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The Dangers and Consequences of Marijuana Abuse

Table of Contents

Introduction.....	2
Is Marijuana Medicine?	3
Dangers of Marijuana.....	6
Marijuana is Dangerous to the User and Others.....	6
Mental Health Issues Related to Marijuana.....	8
Physical Health Issues Related to Marijuana.....	13
Environmental Issues Related to Marijuana.....	18
Marijuana as a Precursor to Abuse and Other Drugs.....	22
Dependency and Treatment.....	23
Dangers to Non Users.....	24
Delinquent Behaviors.....	24
Drugged Drivers.....	25
Other Consequences of Marijuana Use.....	29
Marijuana and Incarceration.....	33
Other Considerations.....	34
Marijuana Use Among Youth is Rising as Perception of Risk Decreases.....	34
A Final Note.....	36
Endnotes.....	37

INTRODUCTION

The Drug Enforcement Administration's (DEA) responsibility as it pertains to marijuana is clearly delineated in federal law. But our responsibility to the public goes further – to educate you about marijuana with fact and scientific evidence.

DEA supports research into the use of marijuana as a medicine, to be approved through the Food and Drug Administration (FDA) process, the same as required of all other medicines in the U.S.

We also want the public to understand the ramifications of the use of this drug and the consequences it will have on our youth and our society as a whole.

IS MARIJUANA MEDICINE?

Scientists and researchers contend that the marijuana plant contains several chemicals that may prove useful for treating a range of illnesses or symptoms, leading many people to argue that it should be made legally available for medical purposes. Marijuana is currently categorized as a Schedule I drug under the Controlled Substances Act (CSA), Title 21 U.S.C. § 801, et seq. This classification does not interfere with allowing research, and for those drugs formulated with the plant or its crude extracts from being reviewed and approved by the FDA. The fact is much research is being done. The National Institute on Drug Abuse (NIDA) and DEA have fostered research on marijuana for many years.

According to NIDA:

- Scientific study of the active chemicals in marijuana, called cannabinoids, has led to the development of two FDA-approved medications already, and is leading to the development of new pharmaceuticals that harness the therapeutic benefits of cannabinoids while minimizing or eliminating the harmful side effects (including the “high”) produced by eating or smoking the leaves.
- Cannabinoids are a large family of chemicals related to delta-9-tetrahydrocannabinol (THC), marijuana’s main psychoactive (mind-altering) ingredient. In addition to THC, the marijuana plant contains over 100 other cannabinoids.
- Currently two main cannabinoids of interest therapeutically are THC and cannabidiol (CBD), found in varying ratios within the marijuana plant. THC stimulates appetite and reduces nausea (and there are already approved THC-based medications for these purposes), and it may also decrease pain, inflammation, and spasticity. CBD is a non-psychoactive cannabinoid that may also be useful in reducing pain and inflammation, controlling epileptic seizures, and possibly even treating psychosis and addictions.
- An FDA–approved drug called Dronabinol (Marinol®) contains THC and is used to treat nausea caused by chemotherapy and wasting disease (extreme weight loss) caused by AIDS. Another FDA-approved drug called Nabilone (Cesamet®) contains a synthetic cannabinoid similar to THC and is used for the same purposes. Both are available through a doctor’s prescription and come in pill or capsule form.
- Sativex®, an oromucosal spray for treatment of spasticity due to multiple sclerosis, is already approved for use in other countries. Sativex® contains equal parts THC and CBD. Sativex® is now in Phase III clinical trials in the U.S. to establish its effectiveness and safety in treating cancer pain.
- Although it has not yet undergone clinical trials to establish its effectiveness and safety (necessary to obtain FDA approval), a CBD-based drug called Epidiolex® has recently been created to treat certain forms of childhood epilepsy.”¹

Although there have been many stories in the media about CBD and the benefits achieved by its use, all these stories are anecdotal. Dr. Elson So, President of the American Epilepsy Society asks

that the “professional and lay community do not make treatment decisions that are not based on sound research.” In his letter to the Miami Herald, Dr. So points out that there is currently a lack of scientific evidence for the use of marijuana as treatment for epilepsy. It is not yet known if it is a safe and efficacious treatment. “In addition, there is little known about the long term effects of using marijuana on infants and children on memory, learning and behavior.” “The lack of information does not mean that it is an ineffective treatment – but let’s be sure that it is and learn how to use it correctly.”²

DEA has always supported ongoing research into potential medicinal uses of marijuana’s active ingredients. As of May 2014:

- There are 237 researchers registered with DEA to perform studies with marijuana, marijuana extracts, and non-tetrahydrocannabinol marijuana derivatives that exists in the plant, such as cannabidiol and cannabinol.
- Studies include evaluation of abuse potential, physical/psychological effects, adverse effects, therapeutic potential, and detection.
- Sixteen of these registered researchers are approved to conduct research with smoked marijuana on human subjects.³

Organizers behind the “medical” marijuana movement did not really concern themselves with marijuana as a medicine – they just saw it as a means to an end, which is the legalization of marijuana for recreational purposes. They did not deal with ensuring that the product meets the standards of modern medicine: quality, safety and efficacy. There is no standardized composition or dosage; no appropriate prescribing information; no quality control; no accountability for the product; no safety regulation: no way to measure its effectiveness (besides anecdotal stories); and no insurance coverage.

DEA and the Federal Government are not alone in viewing how drugs should become medicines, the negative ramifications of the current processes engaged in by some of the states, and the harms that we are doing to our youth by continuing to allow and accept popular vote as a method of determining what medicine is.

- The **American Medical Association (AMA)** in November 2013, amended their position on cannabis, stating that “(1) cannabis is a dangerous drug and as such is a public health concern; (2) sale of cannabis should not be legalized; (3) public health based strategies, rather than incarceration should be utilized in the handling of individuals possessing cannabis for personal use; and (4) that additional research should be encouraged.”⁴
- 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.”⁵ ASAM continues to support these policies, and has also

stated that they do not “support proposals to legalize marijuana anywhere in the United States.”⁶

- 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.”⁷
- 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 at the present time.”⁸
- **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 three hours. The number of significant side effects generated by long-term use of marijuana or long-term inhalation of marijuana smoke make 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.”⁹
- The **American Academy of Pediatrics (AAP)** believes that “[a]ny 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.¹⁰
- **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.”¹¹
- 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 NMSS’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.”¹²
- The **National Association of School Nurses (NASN)** consensus it that marijuana is properly categorized as a Schedule I substance under the Controlled Substances Act and

concur with DEA that “the clear weight of the currently available evidence supports this classification, including evidence that smoked marijuana has a high potential for abuse, has no accepted medicinal value in treatment in the United States, and evidence that there is a general lack of accepted safety for its use even under medical supervision.”¹³ NASN also supports the position of the AAP that “any change in the legal status of marijuana, even if limited to adults, could affect the prevalence of use among adolescents.”¹⁴

- The **American Psychiatric Association (APA)** states that there is no current scientific evidence that marijuana is in any way beneficial for treatment of any psychiatric disorder. Current evidence supports, at minimum, a strong association of cannabis use with the onset of psychiatric disorders. Adolescents are particularly vulnerable to harm due to the effects of cannabis on neurological development. The APA does support further research of cannabis-derived substances as medicine, facilitated by the federal government, and if scientific evidence supports the use for treatment of specific conditions, the approval process should go through the FDA and in no way be authorized by ballot initiatives.¹⁵

DANGERS OF MARIJUANA

MARIJUANA IS DANGEROUS TO THE USER AND OTHERS

Without a clear understanding of the mental and physical effects of marijuana, its use on our youth, our families, and our society, we will never understand the ramifications it will have on the lives of our younger generation, the impact on their future, and its costs to our society.

Legalization of marijuana, no matter how it begins, will come at the expense of our children and public safety. It will create dependency and treatment issues, and open the door to use of other drugs, impaired health, delinquent behavior, and drugged drivers.

This is not the marijuana of the 1970s; today’s marijuana is far more powerful. On May 14, 2009, analysis from the NIDA-funded University of Mississippi’s Potency Monitoring Project revealed that marijuana potency levels in the U.S. are the highest ever reported since the scientific analysis of the drug began.¹⁶ This trend continues.

- According to the latest data, the average amount of THC in seized samples has reached 12.55 percent. This compares to an average of just under four percent reported in 1983 and represents more than a tripling of the potency of the drug since that time.¹⁷
- “We are increasingly concerned that regular or daily use of marijuana is robbing many young people of their potential to achieve and excel in school or other aspects of life,” said NIDA Director Nora D. Volkow, MD. “THC, a key ingredient in marijuana, alters the ability of the hippocampus, a brain area related to learning and memory, to communicate effectively with other brain regions. In addition, we know from recent research that marijuana use that begins during adolescence can lower IQ and impair other measures of mental function in adulthood.”¹⁸

- “We should also point out that marijuana use that begins in adolescence increases the risk they will become addicted to the drug,” said Volkow. “The risk of addiction goes from about 1 in 11 overall to 1 in 6 for those who start using in their teens, and even higher among daily smokers.”¹⁹

The most recent statistics on the use of marijuana in the U.S. shows that marijuana use continues to rise.

- In 2012, an estimated 23.9 million American’s aged 12 and older were current (past month) illicit drug users. This represents 9.2 percent of the population 12 and older. Marijuana was the most commonly used illicit drug with 18.9 million past month users.²⁰
- The use of illicit drug use among young adults aged 18 to 25 increased from 19.7 percent in 2008 to 21.3 percent in 2012, driven largely by an increase in marijuana use (from 16.6 percent in 2008 to 18.7 percent in 2012).²¹
- In 2012, an estimated 2.9 million persons aged 12 and older used an illicit drug for the first time within the past 12 months. That equals about 7,900 initiates per day. The largest number of new initiates used marijuana (2.4 million).²²
- Among 12 and 13 year olds, 1.2 percent used marijuana; for 14 and 15 year olds, it was 6.1 percent; and for 16 and 17 year olds, it climbed to 14 percent.²³
- An estimated 17 percent of past year marijuana users aged 12 and older used marijuana on 300 or more days within the past 12 months. This means that almost 5.4 million persons used marijuana on a daily or almost daily basis over a 12 month period.²⁴
- An estimated 40.3 percent (7.6 million) of current marijuana users aged 12 and older used marijuana on 20 or more days in the past month.²⁵
- Among persons aged 12 or older, of the estimated 1.4 million first-time past year marijuana users initiated use prior to age 18.²⁶
- On an average day 646,707 adolescents aged 12-17 years of age smoked marijuana, and 4,000 adolescents used marijuana for the first time.²⁷
- According to the 2013 Monitoring the Future Survey, one in every 15 high school seniors (6.5 percent) is a daily or near-daily marijuana user.²⁸
- Nearly 23 percent of high school seniors say they smoked marijuana in the month prior to the survey, and just over 36 percent say they smoked within the previous year. More than 12 percent of eighth graders said they used marijuana during the past year.²⁹
- The 2011 Partnership Attitude Tracking Study found that nine percent of teens (nearly 1.5 million) smoked marijuana heavily (at least 20 times) in the past month. Overall, past-month teen use was up 80 percent from 2008.³⁰

- Nearly half of all teens (47 percent) have ever used marijuana – a 21 percent increase from 2008.³¹
- Two out of every five teens (39 percent) have tried marijuana during the past year, an increase from 31 percent in 2008.³²
- Past-month use increased 42 percent, from 19 percent in 2008 to 27 percent in 2011 (an increase of 4 million teens).³³
- Past-year use is up 26 percent from 31 percent in 2008 to 39 percent in 2011 (an increase of 6 million teens).³⁴
- Lifetime use is up 21 percent, from 39 percent in 2008 to 47 percent in 2011 (an increase of 8 million teens).³⁵

Increasingly, the international community is joining the U.S. in recognizing the fallacy of arguments claiming marijuana use is a harmless activity with no consequences to others.

- Antonio Maria Costa, then Executive Director of the United Nations Office on Drugs and Crime, noted in an article published in *The Independent on Sunday* “The debate over the drug is no longer about liberty; it’s about health.” He continued, “Evidence of the damage to mental health caused by cannabis use—from loss of concentration to paranoia, aggressiveness and outright psychosis—is mounting and cannot be ignored. Emergency-room admissions involving cannabis is rising, as is demand for rehabilitation treatment. ... It is time to explode the myth of cannabis as a ‘soft’ drug.”³⁶
- The President of the International Narcotics Control Board (INCB), Raymond Yars, voiced grave concern about the recent referenda in the U.S. that would allow the recreational use of cannabis by adults. “Legalization of cannabis within these states would send wrong and confusing signals to youth and society in general, giving the false impression that drug abuse might be considered normal and even, most disturbingly, safe. Such a development could result in the expansion of drug abuse, especially among young people, and we must remember that all young people have a right to be protected from drug abuse and drug dependency.”³⁷

“The concern with marijuana is not born out of any culture war mentality, but out of what science tells us about the drug’s effects.”³⁸

MENTAL HEALTH ISSUES RELATED TO MARIJUANA

There is mounting evidence that the use of marijuana, particularly by adolescents, can lead to serious mental health problems.

- According to Nora Volkow, the Director of NIDA, “Regular marijuana use in adolescence is known to be a part of a cluster of behaviors that can produce enduring detrimental effects and alter the trajectory of a young person’s life – thwarting his or her potential. Beyond potentially lower IQ, teen marijuana use is linked to school dropout, other drug

use, mental health problems, etc. Given the current number of regular marijuana users (1 in 15 high school seniors) and the possibility of this increasing with marijuana legalization, we cannot afford to divert our focus from the central point: regular marijuana use stands to jeopardize a young person's chances of success – in school and in life.”³⁹

- A major study published in the Proceedings of the National Academy of Sciences in August 2012 provides finding that long-term marijuana use started in teen years does have a negative effect on intellectual function. The more dependent the person becomes on marijuana, the more significant the impairment. The impairment was significant in five different cognitive areas, especially executive function and processing speed. Participants who used cannabis heavily in their teens and continued through adulthood showed a significant drop in their intelligence quotient (IQ) - an average of eight points. Those who started using marijuana regularly after age 18 showed minor declines. Those who never used marijuana showed no decline. Even after stopping cannabis use, neuropsychological deficits were never recovered among those who started smoking during their teen years.⁴⁰
- A small study by doctors at Northwestern University and Massachusetts General Hospital/Harvard Medical School found that the size and shape of two brain regions involved in emotion and motivation may differ in young adults who smoke marijuana at least once a week (than those that do not). The findings suggest that recreational marijuana use may lead to previously unidentified brain changes and highlight the importance of research aimed at understanding the long-term effects of low to moderate marijuana use on the brain. “The study raises a strong challenge to the idea that casual marijuana use isn't associated with bad consequences,” Dr. Hans Breiter, one of the study authors stated.⁴¹
- People with mental illness are seven times more likely to use marijuana weekly than people without mental illness according to researchers at Toronto's Centre for Addiction and Mental Health who studied U.S. data. Researchers also found that individuals with mental illness were ten times more likely to have a cannabis use disorder. Among those with mental illness reporting weekly cannabis use, rates of use were particularly elevated for those with bipolar disorder, personality disorders, and other substance use disorder.⁴²
- The University of Maryland's School of Public Health released a report in June 2013 that connected student marijuana use and problems with academic retention and performance. The study followed 1,200 college freshmen over a ten year period and found that substance abuse, especially marijuana use, contributed to college students skipping more classes, spending less time studying, earning lower grades, dropping out of college, and being unemployed after college. “On average (marijuana use) increases your risk of having academic problems,” says Amelia Arria, Director for the Center of Young Adult Health and Development. “I don't think people are really putting this together with the possible effect it could have on long-term success. It's something to consider.”⁴³
- “Nearly one in ten first-year college students at a mid-Atlantic university have a Cannabis Use Disorder (CUD) according to a NIDA-funded study of drug use conducted by investigators from the Center for Substance Abuse Research at the University of Maryland.” “Students who had used cannabis five or more times in the past year – regardless of whether or not they met the criteria for CUD – reported problems related to

their cannabis use, such as concentration problems (40.1 percent), regularly putting themselves in physical danger (24.3 percent), and driving after using marijuana (18.6 percent).”⁴⁴

- According to a report by Office of National Drug Control Policy (ONDCP) on teens, depression and marijuana use: ⁴⁵
 - Depressed teens are twice as likely as non-depressed teens to use marijuana and other illicit drugs.
 - Depressed teens are more than twice as likely as their peers to abuse or become dependent on marijuana.
 - Marijuana use can worsen depression and lead to more serious mental illness such as schizophrenia, anxiety, and even suicide.
 - Teens who smoke marijuana at least once a month are three times more likely to have suicidal thoughts than non-users.
 - The percentage of depressed teens is equal to the percentage of depressed adults, but depressed teens are more likely than depressed adults to use marijuana than other drugs.
- Researchers from the University of Oulu in Finland interviewed over 6,000 youth ages 15 and 16 and found that “teenage cannabis users are more likely to suffer psychotic symptoms and have a greater risk of developing schizophrenia in later life.”⁴⁶
- John Walters, then the Director of ONDCP, Charles G. Curie, then the Administrator of the Substance Abuse and Mental Health Services Administration, and experts and scientists from leading mental health organizations joined together in May 2005 to warn parents about the mental health dangers marijuana poses to teens. According to several recent studies, marijuana use has been linked with depression and suicidal thoughts, in addition to schizophrenia. These studies report that weekly marijuana use among teens doubles the risk of developing depression and triples the incidence of suicidal thoughts.⁴⁷
- Dr. Andrew Campbell, a member of the New South Wales (Australia) Mental Health Review Tribunal, published a study in 2005 which revealed that four out of five individuals with schizophrenia were regular cannabis users when they were teenagers. Between 75-80 percent of the patients involved in the study used cannabis habitually between the ages of 12 and 21.⁴⁸ In addition, a laboratory-controlled study by Yale University scientists, published in 2004, found that THC “transiently induced a range of schizophrenia-like effects in healthy people.”⁴⁹
- In a presentation on “Neuroimaging Marijuana Use and Effects on Cognitive Function” Professor Krista Lisdahl Medina suggests that chronic heavy marijuana use during adolescence is associated with poorer performance on thinking tasks, including slower psychomotor speed and poorer complex attention, verbal memory and planning ability.

“While recent findings suggest partial recovery of verbal memory functioning within the first three weeks of adolescent abstinence from marijuana, complex attention skills continue to be affected. Not only are their thinking abilities worse, their brain activation to cognitive task is abnormal.”⁵⁰

Many of these effects of using marijuana affect persons of all ages, not just youth.

- Memory, speed of thinking, and other cognitive abilities get worse over time with marijuana use, according to a study published in the March 14, 2006 issue of *Neurology*, the scientific journal of the American Academy of Neurology. The study found that frequent marijuana users performed worse than non-users on tests of cognitive abilities, including divided attention and verbal fluency. Those who had used marijuana for 10 years or more had more problems with their thinking abilities than those who had used marijuana for 5-to-10 years. All of the marijuana users were heavy users, which was defined as smoking four or more joints per week.⁵¹
- Australian researchers report that long-term, heavy cannabis use may be associated with structural abnormalities in areas of the brain which govern memory, emotion, and aggression. Brain scans showed that the hippocampus was 12 percent smaller and the amygdala 7 percent smaller in men who smoked at least 5 marijuana cigarettes daily for almost 10 years. Dr. Mura Yucel, the lead researcher stated that “this new evidence plays an important role in further understanding the effects of marijuana and its impact on brain functions. The study is the first to show that long-term cannabis use can adversely affect all users, not just those in the high-risk categories such as the young, or those susceptible to mental illness, as previously thought.”⁵²
- A two-year study by the National Cannabis Prevention and Information Centre, at the University of New South Wales in Sydney, Australia found that cannabis users can be as aggressive as crystal methamphetamine users, with almost one in four men and one in three women being violent toward hospital staff or injuring themselves after acting aggressively. Almost 12 percent were considered a suicide risk. The head of the Emergency Department at St. Vincent’s Hospital, Gordian Fulde, said that “most people still believed marijuana was a soft drug, but the old image of feeling sleepy and having the munchies after you’ve smoked is entirely inappropriate for modern-day marijuana. With hydroponic cannabis, the levels of THC can be tenfold what they are in normal cannabis so we are seeing some very, very serious fallout.”⁵³
- Carleton University researchers published a study in 2005 showing that current marijuana users who smoke at least five “joints” per week did significantly worse than non-users when tested on neurocognition tests such as processing speed, memory, and overall IQ.⁵⁴
- U.S. scientists have discovered that the active ingredient in marijuana interferes with synchronized activity between neurons in the hippocampus of rats. The authors of this November 2006 study suggest that action of tetrahydrocannabinol, or THC, might explain why marijuana impairs memory.⁵⁵

- According to an Australian study, there is now conclusive evidence that smoking cannabis hastens the appearance of psychotic illnesses by up to three years. Dr. Mathew Large from the University of New South Wales reports that "...in addition to early cannabis smoking bringing on schizophrenia it brings it on early by an average of 2.7 years early – earlier than you would have otherwise developed it had you not been a cannabis smoker. The risks for older people is about a doubling of the risk." "For young people who smoke cannabis regularly, instead of having around a one percent chance of developing schizophrenia during their life they will end up with something like a five percent chance of developing schizophrenia." Philip Mitchell, head of Psychiatry at the University stated that while "this research can't distinguish about whether cannabis causes schizophrenia or brings it out in vulnerable people...it makes it very clear that cannabis is playing a significant role in psychosis."⁵⁶
- Doctors at Yale University documented marijuana's damaging effect on the brain after nearly half of 150 healthy volunteers experienced psychotic symptoms, including hallucinations and paranoid delusions, when given THC, the drug's primary active ingredient. The findings were released during a May 2007 international health conference in London.⁵⁷
- A pair of articles in the *Canadian Journal of Psychiatry* reflects that cannabis use can trigger schizophrenia in people already vulnerable to the mental illness and assert that this fact should shape marijuana policy.⁵⁸
- Robin Murray, a professor of psychiatry at London's Institute of Psychiatry and consultant at the Maudsley Hospital in London, wrote an editorial which appeared in *The Independence on Sunday*, on March 18, 2007, in which he states that the British Government's "mistake was rather to give the impression that cannabis was harmless and that there was no link to psychosis." Based on the fact that "...in the late 1980s and 1990s psychiatrists like me began to see growing numbers of young people with schizophrenia who were taking large amounts of cannabis." Murray claims that "...at least 10 percent of all people with schizophrenia in the UK would not have developed the illness if they had not smoked cannabis." By his estimates, 25,000 individuals have ruined their lives because they smoked cannabis. He also points out that the "skunk" variety of cannabis, which is very popular among young people in Great Britain, contains "15 to 20 percent THC, and new resin preparations have up to 30 percent."⁵⁹
- Dr. John MacLeod, a prominent British psychiatrist states: "If you assume such a link (to schizophrenia with cannabis) then the number of cases of schizophrenia will increase significantly in line with increased use of the drug." He predicts that cannabis use may account for a quarter of all new cases of schizophrenia in three years' time.⁶⁰
- A study by scientists at the Queensland Brain Institute in Australia on long-term marijuana use and the increased risk of psychosis confirms earlier findings. "Compared with those who had never used cannabis, young adults who had six or more years since first use of cannabis were twice as likely to develop a non-affective psychosis (such as schizophrenia)," McGrath wrote in a study published in the *Archives of General Psychiatry Journal*. "They were also four times as likely to have high scores in clinical tests of delusion."⁶¹

- A study published in the March 2008 *Journal of the American Academy of Child and Adolescent Psychiatry* cited the harm of smoking marijuana during pregnancy. The study found a significant relationship between marijuana exposure and child intelligence. Researchers concluded that “prenatal marijuana exposure has a significant effect on school-age intellectual development.”⁶²
- A study by doctors from NIDA found that people who smoked marijuana had changes in the blood flow in their brains even after a month of not smoking. The marijuana users had PI (pulsatility index) values somewhat higher than people with chronic high blood pressure and diabetes, which suggests that marijuana use leads to abnormalities in the small blood vessels in the brain. These findings could explain in part the problems with thinking and remembering found in other studies of marijuana users.⁶³

PHYSICAL HEALTH ISSUES RELATED TO MARIJUANA

Marijuana use also affects the physical health of users, both short and long term.

- In 2011, according to the Drug Abuse Warning Network (DAWN), there were 1,252,000 emergency department (ED) visits involving an illicit drug. Marijuana was involved in 455,668 of these visits, second only to cocaine.⁶⁴
- ED visits for marijuana increased 19 percent between 2009 and 2011.⁶⁵
- Among ED visits made by patients aged 20 or younger resulting in drug misuse or abuse, marijuana was the most commonly involved illicit drug (143.9 visits per 100,000).⁶⁶
- In 2012, an estimated 22.2 million persons aged 12 or older were classified with substance dependence and abuse in the past year (8.5 percent of the population 12 or older). Marijuana was the illicit drug with the largest number of persons (4.3 million) with past year dependence or abuse.⁶⁷
- On an average day in 2010 there were 266 drug related ED visits for youth 12 to 17 years of age that involved marijuana.⁶⁸
- NIDA reports that marijuana increases heart rate by 20-100 percent shortly after smoking, an effect that can last for up to three hours. In one study, it was estimated that marijuana users have a 4.8-fold increase in the risk of heart attack in the first hour after smoking.⁶⁹
- Under the Safe Drinking Water and Toxic Enforcement Act of 1986, the Governor of California is required to revise and republish at least once a year the list of chemicals known to the state to cause cancer or reproductive toxicity. On September 11, 2009, the California Environmental Protection Agency, Office of Environmental Health Hazard Assessment, published the latest list. The list included a chemical added in June, marijuana smoke, and lists cancer as the type of toxicity.⁷⁰

- A study by researchers at the Erasmus University Medical Center in Rotterdam, Netherlands found women who smoked pot during pregnancy may impair their baby's growth and development in the womb. The babies born to marijuana users tended to weigh less and have smaller heads than other infants, both of which are linked to increased risk of problems with thinking, memory, and behavioral problems in childhood.⁷¹
- A long-term study of over 900 New Zealanders by the University of Otago, New Zealand School of Dentistry has found that "heavy marijuana use has been found to contribute to gum disease, apart from the known effects that tobacco smoke was already known to have."⁷²
- A study from Monash University and the Alfred Hospital in Australia has found that "bullous lung disease occurs in marijuana smokers 20 years earlier than tobacco smokers. Often caused by exposure to toxic chemicals or long-term exposure to tobacco smoke, bullae is a condition where air trapped in the lungs causes obstruction to breathing and eventual destruction of the lungs." Dr. Matthew Naughton explains that "marijuana is inhaled as extremely hot fumes to the peak inspiration and held for as long as possible before slow exhalation. This predisposes to greater damage to the lungs and makes marijuana smokers more prone to bullous disease as compared to cigarette smokers."⁷³
- In December 2007 researchers in Canada reported that "marijuana smoke contains significantly higher levels of toxic compounds -- including ammonia and hydrogen cyanide -- than tobacco smoke and may therefore pose similar health risks." "Ammonia levels were 20 times higher in the marijuana smoke than in the tobacco smoke, while hydrogen cyanide, nitric oxide and certain aromatic amines occurred at levels 3-5 times higher in the marijuana smoke."⁷⁴
- Marijuana worsens breathing problems in current smokers with Chronic Obstructive Pulmonary Disease (COPD), according to a study released by the American Thoracic Society in May 2007. Among people age 40 and older, smoking cigarettes and marijuana together boosted the odds of developing COPD to 3.5 times the risk of someone who smoked neither.⁷⁵
- Scientists at Sweden's Karolinska Institute, a medical university, have advanced their understanding of how smoking marijuana during pregnancy may damage the fetal brain. Findings from their study, released in May 2007, explain how endogenous cannabinoids exert adverse effects on nerve cells, potentially imposing life-long cognitive and motor deficits in afflicted new born babies.⁷⁶
- A study from New Zealand reports that cannabis smoking may cause five percent of lung cancer cases in that country. Dr. Sarah Aldington of the Medical Research Institute in Wellington presented her study results at the Thoracic Society conference in Auckland on March 26, 2007.⁷⁷
- Researchers at the Fred Hutchinson Cancer Research Center in Seattle found that frequent or long-term marijuana use may significantly increase a man's risk of developing the most aggressive type of testicular cancer, nonseminoma. Nonseminoma is a fast-growing

testicular malignancy that tends to strike early, between the ages of 20 and 35, and accounts for about 40 percent of all testicular cancer cases. Dr. Stephen Schwartz stated that researchers are still studying the long-term health consequences of marijuana smoking, especially heavy marijuana smoking and “in the absence of more certain information, a decision to smoke marijuana recreationally means that one is taking a chance on one’s future health.”⁷⁸

- According to researchers at the Yale School of Medicine, long-term exposure to marijuana smoke is linked to many of the same kinds of health problems as those experienced by long-term cigarette smokers. “...[C]linicians should advise their patients of the potential negative impact of marijuana smoking on overall lung health.”⁷⁹
- While smoking cigarettes is known to be a major risk factor for the bladder cancer most common among people age 60 and older, researchers are now finding a correlation between smoking marijuana and bladder cancer. In a study of younger patients with transitional cell bladder cancer, Dr. Martha Terriss found that 88.5 percent had a history of smoking marijuana. Marijuana smoke has many of the same carcinogen-containing tars as cigarettes and may get even more into the body because marijuana cigarettes are unfiltered and users tend to hold the smoke in their lungs for prolonged periods. Dr. Terriss notes that more research is needed, but does recommend that when doctors find blood in a young patient’s urine sample, they may want to include questions about marijuana use in their follow-up.⁸⁰
- Smoking marijuana can cause changes in lung tissue that may promote cancer growth, according to a review of decades of research on marijuana smoking and lung cancer. However, it is not possible to directly link pot use to lung cancer based on existing evidence. Nevertheless, researchers indicate that the precancerous changes seen in studies included in their analysis, as well as the fact that marijuana smokers generally inhale more deeply and hold smoke in their lungs longer than cigarette smokers, and that marijuana is smoked without a filter, do suggest that smoking pot could indeed boost lung cancer risk. It is known, they add, that marijuana smoking deposits more tar in the lungs than cigarette smoking does.⁸¹
- Smoking three cannabis joints will cause one to inhale the same amount of toxic chemicals as a whole pack of cigarettes according to researchers from the French National Consumers’ Institute. Cannabis smoke contains seven times more tar and carbon monoxide than cigarette smoke. Someone smoking a joint of cannabis resin rolled with tobacco will inhale twice the amount of benzene and three times as much toluene as if they were smoking a regular cigarette.⁸²
- According to research, the use of marijuana by women trying to conceive or those recently becoming pregnant is not recommended, as it endangers the passage of the embryo from the ovary to the uterus and can result in a failed pregnancy. Researchers from Vanderbilt University say a study with mice has shown that marijuana exposure may compromise the pregnancy outcome because an active ingredient in marijuana, tetrahydrocannabinol (THC), interferes with a fertilized egg’s ability to implant in the lining of the uterus.⁸³

- Infants exposed to marijuana in the womb show subtle behavioral changes in their first days of life, according to researchers in Brazil. The newborns were more irritable than non-exposed infants, less responsive, and more difficult to calm. They also cried more, startled more easily, and were jitterier. Such changes have the potential to interfere with the mother-child bonding process. “It is necessary to counter the misconception that marijuana is a ‘benign drug’ and to educate women regarding the risks and possible consequences related to its use during pregnancy,” Dr. Marina Carvahlo de Moraes Barros and her colleagues concluded.⁸⁴
- Marijuana smoking has been implicated as a causative factor in tumors of the head and neck and of the lung. The marijuana smokers in whom these tumors occur are usually much younger than the tobacco smokers who are the usual victims of these malignancies. Although a recent study published by the Medical College of Georgia and Stanford University suggests a causal relationship between marijuana exposure and bladder cancer, larger scale epidemiologic and basic science studies are needed to confirm the role of marijuana smoking as an etiologic agent in the development of transitional cell carcinoma.⁸⁵
- According to a 2005 study of marijuana’s long-term pulmonary effects by Dr. Donald Tashkin at the University of California, Los Angeles, marijuana smoking deposits significantly more tar and known carcinogens within the tar, such a polycyclic aromatic hydrocarbons, into the airways. In addition to precancerous changes, marijuana smoking is associated with impaired function of the immune system components in the lungs.⁸⁶
- Smoked marijuana has also been associated with an increased risk of the same respiratory symptoms as tobacco, including coughing, phlegm production, chronic bronchitis, shortness of breath and wheezing. Because cannabis plants are contaminated with a range of fungal spores, smoking marijuana may also increase the risk of respiratory exposure by infectious organisms (i.e., molds and fungi).⁸⁷
- Marijuana takes the risks of tobacco and raises them. Marijuana smoke contains more than 400 chemicals and increases the risk of serious health consequences, including lung damage.⁸⁸
- An April 2007 article published by the *Harm Reduction Journal*, and funded by the pro-legalization Marijuana Policy Project, argues that the use of a vaporizer has the potential to reduce the danger of cannabis as far as respiratory symptoms are concerned. While these claims remain scientifically unproven, serious negative consequences still remain. For example, driving skills are still impaired, heavy adolescent use may create deviant brain structure, and 9-12 percent of cannabis users develop symptoms of dependence. A vaporizer offers no protection against these consequences.⁸⁹
- According to two studies, marijuana use narrows arteries in the brain, “similar to patients with high blood pressure and dementia,” and may explain why memory tests are difficult for marijuana users. In addition, “chronic consumers of cannabis lose molecules called CB1 receptors in the brain’s arteries,” leading to blood flow problems in the brain which can cause memory loss, attention deficits, and impaired learning ability.⁹⁰

- A small study (50 patients) was conducted by the University of California San Francisco, from 2003 to 2005, leading researchers to find that smoked marijuana eased HIV-related foot pain. This pain, known as peripheral neuropathy, was relieved for 52 percent of the patients in the controlled experiment. Dr. Donald Abrams, director of the study said that while subjects' pain was reduced he and his colleagues "found that adverse events, such as sedation, dizziness and confusion were significantly higher among the cannabis smokers."⁹¹
- In response to this study, critics of smoked marijuana were quick to point out that while THC does have some medicinal benefits, smoked marijuana is a poor delivery mechanism. Citing evidence that marijuana smoke is harmful, Dr. David Murray, then chief scientist at ONDCP, noted that "People who smoke marijuana are subject to bacterial infections in the lungs...Is this really what a physician who is treating someone with a compromised immune system wants to prescribe?"⁹²
 - Dr. Murray also said that the findings are "not particularly persuasive" because of the small number of subjects and the possibility that subjects knew they were smoking marijuana and had an increased expectation of efficacy. He expressed the government's support for pain relief for HIV-affected individuals and said that while "We're very much supportive of any effort to ameliorate the suffering of AIDS patients, the delivery mechanism for THC should be pills, and not smoked marijuana, which can cause lung damage and deliver varying dosages of THC."⁹³
 - Researchers involved with the University of California, San Francisco, project admitted that there may be a problem with efforts to gauge the effects of marijuana vs. the effects of a placebo. Some users were immediately able to acknowledge that their sample was indeed cannabis because of the effects of that substance. One participant, Diana Dodson said, "I knew immediately [that I received cannabis] because I could feel the effects."⁹⁴
- Pro-marijuana advocates were encouraged by a medical study published in *Cancer Epidemiology, Biomarkers & Prevention*. The study, published in October 2006, was based on interviews with people in Los Angeles (611 who developed lung cancer, 601 who developed cancer of the head or neck regions, and 1,040 people without cancer who were matched [to other subjects] on age, gender, and neighborhoods). The study found that people who smoke marijuana do not appear to be at increased risk of developing lung cancer.⁹⁵ While this study's findings differed from previous studies and researchers' expectations, "[o]ther experts are warning that the study should not be viewed as a green light to smoke pot, as smoking marijuana has been associated with problems such as cognitive impairment and chronic bronchitis."⁹⁶ NIDA continues to maintain that smoking marijuana is detrimental to pulmonary functions.
 - In its October, 2006, issue of *NIDA Notes*, mention is made of the most recent Tashkin study. "Biopsies of bronchial tissue provide evidence that regular marijuana smoking injures airway epithelial cells, leading to dysregulation of bronchial epithelial cell growth and eventually to possible malignant changes."

Moreover, he adds, because marijuana smokers typically hold their breath four times as long as tobacco smokers after inhaling, marijuana smoking deposits significantly more tar and known carcinogens within the tar, such as polycyclic aromatic hydrocarbons, in the airways. In addition to precancerous changes, Dr. Tashkin found that marijuana smoking is associated with a range of damaging pulmonary effects, including inhibition of the tumor-killing and bactericidal activity of alveolar macrophages, the primary immune cells within the lung.”

- NIDA also comments on the Tashkin study in the *Director’s Notes* from February 2007. While acknowledging that the study concluded “that the association of these cancers with marijuana, even long-term or heavy use, is not strong and may be below practically detectable limits...these results may have been affected by selection bias or error in measuring lifetime exposure and confounder histories.”⁹⁷
- In October 2006, one of the study’s authors, Dr. Hal Morgenstern, Chair of Epidemiology at the University of Michigan School of Public Health, said although the risk of cancer did not prove to be large in the recent study, “I wouldn’t go so far as to say there is no increased cancer risk from smoking marijuana.”⁹⁸
- The British Lung Foundation’s 2012 survey of 1,000 adults found that a third wrongly believed that cannabis did not harm one’s health. The survey also revealed that 88 percent thought tobacco cigarettes were more harmful than cannabis ones, although the risk of lung cancer is actually 20 times higher from a cannabis cigarette than a tobacco cigarette. Part of the reason for this is that people smoking cannabis take deeper puffs and hold them for longer than tobacco smokers. This means that a person smoking a cannabis cigarette inhales four times as much tar and five times as much carbon monoxide as someone smoking a tobacco cigarette. The Foundation warned that smoking one cannabis cigarette increase the chances of developing lung cancer by as much as an entire packet of 20 cigarettes. “It is alarming that, while new research continues to reveal the multiple health consequences of smoking cannabis, there is still a dangerous lack of public awareness of quite how harmful this drug can be,” said Dame Helena Shovelton, Chief Executive of the British Lung Foundation. “We therefore need a serious public health campaign – of the kind that helped raise awareness of the dangers of eating fatty food or smoking tobacco – to finally dispel the myth that smoking cannabis is somehow a safe pastime.”⁹⁹
- A large international study by researchers from the University of Adelaide found that women who use marijuana during pregnancy double the risk of giving birth prematurely. Preterm or premature births, which is at least three weeks prior to the due date, can result in serious and life-threatening health problems for the baby, and increased health problems in later life, such as heart disease and diabetes.¹⁰⁰

ENVIRONMENTAL ISSUES RELATED TO MARIJUANA

Marijuana grows are having a negative impact on our environment.

- In October 2010 the state Department of Fish and Game (DFG) wardens in California discussed recent cases involving the diversion of water from creeks. “When people divert

water from creeks they deprive wildlife of its most basic water need,” said DFG warden and spokesman Patrick Foy. “(Growers) also allow chemicals needed for cultivation to drain back onto the creek...poisoning everything downstream for who knows how long. We walk upstream to find out why the fish have died, and more often now than 25 years ago, we’re finding the cause is marijuana gardens,” Foy said.¹⁰¹

- “Those who cultivate marijuana on public lands pose a safety threat to the public and an environmental threat to the land and to wildlife, said U.S. Attorney Wagner of the Eastern District of California after results of Operation Mountain Sweep were announced.”¹⁰² Public lands are suffering from the effects of the illegal marijuana grows long after the crop has been harvested. The growers removed natural vegetation, cut down trees, diverted streams to irrigate the marijuana crops and used chemicals, poisons, rodenticides and insecticides which filter into the ground and streams. Trash and equipment were left behind, littering the natural preserves.¹⁰³
- In California scientists are studying the marijuana grows in the forests to gauge the effects that the marijuana grows are having on the environment.
 - In one remote 37-square mile patch of forest, they counted 281 outdoor pot farms and 286 greenhouses containing an estimated 20,000 plants, fed by water diverted from creeks or a fork of the Eel River. It was determined that the farms were siphoning roughly 18 million gallons from the watershed every year, around the time when salmon need it most.
 - The excess potting soil and fertilizer runoff, combined with lower-than-normal river flow due to water diversions, has caused a rash of toxic blue-green algae blooms in North Coast rivers over the last decade. The cyanobacteria outbreaks threaten public health for swimmers and kill aquatic invertebrates that salmon and steelhead trout eat. Officials warn residents in later summer and fall to stay out of certain stretches of water and keep their dogs out – eleven dogs died from ingesting the algae since 2001. It has also affected the recovery of the salmon runs that were improving after damage from years of logging.
 - Every grow leaves its own damage. Urban indoor growers might not pollute the rivers but they guzzle energy. A study in the Journal of Energy Policy calculated that indoor marijuana cultivation could be responsible for nine percent of California’s household electricity use.¹⁰⁴
- According to the National Forest Service, in 2012 marijuana was grown illegally in 67 national forests across 20 states, damaging the environment and endangering visitors and employees.¹⁰⁵
- Marijuana farms were also a contributing factor to the effects of the serious drought in California in 2009 and are a contributing factor to the effects of the drought in 2014. According to California State officials, a pot plant uses six gallons of water every day.¹⁰⁶

- The situation has become so bad in California that public officials are now focusing on both legal and illegal grows. The sheriff in Mendocino County is cracking down on growers who steal water. Governor Jerry Brown’s January budget proposed \$3.3 million to enforce pot cultivation rules to protect water and endangered species. Congressional representatives want to give \$3 million to the DEA to get rid of large pot-operations in public forests.¹⁰⁷
- A study by biologists from the University of California Davis found that potent rat poisons used on large-scale marijuana farms sprinkled throughout the forest lands in the state may be killing off a rare forest carnivore. The study documents the deaths of fishers, reclusive members of the Mustelid family that are candidates for protection under the Endangered Species Act. Eighty percent of fishers found dead by researchers between 2006 and 2011 had been exposed to high levels of anticoagulant rodenticide. Most of the deaths occurred between mid-April and mid-May, which overlapped with the time period that marijuana farmers used the high levels of commercial pesticides and rodenticides. The concern is that the whole prey group could be wiped out, leading to the collapse or partial collapse of a food chain within the forests.¹⁰⁸ The study is just one of many that are beginning to examine the negative impact that marijuana grows are having on the environment.
- “The illegal cultivation of marijuana on our National Forest System is a clear and present danger to the public and the environment,” said U.S. Forest Service Law Enforcement Director David Ferrell, testifying before the Senate Caucus on International Narcotics Control. Natural vegetation and wildlife are killed as growers use liberal doses of herbicides, rodenticides and pesticides, some of them banned in the United States. These chemicals can cause extensive and long-term damage to the ecosystems. Human waste and trash in the grow sites are widespread. Winter rains create severe soil erosion and wash the poisons, this waste and trash into stream and rivers – including the Wild and Scenic Rivers and National Recreation Areas. Cleanup of an acre costs approximately \$5,000. The restoration of the site to re-establish streams cost another \$5,000 per acre. An additional \$5,000 is needed to restore the area to its natural state.¹⁰⁹

The detection and dismantling of these operations have become increasingly dangerous through the introduction and presence of firearms and “booby-traps” deployed by illicit growers to protect their capital investment. In addition, Mexican Drug Trafficking Organizations (DTOs) have realized that the lucrative California marijuana cultivation business eliminates the need to breach the southern border with contraband. The DTOs have tapped the expanding and voracious consumer appetite through outlets provided by the dispensaries, generating millions of dollars in cash which is easily smuggled south of the border back to the DTOs.

A marked increase in violent crime throughout Mexico has been driven, in part, by the kidnapping and forced servitude of Mexican nationals in working the illicit cultivation operations in northern California (and elsewhere) to avoid retribution to themselves or extended families by the DTOs.

In addition to the harm caused by outdoor grows, indoor grows are causing millions of dollars in property damage for homeowners.

- A couple in Altadena, California bought their first home, what seemed to be a buyers dream, with fresh paint, carpet and fixtures. After they moved in their dream house became a nightmare. The smell of fresh paint was overtaken by the smell of stachybotrys mold growing throughout the house, forcing them to relocate and spend over \$42,000 in repairs. Months later an electrical fire put them out again. The mold, faulty wiring, and gas leaks all stemmed from the undisclosed past of the house being used as a marijuana grow.¹¹⁰
- The owners of a Satellite Beach house in Brevard County, Florida were told the renters would take care of the lawn and clean the pool themselves. What they didn't know is that they would be using the water from the swimming pool as part of the irrigation system for a hydroponic indoor marijuana grow in three of the four bedrooms of their home. "They even dug into the foundation of the house to put pipes and wires in," according to Kathleen Burgess, one of the owners, who estimated the property damage at \$60,000. The Brevard County Sheriff's Office found 24 marijuana plants inside with a possible yield of 200 pounds of cannabis.¹¹¹
- A 2011 study by Evan Mills at Lawrence Berkeley National Laboratory showed that indoor marijuana production accounted for one percent of national electricity production, using \$6 billion worth of energy per year, and creating greenhouse gas pollution equivalent to that of 3 million cars. To address this growing problem, the city of Boulder, Colorado enacted environmental regulations which require marijuana growers to purchase wind or solar energy, or to buy carbon offsets. Although that increased their cost of business, it protects the environment.¹¹²
- According to National Jewish Health Industrial Hygienist Dr. John Martyny, houses and other buildings used to grow marijuana indoors contain high levels of mold, which may pose a threat to residents living there and to law enforcement agents investigating them. "The combination of warm temperatures and high humidity found in many indoor marijuana grow operations can fuel extensive mold growth," said Dr. Martyny. "Airborne levels of mold spores that we found inside these structures may subject the occupants, emergency personnel and other individuals to significant health hazards, especially allergies, asthma, hypersensitivity pneumonitis and other respiratory diseases."¹¹³
- A study done by The Werc Shop, an independent testing lab for medical threat, and published in the *Journal of Toxicology*, found that up to 70 percent of the pesticides found on a marijuana bud can transfer to the smoke being inhaled. "I think that what's so alarming to us is that such a huge amount of pesticide material could be transferred," said Dr. Jeffrey Raber, who runs the testing lab. "And, you have to consider that when you inhale (something), it's much like injecting it directly into your bloodstream."¹¹⁴

There are many other concerns with growing marijuana. In Oregon, where voters legalized "medical" marijuana for qualifying patients in November 1998, patients must grow their own marijuana or have a licensed grower provide it for them through an unpaid arrangement. While the initiative had good intentions, numerous concerns exist.

- According to Lt. Michael Dingeman, Director of the Oregon State Police Drug Enforcement Section, many calls from cardholders are about never receiving the marijuana from their designated growers. The “growers are simply using the cardholders for cover, and selling their crops on the black market. In fact, some county sheriffs estimate that as much as one half of the illegal street marijuana they’re seeing is being grown under the protection of the state’s medical marijuana program.”¹¹⁵
- Deputy Chief Tim George of the Medford Police Department says that the region is “swimming in weed,” and the problem keeps getting worse. “People are traveling with large sums of money to buy marijuana. Weed is being shipped out of Oregon at record levels. Medical Marijuana has made it easier for criminals to grow it.”¹¹⁶
- Sergeant Erik Fisher of the Drug Enforcement Section of the Oregon State Police says that “the perception of the marijuana drug trade is mellower than other drug operations is wrong.” He notes that almost all the distributors and growers carry firearms. “The other striking trend has been the increase in home invasion robberies of medical marijuana folks, and how absolutely violent they can be. We have more home invasions going on with medical marijuana people than any other drug dealer I can think of.”¹¹⁷

MARIJUANA AS A PRECURSOR TO ABUSE OF OTHER DRUGS

- Teens who experiment with marijuana may be making themselves more vulnerable to heroin addiction later in life, if the findings from experiments with rats are any indication. “Cannabis has very long-term, enduring effects on the brain,” according to Dr. Yamin Hurd of the Mount Sinai School of Medicine in New York, the study’s lead author.¹¹⁸
- Marijuana is a frequent precursor to the use of more dangerous drugs and signals a significantly enhanced likelihood of drug problems in adult life. The *Journal of the American Medical Association* reported, based on a study of 300 sets of twins, “that marijuana-using twins were four times more likely than their siblings to use cocaine and crack cocaine, and five times more likely to use hallucinogens such as LSD.”¹¹⁹
- Long-term studies on patterns of drug usage among young people show that very few of them use other drugs without first starting with marijuana. For example, one study found that among adults (age 26 and older) who had used cocaine, 62 percent had initiated marijuana use before age 15. By contrast, less than one percent of adults who never tried marijuana went on to use cocaine.¹²⁰
- Columbia University’s National Center on Addiction and Substance Abuse (CASA) reports that teens who used marijuana at least once in the last month are 13 times likelier than other teens to use another drug like cocaine, heroin, or methamphetamine and almost 26 times likelier than those teens who have never used marijuana to use another drug.¹²¹
- Marijuana use in early adolescence is particularly ominous. Adults who were early marijuana users were found to be five times more likely to become dependent on any drug,

eight times more likely to use cocaine in the future, and fifteen times more likely to use heroin later in life.¹²²

- Healthcare workers, legal counsel, police and judges indicate that marijuana is a typical precursor to methamphetamine. For instance, Nancy Kneeland, a substance abuse counselor in Idaho, pointed out that “in almost all cases meth users began with alcohol and pot.”¹²³
- An estimated 2.9 million persons aged 12 or older – an average of approximately 7,900 per day - used a drug other than alcohol for the first time in the past year according to the 2012 National Survey on Drug Use and Health. Almost two-thirds (65.6 percent) of these new users reported that marijuana was the first drug they tried.¹²⁴
- Nearly one in ten high school students (9 percent) report using marijuana 20 times or more in the past month according to the findings of the 2011 Partnership Attitude Tracking Survey.¹²⁵
- Teens past month heavy marijuana users are significantly more likely than teens that have not used marijuana in the past to: use cocaine/crack (30 times more likely); use Ecstasy (20 times more likely); abuse prescription pain relievers (15 times more likely); and abuse over the counter medications (14 times more likely). This clearly denotes that teens that use marijuana regularly are using other substances at a much higher rate than teens who do not smoke marijuana, or smoke less often.¹²⁶

DEPENDENCY AND TREATMENT

- “The basic rule with any drug is if the drug becomes more available in the society, there will be more use of the drug,” said Thomas Crowley, a University of Colorado psychiatry professor and director of the university’s Division of Substance Dependence. “And as use expands, there will be more people who have problems with the drug.”¹²⁷
- A study of substance abuse treatment admissions in the U.S. between 1998 and 2008 found that although admission rates for alcohol treatment were declining, admission rates per 100,000 population for illicit drug use were increasing. One consistent pattern in every region was the increase in the admission rate for marijuana use which rose 30 percent nationally.¹²⁸
- California, a national leader in ‘medical’ marijuana use, saw admission for treatment for marijuana dependence more than double over the past decade. Admissions grew from 52 admissions per 100,000 population in 1998 to 113 per 100,000 in 2008, an increase of 117 percent.¹²⁹
- “[R]esearch shows that use of [marijuana] can lead to dependence. Some heavy users of marijuana develop withdrawal symptoms when they have not used the drug for a period of time. Marijuana use, in fact, is often associated with behavior that meets the criteria for substance dependence established by the American Psychiatric Association.”¹³⁰

- Marijuana was the illicit drug with the highest rate of past year dependence or abuse in 2012; of the 7.3 million persons age 12 or older classified with illicit drug dependence or abuse, 4.3 million had marijuana dependence or abuse (representing 1.7 percent of the total population aged 12 or older and 58.9 percent of all those classified with illicit drug dependence or abuse).¹³¹
- Among all ages, marijuana was the second most common illicit drug responsible for treatment admissions in 2011 after opioids, accounting for 18 percent of all admissions--outdistancing cocaine, the next most prevalent cause.¹³²
- The proportion of admissions for marijuana as the primary substance of abuse for persons aged 12 or older increased from 15 percent in 2001 to 18 percent in 2011.¹³³
- Forty percent of primary marijuana admissions were under age 20 (versus 11 percent of all admissions).¹³⁴
- Twenty-five percent of primary admissions had first used marijuana by age 12 and another 32 percent by age 14.¹³⁵

DANGERS TO NON USERS

DELINQUENT BEHAVIORS

Marijuana use is strongly associated with juvenile crime.

- In a 2008 paper entitled *Non-Medical Marijuana III: Rite of Passage or Russian Roulette*, CASA reported that in 2006 youth who had been arrested and booked for breaking the law were four times likelier than those who were never arrested to have used marijuana in the past year.¹³⁶
- According to CASA in their report on *Criminal Neglect: Substance Abuse, Juvenile Justice and the Children Left Behind*, youth who use marijuana are likelier than those who do not to be arrested and arrested repeatedly. The earlier an individual begins to use marijuana, the likelier he or she is to be arrested.
- Marijuana is known to contribute to delinquent and aggressive behavior. A June 2007 report released by ONDCP reveals that teenagers who use drugs are more likely to engage in violent and delinquent behavior. Moreover, early use of marijuana, the most commonly used drug among teens, is a warning sign for later criminal behavior. Specifically, research shows that the instances of physically attacking people, stealing property, and destroying property increase in direct proportion to the frequency with which teens smoke marijuana.¹³⁷

In a report titled *The Relationship between Alcohol, Drug Use, and Violence among Students*, the Community Anti-Drug Coalitions of America (CADCA) reported that according to the 2006 Pride Surveys, during the 2005-2006 school year:

- Of those students who report carrying a gun to school during the 2005-2006 year, 63.9 percent report also using marijuana.
- Of those students who reported hurting others with a weapon at school, 68.4 percent had used marijuana.
- Of those students who reported being hurt by a weapon at school, 60.3 percent reported using marijuana.
- Of those students who reported threatening someone with a gun, knife, or club or threatening to hit, slap, or kick someone, 27 percent reported using marijuana.
- Of those students who reported any trouble with the police, 39 percent also reported using marijuana.¹³⁸
- According to ONDCP, the incidence of youth physically attacking others, stealing, and destroying property increased in proportion to the number of days marijuana was smoked in the past year.¹³⁹
- ONDCP reports that marijuana users were twice as likely as non-users to report they disobeyed school rules.¹⁴⁰
- Youths aged 12 to 17 who had engaged in fighting or other delinquent behaviors were more likely than other youths to have used illicit drugs in the past month. In 2012 past month illicit drug use was reported by 17.5 percent of youths who had gotten into a serious fight at school or work compared with 7.6 percent of those who had not engaged in fighting at school or work, and by 43.8 percent of those who had stolen or tried to steal something worth over \$50 in the past year compared with 8.2 percent who had not attempted or engaged in such theft.¹⁴¹

DRUGGED DRIVERS

Drugged driving, also referred to as impaired driving, is driving under the influence of alcohol, over-the-counter-medications, prescription drugs, or illegal drugs.

- The principal concern regarding drugged driving is that driving under the influence of any drug that acts on the brain could impair one's motor skills, reaction time, and judgment. Drugged driving is a public health concern because it puts not only the driver at risk, but also passengers and others who share the road.¹⁴²
- In Montana, where there has been an enormous increase in "medical" marijuana cardholders, Narcotics Chief Mark Long told a legislative committee in April 2010 that "DUI arrests involving marijuana have skyrocketed, as have traffic fatalities where marijuana was found in the system of one of the drivers."¹⁴³
- In Washington State, where marijuana use was legalized for recreational purposes, state police have noticed that significantly more drivers being stopped are testing positive for

marijuana. Toxicology reports show that in the first six months of 2013, the percentage of driving cases where the driver tested positive for delta-9-THC rose by 33 percent. From 2011 to 2012, there was a 7.9 percent decrease. This increase is especially notable because Washington had increased the legal limit of THC in the blood.¹⁴⁴

- The Las Vegas, Nevada Metropolitan Police Department reports that they have a large problem with people using marijuana and driving, and that the problem is getting worse. During the last three years, the Department's forensics lab screened 4,500 blood samples for marijuana, with the bulk of those being impaired drivers. Department statistics show that if police were able to test each impaired driver involved in a fatal crash today, one in ten would likely test positive for marijuana. "If it continues on this path, in the next five or six years, we could see marijuana and other non-alcoholic drugs overtake our DUI problems with alcohol," Sergeant Todd Raybuck of the Department's Traffic Bureau said. Statewide records from 2002 to 2012 revealed that 45 percent of drivers who were impaired by drugs had marijuana in their system.¹⁴⁵
- In 2012 there were 10.3 million persons aged 12 and older who reported driving under the influence of illicit drugs during the past year. The rate was highest among young adults aged 18 to 25.¹⁴⁶
- Drugs that may affect driving were detected in one of every seven weekend nighttime drivers in California during the summer of 2012. In the first California statewide roadside survey of alcohol and drug use by drivers, 14 percent of drivers tested positive for drugs and 7.4 percent of drivers tested positive for alcohol, and just as many as tested positive for marijuana as alcohol.¹⁴⁷
- Since 2000, Liberty Mutual Insurance and Students Against Destructive Decisions (SADD) have been conducting a study of teens driving under the influence.
 - The 2013 survey found that nearly one in four teens admits to driving under the influence of marijuana, alcohol, and prescription drugs.
 - They also found that driving under the influence of marijuana (16 percent) is a greater threat than driving under the influence of alcohol (15 percent).
 - There are 13 million driving-aged teenagers on the road; 23 percent admit to driving under the influence of alcohol or other drugs. That means that there may be 3 million impaired teen drivers on the road.
 - Of the teens responding to the survey, 25 percent felt that driving under the influence of marijuana was not distracting; 23 percent felt that driving under the influence of prescription drugs was not distracting; and, 14 percent felt that driving under the influence of alcohol not distracting.
 - What is even more astounding is that 75 percent of teens who have driven under the influence of marijuana believe it had no impact or even improves their driving and

38 percent of teens who admit to drinking and driving claim that alcohol had no impact or even improved their driving.¹⁴⁸

- The 2014 survey focused on safe driving, and although it focused mainly on alcohol, they did find that there is a sharp disconnect between what teens acknowledge as risky behavior and what they actually admit to doing behind the wheel. Some of the teens (21 percent) defined a designated driver as someone basically sober (only having had “a little” alcohol or other drugs), and 4 percent described it as the most sober person in the group.¹⁴⁹
- A 2013 study examining the data from the 2001 to 2011 Monitoring the Future Surveys found that one out of every four (28 percent) high school seniors either drove or rode with a driver who was under the influence of alcohol or other illicit drugs, with the percentage of high school seniors driving after smoking marijuana almost three times greater than alcohol impaired drivers. Driving after drinking has declined in recent years but driving after using marijuana has increased.¹⁵⁰
- According to researchers at Columbia University’s Mailman School of Public Health, the prevalence of non-alcoholic drugs detected in fatally injured drivers in the U.S. has been steadily rising and has tripled between 1999 and 2010 for drivers who tested positive for marijuana. Drugs combined with alcohol created an even greater risk for driving fatalities. Joanne Brady, a PhD candidate in epidemiology and lead author of the study, noted that “the marked increase in its prevalence as reported in the present study is likely germane to the growing decriminalization of marijuana. Although each of these states has laws that prohibit driving under the influence of marijuana, it is still conceivable that its decriminalization may result in increases in crashes involving marijuana.”¹⁵¹
- A study in the British Medical Journal on the consequences of cannabis impaired driving found that drivers who consume cannabis within three hours of driving are nearly twice as likely to cause a vehicle collision as those who are not under the influence of drugs or alcohol.¹⁵²
- Researchers at the Pacific Institute for Research and Evaluation in Maryland studied a government data base on traffic fatalities and examined the data from 44,000 drivers involved in single-vehicle crashes who died between 1999 and 2009. They found that 24.9 percent of the drivers tested positive for drugs and 37 percent had blood-alcohol levels in excess of .08, the legal limit. The study is one of the first to show the prevalence of drug use among fatally injured drivers. Among the drivers who tested positive for drugs, 22 percent were positive for marijuana, 22 percent for stimulants, and 9 percent for narcotics.¹⁵³
- In a study of seriously injured drivers admitted to a Maryland Level-1 shock-trauma center, 65.7 percent were found to have positive toxicology results for alcohol and/or drugs. Almost 51 percent of the total tested positive for illegal drugs. A total of 26.9 percent of the drivers tested positive for marijuana.¹⁵⁴

- The percentage of fatally injured drivers testing positive for drugs increased over the last five years according to data from the National Highway Traffic Safety Administration (NHTSA). In 2009, 33 percent of the 12,055 drivers fatally injured in motor vehicle crashes with known test results tested positive for at least one drug compared to 28 percent in 2005. In 2009, marijuana was the most prevalent drug found in this population – approximately 28 percent of fatally injured drivers who tested positive tested positive for marijuana.¹⁵⁵
- Recognizing that drugged driving is a serious health and safety issue, the National Organization for the Reform of Marijuana Laws (NORML) has called for a science-based educational campaign targeting drugged driving behavior. In January of 2008, Deputy Director Paul Armentano released a report titled, *Cannabis and Driving*, noting that motorists should be discouraged from driving if they have recently smoked cannabis and should never operate a motor vehicle after having consumed both marijuana and alcohol. The report also calls for the development of roadside, cannabis-sensitive technology to better assist law enforcement in identifying drivers who may be under the influence of pot.¹⁵⁶
- In a 2007 National Roadside Survey of alcohol and drug use by drivers, a random sample of weekend nighttime drivers across the United States found that 16.3 percent of the drivers tested positive for drugs, compared to 2.2 percent of drivers with blood alcohol concentrations at or above the legal limit. Drugs were present more than 7 times as frequently as alcohol.¹⁵⁷
- According to a NIDA funded study, a large number of American adolescents are putting themselves and others at great risk by driving under the influence of illicit drugs or alcohol. In 2006, 30 percent of high school seniors reported driving after drinking heavily or using drugs, or riding in a car whose driver had been drinking heavily or using drugs, at least once in the prior two weeks. Dr. Patrick O'Malley, lead author of the study, observed that "Driving under the influence is not an alcohol-only problem. In 2006, 13 percent of seniors said they drove after using marijuana while ten percent drove after having five or more drinks." "Vehicle accidents are the leading cause of death among those aged 15 to 20," added Dr. Nora Volkow, Director of NIDA. "Combining the lack of driving experience among teens with the use of marijuana and/or other substances that impair cognitive and motor abilities can be a deadly combination."¹⁵⁸
- A June 2007 toxicology study conducted at the University of Maryland's Shock-Trauma Unit in Baltimore found that over 26 percent of injured drivers tested positive for marijuana. In an earlier study, the U.S. National Survey on Drug Use and Health estimated that 10.6 million Americans had driven a motor vehicle under the influence of drugs during the previous year.¹⁵⁹
- A study of over 3000 fatally-injured drivers in Australia showed that when marijuana was present in the blood of the driver they were much more likely to be at fault for the accident. And the higher the THC concentration, the more likely they were to be culpable.¹⁶⁰

- NHTSA has found that marijuana significantly impairs one’s ability to safely operate a motor vehicle. According to its report, “[e]pidemiology data from road traffic arrests and fatalities indicate that after alcohol, marijuana is the most frequently detected psychoactive substance among driving populations.” Problems reported include: decreased car handling performance, inability to maintain headway, impaired time and distance estimation, increased reaction times, sleepiness, lack of motor coordination, and impaired sustained vigilance.¹⁶¹

OTHER CONSEQUENCES OF MARIJUANA USE

- In Massachusetts in 2009 the possession of one ounce of marijuana went from a criminal charge to a civil fine. Police and District Attorneys want residents to know that smoking marijuana is not a victimless crime. Middlesex District Attorney Gerard T. Leone Jr. says that he fears that “decriminalization has created a booming ‘cottage industry’ for dope dealers to target youths no longer fearing the stigma of arrest or how getting high could affect their already dicey driving. What we’re seeing now is an unfortunate and predictable outcome. It’s a cash and carry business. With more small-time dealers operating turf encroachment is inevitable. This tends to make drug dealers angry.” Wellesley Deputy Police Chief William Brooks III, speaking on behalf of the Massachusetts Chiefs of Police Association said “the whole thing is a mess. The perception out there among a lot of people is it’s ok to do it now, so there’s an uptick in the number of people wanting to do it...Most of the drug-related violence you see now – the shootings, murders – is about weed.” Several 2010 high-profile killings have been linked by law enforcement to the increased market:
 - The May fatal shooting of a 21-year-old inside a Harvard University dorm, allegedly in a bid to rob him of his pot and cash.
 - The June murder of a 17-year-old in Callahan State Park, where he was lured by two men seeking revenge in a fight over marijuana.
 - The September massacre of four people in Mattapan, including a 21-year-old woman and her 2-year-old son, over an alleged pot-dealing turf dispute.
 - The September fatal shooting of a 29-year-old man, by four men, one a high school senior, in connection with robbery and murder of a drug dealer.¹⁶²
- Children often bear the consequences of actions engaged in by parents or guardians involved with marijuana.
 - In Bradenton, Florida a Highway Patrol officer tried to stop a man speeding on I-75. The driver did not stop until he ran up on the median and crashed into a construction barrel. In the car the troopers found three small children, forty pounds of marijuana and several thousand dollars in cash.¹⁶³
 - A Hamilton, Montana man put his three toddlers in the back seat of his one ton Chevy pickup and then partied with a friend as he drove along the highway. At 50

miles an hour he swerved into another car killing the owner. While partying with his friend in the vehicle he had smoked two bowls of pot.¹⁶⁴

- An Ohio mother is accused of teaching her two-year-old daughter to smoke pot and recording the incident on her cell phone.¹⁶⁵
- A Virginia mother and her roommate were charged with reckless child endangerment after her two-year-old daughter ingested an unknown amount of marijuana in a motel room.¹⁶⁶
- A California couple was arrested after a video surfaced of them allowing their 23-month-old son to use a marijuana pipe. The video showed the child smoking the pipe. The pipe was tested and found to have marijuana residue in it. Both parents said they had medical marijuana cards, but could not explain why they would give it to their child and then videotape the incident.¹⁶⁷
- Cincinnati, Ohio police arrested a woman for allegedly giving her three children, ages seven, four, and one, marijuana. The seven-year-old told the school counselor that she had been forced to smoke marijuana. All three children tested positive for marijuana.¹⁶⁸
- In Stockton, California a two-year-old girl was in critical condition after ingesting marijuana resin. Although four adults were home at the time, none were supervising the child when she found a jar lid containing resin.¹⁶⁹
- Two toddlers in Louisiana were hospitalized after ingesting marijuana and amphetamines. A search warrant of the home found several unsecured bottles of prescription medication and a hand-rolled cigar containing marijuana.¹⁷⁰

With the legalizing of marijuana for recreational use in Colorado, there has been an increase in the sale of edibles laced with marijuana. Although the state has regulations for edibles, including tamper proof packaging, problems will still persist. There is no guarantee of the quality of the product; no consistent dosaging; and edibles take longer to take effect than smoked marijuana, often causing people to eat too much and overdose themselves.¹⁷¹

- An African college exchange student on spring break plummeted to his death from a hotel balcony in Denver after eating a marijuana-infused cookie. Eating more than the recommended amount at one time, he began shaking, screaming and throwing things around the hotel room before jumping to his death. Although the cause of death was injuries from the fall, marijuana intoxication was listed as a significant contributing factor by the Denver Medical Examiner's Office. The autopsy revealed no other medical problems or medications in his system.¹⁷²
- A Denver man is accused of killing his wife after eating marijuana-infused candy. Kristine Kirk called 911 and told the dispatcher her husband ate marijuana candy and was hallucinating. She asked the dispatcher to hurry and send the police because her husband asked her to get a gun and shoot him. She was scared of what he might do.¹⁷³

- The rate of poison center calls for unintentional pediatric marijuana exposures in children ages 9 and under more than tripled in states that decriminalized marijuana before 2005. The call rate in transitional states (those that enacted legislation between 2005–2011) also increased over that period. States that had not passed marijuana decriminalization showed no change in call rates.¹⁷⁴
- Children see the edible brownies or candy and want some. According to Denver Children’s Hospital Emergency Room physician and toxicology expert Dr. George “Sam” Wang, they are treating one or two kids a month for accidental ingestion. Before 2009, when edibles became popular, none were treated.¹⁷⁵
- In Westminster, Colorado’s Shaw Heights Middle School, when teachers noticed a few students acting strangely during class, it was discovered that marijuana-laced candies were passed around and eaten by 15 students. Some of the students were unaware that the candy had marijuana in it. Several students were arrested and others have been expelled.¹⁷⁶

Pets are also at risk. More dogs are being poisoned by marijuana.

- A *Los Angeles Times* article on dog poisonings noted that: a Colorado study on the poisoning of dogs living in the state quadrupled after voters legalized “medical” marijuana in 2000; reports from the *Oregonian* newspaper in April 2013 related that cases are on the rise in the Pacific Northwest; and veterinarians in Los Angeles say that they frequently see ingestion cases.¹⁷⁷
- Eagle Rock Clinic Emergency veterinarian technician Bruce Castillo says he treats two to three stoner dogs a night. “I see a lot of cases where dogs have been walking in the park and then become lethargic, shaky and disoriented,” Castillo said. Most dogs recover, but some do not.¹⁷⁸
- Veterinarian Leia Castaneda at the San Gabriel Valley Emergency Pet Clinic in El Monte noted that there was an uptick in her clinic beginning in about 2007. Dogs pick up discarded joints, blunts or buds, gulp down marijuana brownies, or even lick resin off pipes.¹⁷⁹
- “It’s a really bad trip for dogs,” veterinarian Paige Lorimer told *Steamboat Today*. Dogs can become very depressed, cry out, or have trouble walking. Their eyes get dilated and red. Their heart rate may slow and they can even become comatose. They may become anxious. Intoxication of animals is abnormal and uncomfortable. There is no antidote for marijuana ingestion in pets and no tests to diagnose it.¹⁸⁰

In recent years there have been an increased number of people using the marijuana plant to make “wax” or “honey oil,” a liquid form of THC that can be used with electronic cigarettes and other vaporizing devices. Making this extract is extremely dangerous as butane (a colorless, flammable gas) is often used.

- According to the *Los Angeles Times* in a February 2014 article, in the past 14 months at least 17 cooks and bystanders have landed in the Southern California burn centers with catastrophic injuries, much worse than from meth lab explosions. In Northern California the UC Davis System's Burn Unit treated 27 victims last year with similar injuries. Many of these are deep flash burns that require skin grafts and reconstructive surgery.¹⁸¹ Similar stories have been appearing in the media from all over the U.S.
- A smoky explosion rocked a hotel near Sea World in San Diego in January 2014 that sent guests fleeing. A 22-year-old man, whose skin was hanging off him, was fighting for his life while two others were also injured. The scene was described as a war zone.¹⁸²
- Inside a West Hollywood apartment windows shattered and walls bowed from a hash oil explosion. The 39-year-old man, who was charged with four felony counts, was badly injured.¹⁸³
- A ceiling in Monrovia was blasted off the house and three men were burned over 80 percent of their bodies when their hash oil erupted.¹⁸⁴
- In a San Francisco apartment building a hash oil explosion injured a woman and her 12 year old son, who needed skin grafts on his face and body.¹⁸⁵
- In Santa Clara, California, in one week in December, four dispensaries and one marijuana grower were hit by vandals, burglars, or armed robbers. At one location four suspects robbed the victim by throwing him to the floor, holding a piece of metal to his throat, and demanding marijuana and money. At one dispensary, the owner, who is paralyzed and in a wheelchair, was closing up the shop when armed robbers knocked him over and barged in. The robbers tied him up and took marijuana and cash.¹⁸⁶
- The Los Angeles Police Department investigated a series of robberies and shootings at marijuana dispensaries. Over a one week period in June 2010 a Northridge dispensary robbery left one employee in critical condition after being shot in the face; the shooting was the second at that business that year and the third dispensary to be targeted in three days. Two people were fatally shot in pot shop robberies in Echo Park and Hollywood, and a third person was wounded.¹⁸⁷
- On March 4, 2010, a California man was killed after opening fire on two Pentagon Police Officers. In a story on MSNBC, the Friday before the incident, John Patrick Bedell's parents had warned local authorities that his behavior had become erratic and that he was unstable and had a gun. Bedell was diagnosed as bipolar and had been in and out of treatment programs for years. His psychiatrist, J. Michael Nelson, said "Bedell tried to self-medicate with marijuana, inadvertently making his symptoms more pronounced."¹⁸⁸ Bedell had been given a recommendation for medical use of marijuana in 2006 for chronic insomnia. According to long-time friend Reb Monaco "he was not a person who should have been issued a medical clearance to use marijuana, but he was."¹⁸⁹

- A marijuana dealer kidnapped and murdered a 15 year-old boy after he got angry at the teen's half-brother for owing him a \$2,500 drug debt.¹⁹⁰
- Grant Everson and three friends armed with box cutters and a shot-gun slipped into Everson's parents' Chaska, Minnesota home demanding money to open a coffeehouse in the marijuana-friendly City of Amsterdam, Netherlands. Although Grant lost his nerve, his friends proceeded to shoot and kill his mother. All four were arrested. Their alibi was that they had been sleeping in the same Burnsville apartment after a night of smoking marijuana and playing video games.¹⁹¹
- The National Transportation Safety Board investigation of a small plane crash near Walnut Ridge, Arkansas, killing a passenger and the pilot, determined it was a result of pilot error. Pilot Jason Heard failed to fly high enough and maintain enough airspeed to avoid a stall. The report notes that Pilot Jason Heard had enough marijuana in his system to have contributed to the accident.¹⁹²

MARIJUANA AND INCARCERATION

Federal marijuana investigations and prosecutions usually involve hundreds of pounds of marijuana. Few defendants are incarcerated in federal prison for simple possession of marijuana.

- In 2008, according to the United States Sentencing Commission (USSC), 25,337 people were sentenced in federal court for drug crimes under six offense categories. Marijuana accounted for 6,337 (25 percent). Looking even further, of the 6,337 people sentenced, only 99 people or 1.6 percent, were sentenced for "simple possession" of marijuana.¹⁹³
- According to a Bureau of Justice Statistics survey of state and federal prisoners published in October 2006, approximately 12.7 percent of state prisoners and 12.4 percent of federal prisoners were serving time for a marijuana-related offense. This is a decrease from 1997 when these figures were 12.9 percent and 18.9 percent respectively.¹⁹⁴
- Between October 1, 2005 and September 30, 2006, there were 6,423 federal offenders sentenced for marijuana-related charges in the U.S. Courts. Approximately 95.9 percent of the cases involved trafficking.¹⁹⁵
- In Fiscal Year 2006, there were 25,814 offenders sentenced in federal court on drug charges. Of those, only 1.6 percent (406 people) were sentenced for simple possession.¹⁹⁶
- According to ONDCP, "Many inmates ultimately sentenced for marijuana and possession were initially charged with more serious crimes but were able to negotiate reduced charges or lighter sentences through plea agreements with prosecutors. Therefore the ... figure for simple possession defendants may give an inflated impression of the true numbers, since it also includes these inmates who pled down from more serious charges."¹⁹⁷

- While illicit drugs are implicated in three-quarters of incarcerations (75.9 percent), few inmates are incarcerated for marijuana possession as their controlling or only offense. Inmates incarcerated in federal and state prisons and local jails for marijuana possession as the controlling offenses accounted for 1.1 percent of all inmates and 4.4 percent of those incarcerated for drug law violations. Those incarcerated for marijuana possession as their only offense accounted for .9 percent of all inmates and 2.9 percent those incarcerated for drug law violations.¹⁹⁸
- Findings from the 2008 Arrestee Drug Abuse Monitoring System (ADAM II), which surveys drug use among booked male arrestees in ten major metropolitan areas across the country, shows the majority of arrestees in each city test positive for illicit drug use, with as many as 87 percent of arrestees testing positive for an illegal drug. Marijuana is the most commonly detected drug at the time of the arrest. In seven of the ten sites arrestees who are using marijuana are using it on the average of every other day for the past 30 days.¹⁹⁹

OTHER CONSIDERATIONS

MARIJUANA USE AMONG YOUTH IS RISING AS PERCEPTION OF RISK DECREASES

- Historical drug trends from the national Monitoring the Future Survey show that when anti-drug attitudes soften there is a corresponding increase in drug use in the coming years. An adolescent's perception of risks associated with substance use is an important determinant of whether he or she engages in substance abuse. Youths who perceive high risk of harm are less likely to use drugs than youths who perceive low risk of harm.
- The 2013 Monitoring the Future Survey five-year trends are showing significant increase in past-year and past-month (current) marijuana use across all three grades, as well as increase in lifetime and daily marijuana use among 10th graders. From 200
- 8 to 2013, past month use increased from 5.8 percent to 7 percent among 8th graders, 13.8 percent to 18 percent among 10th graders and 19.4 percent to 22.7 percent among 12th graders.²⁰⁰
- Nearly 23 percent of seniors say they smoked marijuana in the past month, and just over 36 percent smoked it in the past year.²⁰¹ This means that one in every 15 high school seniors is a daily or near daily user of marijuana.²⁰²
- For 10th graders, 4 percent say they use marijuana daily, with 18 percent using in the past month, and 29.8 percent using in the past year. More than 12 percent of 8th graders (13 and 14 year olds) say they used marijuana in the past year.²⁰³
- This increase in use by teens reiterates the link between use and the perception of risk. Lloyd Johnston, principal investigator of the Monitoring the Future Survey, once again raises this concern as a result of the findings of the survey. "Most noteworthy is the fact that the proportion of adolescents seeing marijuana use as risk declined again sharply in all

three grades. Perceived risk- namely the risk to the user that teenagers associate with a drug- has been a lead indicator of use, both for marijuana and other drugs, and it has continued its sharp decline in 2013 among teens. This could foretell further increases in use in the future.”²⁰⁴

- From 2005 to 2013, the percent of teens seeing great risk from being a regular marijuana user has fallen among 8th graders from 74 percent to 61 percent; among 10th graders, from 66 percent to 47 percent; and among 12th graders, from 58 percent to 40 percent.²⁰⁵
- This means that among high school seniors, sixty percent do not view regular marijuana use as harmful.²⁰⁶
- Survey results from the past two years also revealed that 34 percent of marijuana-using 12th-graders living in states with medical marijuana laws say that one of the ways they obtain the drug is through someone else’s medical marijuana “prescription.” In addition, more than 6 percent say they get it with their own “prescription.” Thus states with medical marijuana laws do seem to provide another avenue of accessibility to the drug. This link between state laws and marijuana’s accessibility to teens will continue to be explored.²⁰⁷
- According to the Partnership Attitude Tracking Survey, 2011 Parents and Teens, nine percent of teens (1.5 million) smoked marijuana heavily (at least 20 times in the past month). Between 2008 and 2011, past month use is up 42 percent, past year use is up 26 percent and lifetime use is up 21 percent among teens.²⁰⁸
- Teens report seeing more of their peers smoking marijuana; only 26 percent say that in their school most teens don’t smoke marijuana. Also, 71 percent of teens say they have friends that smoke marijuana regularly, up from 64 percent in 2008.²⁰⁹
- A continuing erosion of anti-marijuana attitudes was also noted; only about half of teens (51 percent) say they see great risk in using marijuana, down from 61 percent in 2005.²¹⁰
- Media also plays a role in changing the perception of marijuana use. Nearly half (45 percent) of teens say that the music they listen to makes marijuana seem cool and almost half (47 percent) agree that movies and television shows make drugs seem like the thing to do.²¹¹
- A recent study by researchers from New York University’s Center for Drug Use and HIV Research found that a large proportion of high school students normally at low risk for marijuana use reported intention to use marijuana if it were legal. “What I personally find interesting is the reasonably high percentage of students who are very religious, non-cigarette smoking, non-drinkers, and those who have friends who disapprove of marijuana use – who said they intended to try marijuana if it was legal,” said Dr. Palamar, Assistant Professor at the Department of Population Health, NYU Langone Medical Center.²¹²

A FINAL NOTE

The intent of this document was to clarify any misconceptions about marijuana. We hope we have relayed to you the importance of understanding all the facts and making clear, informed decisions about your future, the future of our youth, and of our society as a whole.

For more information about marijuana and other drugs of abuse, please visit our websites: www.DEA.gov; our teen website, written for teens, www.JustThinkTwice.com; and our parent website, written for parents, caregivers, and educators: www.GetSmartAboutDrugs.com.

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