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World Views in Examining Drug Policy

In our Commentary, ***Why I Oppose Legalizing Marijuana***, Representative Matt Baker, Chairman, Health Committee, Pennsylvania House of Representatives, succinctly outlines his position based upon his analysis of the available research and information currently available, and urges the public to support our FDA approval process in the development of legitimate medicines.

Our feature paper, ***Alternative Development and Counter-Narcotics Policies: Afghanistan, Lao PDR, and Myanmar***, by M. Reza Amirkhizi, PhD, Lecturer, International Studies Program, School of Social Sciences, University of California, Irvine, is a follow-up to a previous paper we published in January 2017, entitled, *An Analysis of the Data on the Effectiveness of Policies in Controlling Production of Illicit Narcotics in Afghanistan*.

Dr. Amirkhizi's experience with the United Nations Office on Drugs and Crime and Middle East diplomacy render a valuable and unique perspective on the situation of opium production in Afghanistan and other parts of the world. This new paper highlights successful and unsuccessful practices regarding the cultivation of opium and the programs initiated with international support to replace current cultivation practices with equally lucrative agricultural alternatives.

Finally, presented as a reprint from The Journal of Addiction Research and Therapy, ***Health Policy for Marijuana***, is by Norman S Miller, MD, JD, President of Health Advocates in East Lansing, MI, and Thersilla Oberbarnscheidt, MD, PhD, Department of Psychiatry, Central Michigan University, Mount Pleasant, MI. 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.



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COMMENTARY

Why I Oppose Legalizing Marijuana

Why I Oppose Legalizing Marijuana

Pennsylvania Representative Matt Baker

The debate over whether or not to legalize marijuana as medicine has been a very controversial one. The House Health and Judiciary committees have completed a combined series of hearings to further investigate this issue. In 1979, Keith Stroup, founder of NORML (National Organization for Reform of Marijuana Laws), announced at Emory University that the term “medical marijuana” would be used as a red herring to give pot a good name as a first step toward full legalization. It has been a long, patient plan, but obviously working with the financial help of a few billionaires, with George Soros at the helm. Notwithstanding, the following reputable medical organizations and groups are opposed to the legalization of marijuana:

- Pennsylvania Medical Society
- American Medical Association
- American Academy of Family Physicians
- American College of Physicians
- American Psychiatric Association
- American Academy of Pediatrics
- American Academy of Neurology
- American Epilepsy Society

- National Multiple Sclerosis Society
- American Society of Addiction Medicine
- American Cancer Society
- American Glaucoma Foundation
- National Eye Institute
- American Academy of Ophthalmology
- American Lung Association
- American Academy of Child and Adolescent Psychiatry
- National Institute for Neurological Disorders and Stroke
- Pennsylvania State Nurses Association opposes Senate Bill 3
- Pennsylvania Society of Anesthesiologists
- Pennsylvania Allergy and Asthma Association
- Pennsylvania Neurosurgical Society
- Robert H. Ivy Society for Plastic Surgeons
- Pennsylvania Society for Pulmonary Disease
- Pennsylvania Rheumatology Society
- Pennsylvania Chapter of the American College of Cardiology
- Pennsylvania Occupational and Environmental Medical Society
- Pennsylvania Academy of Otolaryngology
- Pennsylvania Chapter of the American College of Physicians
- Pennsylvania Chapter American College of Emergency Physicians

These groups, by and large, encourage further testing and research of marijuana and do not support its legalization outside the Food and Drug Administration (FDA) approval process.

After hearing all the hard evidence and heavily weighing the testimony from these reputable medical organizations and other groups, I continue to oppose the legalization of medical marijuana in the Commonwealth.

Marijuana is currently classified and defined by federal law as a Schedule I drug under the Federal Controlled Substances Act, which defines marijuana as having a high potential for abuse, no currently accepted medical use in the United States, and lacking safety for use under medical supervision. The FDA considers marijuana an illegal drug, classified in the same category as heroin, LSD, ecstasy and bath salts and; therefore, the FDA does not define marijuana as medicine but rather an illegal and harmful drug. The American Epilepsy Society stated in a letter to the Health Committee that it does not recommend legalization of artisanal cannabidiol (CBD) marijuana oils, “We urge you and your fellow committee members to delay adoption of new cannabis legislation and to continue to support and encourage new research...” “A study by a team from Children’s Hospital Colorado..., found that artisanal ‘high CBD’ oils resulted in no significant reduction in seizures in the majority of patients,” and that “not a single pediatric neurologist in Colorado recommends the use of artisanal cannabis preparations.” The organization concluded that, “We urge you and your fellow committee members to delay adoption of new cannabis legislation and to continue to support and encourage new research.” It is significant to note that the Children’s Hospital Colorado have cared for the largest number of cases of children with epilepsy treated with cannabis in the U.S.

Even if legislation were to pass to legalize marijuana in Pennsylvania, it would still be illegal under federal law pursuant to the Federal Controlled Substance Act.

Although most doctor and medical groups do not view marijuana as medicine, they do believe derivatives of marijuana can be potentially approved as medicine by the FDA, such as Marinol and Cesamet, which have been approved and are used to help cancer and HIV patients. Two other potential new medicines that are being developed, subject to FDA clinical trials, that are derivatives of cannabis, are Sativex and Epidolex. Hopefully, the FDA will approve these drugs soon to treat cancer pain and epileptic seizures. If these medicines meet safety and efficacy tests, the FDA will approve them, doctors will be able to prescribe them and pharmacies will be able to dispense them.

Marinol and Cesamet are medications that have been rigorously tested and approved by the FDA for the treatment of certain ailments. It is my fervent hope that the FDA conducts further testing on marijuana derivatives in various formulations and determines if this is, or is not, a chemical that can be used to treat certain illnesses beyond the limited compounds from marijuana that have currently been approved by the FDA.

However, I find no hard evidence at this time for legalizing marijuana in formulations other than those already approved by the FDA. In fact, my research and discussions with those in the medical community suggest there are very real and substantiated concerns as to the use of whole marijuana should it become legal. Growing marijuana, converting it to oils and other products and then selling it locally and statewide as “medical marijuana” I believe, per the documented testimony proffered to our joint Health and Judiciary committees, will usher in many challenges and concerns, including:

- Product safety.

- Quality control.
- Packaging and labeling.
- Drug diversion, drug abuse, and drug addiction.
- Conflict with federal law.
- Increased crime.
- Dispensaries being located possibly too close to schools, day care centers, churches and parks.
- Lack of local control and zoning issues.
- Increased costs to human services, law enforcement, and drug treatment facilities.
- Increased drugged driving and vehicle accidents.
- Increased emergency room and hospital admissions.
- Increased efforts to bypass FDA approval process for other Schedule 1 illegal drugs or new drugs being developed.

The Pennsylvania Health Care Cost Containment Council revealed that in the last three years there were a total of 72,880 hospital admissions with a diagnosis of marijuana dependence and abuse. The National Association of Drug Court Professionals have stated that emergency room mentions for marijuana use now exceed those of heroin and are continuing to rise per The Substance Abuse and Mental Health Services Administration (SAMHSA), Center for Behavioral Health Statistics and Quality. According to the White House Office of National Drug Control Policy, marijuana is the most abused drug in the United States.

The approval of a drug that could be given to children and those dealing with any number of ailments is an awesome responsibility to place on lawmakers, and it is not one that can or should

be made based solely on emotion or anecdotal information. For that reason, medical groups, such as those listed above, oppose legalization of marijuana outside the FDA approval process.

In the United States, all medications must undergo strict FDA approved clinical trials that include extensive randomized, peer reviewed double-blind studies to prove they are safe, effective and produce more benefits than risks. Interestingly, some medications already in use overseas and approved by European regulators are still required to pass muster with the FDA before they can be used here, a practice universally accepted by U.S. physicians and researchers.

There is a substantial amount of misleading information, causing many to believe that marijuana is harmless and is a panacea and miracle drug for a plethora of medical diseases, when the substantiated medical research that has been conducted up to this point simply does not support these claims. That's why the leading professional medical organizations do not support legalization of marijuana outside the FDA approval process.

As a lawmaker, it is not my place to do an end run around the FDA and legalize artisanal drugs that people can grow, make products from and then sell for Commonwealth citizens to take, all without approval of the FDA, and outside what current medical practice allows. Central regulatory oversight by the FDA makes possible the recall of harmful drugs or contaminated batches and the dissemination of new information about drug safety. Medicines should undergo strict FDA clinical trials and an approval process to ensure they are safe and effective, prescribed by a doctor, and dispensed by a pharmacist. The good people of Pennsylvania deserve medicine that is proven to be safe and effective for both children and adults and is supported by the medical community and approved by the FDA and is not illegal under federal law.

As chairman of the House Health Committee, I believe that I have consistently shown that I care deeply about the health and well-being of the people of this great state. I want only the best medicine that is proven to be safe and effective for our children and my heart breaks for both children and adults that have to endure serious medical conditions. I used to work in a law firm as a Disability Advocate representing the disabled before federal administrative judges for over 12 years and I have seen much suffering but I am also grateful for the good and great medicine that has been proven to be both safe and effective and approved by the FDA to have more benefits than harm. Medicine should be left to the medical and scientific experts and not politicians.

About the Author

Matt Baker is currently serving his 13th term in the Pennsylvania House of Representatives, representing all of Tioga County and parts of Bradford and Potter counties. He has more than 35 years of knowledge and experience of public service and state government with him as a state representative.

In the House, Baker serves as majority chairman of the House Health Committee and is a member of the Rules Committee. Representative Baker has been recognized by many organizations for his many accomplishments during his tenure including legislation to combat the spread of substance abuse.

Conflict of Interest

I declare that I have no proprietary, financial, professional or other personal interest of any nature or kind in any product, service and/or company that could be construed as influencing the position presented in, or the review of, the manuscript entitled *Why I Oppose Legalizing Marijuana*.

Alternative Development and Counter-Narcotics Policies: Afghanistan, Lao PDR, and Myanmar

M. Reza Amirkhizi, Ph.D.

Abstract

This short study compares the outcome of policies for utilizing alternative development programs to eradicate illicit opium cultivation in Afghanistan, Myanmar, and Lao PDR.

There has been a relative success with the policies to eradicate illicit cultivation of opium and implementation of alternative livelihood projects in Myanmar and Laos. In Myanmar, although production of illicit opium in 2005 dropped to about 30% of its production level in 2000, it has been stabilized at around 60% of its production level in 2000. In Laos, although the policies to eradicate illicit opium cultivation succeeded to drop production to negligible levels by 2007, the current level of production is about one-third of the production level in 2000.

Afghanistan however, has been a case of failure to curtail illicit opium production. The international community and the central government in Kabul, spending billions of dollars not only have not been able to reduce cultivation of illicit opium, but production levels have

substantially increased with a peak of, in 2007, more than twice the production level of 2000. Afghanistan has become a case-study of what "not to do" in fighting illicit narcotics.

Keywords

Drug policy, Afghanistan, illicit opium production, drug control, alternative livelihood and development

Introduction

This short study compares the outcome of alternative development (livelihood) programs designed for eradicating illicit opium cultivation in Afghanistan, Myanmar, and Lao PDR. Alternative livelihood programs are attempts by governments, national and international agencies to replace the source of income of farmers in drug-affected countries from relying on the illicit cultivation of banned products, such as opium, with alternative legal crops or activities. A partial list of donors comprising of national, international and governmental agencies that have sponsored and worked with drug producing countries in implementing alternative livelihood programs is available in Table 1.

Tables 2 to 5 show the data for poppy cultivated area and production of opium for the three countries mentioned above and the world total for the years 2000 to 2015. Although the figures for 2016 production of opium in Afghanistan are available, due to lack of availability of data for 2016 in Lao PDR and Myanmar, this study will be focused on comparing the data up to 2015.

Alternative Development

The original concept of alternative development by means of crop substitution has been overtaken by the broader policy and practice of providing alternative sustainable sources of income. A crop substitution policy is meant to take measures towards replacing cultivation of illicit crops by simultaneously supporting development initiatives. Alternative development continues to be the principal method used by Member States to address adverse effects of elimination of illicit drug crop cultivation on farmers living in poor and underdeveloped areas. It involves providing alternatives to poppy growers through mainstreaming counter-narcotics consideration in general reconstruction and development efforts. The aim is to provide a sustainable livelihood for farmers based on alternative sources of licit productions.

In September 1998, the 20th Special Session of the United Nations General Assembly recognized alternative development as “a process to prevent and eliminate the illicit cultivation of plants containing narcotics and psychotropic substances through specifically designed rural development measures in the context of sustained national growth and sustainable development efforts in countries taking action against drugs, recognizing the particular socio-economic characteristics of the target communities and groups, within the framework of a comprehensive and permanent solution to the problem of illicit drugs.” (1)

Eliminating the conditions which permit the continuation of illicit opium cultivation is lengthy and expensive. It cannot be done with a few simple alternative livelihood projects. Success may be reached after years of planning and implementing comprehensive alternative development projects. And, it needs to go in parallel with other elements necessary for dealing with the illicit

cultivation of drugs. The result of the past experiences in the illicit drug producing countries would suggest a more realistic approach to the problem.

Pakistan with 9,493 hectares under cultivation in 1992 gradually decreased the production to 2,500 hectares in 2003 and 372 hectares in 2015. Lao PDR, with 30,580 hectares under cultivation in 1990, except for a couple of years, had gradually decreased the area under cultivation to about 12,000 hectares in 2003 and 1,500 hectares in 2007. Since then, however, the cultivation of poppy has increased in Lao PDR every year to the level of 5,700 hectares in 2015. Myanmar, staying between 150,000 and 165,000 hectares between 1990 and 1997, had dropped the area under cultivation to 62,200 in 2003 and 21,500 hectares in 2006. Since 2007, cultivated areas have increased gradually to the current level of 55,500 hectares in 2015. Thailand, with 3,727 hectares in 1991, dropped to 750 hectares in 2002 and 265 hectares in 2013. Vietnam, with 18,000 in 1990 dropped to 422 in 1999. The success stories shared something in common: a balanced approach comprising law enforcement and alternative livelihood. Where comprehensive development programs and law enforcement lapsed, the areas under illicit poppy cultivation increased.

The Golden Triangle

The “Golden Triangle” was one of the most extensive opium/heroin producing areas of the world from the 1950s to the almost end of the 20th century when Afghanistan became the world’s largest producer. The area is approximately 950,000 km² that includes the mountains of Myanmar, Lao PDR, and Thailand.

There has been a relative success to the narcotics control policies in the golden triangle. Poppy cultivation in the Golden Triangle declined substantially by more than 80 percent from 1998 to 2006 as a result of a coordinated eradication campaign, strengthening rule of law, China's pressure on Myanmar ethnic groups along its border areas, and alternative livelihood programs supported by the international community. In fact, the combination of policies to enhance security and providing development assistance proved effective.

Myanmar has been relatively successful if one compares the areas under cultivation in the 1990s to the current levels in 2015. It lowered cultivation area from the high of 165,000 hectares in the 1990s to about one-third of the previous levels, currently about 55,500 hectares in 2015. However, Myanmar had lowered the area under cultivation to the lowest level of 21,500 hectares in 2006. The internal security situation and rule of law changed since 2006, resulting in an increase in the opium production and a reduction on alternative development programs. Myanmar is now again a major producer of opium. The opium production has moved to the areas in the south, far from Chinese borders, controlled by ethnic groups. Some of the ethnic groups involved in opium business are allies of the central government and some are fighting them. Save the big towns and areas under the central government control, areas under the pro-government militias and anti-government ethnic armies are the new illicit opium production centers.

Lao PDR has also been relatively successful in its counter-narcotics program. With 30,580 hectares under cultivation in 1990, save a couple of years, it had gradually decreased the area under cultivation to about 12,000 in 2003 and 1,500 in 2007. Since then, however, cultivation of poppy has increased in Lao PDR every year to the level of 5,700 hectares in 2015.

Thailand has been the success story in the golden triangle in dealing with its illicit opium cultivation in more than two decades. The area under illicit opium cultivation in 1991 was 3,727 hectares, dropping to 750 hectares in 2002 and 265 hectares in 2013.

Myanmar

The area used for opium production is mostly in the Shan State of Myanmar, a conflict area (between the central government and the ethnic armed groups) close to borders of China to the north, Laos PDR to the east, and Thailand to the south. Shan State is almost a quarter of Myanmar's total area and covers 155,800 km². Several ethnic groups including the Shan people with existing armed groups inhabit the Shan State, a largely rural area. The Myanmar's military and the ethnic groups in Shan state have been fighting each other since Myanmar's independence. The government has different relations with the armed groups in control of the territories and has ceasefire agreements with many of the groups, but a vast area of the state is not under the control of the central government. "The Restoration Council of Shan State (RCSS) has grown exponentially since the early 2000s, and currently maintains strongholds along the Shan State border with Thailand... Further east, its hold on the border is contested by the United Wa State Party (UWSP), and in some areas, the Tatmadaw, resulting in a patchwork of civilian settlements that are effectively under different jurisdictions. The RCSS also has a significant guerrilla presence and strong relations with rural populations throughout much of Shan (South) and Shan (East)."(2) Profits from the drug trade have financed all sides in this conflict.

Shan state is a poverty stricken area which benefits from the high prices of opium cultivation to alleviate poverty. The farmers choose to cultivate illicit poppy since it is the only crop that

provides them with enough income to provide food and medicine for their family throughout the year and meet other essential demands such as education for their children.

It is estimated that almost 20 million of Myanmar's 53 million populations, close to 38%, live below the poverty line. Myanmar is considered among the least developed nations in the world. The continued violence in areas such as in the Shan state is the source of displacement and food insecurity in that country. It is estimated that 33% of children under the age of 5 suffer from chronic malnutrition. "Myanmar has the lowest life expectancy rate at 66 years and the second highest infant and child mortality rates currently estimated at 50 deaths per 1000 live births." (3) According to World Food Program (WFP), there are high rates of tuberculosis (TB) infection and HIV in Myanmar. (4)

Myanmar is also heavily susceptible to cyclones, floods, and landslides. "According to the Global Climate Risk Index, Myanmar ranks among the top three countries most affected by natural disasters, which led to massive displacement of people and the destruction of livelihoods, crops and other food sources." (5)

Myanmar, staying between 150,000 and 165,000 hectares under illicit opium cultivation from 1990 to 1997, had dropped the area under cultivation to 62,200 in 2003 and 21,500 hectares in 2006. Since 2006, Myanmar has been witnessing a gradual rise in production of opium to the current level of 55,500 hectares in 2015, more than 50,000 hectares of which is in the Shan state. (6) The current level of cultivated area under opium poppy in 2015 has remained stable for the third year in the row, after consecutive yearly increases from the lowest rate in 2006. (7)

Myanmar, in 2015, produced 647 metric tons of opium mostly in the Shan state, almost 14% of world production, making it the second largest after Afghanistan, the result of corruption, poverty, civil unrest and absence of rule of law.

It is estimated that almost 173,000 households were involved in poppy cultivation in 2015, down from 183,000 the year before. Cultivation of illicit poppy is the main source of income for the Shan villagers, with each family earning close to \$2,000 per year. (8) For farmers in the Shan state, opium poppy is the only crop that generates enough money to feed their families and take care of their essential needs, almost three times more than income from cultivation of other crops. Faced with food insecurity, and lack of essential infrastructures, such as roads, electricity or running water, farmers in the Shan state have limited options. There is no other business like growing poppy that will earn enough money for farmers. It does not make the farmers rich but takes care of their essential needs for food, healthcare, and education for the younger generation.

"The cultivation of opium poppy is associated with difficult living conditions, a number of infants who died last month, households in debt and poor accessibility to market. Poppy-growing villages also have fewer alternative sources of income and receive less external agricultural assistance than non-poppy-growing villages. This is underlined by the fact that many poppy-growing farmers seem to be primarily covering subsistence needs with poppy income. Almost all village headmen (94%) interviewed in poppy-growing villages during the 2015 Myanmar village survey stated that villagers use income from opium for purchasing food more than for any other reason. Rice deficit also decreased to a greater extent in poppy-growing villages than in non-

poppy-growing villages, which reinforces this implication (21% decreases in poppy-growing villages, versus 14% in non-poppy-growing villages).” (9)

Illicit drug trafficking potentially generates over \$2 billion every year in Myanmar. Ethnic groups in the Shan state fund their fight against the central government through opium production and trafficking, especially in areas under their control bordering China and Thailand. The ethnic fighters of the United Wa State Army, controlling the border areas of the Shan State with Thailand, are the other source of illicit opium market in Myanmar. The group is considered an ally of the military junta in Myanmar.

The army units and the local militias supporting them finance their activities through their involvement in the drug economy of the region and do not rely on income from the central government. The local militias in the Shan state, in addition to supporting the army units operations, protect pipelines and dams. They are compensated through their "right" to tax poppy farmers, refine opium to heroin and selling them to traffickers. In general, one could say that the central government-backed militias are running the bulk of drug trade in the Shan state. Most of the heroin in Australia comes from these poppy fields in Myanmar. (10)

In Myanmar, the military government has been involved in the drug trade to finance its operations through extortion from middle-men, taxing the farmers, traders, and traffickers. The government has a policy of eradicating the lands used for cultivation of illicit opium. But, the military units have been taking bribes and protection money from farmers in implementing the government run crop elimination policies and fabricating eradication figures. The government

realizes that eradication will exacerbate security concerns and will increase poverty in the affected areas. It is, therefore, closing its eyes to the corruption of its military units to protect the farmers.

According to Mr. John Whalen, former Director of the U.S. Drug Enforcement Administration office in Myanmar, the government of Myanmar is turning a blind eye to corruption of its local government officials and military officers who are paid to look the other way. The military junta in Myanmar fears that cracking down on drugs might jeopardize its tenuous alliance with the militia groups supporting the central government. “Various militia groups are allowed to carry on because the government needs them.” (11)

Lao PDR

Laos, officially known as the Lao People's Democratic Republic, borders Myanmar and China to the northwest, Vietnam to the east, Cambodia to the southwest, and Thailand to the west and southwest. Laos has been experiencing an average annual GDP growth of 7% over the past decade. According to Transparency International, Laos is ranked 139 out of 168 countries on Transparency International's corruption perception index for 2015. It has a corruption score of 25 for 2015, indicating the “perceived level of public sector corruption on a scale of 0 (highly corrupt) to 100 (very clean).” (12) Laos has one of the lowest annual incomes in the world. A third of the population lives below the international poverty line. (13) It ranks 141 on the UNDP Human Development Index and the “International Food Policy Research Institute 2012 Global Hunger Index describes the situation in Lao PDR as serious. Many villages are remote and not accessible by road, starving people of essential resources. Over 40 percent of children under 5

and 63 percent of children under 2 suffer from anemia and malnutrition. Almost 45 percent of children under 5 and 23 percent of women between 12 and 49 years of age are affected by sub-clinical Vitamin A deficiency. Forty-four percent of children under 5 are stunted due to poor diets and malnutrition.” (14)

In the 1990s, as recently as 1998, Laos was the third largest world producer of illicit opium with one of the highest opium related addiction rates. (15) The cultivation of illicit opium was mainly in the northern areas of the country, in remote border areas with lack of communications, where the resources were scarce. In 1987, United States initiated cooperation with Laos to control illicit drug production and trafficking and provide a viable alternative livelihood program for the country.

Starting in 1989, opium production showed a decline every year. The alternative livelihood programs targeting specific areas and mainly initiated and supported by the United States were proving to be successful. The government’s commitment to control illicit opium production reduced opium poppy cultivation to “marginal levels.” (16)

“Decreased opium cultivation and production are also the result of increased law enforcement efforts, narcotics-related arrests and crop seizures, and a greater effort to disseminate information on the disadvantages of drug trafficking. Although the government tends to deny that it has a domestic drug problem, a public awareness program stressing the dangers of drug use and trafficking has been established, and, as part of the information and education campaign, there has been increased publicity on penalties for offenses.” (17)

Lao PDR, with 30,580 hectares under cultivation in 1990, with a couple of incomparable years, gradually decreased the area under cultivation to about 12,000 hectares in 2003 and 1,500 in 2007. Since then, cultivation of poppy has increased in Laos every year to the current level of 5,700 hectares in 2015. The area under opium cultivation in Laos was mainly concentrated in Phongsali and Houaphan provinces with the largest share estimated at Phongsali. (18) The data for 2015 reveals a marginal reduction compared to 2014. “Although significant, at 5,700 hectares it was only roughly a tenth of the size of the area under opium cultivation in Myanmar.” (19)

In 2005, cultivation of opium poppy was made illegal in Laos, putting pressure on the remaining farmers who were cultivating illicit opium. Although the government efforts to fight illicit drug production and trafficking continue, corruption and involvement of both civil and military officials in narcotics business have weakened the continued success of drug control policies post-2007.

Afghanistan

Since 2000, Afghanistan has been the main opium poppy grower in the world, producing in the past 16 years, in average, 80% of global illicit opium. The lowest percentage of world production by Afghanistan, with the exception of 2001 during the Taliban ban, was 69% in 2015 and the highest percentage of 91% in 2006 and 2007. (20)

With a global total of over 281,000 hectares under illicit opium cultivation in 2015, the 183,000 hectares under opium poppy cultivation in Afghanistan represented 65% of the world cultivated

lands. In the same year, with a global total production of over 4,760 metric tons, the 3,300 tons of production in Afghanistan represented 69% of world production. Looking at the data for the cultivation of poppy and production of opium in Afghanistan over the past 15 years, it is evident that the policies by the central government and the international community, including the programs for sustainable alternative livelihood, have not been successful at all. The preliminary data for opium poppy cultivation and production in 2016 reveal an increase in the main opium growing regions in Afghanistan.

In Afghanistan, the agricultural sector is structurally weak, with poor marketing, small land holdings and a shortage of agricultural inputs such as improved seeds, fertilizers, basic agricultural tools, and access to water and to formal credit. Opium cultivation and harvesting is labor intensive and provide poor itinerant agricultural laborers significant opportunities to gain additional incomes.

There are many inside players in drug production related activities in Afghanistan:

- Farmers, cultivating poppy for a variety of reasons including poverty, lack of infrastructure and unavailability of market for other products, among others;
- Local traders, providing loan to the farmers who need the cash advance to take care of their needs for foods and medicine;
- Traffickers, with strong ties to the local traders and officials and a transit network for the products through the neighboring countries to lucrative markets in the West and Russia;
- Corrupt officials at different levels with huge amounts of profits earned from illicit opium trade and their role in increasing production of drugs in Afghanistan; and

- Groups with political agenda involved in the opium trade to finance their military and terrorist activities inside and outside of Afghanistan.

Why do farmers choose to cultivate opium? The answer is very simple. The farmers make rational business decisions. In an environment, where the resources are scarce, the power of the central government is limited and the national economy and local players benefit from the continued cultivation of opium by farmers, there are limited risks for the farmers in producing an illegal product. It provides them with easy credit from the middle-men and the local traders connected to the traffickers, which they need to run their lives throughout the year. It earns the farmers more money than any other product which permits them to pay back the loan and have enough left for their household to deal with other needs and pay taxes and protection money to the local power brokers. Sixteen years after the fall of Taleban and establishment of a central government supported by the international community, we are not anywhere close to providing the farmers with incentives which have been provided by the traffickers for the past few decades.

Although income from illicit opium production provides livelihoods to many poor people in the rural areas, it does not lead to the rural development or contribution to the national development of Afghanistan or to a thriving legal economy. In fact, although the farmers get some share of profit which contributes to their continued survival, their endeavor enriches the traffickers and maintains the current levels of national economy.

All those benefiting from the illicit trade will do their utmost to ensure and encourage more production and trafficking of drugs in Afghanistan. The traffickers act as a super-national

authority who don't pay taxes and do not contribute to the national programs and budget, leaving the Government to pay for all the public sector needs. The objective of the traffickers is to make sure that rule of law is not established. Compared to the profits earned by international traffickers and international organized crime, the profits earned by local traffickers are very modest.

Addressing the drug problem in Afghanistan is not going to be easy. There is the need to look at the complex political and security background to the Afghan narcotics problem and not underestimate the constraints on overcoming it. The opium economy has become pervasive in almost all of the country, one of the poorest countries in the world. The production and trafficking of opium produce income estimated to equal almost half of the GDP of Afghanistan. Almost all influential leaders in Afghanistan depend directly or indirectly on revenues generated from production and trafficking of illicit drugs. The economy of Afghanistan has become so much dependent on the illicit drugs business as a percentage of its GDP, unlike any other country with illicit drug problems in the past, which any attempt similar to those taken in other countries such as Myanmar and Laos will be ineffective. (21)

Assessment

In reviewing cultivation and production of illicit opium in Afghanistan, Myanmar, and Lao PDR, the following elements seem to be common in the affected areas:

- a. Cultivation are mostly in isolated areas;
- b. Cultivation are mostly in areas with widespread poverty;
- c. Cultivation of licit crops does not provide the income needed by the farmers for their food and medical needs throughout the year;

- d. No access to market and the lack of infrastructure (roads, railroads, energy) to support the cultivation of licit crops to create a market for licit crops;
- e. Lack of investment by the central government in the services needed in rural areas;
- f. Structurally weak agricultural sector;
- g. Shortage of agricultural inputs such as improved seeds, fertilizers, and basic agricultural tools;
- h. Absence of formal credit mechanisms;
- i. Small and marginal land holdings;
- j. No access to water;
- k. Poppies are a cash crop, providing result in four to six months in every growing season with much less attention and investment, but in Myanmar, they have to wait for 3 years to get their first coffee yield;
- l. Poppies are well-suited for the growth in the affected areas, better than wheat in Afghanistan and rice or tea in golden triangle;
- m. The buyers come to them and they need no infrastructure to maintain and sell their product;
- n. Serious drug abuse and associated HIV/AIDS problems;
- o. Conflicts, insecurity, corruption, and absence of rule of law common in the areas;
- p. Relative or no control of the government in the affected areas;
- q. Opium economy benefitting those in power and those in control of the areas;
- r. Driving the war economy, providing cash to armed groups by levying taxes on the producers.

Farmers in the affected areas of Afghanistan, Myanmar, and Laos, choose to cultivate opium for following reasons:

1. High cash value for opium;
2. Ability to store the product without the risk of perishing;
3. Ease of trade throughout the year;
4. Provision of relatively secure and substantial cash income; (22)
5. Relatively short time of four to six months between planting and harvesting;
6. Opium cultivation and harvesting is labor intensive; (23)
7. No substantial risk for farmers to cultivate illicit opium poppy as they are protected by the local people with influence involved in making huge profits out of this business.

There has been a relative success with the policies to eradicate illicit cultivation of opium and implementation of alternative livelihood projects in Myanmar and Laos. In Myanmar, although production of illicit opium in 2005 dropped to about 30% of its production level in 2000, it has been stabilized at around 60% of its production level in 2000. In Laos, although the policies to eradicate illicit opium cultivation succeeded to drop production level to negligible levels by 2007, the current level of production is about one-third of the production level in 2000.

Afghanistan however, has been a case of failure to curtail illicit opium production. The international community and the central government in Kabul, spending billions of dollars not only have not been able to reduce cultivation of illicit opium, but the production levels have substantially increased with a peak of, in 2007, more than twice the production level of 2000. Afghanistan has become a case-study of what “not to do” in fighting illicit narcotics.

Alternative Development – Going Forward

For many poor farmers in the least developed areas of the world, the illicit opium is not a problem but rather a solution to their problems. To be successful with policies in eliminating drug production in affected areas of Afghanistan, Myanmar, and Laos, there is the fundamental need to address the primary reasons of illicit drug cultivation. Recognizing the realities on the ground and political economy of profits from insecurity will be the first step to devising policies that may have a chance to provide results. Any international strategy to eliminate the illicit opium poppy cultivation must take this into consideration and address the economic and social causes of the cultivation. Considering past conditions and current status of illicit opium cultivation areas in Afghanistan, Myanmar and Lao PDR, a combination of the following dominant factors and appropriate alternative development policies are identified:

DOMINANT FACTORS	APPROPRIATE ALTERNATIVE DEVELOPMENT POLICIES
Insurgency and lack of rule of law	Establishment of peace in the conflict areas and instituting rule of law
Corruption	Rooting out corruption,
Difficult living conditions of the farmers and locals in general	Enhancement of socio-economic conditions of communities, farmers and their families in rural areas by increasing and diversifying their income and improving access to markets, inter alia, through creation and development of needed infrastructure, including roads and electricity
Food insecurity	Provision of agricultural products, equipment, and fuel
High child mortality rates	Providing access to clean water and sanitation, and
Debt	Elimination of extreme poverty in affected areas and provision of rural credits
Land governance and ownership problems	Promotion of good governance and sanctioning legislative initiatives
Democracy and sustainable development	Establishment of educational facilities
	Expansion of people's freedoms and opportunities to decide who to be, what to do, and how to live
	Improvement of the well-being of people
	Promotion of gender equality and empowerment of women
	Promotion of environmental sustainability

Successful examples of sustained elimination of illicit opium cultivation, such as in Pakistan and Thailand, and those with relative success, such as in Myanmar and Laos, shared something in common: a balanced approach comprising law enforcement and alternative livelihood. Where development programs and law enforcement lapsed, the areas under illicit poppy cultivation increased.

Currently, the single major problem is the continued production of the bulk of the global illicit opiates in Afghanistan. To deal with the illicit narcotics problem in Afghanistan, there is the need for a two-pronged policy. One, dealing with traffickers and processing laboratories which need stronger law enforcement capacity of the Government and the other, dealing with farmers which need a comprehensive alternative livelihood approach as part of the greater reconstruction and development policy. Filling the gap created by taking half of the GDP of the country, would need substantial assistance to the economy of the country only to keep it at the same level. The elimination of drugs from Afghanistan has to go through the phase of reduction and eventual elimination.

For eventual elimination of illicit drugs, alternative development for Afghanistan is ultimately linked to long-term development. An extensive and substantial rural development program goes beyond merely introducing alternative crops. No crops will substitute the income that opium produces. We need to think about generating work and a licit rural economy with substantial government programs to provide assistance, including non-farm opportunities.

The above-mentioned objectives could be attained by adoption and implementation of following policies by the parliament and government of Afghanistan:

- Strengthening ties with the world economy;
- Privatization of the telecommunications, power sector and civil aviation;
- Creation and modernization of infrastructure by promoting commercialization;
- Creation of strong institutional and regulatory framework and competition through private sector involvement;
- Investments in financial sector;
- Investments in mining industry, especially gold, lithium, uranium, and iron ore; (24)
- Promoting trade financing;
- Developing and supporting micro-businesses and small and medium-sized enterprises, essential for economic development, through financing and improving investment climate;
- Opening foreign investment;
- Making the investment climate more attractive to foreign businesses by addressing corporate governance and transparency issues.

Conclusion

Two final points:

1. To encourage the government of Afghanistan, Laos, and Myanmar to focus on delivering results, a carrot and stick policy by the international community is suggested.
2. Dealing with the supply of illicit drugs cannot be successful without dealing with the demand for the same. As long as there is a demand for illicit drugs, there will be

suppliers. If Afghanistan, Myanmar, and Laos become drug-free, traffickers will find another corner of the world to start a conflict and continue to thrive in an environment free from rule of law.

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Conflict of Interest

I declare that I have no proprietary, financial, professional or other personal interest of any nature or kind in any product, service and/or company that could be construed as influencing the position presented in, or the review of, the manuscript entitled *Alternative Development and Counter-Narcotics Policies: Afghanistan, Lao PDR, and Myanmar*.

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20. Given the increase in production of illicit opium in Afghanistan in 2016 by almost 45% compared to 2015, the prospects for the success of alternative livelihood programs in the current situation in Afghanistan seems very dim.
21. Afghanistan, Myanmar, and Laos provide their products to different buyers/users and are not competing against each other market. Afghanistan's opium is sold for internal consumption and in the neighboring countries of Pakistan, Iran and Central Asian Republics in route mainly to Russia, and Europe with some reportedly trafficked to the east coast of the United States. Opium from Myanmar and Laos in addition to local consumption is mostly for the markets in China, Australia and the western parts of the United States, including Hawaii.
22. It is one of the very few crops for which farmers can receive advance credits at times of need.
23. It provides income to the poor itinerant agricultural laborers who find employment during the planting areas.
24. Afghanistan's resources could make it the richest mining region on earth, Independent, June 14, 2010. Available at: <http://www.independent.co.uk/news/world/asia/afghanistans-resources-could-make-it-the-richest-mining-region-on-earth-2000507.html>. According to a joint study by Pentagon and the United States Geological Survey, Afghanistan has an estimated 1 trillion USD of untapped minerals. "The sheer size of the deposits – including copper, gold, iron and cobalt as well as vast amounts of lithium, a key

component in batteries of Western lifestyle staples such as laptops and BlackBerrys – holds out the possibility that Afghanistan, ravaged by decades of conflict, might become one of the most important and lucrative centers of mining in the world.”

TABLE 1

**PARTIAL LIST OF DEVELOPMENT AGENCIES FROM DEVELOPED COUNTRIES
AND INTERNATIONAL ORGANIZATIONS INVOLVED IN IMPLEMENTATION
OF ALTERNATIVE LIVELIHOOD/DEVELOPMENT PROGRAMS IN DRUG
PRODUCING COUNTRIES¹**

Belgian Development Cooperation

Canadian International Development Agency (CIDA)

Danish International Development Agency (DANIDA)

European Union (EU)

German Federal Ministry for Economic Cooperation and Development (BMZ)

Japan International Cooperation Agency (JICA)

Luxembourg Agency for Development Cooperation

Netherlands Foreign Trade and Development Agency (NFTDA)

New Zealand Agency for International Development

Norwegian Agency for Development Cooperation (NORAD)

Swedish International Development Cooperation Agency

United Kingdom Department for International Development (DFID)

United States Agency for International Development (USAID)

US State Department

United Nations Development Program (UNDP)

United Nations Office on Drugs and Crime (UNODC)

World Bank Group

¹ This list is not exhaustive and mentions partially, for informative purposes, some of the international agencies and donor agencies from developed countries involved in funding and implementation of alternative development projects in drug-affected countries.

Tables On Cultivation And Production Of Illicit Opium²

TABLE 2 - CULTIVATION OF OPIUM POPPY, HECTARES, 2000-2015

	AFGHANISTAN	LAO PDR	MYANMAR	WORLD TOTAL
2000	82,171	19,052	108,700	221,952
2001	7,606	17,255	105,000	142,094
2002	74,100	14,000	81,400	180,225
2003	80,000	12,000	62,200	168,600
2004	131,000	6,600	44,200	195,940
2005	104,000	1,800	32,800	151,500
2006	165,000	2,500	21,500	201,000
2007	193,000	1,500	27,700	235,700
2008	157,000	1,600	28,500	213,003
2009	123,000	1,900	31,700	185,935
2010	123,000	3,000	38,100	190,662
2011	131,000	4,100	43,600	207,500
2012	154,000	6,800	51,000	234,895
2013	209,000	3,900	57,800	295,291
2014	224,000	6,200	57,600	316,709
2015	183,000	5,700	55,500	281,064
AVERAGE	133,805	6,744	52,956	213,879

**TABLE 3 - PERCENTAGE OF WORLD CULTIVATION
2000-2015**

	AFGHANISTAN	LAO PDR	MYANMAR
2000	37	9	49
2001	5	12	74
2002	41	8	45
2003	47	7	37
2004	67	3	23
2005	69	1	22
2006	82	1	11
2007	82	1	12
2008	74	1	13
2009	66	1	17
2010	65	2	20
2011	63	2	21
2012	66	3	22
2013	71	1	20
2014	71	2	18
2015	65	2	20
AVERAGE	61	3	26

² Data extracted from UNODC “Illicit Crop Monitoring reports” for Afghanistan, Lao PDR, and Myanmar, 2000-2015; and UNODC “World Drug Report,” 2015.

**TABLE 4 - POTENTIAL PRODUCTION OF OVEN-DRY OPIUM
METRIC TONS, 2000-2015**

	AFGHANISTAN	LAO PDR	MYANMAR	WORLD TOTAL
2000	3,276	167	1,087	4,691
2001	185	134	1,097	1,630
2002	3,400	112	828	4,520
2003	3,600	120	810	4,783
2004	4,200	43	370	4,850
2005	4,100	14	312	4,620
2006	5,300	20	315	5,810
2007	7,400	9	460	8,091
2008	5,900	10	410	6,841
2009	4,000	11	330	4,953
2010	3,600	18	580	4,730
2011	5,800	25	610	6,983
2012	3,700	41	690	4,831
2013	5,500	23	870	6,810
2014	6,400	92	670	7,732
2015	3,300	130	647	4,766
AVERAGE	4,354	61	630	5,415

**TABLE 5 - PERCENTAGE OF WORLD PRODUCTION
2000-2015**

	AFGHANISTAN	LAO PDR	MYANMAR
2000	70	4	23
2001	11	8	67
2002	75	2	18
2003	75	3	17
2004	87	1	8
2005	89	0.3	7
2006	91	0.34	5
2007	91	0.11	6
2008	86	0.15	6
2009	81	0.22	7
2010	76	0.38	12
2011	83	0.36	9
2012	77	1	14
2013	81	0.34	13
2014	83	1	9
2015	69	3	14
AVERAGE	80	1	12



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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 by 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 selfdestructive 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 long-term 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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Conflict of Interest

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

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