

MARIJUANA

Overview

Marijuana comes from the "Cannabis sativa" or hemp plant. Its main active ingredient, delta-9-tetrahydrocannabinol or THC, binds to cannabinoid receptors in the brain, causing a user's "high." The THC content of marijuana has steadily increased over the past 30 years, thereby also increasing its potency.¹ According to the 2013 National Survey on Drug Use and Health (NSDUH), **marijuana is the most used illicit drug** with 19.8 million (7.5%) Americans (12 or older) reporting past month use. The percentage of Americans using marijuana (during the past month) has been consistently increasing over the past six years from 5.8% in 2007 to 7.5% in 2013. In addition to the increasing rates of past month use, the rate of Americans (12 or older) who use marijuana on a daily or almost daily basis has also steadily increased. In 2013, 8.1 million people used marijuana on 20 or more days in the past month and 5.7 million used marijuana on 300 or more days during the past year. As drug use increases, drug dependence and admissions to substance use disorder treatment also increase. **In 2013, 4.2 million Americans were dependent on or abused marijuana (more than pain relievers, cocaine, and heroin combined)** and roughly 316,000 people received treatment for marijuana use – the second most common substance individuals receive treatment for behind alcohol.^{3,2}

Marijuana Use: A Closer Look

Treatment Admissions: In 2012, 17% of individuals admitted to treatment in the U.S. reported marijuana as their primary substance of abuse. The average age of individuals admitted for marijuana was 25. Of treatment admissions for individuals aged 12-14 and 15-17, marijuana was the primary substance in 76% of admissions. More than half (56%) of individuals admitted to marijuana treatment first used marijuana by age 14. 52% of people admitted to treatment for marijuana were referred by a criminal justice agency (incl. Driving Under the Influence/DUI).²

NSDUH 2013 Data:

Past Month Use of Illicit Drugs, U.S. Population

12 and Older

Illicit Drug	Use % (estimate)
Marijuana	7.5% (19,800,000)
Psychotherapeutics*	2.5% (6,500,000)
Cocaine	0.6% (1,500,000)
Hallucinogens	0.5% (1,300,000)
Inhalants	0.2% (500,000)
Heroin	0.1% (300,000)

Psychotherapeutics are prescription medications such as opioid pain relievers, tranquilizers, stimulants, and sedatives.

Past Month Use, Marijuana Users

By Age

Age	Use % (estimate)
12-17	9% (1,762,000)
18-25	33% (6,636,000)
26-34	24% (4,721,000)
35 and older	34% (6,691,000)

By Gender, 12 and Older

Gender	Use % (estimate)
Female	38% (7,510,000)
Male	62% (12,300,000)

By Race/Ethnicity, 12 and Older

Primary Race/Ethnicity	Use % (estimate)
White	66% (13,168,000)
Black	14% (2,727,000)
Hispanic	13% (2,663,000)
Am. Indian/AK Native	0.7% (151,000)
Asian	1.5% (300,000)

Trends in Treatment Admission for Marijuana

A large scale review of the scientific literature reveals that the number of individuals seeking treatment for marijuana use has increased during the past 20 years in the United States, Europe, and Australia. This increase has generally occurred roughly 10 years after an increase in marijuana use among young adults. This increase cannot be explained by increased court diversion – in fact, a similar increase has occurred in the Netherlands where marijuana has been decriminalized for more than 40 years.⁵ Many hypotheses exist for this increase, though the literature remains inconclusive.

Is Marijuana Addictive?

According to results from the 2013 NSDUH, **young people who initiate marijuana use are more likely to become dependent on illicit drugs** – 11.5% of adults aged 18 or older who first used marijuana at 14 or younger were classified as having an illicit drug dependence versus 2.6% of adults who first used marijuana at 18 or older.³ NIDA researchers estimate that **9% of people who use marijuana will become dependent** on it. For individuals who initiate use during adolescence, an estimated 17% will become dependent. The risk is even higher among people who use marijuana daily, with 25-50% becoming dependent.¹ In addition to heavy, recurrent use and the social problems that are associated with cannabis use disorder, as defined in the Diagnostic and Statistical Manual of Mental Disorders (DSM V), marijuana dependence is also associated with withdrawal symptoms that include irritability, difficulty sleeping, craving, and aggression.⁶

Marijuana Use in Adolescence (ages 12-17):

Prevalence

Marijuana is the **most commonly used illicit drug by adolescents aged 12-17**. This trend has been consistent over the last decade, with rates varying between a high of 8.2% of adolescents using during the past month in 2002 to a low of 6.7% from 2006-2008. In 2013, the rate was 7.1% or more than 1.7 million adolescents.³ In fact, according to the 2013 Monitoring the Future study, more American high school seniors have tried marijuana than have tried cigarettes (45.5% vs. 38.1%).¹⁰ Brain development continues through adolescence and young adulthood, making adolescents particularly susceptible to the negative effects of marijuana and other drugs.

Public Health Impact

According to the National Institute on Drug Abuse (NIDA), using marijuana impairs individuals' abilities to form new memories and disrupts the sections of the brain that regulate balance, posture, coordination, and reaction time. In rare cases, a large dose of marijuana may cause acute psychosis, including hallucinations, delusions, and a loss of the sense of personal identity. A recent NIDA-funded review of scientific literature on adolescent marijuana use suggests that earlier marijuana initiation, particularly before 18 years old, is associated with greater health consequences, namely poorer attention, reduced IQ, and deficits in executive function.⁴ A large longitudinal study found that individuals who began persistently using marijuana during adolescence showed an average decline of 8 IQ points. This decline in IQ put marijuana users' IQ below 70% of their peers.¹¹ Another study, integrating the data from three large longitudinal studies, consistently showed negative impacts from adolescent marijuana use including lower educational achievement, use of other illicit drugs, and an increased risk of suicide. In addition, this study found dose-response characteristics across the outcomes, meaning that as marijuana use increases during adolescence, negative consequences in young adulthood also increase.¹²

Driving under the influence of marijuana is also a major public health concern. After alcohol, THC is the most commonly found substance in the blood of impaired drivers, fatally injured drivers, and crash victims. Current research indicates that marijuana use can impair a driver's attentiveness, perceptions of time and speed, and ability to recall information from past experiences. These issues increase significantly when marijuana is used with alcohol.¹³

Perception of Risk and Marijuana Use

Perception of risk is an important predictor of substance use, particularly among youth. The perception of risk among youths aged 12-17 of using marijuana has declined over the past five years. This decline in perception of risk coincides with an increase in use. The chart on the right illustrates that when youths' (in this case 12th graders) perceived risk of using marijuana declines, use of marijuana increases.^{3,10}

The Role of State Substance Abuse Agencies in Substance Use Disorder Prevention, Treatment, and Recovery

State Substance Abuse Agency Directors have the front-line responsibility for managing the nation's publicly funded substance abuse prevention, treatment, and recovery systems in each State. The Substance Abuse Prevention and Treatment (SAPT) Block Grant is a formula grant awarded to every State and Territory. It is the backbone of each State's publicly funded substance abuse system. This flexible funding stream is designed to help States address their own unique needs related to substance abuse. In addition, 20 percent of the SAPT Block Grant is, by law, dedicated to prevention services. **The SAPT Block Grant accounts for roughly 40% of expenditures by State Substance Abuse Agencies and an estimated 64% of State Substance Abuse Agencies' expenditures on prevention.**⁷ According to SAPT Block Grant reports (submitted by all States and Territories), SAPT Block Grant funds enabled more than 1.6 million Americans to receive treatment services during the 2014 report year. In addition, more than 7.4 million Americans received SAPT Block Grant-funded prevention services in individual-based programs and more than 285 million were served in population-based programs during the same period.⁹

Increases in the use of marijuana increases marijuana dependence, and in turn, increases the burden on substance use disorder treatment and recovery resources. In addition, trends in adolescent marijuana use increases the need for evidence-based prevention efforts. Educating parents on how to discuss drug use with young persons is an effective way to discourage use. According to 2013 NSDUH data, youths aged 12 to 17 who thought their parents would "strongly disapprove" of trying marijuana were less likely (4.1%) to have used marijuana during the past month than those who did not (29.3%). School-based programs are also effective in reducing substance abuse, as well as a great financial investment. According to cost benefit analyses conducted by SAMHSA and other researchers, every \$1 spent on effective school-based prevention programs, saves roughly \$18. These evidence-based programs can lower students' risk of misusing substances and/or developing a substance use disorder.⁸

Benefits of Prevention and Treatment Programs and Services

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Key Federal Programs

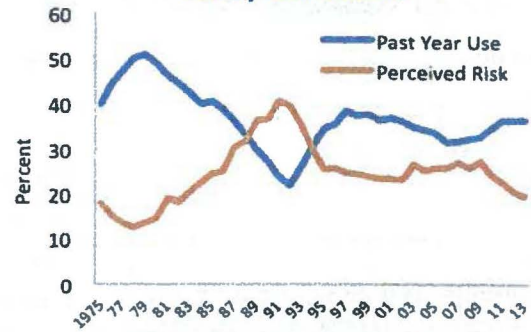
State Substance Abuse Agency Directors have a variety of evidence-based tools and strategies at their fingertips. These tools are supported by key federal programs, including the **SAPT Block Grant**. With almost 316,000 Americans receiving substance use disorder treatment services for marijuana alone, the funding that the SAPT Block Grant provides (\$1.7 billion in FY 2014 for States and U.S. Territories) is essential. More importantly, SAPT Block Grant-funded treatment services produce results. During the 2014 report year clients who were discharged from SAPT Block Grant-funded treatment services had the following outcomes: 92.9% reported having a stable living situation; 93.9% had no arrests during the past 30 days; 81.5% were abstinent from alcohol; and 72.1% were abstinent from illicit drugs.⁹

SAMHSA's Center for Substance Abuse Prevention (CSAP), funded at \$175 million in FY 2014, supports States and communities with service capacity expansion grants and science and service areas. The Partnerships for Success Initiative is a NASADAD priority program designed to help States achieve a quantifiable decline in substance use disorder rates using the Strategic Prevention Framework (SPF) approach. States use data to identify problem areas and craft a coordinated, cross-agency plan.

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Marijuana Perceived Risk vs. Past Year Use by 12th Graders



SOURCE: University of Michigan, 2013 Monitoring the Future Study



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Research indicates regular pot use may harm developing brains



Customers stand in line outside a Denver pot shop on Jan. 1, the first day of Colorado's legal, limited recreational sale of pot to those 21 and older. Washington state has also legalized the drug. (BRENNAN LINSLEY / AP)

By Ilene Raymond Rush, For The Inquirer

POSTED: JANUARY 13, 2014

Memory loss, cognitive deficits, drops in IQ, and abnormal brain structures: these are but a few of the neurotoxic effects that recent research has correlated to marijuana use in adolescents.

But while a number of studies suggest a link between these changes and regular cannabis use, particularly for young teens, there is no definitive evidence that marijuana is entirely to blame. Adolescents who smoke daily, for example, may have problems that predate marijuana use.

One thing is certain: pot smoking among American teenagers is on the rise. According to the 2013 Monitoring the Future survey from the National Institute on Drug Abuse, 6.5 percent of high school seniors smoke daily, up from 2.4 percent in 1993.

And with a recent Gallup poll finding that 58 percent of the American public favors legalization - and with marijuana already legal in Washington state and Colorado - understanding any negative effects of marijuana has gained fresh urgency.

"This is really hard research to do," admits Sharon Levy, medical director of the Adolescent Substance Abuse Program at Boston Children's Hospital. "We can look at big groups of kids that decided to smoke and look at their outcomes, but that data can only show us associations. But this was how we did tobacco research and discovered problems with nicotine.

"It's always hard to study something that is an illegal behavior - we're never going to do a study where we take 100 14-year-olds and ask half of them to smoke marijuana," Levy said. "Our advantage today is that we can look at the brain, and we have a more sophisticated sense of neurobiology."

"As the rates of smokers go up," she added, "more and more studies will show findings pointing in the same direction. More and more, we will come to say that this is not just an association."

Thomas McLellan, CEO of the Treatment Research Institute in Philadelphia and a former high-ranking drug adviser to the Obama administration, agrees with Levy.

"There are known problems with marijuana. It's a fact that as use of marijuana becomes more regular and done by a person who has a developing brain, you have concentration, motivation, and cognitive problems associated with the drug," McLellan said. "The effects vary with dose, duration, and population. If you have a smart, capable, older adolescent smoking every once in a while, there may be a very minimal effect. But for 14-year-olds who have underlying problems of depression and concentration, you have a much more serious problem. How significant and how pervasive isn't clear, but they exist.

"You can be a proponent of marijuana or you can be against marijuana," he said, "but you can't say marijuana is good for a developing brain."

A number of new studies support that. In research in the journal *Schizophrenia Bulletin*, healthy and schizophrenic teens who smoked cannabis daily for three years, then abstained for two years, showed abnormal brain structures on MRIs and had declines in memory when compared with nonsmokers.

Memory-related structures in the brains of adolescent smokers appeared to shrink and collapse inward, perhaps reflecting a decrease in neurons. The younger the smokers were when they started using marijuana, the greater the abnormalities.

"We observed a lower level of performance in the marijuana groups that was associated with the pattern of how the brain looked," said lead author Matthew Smith, assistant research professor of psychiatry at Northwestern University.

While documenting these abnormal MRIs in heavy marijuana smokers, Smith warned that the study provided a picture "at one point of time" rather than over a long period. So he could not say definitively that marijuana alone caused the changes.

"One thing we can be sure of is that marijuana has a stronger effect on younger brains," Smith said. "At that age, the brain is changing on a daily basis, and it's risky to introduce substances into the brain that have detrimental effects. And if someone has a family history of schizophrenia, data shows that there could be an increased risk for developing that disorder if someone uses marijuana."

Smoking marijuana regularly before age 18 "has been linked with the greatest neurocognitive deficits," according to a recent study in *Frontiers in Psychiatry*. The study notes that cannabis has been tied to structural abnormalities in brain areas that underlie "inhibitory control, working memory and attention, emotional regulation, and processing speed in teenagers 15-19, all of which translate into poorer cognitive functioning," said lead author Krista Lisdahl, assistant professor of psychology at the University of Wisconsin-Milwaukee.

"There is substantial resistance to the idea that regular marijuana use is detrimental to health," Lisdahl said. "I can see why this gets confusing. For example, demonstrating that part of the marijuana plant (e.g. THC) significantly improves nausea in a clinical trial over a limited time period in individuals with life-threatening conditions does not mean that marijuana is good for your health."

"Most teens and young adults care about their brain and physical health," Lisdahl continued. "Marijuana has several psychoactive ingredients, especially THC, that attach to cannabinoid receptors throughout the brain. Over time, if you keep using regularly, you will begin to change your brain structure and how the brain connects. You will likely experience symptoms of craving and other cognitive and emotional symptoms."

Another study, from Duke University in *PNAS*, linked persistent cannabis use to neuropsychological decline from adolescence to midlife, as measured by lower IQs among 1,000 New Zealanders. Subjects who smoked marijuana in adolescence and continued to use it for years afterward showed a drop in IQ of eight points between ages 13 and 38. Quitting pot did not appear to reverse the loss, said lead researcher Madeline Meier, now an assistant professor of psychology at Arizona State University.

Meier's findings were challenged by economist Ole Rogeberg, senior research fellow at the Frisch Centre in Norway, who blamed socioeconomic factors for the reported drops in IQ. In a response in PNAS, Meier discounted Rogeberg's objections, but also noted, "Observational studies like ours cannot prove causation."

There is much less debate about the wisdom of adolescents using marijuana. Colorado, which began allowing limited retail sales of marijuana on Jan. 1, forbids use by anyone under 21.

"Young people should not be using marijuana, alcohol, or any other illegal drugs," said Mason Tvert, director of communications for the Marijuana Policy Project, a pro-legalization group.

He also maintained that "marijuana causes far less harm than alcohol."

So what's a parent to do?

"These are things I know," said Gary Emmett, clinical professor of pediatrics at Thomas Jefferson University Hospital. "That when smoked by a mother, marijuana is transferred to the fetus. That when a mother is breastfeeding, the marijuana gets to the baby in large amounts. My gut feeling is that marijuana is bad for infants and children."

When it comes to adolescents, those who self-medicate with alcohol or drugs may already have problems, Emmett said. "People who use substances get in a lot more trouble, they have poorer academic achievements, and often have preexisting reasons which prompt them to use drugs."

Yet, this doesn't detract from the drug's effects, which can include poor school performance and reckless driving, he added.

Levy, who views marijuana as an addictive drug, worries about the effects of secondhand smoke on children and toddlers who might ingest marijuana. She also warned that public-health authorities and parents are behind in talking about marijuana to children and teens.

"More and more people believe that marijuana is entirely benign and don't know what to think about or do about their kids using marijuana," she said. "Ten years ago, a kid who smoked would be brought in to a substance-abuse center right away, but now there is so much information out there saying that marijuana is really benign."

"I was recently in a New York City subway car and noticed all the messaging against sugar-sweetened beverages," Levy said. "I know parents who won't let their kids have a Coca-Cola but don't know what to do about marijuana."

In the end, Lisdahl offers this advice: "Do not try marijuana under age 18. If you have used marijuana, make sure that you use it less than once a month.

"Life is challenging and you want every advantage you can get."

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**National
Multiple Sclerosis
Society**
Pennsylvania Chapter
Advocacy Network

**Written Testimony of the National MS Society – Pennsylvania Chapters
In regards to Medical Marijuana
Submitted to House Health Committee and Judicial Committees
April 8th, 2015**

Thank you, Chairmen Baker, Fabrizio, Marsico and Petrarca for the opportunity to provide written testimony to your committees in regards to our position of the use of medical marijuana. The National MS Society has a vision of a world free of MS. We mobilize people and resources to drive research for a cure and to address the challenges of everyone affected by MS.

There are an estimated 23,000 individuals living with MS in Pennsylvania. Pennsylvania has the fifth highest prevalence rate of MS in the Country. The MS Society has two chapters in Pennsylvania – the Greater Delaware Valley Chapter and the Pennsylvania Keystone Chapter. We offer a multitude of resources for Pennsylvanian’s affected by MS including: educational programs, financial assistance, self-help groups, employment services and wellness programs.

Multiple sclerosis, an unpredictable, often disabling disease of the central nervous system, interrupts the flow of information within the brain, and between the brain and body. Symptoms range from numbness and tingling to blindness and paralysis. Anyone at any age can be diagnosed with MS. However, more than two to three times as many women as men develop MS and most people are diagnosed between the ages of 20 to 50. The progress, severity and specific symptoms of MS in any one person cannot yet be predicted and symptoms may include: fatigue, numbness, balance issues, bladder/bowel dysfunction, vision problems, pain, cognitive dysfunction, and depression.

The cause of MS is unknown and there is no cure. There is significant, unmet need for therapies that can address complex and painful symptoms often experienced by people with MS. An increasing number of studies suggest that derivatives of marijuana such as oral cannabis extract, sprays and pills may lessen patient reported MS symptoms like spasticity, pain related to spasticity, and frequent urination. The National MS Society supports the rights of people with MS to work with their health care providers to access marijuana for medical purposes in accordance with legal regulations in those states where such use has been approved.

Although current Pennsylvania law does not allow Pennsylvanian’s living with MS to gain access to cannabis for medical purposes, the Society supports expanding the law to allow those with MS to have access to this option for treatment.

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As with any therapy, along with potential benefits come potential side effects and the use of cannabis is not the best treatment for all people living with MS. Each individual, in consultation with their health care provider, should make an informed risk-benefit decision regarding the use of marijuana.

The National MS Society supports the need for more research to better understand any potential benefits and risks of cannabis as a treatment for MS. Recognizing that additional research is still needed, we are looking at ways we can remove the barriers to allowing research on medical marijuana at the federal level, which is complex due to government restrictions.

Thank you again for the opportunity to submit these comments and if you have any questions, please do not hesitate to contact Mara Brough, the Society's Senior Advocacy Manager for Pennsylvania and New Jersey at (215) 271 – 1500.