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Health Policy for Marijuana

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Abstract

Marijuana is a substance that has been used for recreational purposes since ancient years and that is currently discussed to have a therapeutic or medical value and to be seen as a Medicine.

According to the FDA, marijuana is classified as a Schedule I drug with high risk of addiction and no medical benefit. However, it is legal in several states for deliberating conditions e.g. various pain conditions, depression, anxiety, nail patella, glaucoma and even HIV.

In addition people use is for various other conditions even though studies have shown greater harmful effects then benefit. Especially with marijuana, there is a high rate of misperception in the users. In addition, marijuana has a unique pharmacology and pharmacodynamics because of its more than 400 partially unknown components and the storage in the user's lipophilic tissues and redistribution long after the last use.

The legalization of marijuana is already done in some states and other states are pressured to follow along.

This article is a systematic review of literature analyzing the current policies, legal situations and trend as well as politics regarding marijuana and its use. The article is focused on the natural form of the *Cannabis sativa* plant.

Keywords: *Cannabis sativa*; Cigarette; Marijuana; Tobacco; Alcohol

Introduction

What is marijuana? How do people use it? Importantly, why do they use it? Is marijuana good or bad? What is our policy for marijuana for its production, distribution and use? Do we have a policy? Importantly, how do we form policy? Why should we form a policy for marijuana? What are the elements of policy and how does policy eventually become law, if it does? Interestingly, is policy enough and what more do we need to do in regards to marijuana? For marijuana, there is considerable antagonism between public interests in health, safety and welfare and individual fundamental rights to use and induce self-harm [1,2].

To answer these questions, a comprehensive review of the characteristics of marijuana is essential to understand the basic pharmacology, comparison to alcohol, addicting potential, costs to individual and public, risks, medical value, origin of policy, current federal and state laws, supply and distribution, role of entitlements, public education, and future of marijuana. No one knows for sure what form policy for marijuana will take, however, most agrees that marijuana will be used in some fashion in the foreseeable future and probably beyond [3-7].

What is marijuana?

Marijuana is not simply a drug, surprisingly. In fact, it is a plant, *Cannabis sativa*. *Cannabis sativa* is naturally grown and it contains over 400 constituent chemicals [5]. Many of the uses and identities of these chemicals are unknown; however, the psychoactive ingredient that makes marijuana popular and motivates its use is the chemical, Tetrahydrocannabinol, commonly referred to as THC [7].

Naturally occurring THC is different from the naturally occurring cannabinoids and synthetic cannabinoids approved to medical use in the United States. Cannabinoids are active chemicals contained in the plant *Cannabis sativa* as well as being synthetically produced. Most of the medical knowledge and uses related to marijuana are derived from cannabinoids, and not the smoked or edible marijuana itself. Naturally occurring marijuana or THC has not been extensively researched for its health benefits and its effectiveness as a medication is not supported by existing research [5,8].

Proponents frequently advocate that marijuana is safer than alcohol. Is that true? When the pharmacological properties of marijuana and alcohol are compared, there are some striking and contradictory differences. Alcohol as a drug, which it is, has a relatively short half-life. It typically is eliminated from the body within hours, and free of its intoxication effects. Though in some instances, in heavy users, it may last up to a day. Alcohol is metabolized the liver, only a small fraction is excreted in the urine. No residual alcohol remains in the body after it is eliminated [5,9].

In comparison, marijuana is a lipophilic drug that accumulates in the fat stores in the body with regular use. It is slowly metabolized by the liver; however, marijuana being lipophilic is attracted to fat and is stored in tissues that contain fat, such as adipose tissue and muscle. Marijuana is then, over time, slowly or rapidly released back into the blood stream from these lipid storage sites to brain to exert its effects. Therefore, marijuana, having effectively a very long half-life, can often persist for days and months, not hours. Correspondingly, marijuana accumulates and is stored over time, particularly in heavy users, and may be detected months later in the urine [5,9]. Consequently, regular users of marijuana are under the effects of marijuana often for a prolonged period, which can last days to weeks, contrary to the active effects of alcohol, which are eliminated typically within hours [5,9]. In addition, the withdrawal from marijuana is more prolonged, lasting days to weeks, whereas withdrawal from alcohol lasts hours to days.

Furthermore, the potency of alcohol is carefully regulated by state law and its contents are known through labelling in advance for the consumer. Medical marijuana on the other hand is home-grown or grown by farmers and the potency is not disclosed to the consumer, and is not accurately known. Interestingly, due to multiple factors the potency or concentration of THC has increased several folds in recent years, particularly in privately sold "medical marijuana". The marijuana that the older generations used had a much lower concentration of THC and could explain the previously mellow-yellow subjective effects. However, the newer marijuana, being much more potent, has increased the toxic reactions and dangerous effects of marijuana [10-12].

Of no less importance is that other drugs are commonly used with marijuana, particularly heroin, prescription opioid medications, and heroin. Using combination of addicting drugs is not new and is a concern as the drug effects are additive, synergistic and complement each other [13-16].

Is marijuana addicting?

Proponents of marijuana frankly deny it is addicting or it is only mildly addicting drug. Vast clinical experience and available studies in animals and humans confirm marijuana is addicting and similar in addiction potential to alcohol, nicotine and other drugs. The preoccupation with acquiring, compulsive use, and relapse to marijuana use are indicative of addictive use. The actual prevalence of marijuana addiction is not known; however, studies indicate that at least 50% of regular users are addicted [17].

Evidence for preoccupation is that marijuana is the world's most commonly used illicit drug, and the most commonly used drug illicitly or illicitly in the US, alcohol notwithstanding. Evidence for compulsive use is marijuana's adverse consequences are numerous and cited in articles regarding its medical, psychiatric, legal, social and public health. Relapse is assumed as many addicted to marijuana use it for prolonged periods of time, years and decades, despite adverse consequences [18]. Importantly, Cannabis use disorder and Addictive Disorders are a section of the Substance Related Disorders in the Diagnostic and Statistical Manual 5th Edition, DSM-5. DSM-5 was based on extensive scientific studies performed in collaboration by many investigators over years, reviewed by multiple professionals, and subjected to controlled field trials for its validity and reliability. Thus, DSM-5 has a designated section and 11 criteria for cannabis (marijuana) use disorder or cannabis (marijuana) addictive disorder [18].

Marijuana has a basis for its chemical action in various portions of the brain and its addiction potential in the mesolimbic system as with other addicting drugs. Cannabinoids receptors and endogenous cannabinoids have been isolated and marijuana is believed to act at the cannabis receptors and like endogenous opioids, there are endogenous cannabinoids whose role is not clear now [19-21].

The beneficial effects of smoked or edible marijuana have not been documented with chronic use. It is a drug subjectively claimed to produce euphoria and relaxation, release of tension, and outer world experiences; however, these are generally acute effects. The chronic effects are the accumulated negative quantitative effects, which are often harmful and unpleasant. Some of these harmful effects in studies show that marijuana is an intoxicating drug with physical and mental adverse consequences [22,23].

There is a risk for exposure of marijuana for intentional use by teenagers and unintentional use by children. Marijuana is also associated with and promotes other drug use, particularly opioids. There are documented physical health problems, cardiac, pulmonary, cancers, and mood disturbances, psychosis and addiction. Of importance and underemphasized is that addictive or heavy use, not recreational use, drives legalization and its popularity. Twenty percent of daily users consume 80% of marijuana that is consumed. These statistics are like alcohol and nicotine as 80% of the alcohol and cigarettes are consumed by 20% of the users. Those statistics could apply to nicotine as well [15,19,24-28].

Public opinion: In the US, public policy is based on public opinion and is the basis for use and laws regarding marijuana. Contributing to the rise in prevalence in marijuana use and addiction in the US is the increasing view drug abuse or drug problems as less important in recent years than in prior years [29]. Per Gallup polls between the early 1970s and the late 1970s, drug abuse was the most common and most important problem named in the public. Between 1979 and 1984 drug abuse did not appear at all in the gallop polls among the most often mentioned problems, indicating a relatively consistent low level of concern about the issue [19,30].

Not surprisingly, the support for the legalization of marijuana has conversely increased with decreasing public concern [19]. In 1969, only 12% of the US population supported the legalization of per a Gallup poll [30]. By 2000, the support for marijuana legalization reached 30%. From 2000-2015, public support for the legalization of marijuana nearly doubled. In 2015, 58% of the US-population was in favor of marijuana legalization. This trend in support of marijuana legalization is likely to continue to increase. In 2015, 71% of young adults were in support of marijuana legalization. The decrease in concern about marijuana use and the increase in support of marijuana legalization will undoubtedly result in increased marijuana use and addiction [28,29].

Cost for marijuana?

The legal consequences, whether due to legal or illegal activities, are relatively common and known. Marijuana is associated with crime, accidents, personal injury, suicide and homicide. Some studies show that 80% of homicides are associated with drugs, often citing marijuana. The health care costs are only partially known; however, many of the regular users are uninsured and suffer from mental health and physical consequences. The disability cost is rising as at least a third of those enrolled in Social Security Disability are marijuana users. Marijuana users tend to be unemployed because of the toxic,

debilitating effects of marijuana and the increased risk and impairments of marijuana in the workplace. Importantly, regular marijuana use leads to personal loss, lowered self-esteem, lower productivity and interferes and produces conflicts in relationships and may be associated with a shortened lifespan [31,32].

Underemphasized is other addicting drug use is common and marijuana by itself or in combination with other drugs increases the risk of motor vehicle accidents and fatalities due to decreased perception, coordination, and judgment, and unintentional pediatric ingestion [33-36].

Relationships between perceived risk of marijuana and harmful effects?

There seems to be a clear inverse relationship between the perception of risk and marijuana use, particularly among youth. Currently studies indicate that the perceived risk by the public due to marijuana is low and certainly among users this myth is perpetuated. One of the main factors of the popularity of legalizing marijuana, as over 50% of the public endorses it, is the perceived risk of use of marijuana to health and the individual in society is low [19,29,30].

Historically, marijuana use generally starts in youth and that is still true, and youth are exposed to many myths that marijuana is not addicting, is harmless, and medical marijuana is beneficial sends the message that it is also beneficial. However, facts and studies suggest otherwise that marijuana is associated with poor social outcome and employment, lower income, lower levels of life, and relationship satisfaction [31,37-39].

States in the US that have legalized marijuana have higher rates of marijuana use; however, these states had higher rates of marijuana use prior to legalization. At the federal level, the Obama Administration has instructed prosecutors and law enforcement officials not to focus on individuals "whose actions are unclear and unambiguous compliance with existing state laws providing for the medical use of medical marijuana". Thus, the shift in federal position prompted a drastic increase in registration for medical marijuana, particularly in Colorado [40-44].

Toxic effects of marijuana

Mental toxic effects: As a hallucinogen, Marijuana impairs mental and physical coordination, alters perception for time and surroundings, distorts comprehension of information and cognition, interferes with insight and judgment. These changes may be transient or persistent [25]. Marijuana causes the users to become "stoned" and often induces psychotic symptoms consisting of hallucinations, paranoia and delusions [7,45]. Even a single dose of cannabis can lead to substance- induced psychotic disorder. In patients with pre-existing schizophrenia, it leads to higher rates of readmissions and in bipolar disease it can precipitate a manic episode with or without pre-existing Bipolar Disease [7,22]. These marijuana induced psychotic reactions increase the likelihood of violent behaviors which leads to self-destructive and criminal behaviors. Furthermore, marijuana frequently causes and induces anxiety and depression in the users, which might be brief panic reactions but long lasting psychiatric symptomatology is described [22]. Marijuana impairs the capacity for the users to properly operate machinery, vehicles, and under the influence of cannabis, higher rates of traffic accidents and deaths are reported [5,8,23,46-48].

Typically, regular use of Marijuana leads to a reduced quality of life compared to non-users. In users with pre-existing mental conditions such as anxiety or depression, the decline in quality of life is even more severe [49]. Marijuana's negative effects on attention, memory, and learning may persist for days, weeks or months after the acute effects subside. Consequently, someone who smokes marijuana daily may be functioning at a reduced intellectual level on a chronic basis. Heavy marijuana use is linked to lower income, greater welfare dependence, unemployment, criminal behavior and lower life satisfaction [50].

In the adolescents, the use of marijuana is associated with induced ADHD and causes higher dropout rates in schools and well as an increased likelihood to use other illicit substances as well as licit substances like alcohol and opiates [5,7,23,51-53].

Physical effects: Marijuana causes dose dependent tachycardia and increases the cardiac labor. The risk of suffering an acute cardiac event is increased 5-fold for previously healthy individuals and even higher for users with pre-existing cardiac conditions [8]. Marijuana also causes a reduced blood flow in the brain by increasing the cerebrovascular resistance and systolic velocity significantly compared to non-users [7]. The dilation of peripheral blood vessels leads potentially to orthostatic hypotension and subsequently to syncope's [54]. The smoke of marijuana causes symptoms of COPD and users wheeze and frequently cough. The sputum production is increased like users inhaling tobacco [7,55].

Marijuana also causes negative effects in pregnancy. It alters the neurological development in the embryo in utero. Babies born from mothers who consumed cannabis have a higher pitch cry and tremble more. Cannabis also reaches the new-born through transmission in the breast milk [7].

In addition, the use of marijuana is linked to the development of certain cancers. Gliomas, prostate and cervical cancers are described. In pregnant women increased incidents of leukemia, rhabdomyosarcomas and astrocytomas are linked to cannabis use [55]. Marijuana also influences reproductive organs negatively and significantly lowers sperm concentrations in marijuana smokers compared to non-smokers. THC suppresses the adrenal cortical hormones prolactin, thyroid hormones and growth hormones [55-57].

Marijuana Addiction/Tolerance/Dependence

Marijuana is classified by Drug Enforcement Agency (DEA) in the US as a Schedule I drug which, like heroin, contains substances with a high potential for abuse, with no current accepted medical use and a lack of accepted safety for medical use [9]. Marijuana affects the same reward systems in the brain as alcohol, cocaine and opioids in two different ways. [5] Marijuana induces the release of endorphins in the brain from the nucleus accumbent and the orbit-frontal cortex, which produce the feeling of pleasure and reward. Endorphins are hormones that are naturally produced in the brain that have an opioid like effect. In addition, Marijuana acts as a dopamine agonist in the brain, stimulating reinforcement regions in the meso-telencephalic dopamine (DA) system [8,54].

Due to the developing tolerance, greater amount of cannabis is required over time to experience the same effect. Tolerance to cannabis occurs in relation to mood, psychomotor performance, sleep, arterial pressure, body temperature and antiemetic properties [10,58]. In addictive use, attempts are made to cut back on their use and a great amount of time is spent to obtain the drug. During periods of

abstinence, the user is experiencing cravings or a strong desire to use cannabis [7,45,59].

With discontinuation of the use or in between doses, withdrawal symptoms occur.

Symptoms of marijuana withdrawal are consistent of: anxiety, depression, decreased appetite, headaches, insomnia, irritability, muscle tension, nausea, nightmares and unpleasant vivid dreams [7].

Is medical marijuana as medicine?

Marijuana falls short of the legal definition of medicine as defined by the Federal Drug Administration (FDA) in the US. The drug approval process for a medication is established by the Food and Drug Administration by the federal government following the Federal Food and Drug Act officially recognized in 1930. One of the most important responsibilities of the FDA is to provide drug approval for prescription drugs sold in the marketplace for medical purposes in the US. To determine whether the marijuana plant in its natural form qualifies as safe and effective by FDA standards, the drug must undergo investigation by the FDA [60,61].

The most important factors in considering approval of a drug are determining the safety and effectiveness of the drug. While the FDA does support clinical trials testing the significance of plant, derived marijuana in treating medical conditions, the FDA is yet to approve marijuana for medical use. Also, medical marijuana is not prescribed by physicians in standard medical practice. In many states, it is prescribed outside of usual doctor/patient relationship and a doctor does not monitor the response to marijuana for the medical condition. Typically, a doctor is certified to provide certification for use of medical marijuana. Further, medical marijuana is not dispensed in pharmacies, does not undergo the typical prescribing route, rather it is grown by caregivers who are not under any supervision or regulation and the marijuana is sold in dispensaries that are not tested for effectiveness or safety and distribution is loosely regulated by local ordinances and state law [60,61].

FDA requires 12 stages that a drug must pass to receive FDA approval. Stage 1 is animal testing; stage 2 is investigational new drug application, stage 3 is IND review; stage 4 is clinical trial phase one focused on safety, stage 5 is clinical trial phase two focused on effectiveness; stage 6 is clinical trial phase 3 testing on individuals; stage 7 is FDA review after all the information is collected; stage 8 is a new drug application to the FDA for approval; stage 9 is application reviewed; stage 10 is drug labelling to ensure that the physician and consumer are well informed; stage 11 is facility inspection of where the drugs will be manufactured; and stage 12 is FDA drug approval after review. Medical marijuana does not participate in any of these stages [60,61].

Most of the studies that claim therapeutic benefit of marijuana related chemicals were performed on cannabinoids, both naturally occurring and synthetic, not on marijuana the plant itself and not on THC, the psychoactive ingredient. Those studies done on marijuana were short term, such as five days or involved use of multiple other addicting drugs. No controlled studies have shown that marijuana effectively lowers pain. Marijuana has many side effects that outweigh any perceived benefits in some studies, and the question is how good can a medication being or become if it incapacitates and disables [62-64].

The DEA and the federal government are not alone in viewing smoked marijuana as having no documented medical value. Voices in the medical community likewise do not accept smoked marijuana as medicine:

The American Medical Association (AMA) has always endorsed "well-controlled studies of marijuana and related cannabinoids in patients with serious conditions for which preclinical, anecdotal, or controlled evidence suggest possible efficacy and the application of such results to the understanding and treatment of disease." In November 2009, the AMA amended its policy, urging that marijuana's status as a Schedule I controlled substance be reviewed "with the goal of facilitating the conduct of clinical research and development of cannabinoids-based medicines, and alternate delivery methods." The AMA also stated that "this should not be viewed as an endorsement of state-based medical cannabis programs, the legalization of marijuana, or that scientific evidence on the therapeutic use of cannabis meets the current standards for prescription drug product" [65].

The American Society of Addiction Medicine's (ASAM) public policy statement on "Medical Marijuana," clearly rejects smoking as a means of drug delivery. ASAM further recommends that "all cannabis, cannabis-based products and cannabis delivery devices should be subject to the same standards applicable to all other prescription medication and medical devices and should not be distributed or otherwise provided to patients…" without FDA approval. ASAM also "discourages state interference in the federal medication approval process." ASAM continues to support these policies and has also stated that they do not "support proposals to legalize marijuana anywhere in the United States" [66].

The American Cancer Society (ACS) "is supportive of more research into the benefits of cannabinoids. Better and more effective treatments are needed to overcome the side effects of cancer and its treatment. However, the ACS does not advocate the use of inhaled marijuana or the legalization of marijuana" [66].

The American Glaucoma Society (AGS) has stated that "although marijuana can lower the intraocular pressure, the side effects and short duration of action, coupled with the lack of evidence that its use alters the course of glaucoma, preclude recommending this drug in any form for the treatment of glaucoma now" [66].

The Glaucoma Research Foundation (GRF) states that "the high dose of marijuana necessary to produce a clinically relevant effect on intraocular pressure in people with glaucoma in the short term requires constant inhalation, as much as every 3 h.

The number of significant side effects generated by long-term use of marijuana or long-term inhalation of marijuana smoke makes marijuana a poor choice in the treatment of glaucoma. To date, no studies have shown that marijuana – or any of its approximately 400 chemical components-can safely and effectively lower intraocular pressure better than the variety of drugs currently on the market" [66].

The American Academy of Pediatrics (AAP) believes that "any change in the legal status of marijuana, even if limited to adults, could affect the prevalence of use among adolescents." While it supports scientific research on the possible medical use of cannabinoids as opposed to smoked marijuana, it opposes the legalization of marijuana [66].

The American Academy of Child and Adolescent Psychiatry (AACAP) "is concerned about the negative impact of medical marijuana on youth. Adolescents are especially vulnerable to the many

adverse development, cognitive, medical, psychiatric and addictive effects of marijuana." Of greater concern to the AACAP is that "adolescent marijuana users are more likely than adult users to develop marijuana dependence and their heavy use is associated with increased incidence and worsened course of psychotic, mood and anxiety disorders." "The "medicalization" of smoked marijuana has distorted the perception of the known risks and purposed benefits of this drug." Based upon these concerns, the "AACAP opposes medical marijuana dispensing to adolescents" [66].

The National Multiple Sclerosis Society (NMSS) has stated that "based on studies to date – and the fact that long0term use of marijuana may be associated with significant, serious side effects – it is the opinion of the National Multiple Sclerosis Society's

Medical Advisory Board that there are currently insufficient data to recommend marijuana or its derivatives as a treatment for MS symptoms. Research is continuing to determine if there is a possible role for marijuana or its derivatives in the treatment of MS. In the meantime, other well tested, FDA-approved drugs are available to reduce spasticity" [66].

In 1999, The Institute of Medicine (IOM) released a landmark study reviewing the supposed medical properties of marijuana. The study is frequently cited by "medical" marijuana advocates, but in fact severely undermines their arguments.

After the release of the IOM study, the principal investigators cautioned that the active compounds in marijuana may have medicinal potential and therefore should be researched further. However, the study concluded that "there is little future in smoked marijuana as a medically approved medication" [66].

For some ailments, the IOM found "…potential therapeutic value of cannabinoid drugs, primarily THC, for pain relief, control of nausea and vomiting and appetite stimulation." However, it pointed out that "the effects of cannabinoids on the symptoms studied are generally modest, and in most cases, there are more effective medications [than smoked marijuana]" [66].

The study concluded that, at best, there is only anecdotal information on the medical benefits of smoked marijuana for some ailments such as muscle spasticity. For other ailments, such as epilepsy and glaucoma, the study found no evidence of medical value and did not endorse further research [66].

The IOM study explained that "smoked marijuana…is a crude THC delivery system that also delivers harmful substances." In addition, "plants contain a variable mixture of biologically active compounds and cannot be expected to provide a precisely defined drug effect." Therefore, the study concluded that "there is little future in smoked marijuana as a medically approved medication" [66].

The principal investigators explicitly stated that using smoked marijuana in clinical trials "should not be designed to develop it as a licensed drug, but should be a stepping stone to the development of new, safe, delivery systems of cannabinoids."

Thus, even scientists and researchers who believe that certain active ingredients in marijuana may have potential medicinal value openly discount the notion that smoked marijuana is or can become "medicine" [66].

Origin of policy is the public

As with other health policy, the public is responsible for determining public policy for marijuana. Ultimately it is a public choice, but the public can be taken too far. Currently, approximately 50% support some form of legalization of marijuana in some form; further, policy should be based on health and safety for both the individual and society. In addition, certain segments of the public view using marijuana or any drug for that matter as a "fundamental constitutional right" to determine one's destiny and to have choice over one's body and mind [3,4].

However, an objective and scientific analysis of the medical facts research to date would reveal that policy is based on primarily on profit and addiction. State approved "medical marijuana" is largely a politic action arising outside of traditional medical practice, and not based on usual medical scrutiny and standards. In addition, the public interest may want to expand availability of marijuana to recreational users; however, it is not clear the public understands the distinct majority of the marijuana users are heavy users and likely already addicted to marijuana and not recreational users [3,4]. Unfortunately, nor does the public generally understand drug addiction in the first place and the adverse consequences from additive drug use, and that recreational use of a drug with addiction potential is particularly dangerous [3,4].

If marijuana is legalized, commercial interest will likely expand to and target the addicted users as it does for alcohol and nicotine now. While 90% of the population drinks alcohol, 80% of the alcohol sold in the US is consumed by 20 percent of those who consume alcohol. The same is true of those who smoke cigarettes, and are addicted to nicotine. The addiction potential for marijuana is similar to alcohol and nicotine and assuming legalization would lead to increased availability, the rate of addiction to marijuana would also increase correspondingly similar to alcohol and nicotine. Thus, the accepted level of risk of addiction for alcohol and nicotine may be applied to marijuana, along with their comparable legal and health risks and costs [3,4].

Government regulators will see profit in marijuana sales as a revenue source also and be influenced by Big Pharma and other commercial lobbyists. Big business as does Pharma or small businesses may try to overlook the harm as they with other addicting medications, e.g. opioids, stimulants. Currently, 162 million Americans live in states where medical marijuana is legal for a wide exposure. Addiction can be viewed as vulnerability plus availability. As marijuana is currently, widely available, many are vulnerable to marijuana addiction. Therefore, marijuana addiction will continue to drive fundamental use and policy for legalization and the recreational user will take a back seat so to speak to addictive use in public policy. As will health and safety for the public be adversely influenced by the increased availability through legalization [3,4].

There are different perspectives that underlie policy to control the availability of marijuana. The moral approach views the use of marijuana use as wrong, with or without a moral justification for that view. Historically, the moralist would claim a correlation between an influence from religion and consequent restriction for use of "addicting" harmful substances such as marijuana. In fact, one could argue that the de-emphasis on religion and the relaxation of the absolute concepts of right and wrong have yielded to a permissive view and reliance on legal control to solve our conduct problems. Given the current drug epidemics for opioid prescription medications and

heroin, how effective has law and order been is a subjective of continued discussion [3,4].

The illicit trade, on the other hand, does not want legalization as it generally cuts into their volume of business. Alcohol interests are mostly silent on the legalization debate because it is not clear to them if marijuana helps or hinders their alcohol sales. Marijuana can be considered a substitute for alcohol or compliment to alcohol or trigger the use of more alcohol use. Bureaucracies may support legalization of marijuana as local police pad their budgets to enforce marijuana law as do local and national government agencies such as the Drug Enforcement Agency (DEA) and the U.S. Justice Department [3,4].

In addition to the enormous profits to individuals and corporations, what drives marijuana legalization efforts is the tax revenue, of course, "dummy". Nicotine and alcohol are taxed heavily and contribute to government funds; however, the downside is the poorer populations will be taxed as they are now for nicotine and alcohol so that the taxation is disproportionately prohibitive to certain segments of the population. The current public movement to legalize marijuana could be characterized as emerging public policy that is making "getting stoned" on marijuana not only socially acceptable but profitable. Currently, legal marijuana is regulated by the states and the regular daily heavy use continuously is condoned by state laws that do little to monitor the individual's response to such a pattern of use. Beyond initial certification of the individual to purchase and use "medical marijuana", a doctor or medical practice is not involved in the monitoring and continuing certification of the need and justification for marijuana use [3,4].

Special interest groups and self-serving groups will be common, such as big tobacco and alcohol. The questions are whether big marijuana companies will lie to marijuana users as they fraudulently claimed nicotine was not addicting and try to "sell" them that marijuana is safe without harmful health effects. Marijuana is a gateway drug. It may not be the only gateway drug and as one addicting drug leads to use of another addicting drug, and there is a generalized vulnerability to interchange, substitute and complement addicting drugs.

Current federal and state laws

Medical marijuana is a gray market, quasi-legal in some states, as state medical marijuana laws are in direct conflict with federal law in the US. Generally federal law trumps state law in other legal matters; however, in the case of medical marijuana, federal law passively gives way to state law by not enforcing federal law where "marijuana is clearly and convincingly compliant with state law". State medical marijuana is not FDA approved as a medication as are other medications, even though FDA's main job is to ensure the efficacy and safety of a medicinal drug sold in the US. The FDA takes a hands-off position currently on medical marijuana at the direction of the Executive Branch of government [3,4].

The legalization proponents may argue legalizing marijuana minimizes crime elements from illicit drug trade like that which occurred during "prohibition of alcohol" in the US. Further, proponents argue that there is public benefit from the use of marijuana as there is for alcohol. Legalization opponents argue that marijuana will worsen public health and welfare and there is no public benefit for marijuana. There are facts advanced that support both sides of the arguments. Legalization may reduce harm by reducing crime, but increases harm by increasing the availability to users in society. There is little rationale for scientific benefit from state laws for current "medical marijuana" except in unusual cases and mostly from the natural and synthetic cannabinoids, not THC, the plant marijuana itself.

Who will supply marijuana?

We know from current statistics for patterns of marijuana that most the users will be heavy marijuana users, mostly addicted. Currently, legal state marijuana is supplied by local growers who are relatively unregulated and supervised, and whose quality and safety are not assessed and unknown. Drug dealers who control the illicit drug trade share characteristics with medical marijuana growers; and there is plenty of overlap from the legal side to the illegal side as medical marijuana is not closely controlled and the illicit trade from legal medical marijuana is ostensibly quite high [3,4].

Do we want big business like big tobacco industry or local control by Mom and Pop for the manufacture and distribution and sale of marijuana? Currently state medical marijuana law is employed to protect, not govern, as much local control and supply is loosely enforced. Marijuana dispensaries opened in large numbers to compete and meet the large demand for supply of high-potency legal marijuana in some states. In some local communities, due to the high demand for marijuana, dispensaries have overrun commercial areas and residential neighborhoods. Currently state laws control marijuana on a three-tier model. Separately they license the production, distribution and sales. Marijuana is like alcohol, an intoxicating and addicting drug that is pleasurable, harmful, not for minors and could be regulated by state boards like alcohol [3,4].

Interestingly, corporations may have an upside as they are accustomed to regulatory compliance, product safety, reliability, and market stability. Big corporations are often professional businesses and have policies that concern it to avoid harmful practices. Do we need big marijuana like big tobacco that is now under better control? Should the FDA regulate marijuana as it does tobacco and alcohol to ensure its safety and efficacy? Big corporations depend on reputational accountability, protect regulation, better self-policing and profit motives help to ensure product consistency and quality are emphasized and choice to the consumer is offered and may be more likely to succeed than local growers and producers [3,4].

The role of entitlements

While entitlements such as social security disability benefits have had both a positive and negative influence on public health, certainly disability does occur and unemployment is inevitable from regular marijuana, whether for medical purposes or not. With regard to addicting drugs, the health care industry has reached a high level of entitlement and at an enormous cost to society. "Pain" has been used as a justification for regular heavy and addictive use of drugs, particularly opioids. The opioid epidemic originated an explosion as an entitlement to avoid pain at almost any cost to the individual of society. Access to marijuana grew through medical justification to treat pain and borrowed heavily from the growth of access enjoyed by opioid prescribing [28].

Marijuana and Disability

As with published reports on social security disability associated with prescription opioid medications, it is likely that marijuana use leads to high rates of disability that is caused by the marijuana [28]. As

with opioid addiction and induced disability, disability due to marijuana renders the user unable to perform social, occupational and avoid legal consequences at government expense. Prescribed opioid use in relation to disability, which has been more extensively studied, can serve as a comparison to marijuana addiction affecting disability claims. In a study of disabled Medicare beneficiaries under age 65 years, there was a significant overall rise in prescription opioid consumption. This increase was not driven by overall use in more people using opioids but rather the proportion of those using opioids chronically and addictively, at least 6 and on average 13 prescriptions per year. The authors state that the effectiveness of such a sustained and high dose is supported by scant evidence in this study [28].

Specifically, for marijuana and disability, a study looked at the level of drug abuse among individuals enrolled in the Supplemental Security Income and Social Security

Disability programs: Among these individuals, 23% had a lifetime dependency on marijuana, consistent with the various populations of federal aid recipients. This finding illustrates that almost one quarter of individuals receiving federal aid were using marijuana regularly. This percentage will undeniably increase as the marijuana is more easily accessible through legal means as with opioids and marijuana addiction will lead to disability [28,65].

The study also illustrated that the individuals that had the most difficulty obtaining work were the group with the most psychiatrically impairments. Marijuana use increases psychiatric symptoms and is associated with psychiatric disorders at alarmingly high rates. Therefore, marijuana use and addiction lead to increased unemployment and disability resulting in extremely high costs not only to the individual but also to the public. As in the case of prescribed opiate use, marijuana is not a permanent and medically necessary disability under Social Security Disability and/or other forms of disability. Marijuana associated disability is reversible and improves or resolves with cessation of marijuana use [19,28].

Will education help the public?

Education programs decreased demand for nicotine consumption and high taxes may have had a positive impact, although exploitative, in reducing cigarette smoking prevalence and harm from tobacco use. Education is used when stemming adverse consequences from alcohol. Education is a major element of public health and sometimes education can include facts and evidence to offset self-serving and political interests. Education may motivate us to value health and welfare and the value of individuals in society when public opinion may be too contrary as is the case with marijuana currently.

The future of medical marijuana

Although the federal government has remained silent on states' decisions and actions to legalize marijuana for medical use, recent proposals suggest that the government will soon solidify its position in favor of legalization at the federal level. Both the House and the Senate have proposed two different bills that will alter marijuana's current classification as a schedule 1 substance. In the US, a schedule 1 substance is defined legally as having "no legitimate legal purpose and is highly addicting" [66,67]. Marijuana is currently classified as a schedule 1 drug per the controlled substance laws.

The US House of Representatives introduced a bill entitled "Regulate Marijuana like Alcohol Act of 2015" proposing to eliminate marijuana as a controlled substance and to exempt it from all the schedules under the controlled substance act. Under this bill marijuana would be regulated, sold, and used like alcohol, thus creating marijuana "true legalization" in a sense. The bill also assigns the right to regulate marijuana to the Food and Drug Administration, the Director of the Bureau of Alcohol, Tobacco, Firearms and Explosives (AFT) and The Alcohol and Tobacco Tax and Trade Bureau [68].

Contrary to House bill, the US Senate proposes to amend The Controlled Substance Act by lessening enforcement against individuals complying with "State Medical Marijuana" Laws as illustrated in The Compassionate Access Research Expansion and Respect States Act" Bill. If passed, this bill would not only reclassify marijuana as a schedule II controlled substance under The Controlled Substance Act, but would also establish certain effective and safeguards to legally prescribe marijuana [69]. According to the Controlled Substance Laws, a schedule II drug has legitimate medical purposes but is highly addicting and dangerous.

The House and Senate bills provide the legalization of medical marijuana by taking two very different approaches, either as a beverage or an unequivocally legal medicine. While the House plans to negate marijuana for legal consumption by treating it as a beverage, the Senate sanctifies marijuana for medical use by treating it as a prescription drug that would be required to satisfy the standards of the FDA. Under both bills state medical marijuana laws and programs would presumably cease and be eliminated [69]

Conclusion

Commercialism, professionalism, corporations and marijuana industry will likely take over if legalization of marijuana ultimately occurs, and be more safe and healthy than the current local medical marijuana growth and distribution. In a world where widespread use of marijuana is a fact and legalization is a growing trend, large business organizations may have an important and positive role to play.

Currently, smoked marijuana has no proven benefit for medical purposes and is not part of main stream medical care, though state medical marijuana laws control and legalize its use.

Legalization may occur for marijuana as beverage such as alcohol or a medicine through federal government legislation.

Who says it's a perfect world, and marijuana is not going away. As with nicotine and alcohol, education is a starting point to protect the public from harmful effects of marijuana

Believe it or not, marijuana is highly addicting and its current unregulated high potency products are highly dangerous. Public health risks include but are not limited to addiction, psychosis and violence, adverse mental health and physical affects mental and legal and social consequences.

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