts already leaning this way, it is very likely that we will soon see more insurance plans tailored toward recreational marijuana users and growers.

Effects on Tax Laws and Revenue

The legalization of marijuana has an explicit impact when it comes to tax revenue on both the state and federal levels. While medical marijuana is not taxed, recreational use of marijuana is and the tax revenue gained through this is considerable (Urban Institute, 2019). Medical marijuana cards protect the medical consumer (Dutcher, 2022) and the disbursement of tax revenue provides a foundation for good to come from the legalization of marijuana (Boesen, 2020). Legalizing marijuana at the federal level will also benefit and provide the much-needed help that marijuana businesses need in order to operate (Hanson, 2015). The tax benefits involved with the legalization of marijuana are uncanny and need to be discussed.

Marijuana is taxed when being used for recreational purposes and this tax comes in many forms. Marijuana can be taxed based on the price it is being sold at, the weight

in which it is being sold, and the potency of the marijuana being sold (Urban Institute, 2019). Not every state in which marijuana is being sold is taxed (Urban Institute, 2019) but legalization at a national level would change this. This change would benefit society in ways deeper than marijuana. Currently, states are allocating marijuana tax revenue in sectors such as community colleges and education, public workers, public safety, healthcare, and more (Urban Institute, 2019). In legalizing at the federal level, the observed tax uses would be spread across and prioritized at a federal level which would benefit all of America as a whole. In this, it is easy to see that legalization of marijuana can benefit Americans as a whole rather than simply making marijuana easier to access for users whether recreationally or medically. In some states like Colorado and Illinois, marijuana tax creeps around half of a billion dollars representing about 1% of the state's tax revenue (Urban Institute, 2019). In seeing this it is easy to comprehend at minimum how legalization at the federal level would produce hundreds of millions in state tax revenue for each state along with billions of federal tax revenue for all of America to benefit from.

One common disagreement involving the idea of legalizing marijuana is that legalization would be counterproductive to the drug problem present in America. In many states, the tax revenue from marijuana is rolled into funding public education and prevention campaigns (Hanson, 2015). Also, having a recognized and federal standard along with testing will save lives that could have suffered from laced or unsafe marijuana. Through legalization and getting marijuana off of the streets, it will also be easier to get marijuana out of the hands of minors (Boesen, 2020). In recognizing where tax dollars are being allocated and understanding the safety net produced through

legalization, it is clear how legalization is anything but counterproductive. A simple way to recognize the impact is by understanding that people are going to use marijuana whether it is legal or not. By nationalizing the standard by which marijuana is produced while allocating dollars to education and prevention efforts Americans can be confident that their people are safe and are making the proper choices.

The legalization of marijuana at a federal level would help businesses involved in the industry (Boesen, 2020). Currently, cannabis-based businesses are not treated like regular businesses since marijuana is not legalized at the federal level (Hanson, 2015). This is an issue because businesses do not have proper access to banking, federal tax deductions, and interest trading (Boesen, 2020). With legalization at a national level, these problems would be solved.

Taxation at the federal level could ultimately lower prices in the long run rather than increase them indefinitely. Businesses with better access to banking, federal tax deductions, and interest trading would be able to leverage their money in a way that would produce competitive and possibly decreasing prices (Boesen, 2020). Taxation would also be used to develop the simple idea of taxing marijuana in the sense of testing potency, employing people, and funding marijuana-related spending (Boesen, 2020). This would appear to increase prices and originally it would but in formulating more efficient processes the cost to tax such a commodity would level out and save the consumer money down the road. For people who need marijuana to help them function at a medical level, there is also an easy answer to lower prices. Medical marijuana cards are tax-free passes to obtain marijuana (Dutcher, 2022).

Although the legalization of marijuana can be a gray area of conversation, when looking at the effects on tax laws and revenue there is no argument. The tax revenue produced by the legalization of marijuana, the ways in which this revenue will be used and allocated, and the long-run savings developed from the idea of legalization at a federal level produce a solid argument for legalization.

Conclusion

When weighing the pros and cons involved with the legalization of marijuana there is a clear winner. Whether it is the divergence from other substances to the safer substance of marijuana or the allocation of tax dollars received from the legalization to educate society, the impact is anything but negative. People can begin purchasing the substance already being used safer and legally. Tax dollars used to arrest people in possession and hold them in prison can be reallocated to benefit Americans, and former “criminals” can regain the life they once possessed. Medical practitioners can become confident in their diagnosis, and business owners can benefit as well. Overall, there is no reason to hold back any longer on the decision that will so clearly propel America to a better place. A closing thought is necessary for considering legalization; “The absence of significant adverse consequences is especially striking given the sometimes-dire predictions made by legalization opponents” (Dills, et. al., 2021).

References

- Aizpurua-Olaizola, O., Elezgarai, I., Rico-Barrio, I., Zarandona, I., Etxebarria, N., & Usobiaga, A. (2017). Targeting the endocannabinoid system: future therapeutic strategies. *Drug Discovery Today*, 22(1), 105–110.
<https://doi.org/10.1016/j.drudis.2016.08.005>
- Anslinger, H. J., & Oursler, W. (1961). *The Murderers: The Shocking Story of the Narcotics Gangs* (pp. 541–554). Farrar, Straus and Cudahy.
<http://www.hempology.org/ALL%20HISTORY%20ARTICLES.HTML/1961%3B%20ANSLINGER%20MURDERERS.html>
- Armstrong, W. P. (2015, September 9). *Leaf Terminology (Part 1)*. Wayne's World.
Retrieved from
<https://web.archive.org/web/20150909114619/http://waynesword.palomar.edu/term1f1.htm>
- Austin, J. (2005). *Understanding the economics of decriminalizing marijuana*. Prison Policy. Retrieved September 28, 2022, from
https://www.prisonpolicy.org/scans/jfa/marijuana_report.pdf
- Bachhuber, M. A., Saloner, B., Cunningham, C. O., & Barry, C. L. (2014). Medical cannabis laws and opioid analgesic overdose mortality in the United States, 1999-2010. *JAMA Internal Medicine*, 174(10), 1668–1673.
<https://doi.org/10.1001/jamainternmed.2014.4005>

Barnett v. State Farm General Ins. Co., 200 (2011) Cal.App.4th 536, 132 Cal. Rptr. 3d 742, 11 Cal. Daily Op. Serv. 13519, 2011 Daily Journal D.A.R. 16029 (Cal. Ct. App. 2011)

Boesen, U. (2020, June 9). *A Road Map to Recreational Marijuana Taxation*. Tax Foundation. <https://taxfoundation.org/recreational-marijuana-tax/>

Bradford, A. C., & Bradford, W. D. (2016). Medical Marijuana Laws Reduce Prescription Medication Use In Medicare Part D. *Health Affairs*, 35(7), 1230–1236. <https://doi.org/10.1377/hlthaff.2015.1661>

Bridgeman, M. B., & Abazia, D. T. (2017). Medicinal Cannabis: History, Pharmacology, And Implications for the Acute Care Setting. *P & T : a peer-reviewed journal for formulary management*, 42(3), 180–188.

Brown, B., & McCarthy, Y. (2021). *Report on Medical Cannabis Price Study, Version 1.2*. Minnesota Department of Health. <https://www.health.state.mn.us/people/cannabis/docs/rulemaking/pricereport.pdf>

Campos, A. C., Moreira, F. A., Gomes, F. V., Del Bel, E. A., & Guimarães, F. S. (2012). Multiple mechanisms involved in the large-spectrum therapeutic potential of cannabidiol in psychiatric disorders. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 367(1607), 3364–3378. <https://doi.org/10.1098/rstb.2011.0389>

Cancer Research UK. (2018, December 28). *Does alcohol cause cancer?* <https://www.cancerresearchuk.org/about-cancer/causes-of-cancer/alcohol-and-cancer/does-alcohol-cause-cancer>

- Cass, D. (2021, December 16). *High Hopes for FDA Regulation of CBD Products*. The Regulatory Review. Retrieved September 25, 2022, from <https://www.theregreview.org/2021/12/16/cass-high-hopes-fda-regulation-cbd-products/>
- Centers for Disease Control and Prevention. (2020, August 3). *Alcohol-Related Deaths*. <https://www.cdc.gov/alcohol/features/excessive-alcohol-deaths.html>
- Chihuri, S., & Li, G. (2019). State marijuana laws and opioid overdose mortality. *Injury Epidemiology*, 6(1). <https://doi.org/10.1186/s40621-019-0213-z>
- Colbert, M. (2015, January 26). *Indica, Sativa, Ruderalis - Did We Get It All Wrong?* The Leaf Online. <https://web.archive.org/web/20170214004241/http://theleafonline.com/c/science/2015/01/indica-sativa-ruderalis-get-wrong/>
- Compton, R. (2017, July). *Marijuana-Impaired Driving - A Report to Congress*. (DOT HS 812 440). Washington, DC: National Highway Traffic Safety Administration.
- Compton, R. P., & Berning, A. (2015, February). *Drug and Alcohol Crash Risk*. National Highway Traffic Safety Administration; U.S. Department of Transportation. http://www.nhtsa.gov/staticfiles/nti/pdf/812117-Drug_and_Alcohol_Crash_Risk.pdf
- Conant v. Walters, 309 F.3d 629 (9th Cir 2002)
- Di Forti, M., Quattrone, D., Freeman, T. P., Tripoli, G., Gayer-Anderson, C., Quigley, H., Rodriguez, V., Jongsma, H. E., Ferraro, L., La Cascia, C., La Barbera, D., Tarricone, I., Berardi, D., Szöke, A., Arango, C., Tortelli, A., Velthorst, E., Bernardo, M., Del-Ben, C. M., & Menezes, P. R. (2019). The contribution of

- cannabis use to variation in the incidence of psychotic disorder across Europe (EU-GEI): a multicentre case-control study. *The Lancet Psychiatry*, 6(5), 427–436. [https://doi.org/10.1016/s2215-0366\(19\)30048-3](https://doi.org/10.1016/s2215-0366(19)30048-3)
- Dills, A., Goffard, S., Miron, J., & Partin, E. (2021, February 2). *The Effect of State Marijuana Legalizations: 2021 Update*. Cato Institute. <https://www.cato.org/policy-analysis/effect-state-marijuana-legalizations-2021-update>
- Drug Enforcement Administration. (2018, July 10). *Drug Scheduling*. <https://www.dea.gov/drug-information/drug-scheduling>
- Dutcher, Anthony. (2022, September 12). *7 Benefits of Having a Medical Marijuana Card in a Rec State*. Cannabis Central. <https://www.veriheal.com/blog/why-would-i-get-a-medical-marijuana-card-if-its-rec-in-my-state/>.
- Freeman, D., Dunn, G., Murray, R. M., Evans, N., Lister, R., Antley, A., Slater, M., Godlewska, B., Cornish, R., Williams, J., Di Simplicio, M., Igoumenou, A., Brenneisen, R., Tunbridge, E. M., Harrison, P. J., Harmer, C. J., Cowen, P., & Morrison, P. D. (2014). How Cannabis Causes Paranoia: Using the Intravenous Administration of Δ^9 -Tetrahydrocannabinol (THC) to Identify Key Cognitive Mechanisms Leading to Paranoia. *Schizophrenia Bulletin*, 41(2), 391–399. <https://doi.org/10.1093/schbul/sbu098>
- Ghasemiesfe, M., Barrow, B., Leonard, S., Keyhani, S., & Korenstein, D. (2019). Association Between Marijuana Use and Risk of Cancer. *JAMA Network Open*, 2(11), e1916318. <https://doi.org/10.1001/jamanetworkopen.2019.16318>

Gorelick, D. A., Levin, K. H., Copersino, M. L., Heishman, S. J., Liu, F., Boggs, D. L., & Kelly, D. L. (2012). Diagnostic criteria for cannabis withdrawal syndrome. *Drug and Alcohol Dependence*, *123*(1-3), 141–147.

<https://doi.org/10.1016/j.drugalcdep.2011.11.007>

Grinspoon, P., MD. (2021, September 24). *Cannabidiol (CBD): What we know and what we don't*. Harvard Health. Retrieved September 25, 2022, from <https://www.health.harvard.edu/blog/cannabidiol-cbd-what-we-know-and-what-we-dont-2018082414476>

Hanson, K. (2015, November). *Regulating Marijuana: Taxes, Banking and Federal Laws*. National Conference of State Legislatures.

<https://www.ncsl.org/research/health/regulating-marijuana-taxes-banking-and-federal-laws.aspx>

Hudson, R., Renard, J., Norris, C., Rushlow, W. J., & Laviolette, S. R. (2019).

Cannabidiol Counteracts the Psychotropic Side-Effects of Δ -9-Tetrahydrocannabinol in the Ventral Hippocampus through Bidirectional Control of ERK1–2 Phosphorylation. *The Journal of Neuroscience*, *39*(44), 8762–8777. <https://doi.org/10.1523/jneurosci.0708-19.2019>

Ingold, J. (2016, July 19). *Four Colorado doctors suspended over medical marijuana recommendations*. The Denver Post.

<https://www.denverpost.com/2016/07/19/four-colorado-doctors-suspended-over-medical-marijuana-recommendations/>

Jorgenson, C. (2020, May 19). *How marijuana legalization would benefit the criminal justice system*. The Blue Review. Retrieved September 27, 2022, from

<https://www.boisestate.edu/bluereview/how-marijuana-legalization-would-benefit-the-criminal-justice-system/#:~:text=Recent%20research%20has%20shown%20that,avenue%20of%20raising%20tax%20revenue.>

Kim, L. (2012, January 10). *Marijuana Shown to Be Less Damaging to Lungs Than Tobacco*. University of California San Francisco.

<https://www.ucsf.edu/news/2012/01/98519/marijuana-shown-be-less-damaging-lungs-tobacco>

Lachenmeier, D. W., & Rehm, J. (2015). Comparative risk assessment of alcohol, tobacco, cannabis and other illicit drugs using the margin of exposure approach. *Scientific Reports*, 5(1). <https://doi.org/10.1038/srep08126>

Law Offices of Joseph J. Bogdan, LLC. (2020, November 30). *U.S. DEA Registration Suspension Lawyer*.

<https://www.jjblawoffice.com/drug-enforcement-administration/dea-suspension-revocation-orders>

Lucas, P., Boyd, S., Milloy, M. J., & Walsh, Z. (2021). Cannabis Significantly Reduces the Use of Prescription Opioids and Improves Quality of Life in Authorized Patients: Results of a Large Prospective Study. *Pain Medicine*, 22(3), 727–739. <https://doi.org/10.1093/pm/pnaa396>

Lydon, J., Teramura, A. H., & Coffman, C. B. (1987). UV-B RADIATION EFFECTS ON PHOTOSYNTHESIS, GROWTH and CANNABINOID PRODUCTION OF TWO Cannabis sativa CHEMOTYPES. *Photochemistry and Photobiology*, 46(2), 201–206. <https://doi.org/10.1111/j.1751-1097.1987.tb04757.x>

- Martin, J.-L., Gadegbeku, B., Wu, D., Viallon, V., & Laumon, B. (2017). Cannabis, alcohol and fatal road accidents. *PLOS ONE*, 12(11), e0187320.
<https://doi.org/10.1371/journal.pone.0187320>
- Melamede, R. (2005). Cannabis and tobacco smoke are not equally carcinogenic. *Harm Reduction Journal*, 2(1), 21. <https://doi.org/10.1186/1477-7517-2-21>
- Miller, G. (2017, January 12). *Pot has some medical benefits, U.S. Academies say, but obstacles to research loom*. Science Magazine.
<https://www.science.org/content/article/pot-has-some-medical-benefits-us-academies-say-obstacles-research-loom>
- Muhuri, P. K., Gfroerer, J. C., & Davies, M. C. (2013, August). *Associations of Nonmedical Pain Reliever Use and Initiation of Heroin Use in the United States*. Substance Abuse and Mental Health Services Administration.
<https://www.samhsa.gov/data/sites/default/files/DR006/DR006/nonmedical-pain-reliever-use-2013.htm>
- National Conference of State Legislatures. (2022, September 12). *State Medical Marijuana Laws*.
<https://www.ncsl.org/research/health/state-medical-marijuana-laws.aspx>
- National Institute on Drug Abuse. (2021, April 13). *What are marijuana's effects on lung health?* National Institutes of Health.
<https://nida.nih.gov/publications/research-reports/marijuana/what-are-marijuanas-effects-lung-health>
- O'Grady, C. (2020, August 27). *Cannabis research database shows how U.S. funding focuses on harms of the drug*. Science Magazine.

<https://www.science.org/content/article/cannabis-research-database-shows-how-us-funding-focuses-harms-drug>

Pate, D. W. (1994). Chemical ecology of Cannabis. *Journal of the International Hemp Association*, 2(29), 32–37.

Pisanti, S., Malfitano, A. M., Ciaglia, E., Lamberti, A., Ranieri, R., Cuomo, G., Abate, M., Faggiana, G., Proto, M. C., Fiore, D., Laezza, C., & Bifulco, M. (2017).

Cannabidiol: State of the art and new challenges for therapeutic applications. *Pharmacology & Therapeutics*, 175, 133–150.

<https://doi.org/10.1016/j.pharmthera.2017.02.041>

Pletcher, M. J., Vittinghoff, E., Kalhan, R., Richman, J., Safford, M., Sidney, S., Lin, F., & Kertesz, S. (2012). Association Between Marijuana Exposure and Pulmonary Function Over 20 Years. *JAMA*, 307(2), 173–181.

<https://doi.org/10.1001/jama.2011.1961>

Renault, M. (2021, February 19). *Can you overdose on weed?* Popular Science.

<https://www.popsci.com/overdose-on-weed-marijuana/>

Riedel, G., & Davies, S. N. (2005). Cannabinoid Function in Learning, Memory and Plasticity. *Handbook of Experimental Pharmacology*, 168, 445–477.

https://doi.org/10.1007/3-540-26573-2_15

Schmidlin, K. (2008, September 13). *Column: “War On Drugs” Merely Fights The Symptoms Of A Faulty System*. CBS News.

<https://www.cbsnews.com/news/column-war-on-drugs-merely-fights-the-symptoms-of-a-faulty-system/>

Schwartz, Y. (2017, April 11). *The Holy Land of Medical Marijuana*. U.S. News & World Report.

<https://www.usnews.com/news/best-countries/articles/2017-04-11/israel-is-a-global-leader-in-marijuana-research>

Shrivastava, A., Johnston, M., Terpstra, K., & Bureau, Y. (2014). Cannabis and psychosis: Neurobiology. *Indian Journal of Psychiatry*, 56(1), 8.

<https://doi.org/10.4103/0019-5545.124708>

Skodzinski, N. (2021, February 12). *Your State-by-State Guide to Cannabis Cultivation Business Application and Licensing Fees*. Cannabis Business Times.

<https://www.cannabisbusinesstimes.com/article/state-state-guide-marijuana-application-licensing-fees/>

Takeda Oncology. (2021, November 15). *Medical marijuana and cancer*. CancerCare.

Retrieved September 27, 2022, from

https://www.cancercare.org/publications/328-medical_marijuana_and_cancer

Urban Institute. (2019, May 7). *“Marijuana Taxes.”*

<https://www.urban.org/policy-centers/cross-center-initiatives/state-and-local-finance-initiative/state-and-local-backgrounders/marijuana-taxes>.

Vorvick, L. J. (2021, April 11). *Medical marijuana: Medlineplus medical encyclopedia*.

MedlinePlus. Retrieved September 27, 2022, from

<https://medlineplus.gov/ency/patientinstructions/000899.htm>

Wells, B. (2014). Marijuana Legalization: Implications for Property/Casualty Insurance.

Journal of Insurance Issues, 37(1), 77–92. <http://www.jstor.org/stable/23723898>

Wen, H., & Hockenberry, J. M. (2018). Association of Medical and Adult-Use Marijuana Laws With Opioid Prescribing for Medicaid Enrollees. *JAMA Internal Medicine*, 178(5), 673–679. <https://doi.org/10.1001/jamainternmed.2018.1007>

World Health Organization. (2017). *CANNABIDIOL (CBD): Pre-Review Report*.

Retrieved from

http://web.archive.org/web/20210923022732/https://www.who.int/medicines/access/controlled-substances/5.2_CBD.pdf