MARIJUANA'S IMPACT *on* CALIFORNIA

California High Intensity Drug Trafficking Report

2016

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- San Diego Law Enforcement Coordination Center
- California National Guard Counterdrug Task Force
- National Marijuana Initiative
- Californians for Drug Free Youth

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EXECUTIVE SUMMARY

A growing number of California residents are interested in removing barriers to recreational marijuana use, and this paper will outline the current state of marijuana policy in California and the potential impacts of further legalizing marijuana use.

Section One, The Science on Marijuana
Marijuana is the most abused illicit drug in the world, but the gap between the science on marijuana and the common perception of marijuana has never been greater.

Section Two, California Youth Marijuana Use
In 2013, California was ranked 20th in current use among youth, and by 2014 California was ranked 11th in the country. The state's largest average increase in youth past 30-day use of marijuana coincided with the proliferation of marijuana dispensaries in the state; at that time, California's youth use rate was already 29% higher than the national average.[1]

Section Three, California Schools
Due to a new program, school expulsion rates in California have greatly decreased, even though the number of students who are caught with drugs has not declined.[2]

Section Four, California Marijuana Use Ages 18-25
In 2012 and 2013, adult marijuana use for California adults aged 18-25 years was 22% compared to the national average of 19%.[3]

Section Five, Marijuana-Related Emergency Department Visits and Hospital Admissions
From 2010 to 2014, after marijuana dispensaries began to proliferate, there was a 116% increase in Emergency Department visits and admissions for any related marijuana use.[4] Marijuana-related exposures for young children (0-5 years old) also increased 513% between 2005 and 2015. During the same time there was a 139% increase among children 6-19 years old.[5]

Section Six, Treatment
From 2005 to 2015, the rate of admissions to drug treatment programs for marijuana abuse remained steady – so did the fact that teens and young adults make up the largest proportion of people admitted for treatment.[6]

Section Seven, California Impaired Driving
From 2005 to 2014, total statewide traffic fatalities decreased 29% in California, but fatalities involving drivers testing positive for marijuana increased 17%.[7]

Section Eight, Diversion
More interdiction events, including those by the United States Postal Service (USPS) Inspection Service, resulted in seized marijuana originating from California than from any other state.[8]

Section Nine, THC Extraction Labs

California has by far the largest number of THC extraction labs, but it is difficult to gauge the labs' true prevalence due to inconsistent reporting practices among law enforcement agencies and data collection sources.[9]

Section Ten, Environmental Impacts of Marijuana in California

California is consistently ranked among the top states for outdoor marijuana cultivation in the United States. This is an environmental risk because growing marijuana damages watersheds, land, and fish and wildlife resources – particularly since much of California's marijuana is illegally grown on public lands.

INTRODUCTION

In 1996, California was ahead of the rest of the United States in allowing marijuana use for medicinal purposes. Now, in 2016, a growing number of people are interested in removing all barriers to recreational marijuana use as well. This paper will outline the current and potential impacts of these policies.

Our Purpose

The purpose of this report is to describe the impacts that the legalization of marijuana for medical use has had in California, as well as the potential impacts of legalizing marijuana for recreational use. By gathering and examining data, citizens and policymakers can better understand the implications of increased availability of marijuana. Section one offers a brief synopsis of what we know about the science surrounding marijuana. The subsequent sections each present data on one of the specific effects of marijuana's increased presence in California that we have seen to date.

The On-Going Debate

Due to concerns about public health risks and other possible impacts of marijuana, there is an on-going debate in the United States regarding the effects of the increasing prevalence of marijuana in our society. Those opposed to this present a variety of research and facts showing the possible negative consequences. Those in favor argue that the benefits of removing prohibition outweigh these negative consequences.

Some arguments for reducing restrictions on marijuana use include that it will:

- Eliminate arrests for possession and sale, resulting in fewer citizens with criminal records and a reduction in the incarcerated population;
- Free up law enforcement resources to target more serious and violent crimes, while reducing the disproportionate incarceration of minorities for possession of small quantities of marijuana;[10]
- Reduce traffic fatalities since users will switch from alcohol to marijuana, which doesn't impair driving to the same extent;
- Generate tax revenue from marijuana sales;
- Decrease costs of the criminal justice system;
- Reduce profits for drug cartels trafficking marijuana.

Arguments for continued restrictions include:

- Marijuana use among youth and young adults will increase due to an increase in availability and the normalization of use;
- Marijuana impairment will increase road fatalities;[11]
- Emergency room visits will increase, especially involving children 0-5 years old;
- Marijuana use and abuse will increase the costs of physical and mental health services;
- Marijuana will be diverted from legal markets to illegal markets;
- Heavy users will have a lower quality of life due to a higher rate of mental health

problems;[12]
- Social and economic costs (e.g., a higher chance of dropping out of school) will far exceed the benefit to society of any potential revenue generated;[13]
- Marijuana cultivation causes environmental degradation to air, water, land, and wildlife.

Background on Marijuana in California

California's relationship with marijuana has evolved over time, and a brief look at how it has changed since marijuana first gained any legal status is necessary to understand where the state stands now and to create a starting point for this report.

Early Medical Marijuana 1996 – 2008

California was the first state to decriminalize possession of lesser quantities of marijuana, when voters approved the Compassionate Use Act of 1996.

Proposition 215

In the 1996 general election, voters approved California Statewide Ballot Proposition 215 (Proposition 215), known as the "Compassionate Use Act of 1996." Proposition 215 was intended to ensure that seriously ill Californians could obtain and use marijuana for the treatment of serious medical diseases such as cancer, AIDS, and severe spasms. Proposition 215 makes California one of 25 states that allow marijuana for medical uses.[14]

Proposition 215 allows the use of marijuana upon recommendation of a physician, and ensures that patients and primary caregivers are not prosecuted or sanctioned. It also encourages the federal and state governments to implement plans to provide for the safe and affordable distribution of marijuana to all patients in medical need of it.

To facilitate the tracking of medical marijuana distribution, the California Department of Public Health Medical Marijuana Program (MMP) was specifically established to create a state-authorized medical marijuana identification card (MMIC) program and a registry database for verification of qualified patients and their primary caregivers.[15] This program, however, is voluntary.

California State Assembly Bill 420 (SB420)

The Medical Marijuana Protection Act, which became effective on January 1, 2004, created a voluntary identification card system for purchasing medical marijuana. This bill was signed by Governor Gray Davis in 2003, and was intended to clarify the scope of Proposition 215 and ensure its equitable application across the state. To that end, SB 420 allows the California Attorney General to clarify policies for the possession and cultivation of marijuana, and to create new regulations as needed.[16]

Expansion of Medical Marijuana, 2010 – 2015

Beginning in 2010, marijuana in California grew into a commercialized industry, with the number of dispensaries and other marijuana-related businesses increasing quickly. In 2007 Los Angeles reported 186 dispensaries compared to 2010 when they reported a staggering 545 dispensaries,

an increase of nearly 200%.[17]

California State Assembly Bill 1449 (AB 1449)

In September 2010, Governor Arnold Schwarzenegger signed California State Assembly Bill 1449 (AB 1449) into law, which reduced the sanction for possessing less than one ounce of marijuana from a misdemeanor to an infraction, legally the equivalent of a parking ticket. This essentially decriminalized the personal consumption of up to one ounce of marijuana.[18]

Proposition D (Los Angeles County), Medical Marijuana Regulation and Taxation Ordinance

Proposition D, the Medical Marijuana Regulation and Taxation Ordinance, was approved in 2013, and limited the number of dispensaries in Los Angeles County to no more than 135 open before September 2007. Under Proposition D, medical marijuana dispensaries and landlords who lease space to them can be prosecuted if the shops don't meet several requirements, including being registered under past Los Angles ordinances, and being located a required distance from public parks, schools, and other facilities. This measure also raised taxes on these businesses to $60.00 for every $1,000.00 of gross receipts.[19]

California State Assembly Bills 266 and 243, and Senate Bill 643

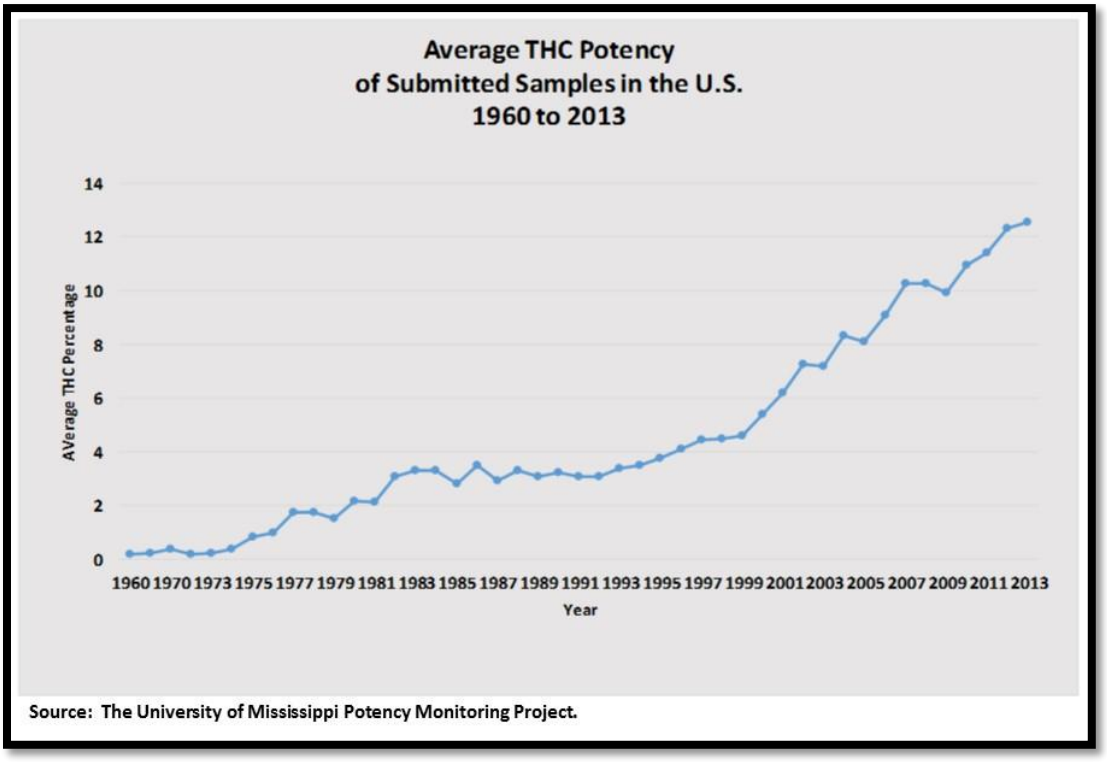
The Medical Marijuana Regulation and Safety Act 2016 (MMRSA) includes three bills: Assembly Bill 266, Assembly Bill 243, and Senate Bill 643.[20] Assembly Bill 266 (Bonta, Cooley, Jones-Sawyer, Lackey, and Wood) establishes a dual licensing structure requiring state and local license permits. Assembly Bill 243 (Wood) aims to establish a regulatory and licensing structure for cultivation sites under the Department of Food and Agriculture. Senate Bill 643 (McGuire) sets the criteria for the licensing of medical marijuana businesses, regulates physicians, and recognizes local authority to levy taxes and fees. The newly created Bureau of Marijuana Cannabis Regulation, out of the California Department of Public Health, anticipates these bills will be enacted by January 2018.

SECTION ONE: The Science on Marijuana

Marijuana is the most abused illicit drug in the world and at the same time one of the most misunderstood. In 2014, 22 million individuals aged 12 or older in the United States reported using marijuana. Of that 22 million, 39% (8.6 million) were 12-25 years of age.[21] Yet, the gap between the science on marijuana and the common perception of marijuana has never been greater.

Potency

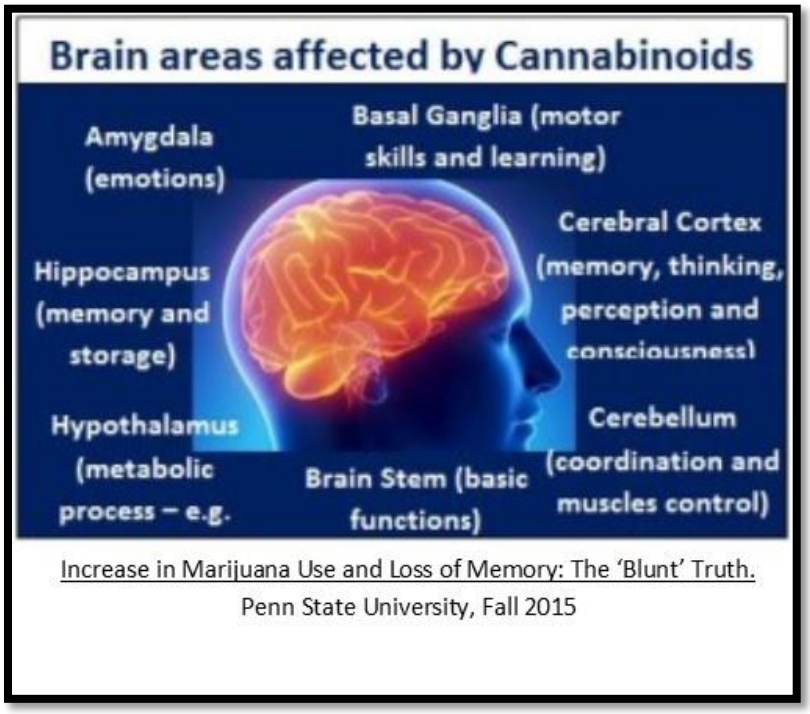
An often-overlooked aspect is that marijuana has increased in strength over time, with the average potency of Tetrahydrocannabinol (THC), the primary psychoactive found in cannabis, up from about 1% in the early 60s to an average of 15% today.[22] The THC content in Colorado retail flower lies between 8-22%, with a mean estimate of roughly 17%.[23] Marijuana extracts can contain up to 90% THC.[24] And THC extraction can present its own risks to public safety, in addition to which, higher THC levels increase users' chances of becoming addicted and of having negative reactions to the drug.[25]



Marijuana and Addiction

As with cigarettes, not everyone who smokes or ingests marijuana will become addicted, but with an increasing number of users and rising THC contents, there will be more people addicted to marijuana in the future. In 2014, 4.2 million users had a marijuana use disorder, the clinical name for what is commonly referred to as addiction; 2.4 million, or 57%, of that 4.2 million people who are addicted to marijuana were 12-25 years of age.[26]

Though not all marijuana users will become addicted, regular use and, to an even greater extent, regular use during childhood or adolescence, greatly increases the chances of becoming addicted. Children and teenagers face the biggest risk of long-term consequences from marijuana use. Dr. Staci Gruber, a physician at Harvard's McLean Hospital, conducted a study on the harmful effects of marijuana, and found that regular marijuana use hinders frontal executive brain function—the ability to perform tasks that require complex thinking. The study also showed that the brains of marijuana smokers needed to work much harder to keep up with the brains of non-marijuana smokers.[27] Because adolescent brains are not fully developed, they are much more likely to experience these negative side effects than adult users.[28]



Increase in Marijuana Use and Loss of Memory: The 'Blunt' Truth.
Penn State University, Fall 2015

Marijuana dependence can be described as a compulsive use of the drug (or repeated use) despite negative consequences.

- A 1994 study showed that adults who smoke marijuana have a 9% chance of becoming addicted. The number increases to 25-50% of those who smoke regularly.[29]
- A 2009 study showed teens and young adults (up to 25 years of age), have a 17% chance of becoming marijuana dependent (the clinical terminology for "addiction."[30]

There are indicators that marijuana addiction is increasingly common. Rehabilitation facilities are reporting higher numbers of marijuana addicts seeking treatment. In 2012 in California, over 62% of adolescents aged 12 to 19 admitted in to a drug treatment facility had a marijuana addiction. [31]

The National Survey on Drug Use and Health estimated that of the 22 million people who

regularly used marijuana in the past 30 days, 2.7 million people 12 years and older met the criteria for marijuana dependence in 2014.[32] Also in 2014, 21% of 12th graders reported using marijuana in the past 30 days.

Marijuana's Effects on the Body and Mind

Marijuana has a wide array of impacts on the body, the extents of which are not yet fully understood.

Lung Health

The American Lung Association states, "We caution the public against smoking marijuana because of the risks it poses to lung health."[33]

Marijuana smoke an irritant to the lungs that can cause, among other things, excess phlegm production, chronic bronchitis, and shortness of breath.[34] In fact, about 20% of regular marijuana smokers suffer from these symptoms. Smoking marijuana irritates the lining of the respiratory tract and causes damage to the cell linings and bronchial passages. This damage impairs the respiratory system's ability to clear toxins and fight off microorganisms.[35]

Marijuana may even present a greater lung health risk than tobacco because marijuana smokers experience a greater exposure-per-breath to tar than that of tobacco smokers due to deeper and longer periods of inhalation.[36] Determining direct causal relationships between marijuana and lung problems, however, is compounded by the fact that many marijuana users also use tobacco.

Marijuana Use During Pregnancy

Marijuana use during pregnancy is linked to negative outcomes such as low birth weight, developmental delay, and behavioral problems.[37] Some of these problems may persist throughout the child's development. Early exposure to marijuana is associated with behavioral problems by the age of 10, and the risk of marijuana use by the age of 14.[38]

Marijuana and Mental Health

The effects of marijuana on the brain have been studied more than any other part of the body. As with addiction, marijuana use does not always cause mental-health issues, but mental health issues among users have been frequently documented, especially among those using higher-potency marijuana. Many people use, or advocate use of, marijuana to mediate other mental health issues. Anxiety and paranoia are the most common complaints. Evidence suggests that generalized anxiety can worsen when the effects of marijuana wear off, and panic attacks are a common side effect of high doses of THC.[39]

Studies have also found that there are also rare but marked associations between the use of marijuana and the development of depression and schizophrenia. Marijuana can bring about an acute psychotic state in a healthy person and can worsen the psychotic symptoms with people that are already experiencing degrees of psychosis.[40] However, determining causality can be difficult because it is hard to tell whether marijuana use contributes to mental health problems, or whether people who already have mental health problems use marijuana in an attempt to reduce symptoms.

Marijuana Affects Memory and Cognitive Skills

Long-term marijuana use can affect cognitive skills, resulting in short-term memory problems, lack of attention, impaired thinking, loss of balance and coordination, difficulty concentrating, changes in sensory perceptions, impaired ability to perform complex tasks, decreased alertness, and decreased reaction time. These adverse effects become more pronounced in adolescents who use marijuana because their brains are still developing, and make learning and sound decision-making more difficult. In adults, these adverse effects can cause more accidents at work; users are more likely to leave work without permission, spend work time on personal matters, or simply daydream.[41]

Research has shown that marijuana's negative effects on attention, memory, and learning can last for days or weeks after the acute effects of the drug wear off. Consequently, someone who smokes marijuana daily may be functioning at a reduced intellectual level most or all of the time.[42]

Marijuana and Learning

Evidence suggests that, compared with their nonsmoking peers, students who smoke marijuana tend to get lower grades and are more likely to drop out of school.[43] A survey showed that 36% of American teens report receiving average grades of mostly B's or lower. The teens with lower grades were more than three times as likely to have used marijuana as the non-smokers.

A recent long-term study found that teens (from 14 to 25) who continuously use marijuana had cognitive and memory problems and an average IQ loss of 8 to 10 points. The study further found that stopping marijuana use did not fully restore these abilities. Marijuana use is not only associated with poor school performance, but also increased absence from school and increased risk of dropping out without graduating.[44]

Medicinal Marijuana

Despite these serious risks of marijuana use, some of the compounds that occur in marijuana do show potential medical benefits, such as the treatment of "chronic pain, neuropathic pain, and spasticity associated with multiple sclerosis."[45] Questions abound in the debate on whether people should be able to access marijuana more readily. This report is intended to be neutral and present the data on the most pressing impacts that increased access to marijuana may have.

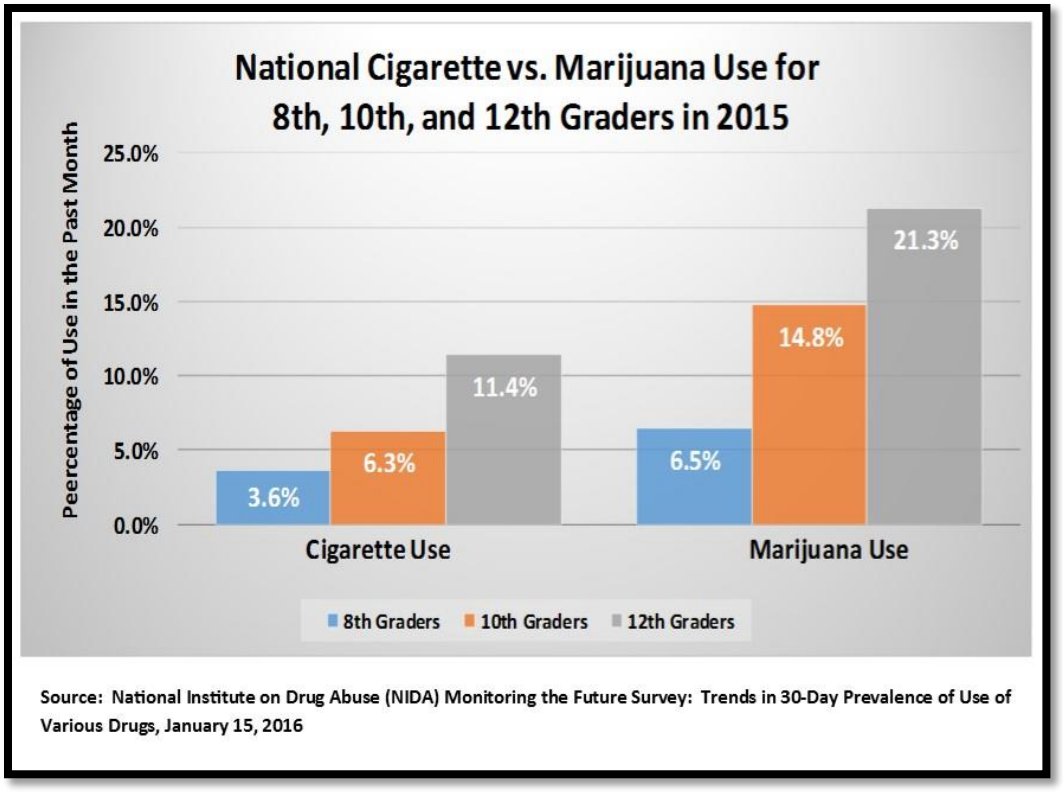
SECTION TWO: California Youth Marijuana Use

Overview

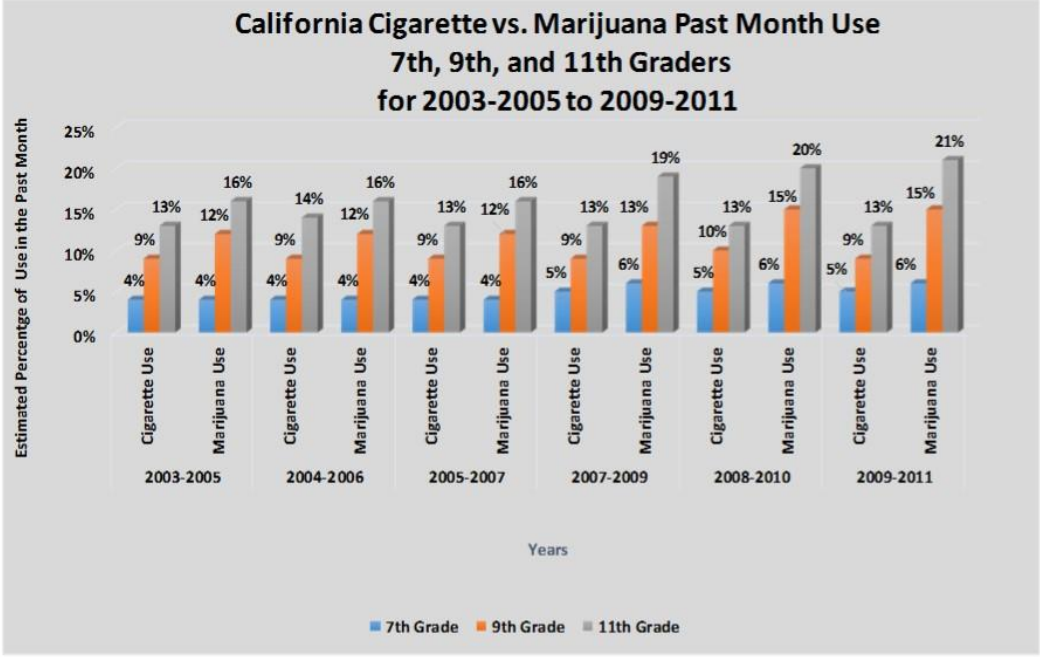
This section takes a look at marijuana youth use rates in California at both the regional and statewide levels, as well as in comparison to national youth use rates. The data also shows the perception of risk associated with marijuana by youth, as well as a ranking of youth use by state while identifying each states' marijuana laws.

Findings:

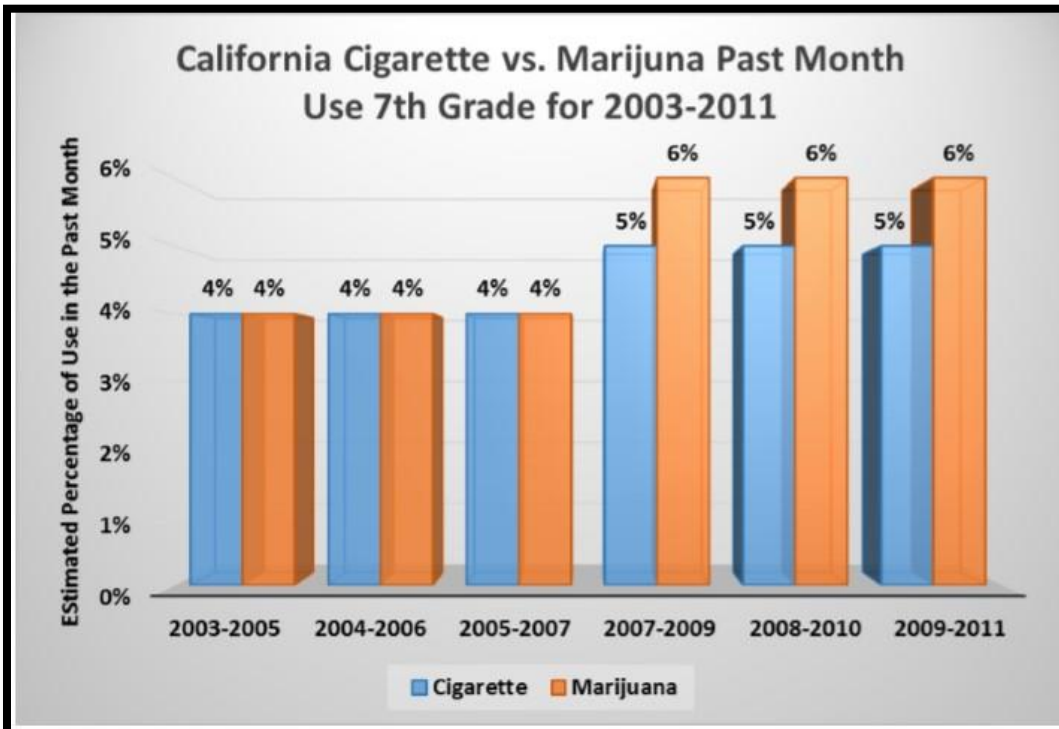
- In 2015, more 8th, 10th, and 12th graders used marijuana than cigarettes.[46]
- For the first time in 41 years of the Monitoring the Future study, marijuana smoking has surpassed cigarette use and was also the most widely used illicit drug.[47]
- California youth (ages 12-17) have a lower perception of great risk of smoking marijuana once a month compared to the national average.[48]
- Since 2008, the prevalence of past month marijuana use for ages 12 or older has been higher in California than the national average. California's largest average increase occurred from 2010-2012 after the proliferation of marijuana dispensaries.[49]
- In California, students enrolled in non-traditional schools show a higher rate of prevalence of marijuana use in 30 days.[50]
- According to the California Healthy Kids Survey (CHKS), past 30 day use for California students' grades 7, 9, and 11, has continued to increase since 2005.[51]
- From 2013 to 2014, states with legalized recreational and/or medical marijuana laws moved up in the national ranking of past month marijuana usage by 12 to 17 year olds.[52]
- Northern California had the highest rate of past year use of marijuana for ages 12 and older from 2005-2010.[53]



The graph above, from the 2015 Monitoring the Future National Survey of 8th, 10th, and 12th grade students, illustrates past 30-day use of cigarettes and marijuana. In 2015, more 8th, 10th, and 12th graders used marijuana than cigarettes. This was the first time in the 41 years of the Monitoring the Future study that, marijuana smoking surpassed cigarette use. Marijuana was also the most widely used illicit drug.[54]



Source: California Healthy Kids Survey (CHKS), Kidsdata.org, California Student Survey (WestEd)



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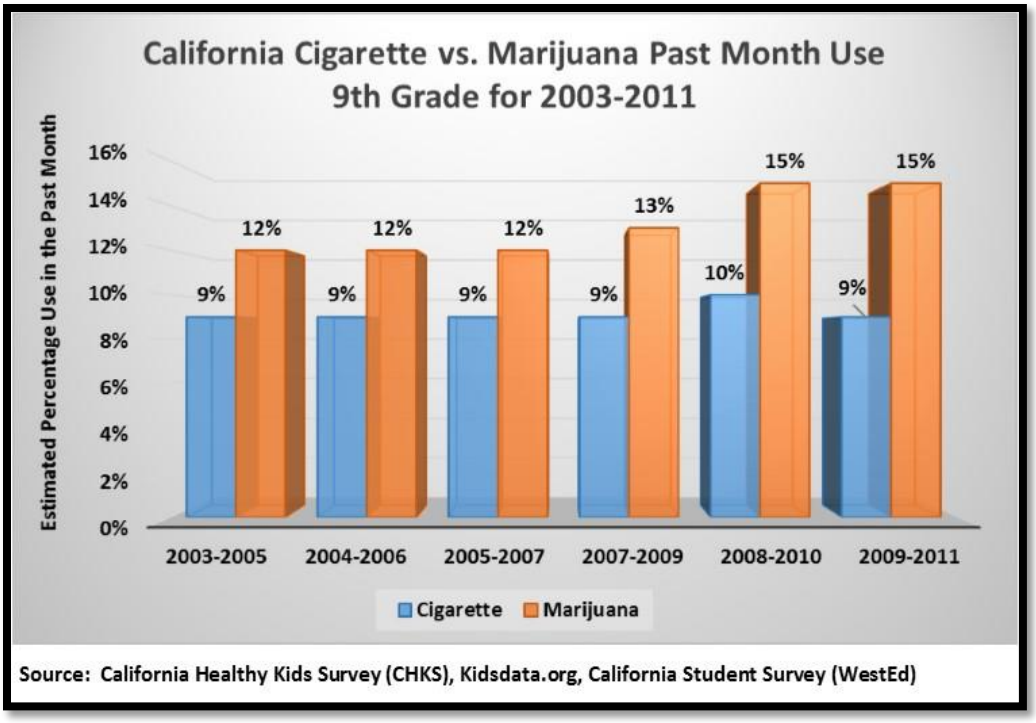
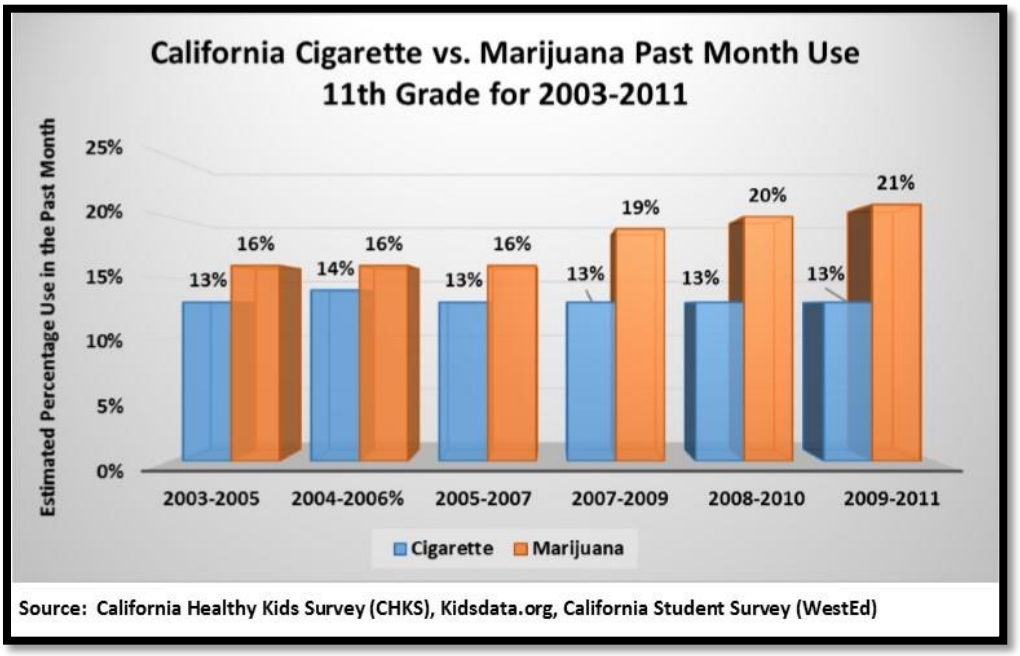
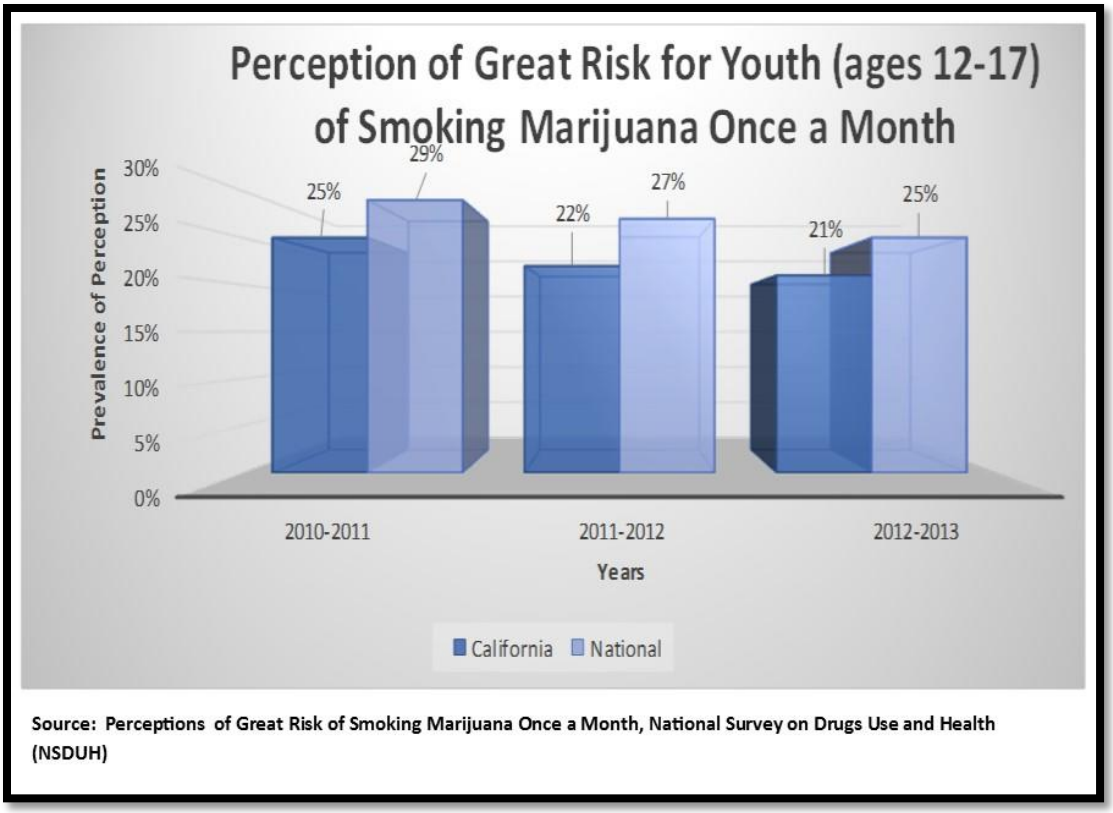


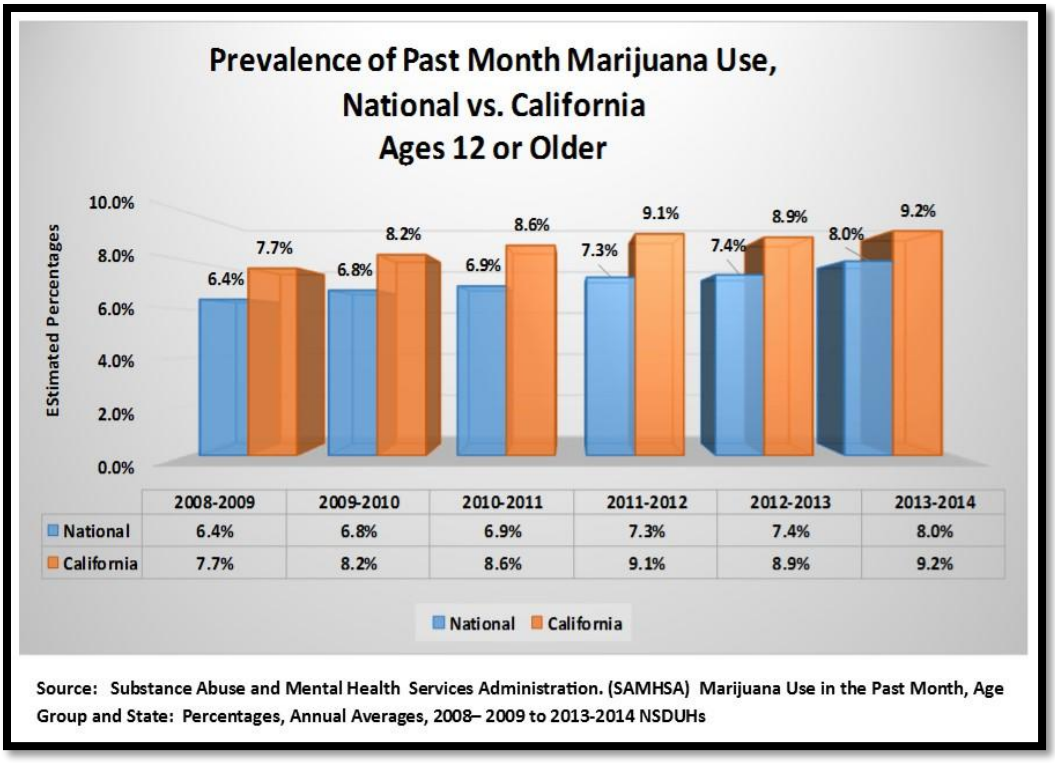


The graphs above shows data derived from the California Healthy Kids Survey (CHKS) of 7, 9, and 11th grade California students, past 30-day use of cigarettes and marijuana over an eight year period. Each survey showed that marijuana use was equal to (7th grade) or higher than (9th and 11th) tobacco use.[55]



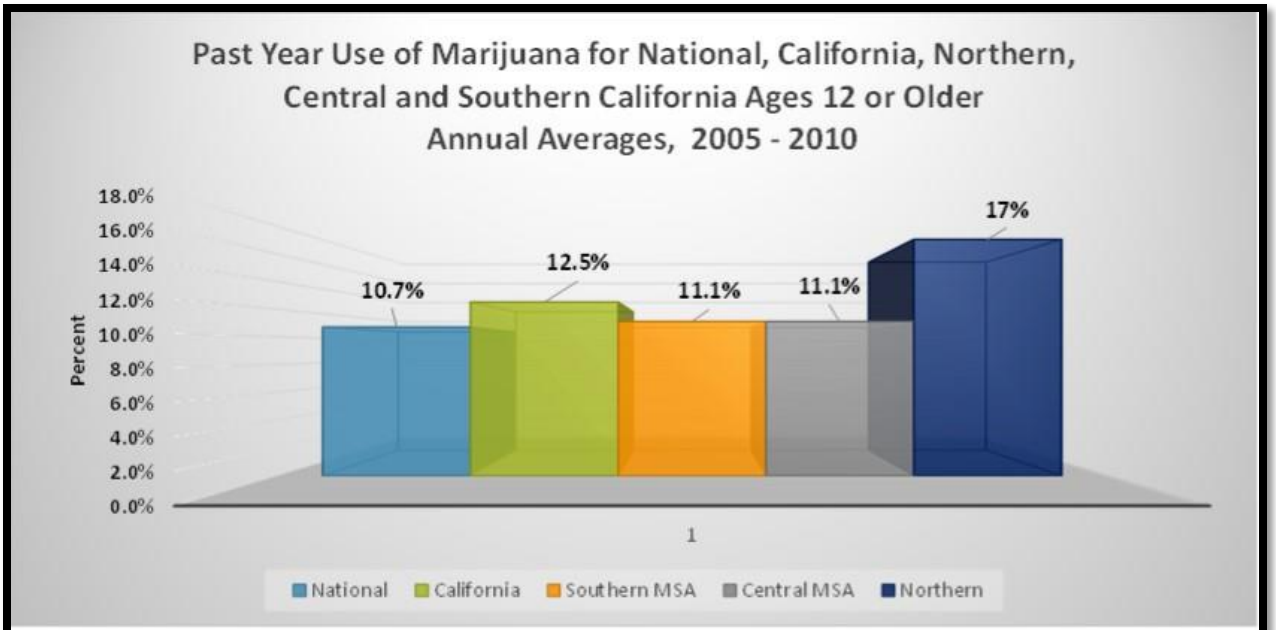
Source: Perceptions of Great Risk of Smoking Marijuana Once a Month, National Survey on Drugs Use and Health (NSDUH)

The data illustrated in the graph above compares the perception of risk of smoking marijuana for youth ages 12-17 in California and nationally. California youth have consistently had a lower perception of great risk of smoking marijuana once a month compared to the national average.[56]



Source: Substance Abuse and Mental Health Services Administration. (SAMHSA) Marijuana Use in the Past Month, Age Group and State: Percentages, Annual Averages, 2008– 2009 to 2013-2014 NSDUHs

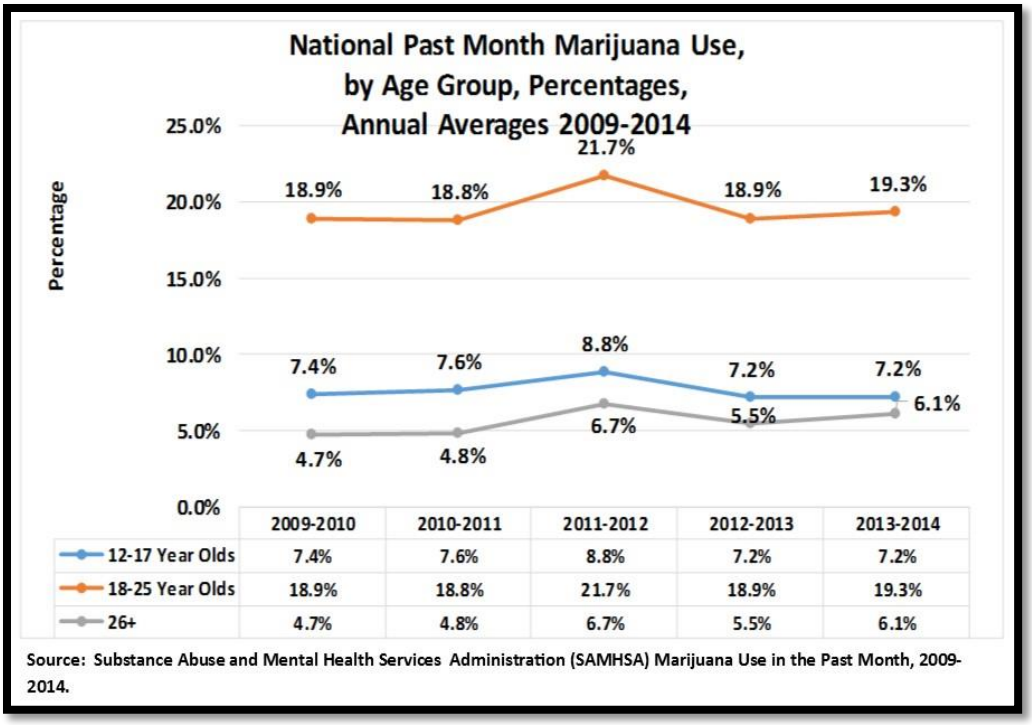
The graph above from the Substance Abuse and Mental Health Services Administration shows past month, national use versus use in California, for ages 12 or older. Since 2008, the prevalence of past month marijuana use for ages 12 or older has been higher in California than the national average. California's largest average increase occurred from 2010-2012 after the proliferation of marijuana dispensaries occurred in California.[57]



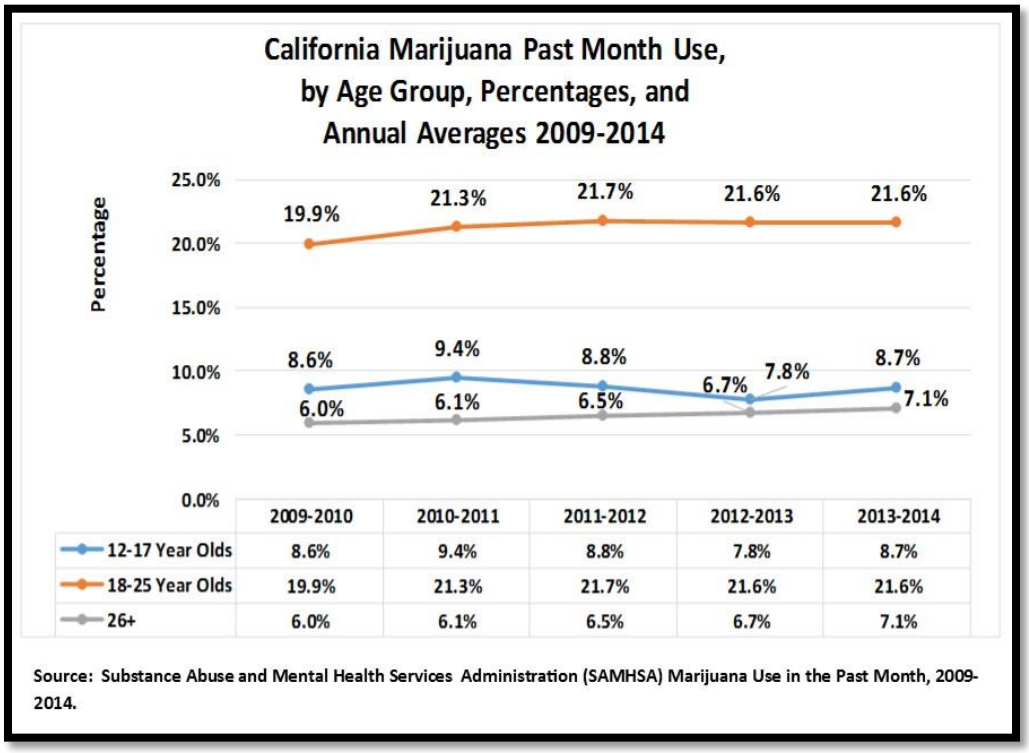
Source: Substance Abuse and Mental Health Services Administration (SAMHSA,) Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health (NSDUHs), 2005-2010

Note: Northern Metropolitan Statistical Area (MSA) is San Francisco-Oakland-Fremont, Central Metropolitan Statistical Area (MSA) is Los Angeles-Long Beach-Santa Ana, and Southern Metropolitan Statistical Area (MSA) is San Diego-Carlsbad-San Marcos areas.

The graph above from the Substance Abuse and Mental Health Services Administration (SAMHSA) depicts the past year use of marijuana for ages 12 or older. Comparisons are made between four of California's Metropolitan Statistical Areas (MSA) to the national average of use.[58]



Source: Substance Abuse and Mental Health Services Administration (SAMHSA) Marijuana Use in the Past Month, 2009-2014.



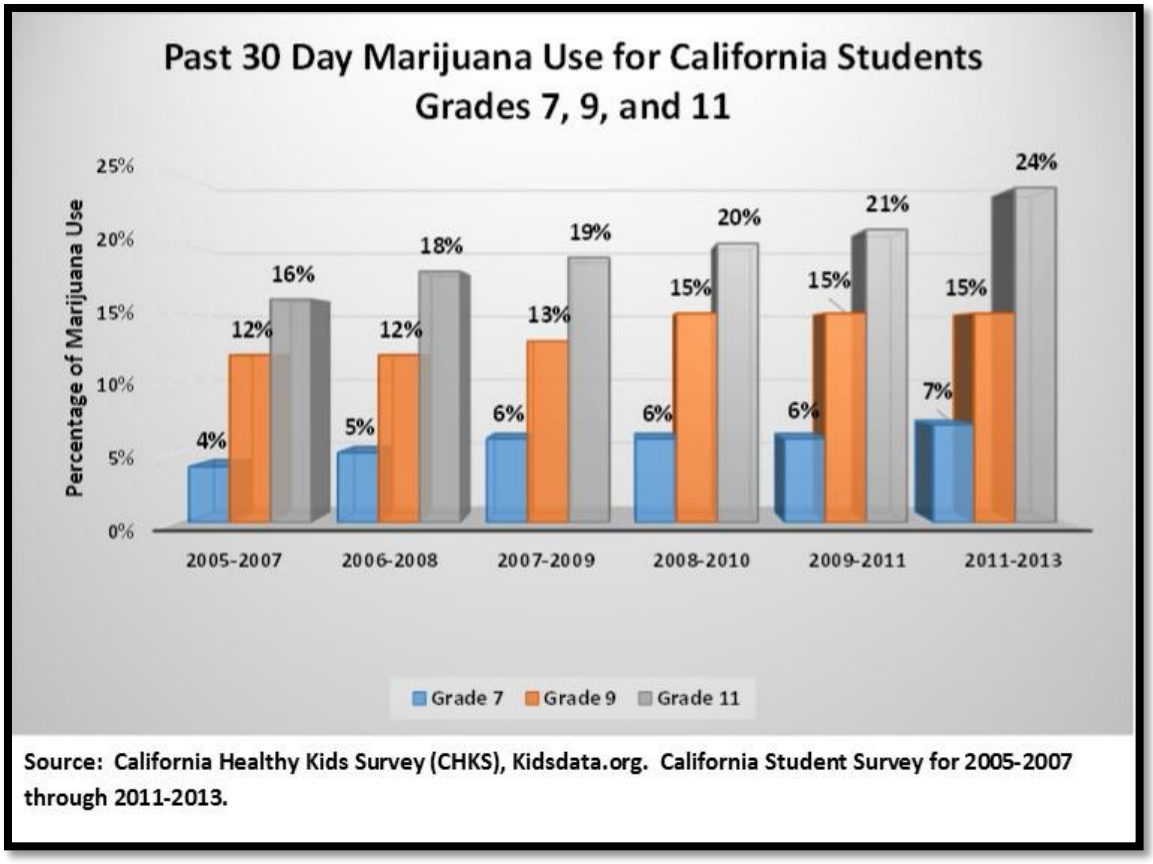
Source: Substance Abuse and Mental Health Services Administration (SAMHSA) Marijuana Use in the Past Month, 2009-2014.

The charts above represent data on the percentages and annual averages for marijuana use in the past month from the National Survey on Drug Use and Health (NSDUHs), for every age group, California's results are higher than the national average.[59]

California	Percent											
	Female						Male					
Grade Level	0 days	1 day	2 days	3-9 days	10-19 days	20-30 days	0 days	1 day	2 days	3-9 days	10-19 days	20-30 days
7th Grade	94.7%	1.7%	0.8%	1.2%	0.8%	0.8%	92.4%	2.4%	1.5%	1.2%	0.6%	1.9%
9th Grade	85.6%	3.7%	2.5%	3.6%	1.8%	2.8%	84.9%	3.0%	2.0%	3.5%	2.0%	4.7%
11th Grade	81.8%	4.7%	3.0%	4.5%	2.5%	3.5%	73.9%	4.8%	3.6%	5.5%	3.3%	8.9%
Non-Traditional	52.5%	6.7%	6.9%	9.2%	5.7%	19.0%	49.0%	6.1%	3.3%	8.7%	4.9%	28.0%
All	86.0%	3.5%	2.3%	3.3%	1.8%	3.0%	82.1%	3.5%	2.4%	3.6%	2.1%	6.3%

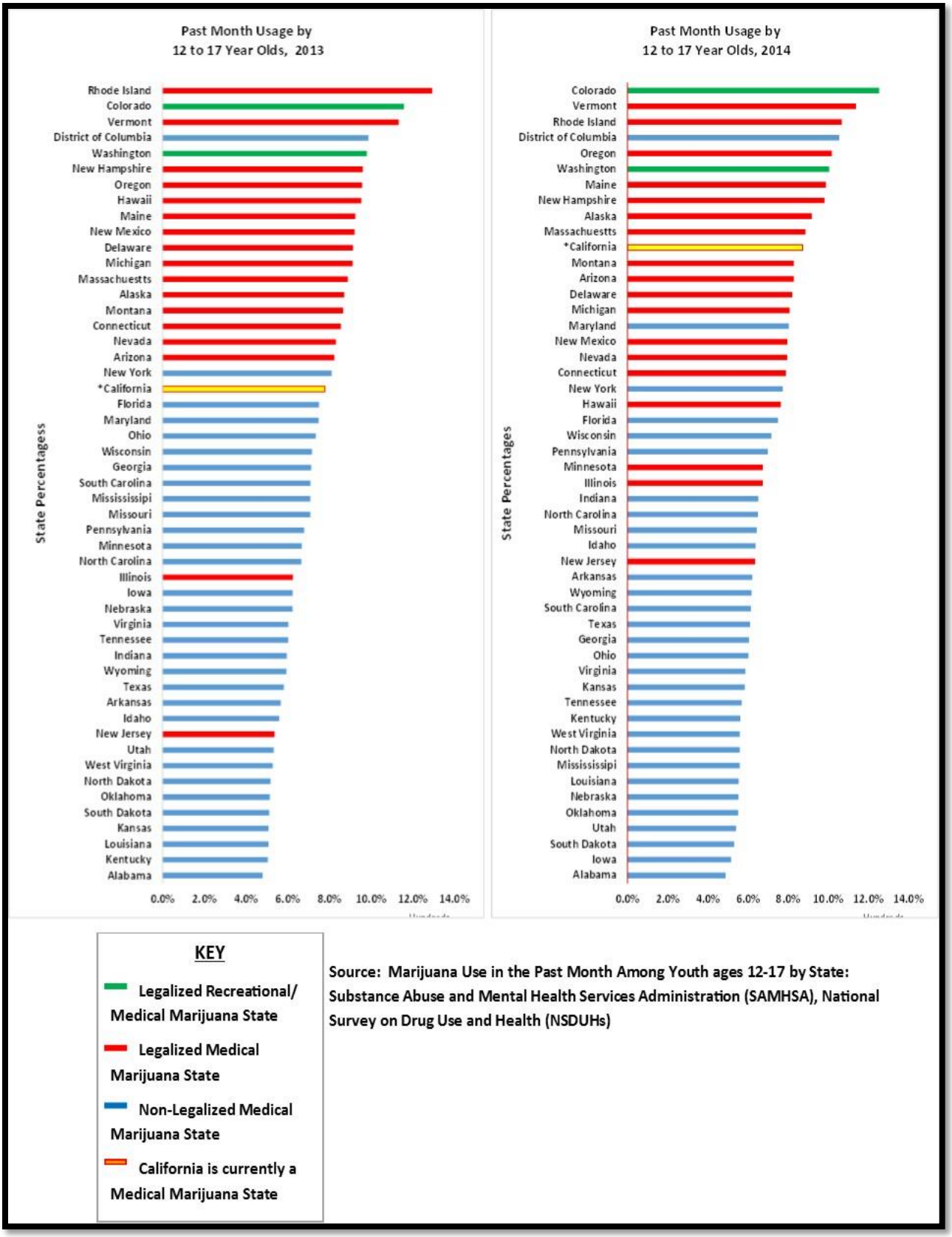
Source: California Healthy Kids Survey (CHKS), Kidsdata.org, California Student Survey (WestEd)

The California Healthy Kids Survey (CHKS) is an anonymous survey given at the district level in various counties throughout the state. CHKS helps school districts, as well as individual schools, identify the strengths and weaknesses at both a student and schoolwide level regarding drug and alcohol use along with other health related issues. The table above shows CHKS responses from both public and non-traditional school students in grades 7, 9, and 11, during the years 2011-2013, reporting on the number of days they have used marijuana in the past 30 days. In California, students enrolled in non-traditional schools show a higher rate of prevalence of marijuana use in the past 30 days.[60]



Source: California Healthy Kids Survey (CHKS), Kidsdata.org. California Student Survey for 2005-2007 through 2011-2013.

The graph above demonstrates the past 30 day use of marijuana for California students in grades 7,9, and 11 from the years 2005-2013, derived from California Healthy Kids Survey (CHKS). Past 30 day use for California students' grades 7, 9, and 11, has continued to increase since 2005.[61]



Source: Marijuana Use in the Past Month Among Youth ages 12-17 by State: Substance Abuse and Mental Health Services Administration (SAMHSA), National Survey on Drug Use and Health (NSDUHs)

The previous graph from the Substance Abuse and Mental Health Services Administration (SAMHSA) illustrates each state's, and the District of Columbia's, past month use of marijuana, 2013 and 2014, for ages 12-17. From 2013 to 2014, states with legalized recreational and/or medical marijuana laws moved up in the national ranking. In 2013 California was ranked 20th in the nation, but by 2014 the increase in usage moved the state up to 11th in the nation.[62]

Conclusion

As California saw a proliferation of medical marijuana dispensaries, it also saw a corresponding increase in the use of marijuana among all ages as well as a decrease in the perception of risk, which likely has and will continue to lead to increasing use, especially among youth ages 12-17. California's past month marijuana use rates continue to be above the national average and have risen as the normalization of marijuana has increased within the state. It is logical to conclude that if more marijuana is legally available, youth use throughout the state will continue to increase.

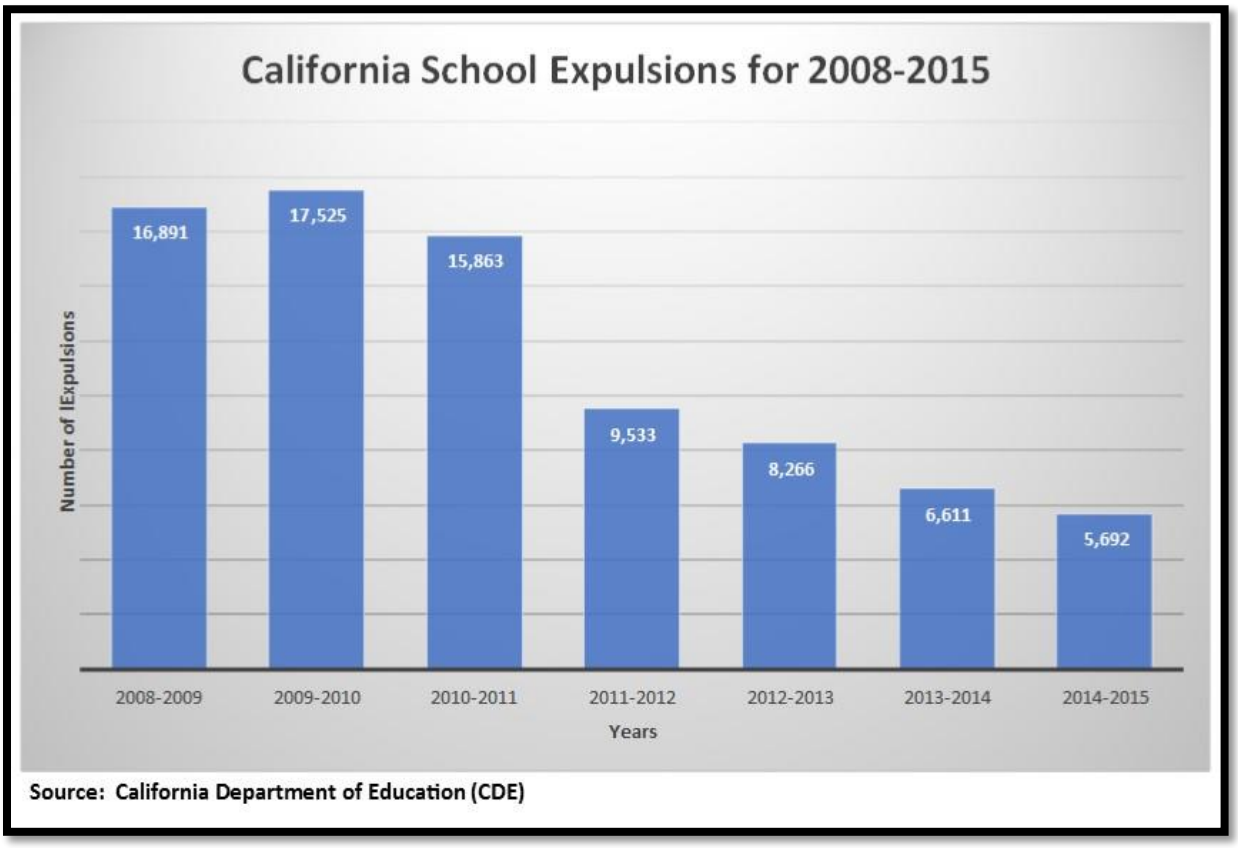
SECTION THREE: California Schools

Overview

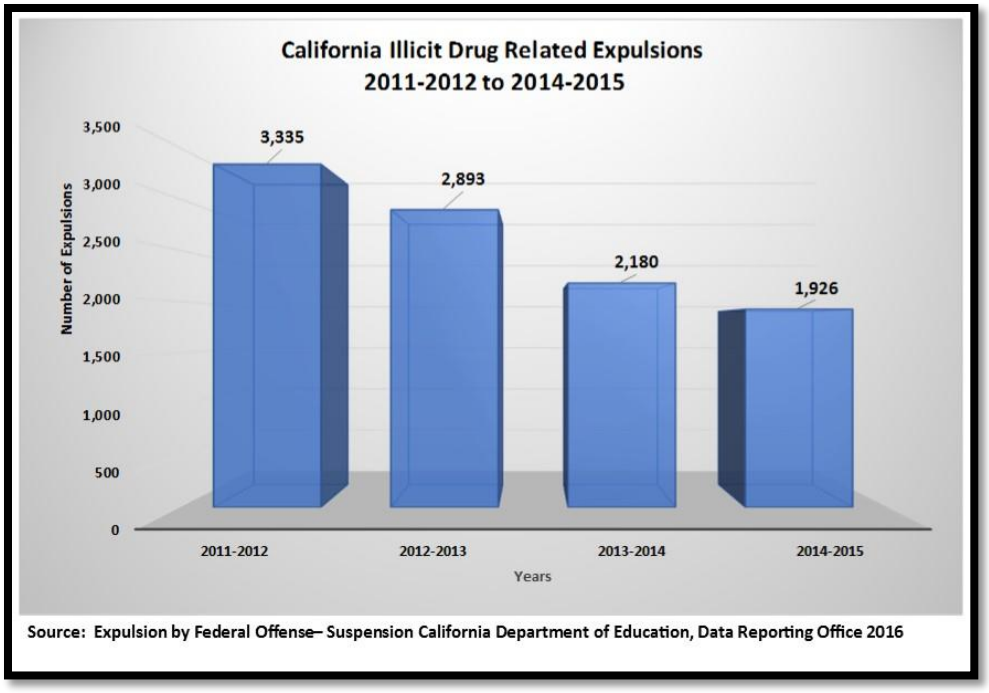
In 2011, the California school system began implementing a program called Restorative Practices. This program aims to keep students found in violation of school drug policies from being expelled.[63] For this reason, school expulsion rates in California have greatly decreased, even though the number of students who are caught with drugs has not declined.

Findings:

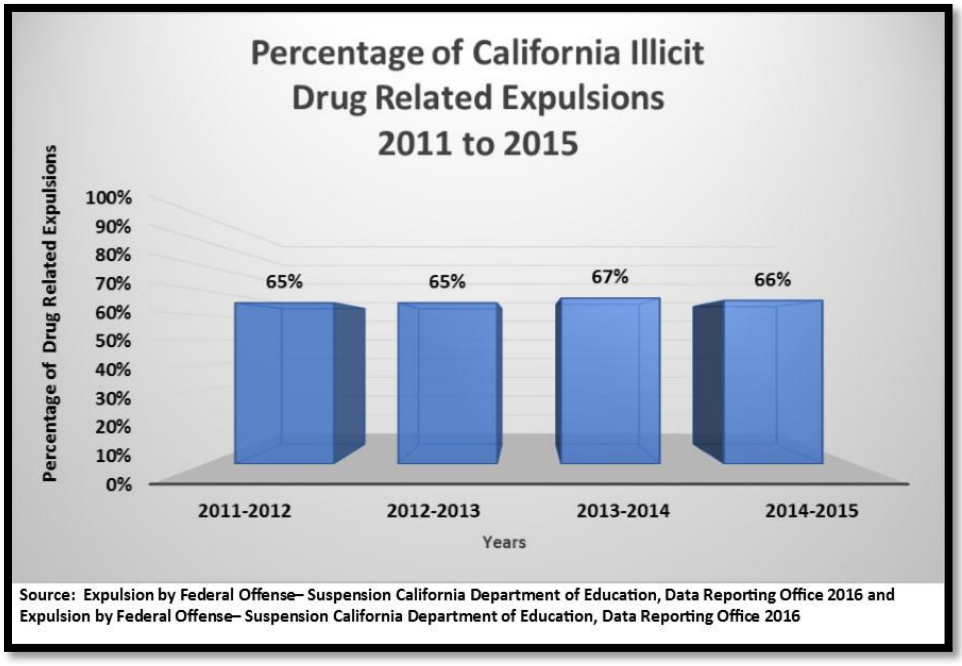
- The number of expulsions in the state of California has decreased at a rapid rate.
- The number of illicit drug related expulsions in the state of California has decreased, but at a slower rate than overall expulsions.[64]
- Restorative Practices began in 2011, requiring school districts to come up with alternatives to expulsion.[65]



The graph above from the California Department of Education (CDE) depicts the total number of expulsions within the California education system from 2008 to 2015.



The graph above from the California Department of Education (CDE) shows the number of illicit drug related expulsions throughout the state from 2011 to 2015.



The graph above from the California Department of Education (CDE) shows the percentage of illicit drug related expulsions throughout the state from 2011 to 2015.

Conclusion

Restorative practices appears to be addressing the issue of high expulsion rates. Nonetheless, while overall expulsion rates throughout the state have been decreasing dramatically, drug related expulsion rates have been dropping at a much slower rate- and thus drug-related expulsions are constituting a higher percentage of total expulsions. This may suggest that drug use in California schools is a mounting problem.

What happens to these students once they are found in violation of school drug policy? Do they have access to resources to address patterns of substance abuse? Do they continue going to their regular classes? If so, what is the effect on other students? And if they go to another class, what steps are being taken to address their drug use and ensure that they remain on track to graduate? California schools were given this mandate without being provided with additional funding or statewide guidance, as such programs vary greatly between districts.

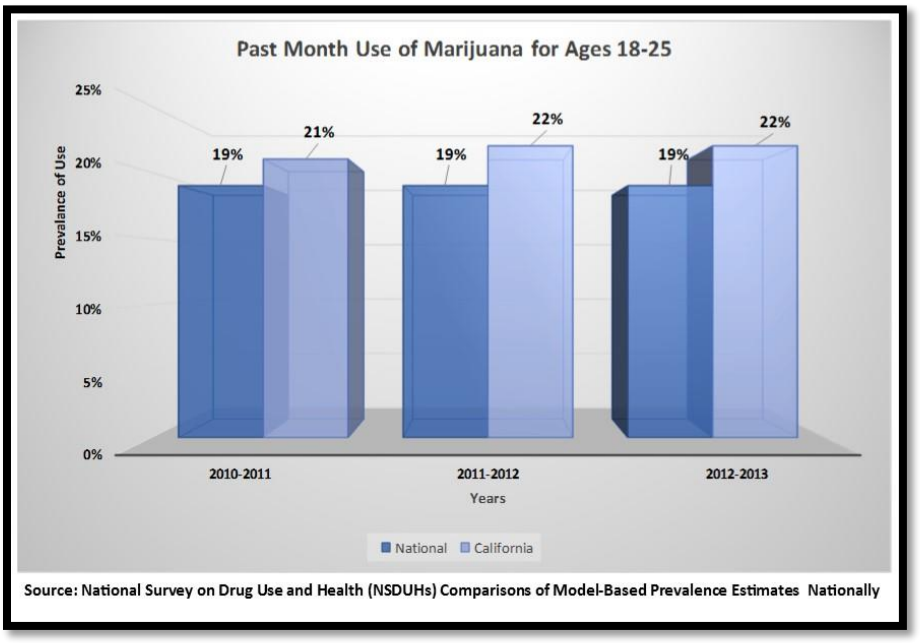
SECTION FOUR: California Marijuana Use Ages 18-25

Overview

This section takes a look at marijuana use rates, ages 18-25, in California at both the regional and statewide levels, as well as in comparison to national use rates.

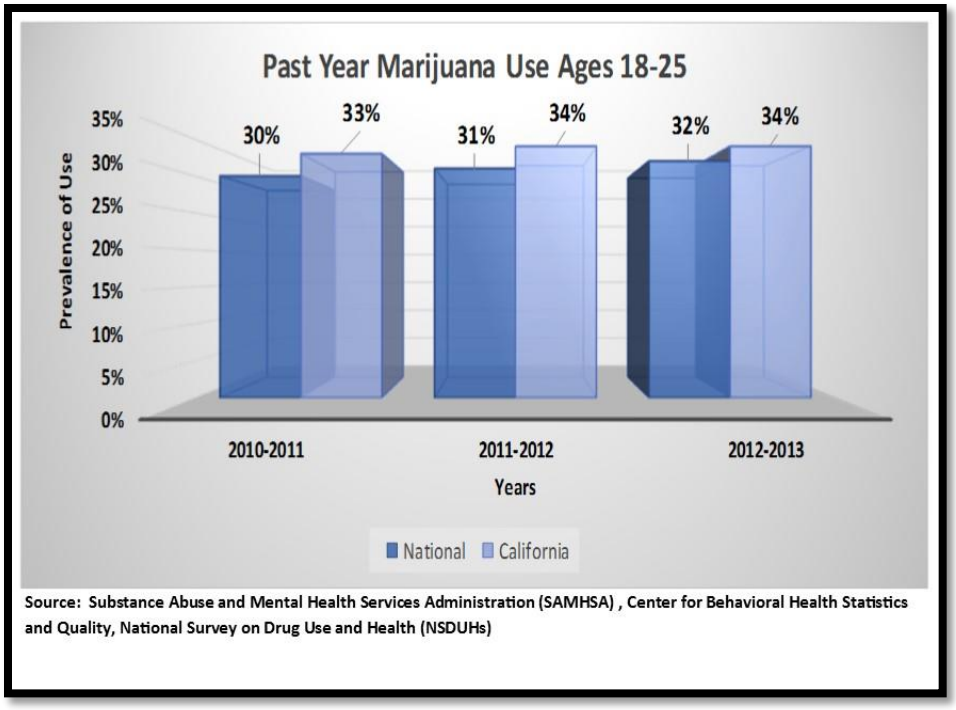
Findings:

- California's past month marijuana use rate for ages 18-25 is higher than the national average, as is California's past year marijuana use rate for ages 18-25.[66]



Source: National Survey on Drug Use and Health (NSDUHs) Comparisons of Model-Based Prevalence Estimates Nationally

The graph above from the National Survey on Drug Use and Health (NSDUHs) shows the comparison of past month use of marijuana for ages 18-25 for California and National.[67]



Source: Substance Abuse and Mental Health Services Administration (SAMHSA) , Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health (NSDUHs)

The above graph from the National Survey on Drug Use and Health (NSDUHs) shows the comparison of past year use of marijuana for ages 18-25 for California and National rates.[68]

Conclusion

California's marijuana use rates for individuals ages 18-25, both past month and past year, continue to be higher than that of the national average. We also saw increases in use among all ages as medical marijuana dispensaries and permissive marijuana laws became more common. Use was higher in the Northern Metropolitan Statistical Area (MSA) of California where research has shown increased access to marijuana due to greater availability than in other areas. We expect rates of use will continue to rise with increasing accessibility and normalization.

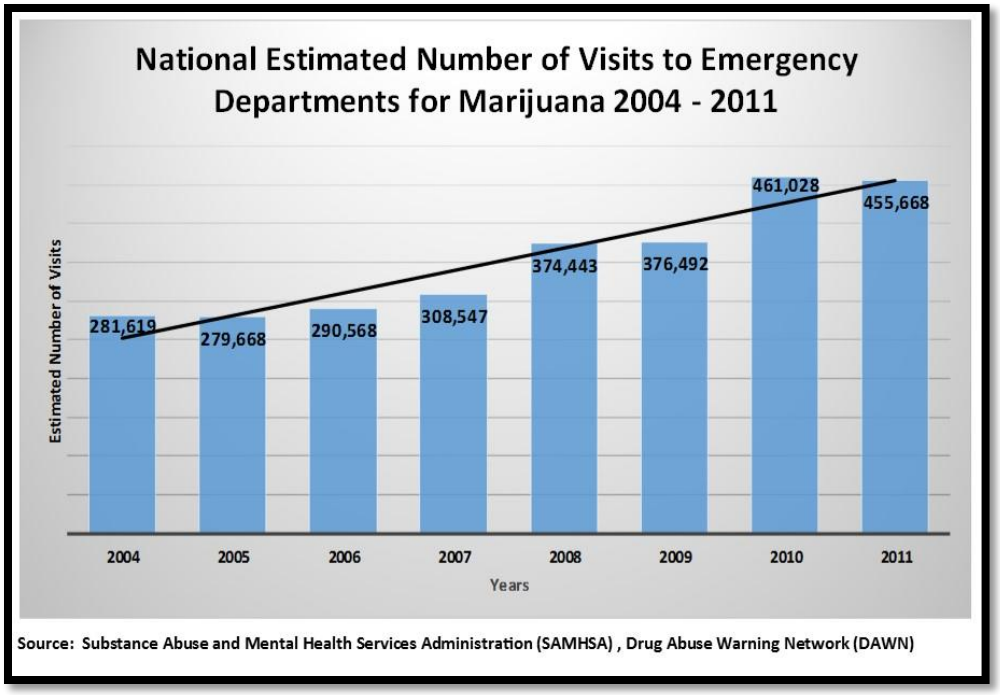
SECTION FIVE: Marijuana-Related Emergency Department Visits and Hospital Admissions

Overview

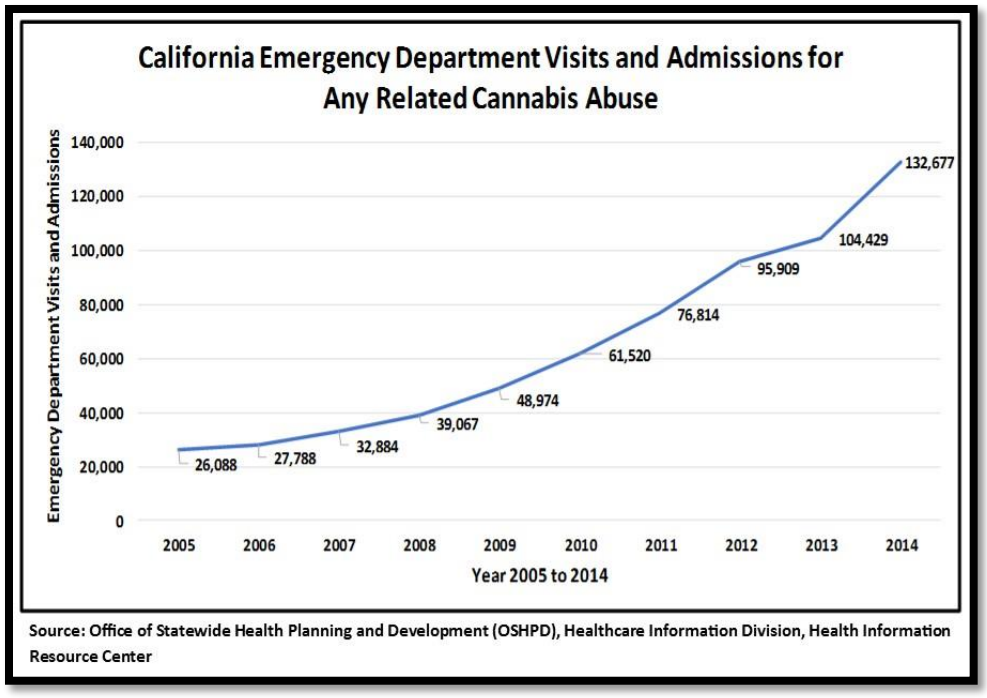
This section will examine the number of marijuana-related emergency department visits and hospital admissions both nationally and in California. The increase in marijuana-related exposures among children and adults resulting in emergency department hospital visits and admissions will also be exhibited.

Findings:

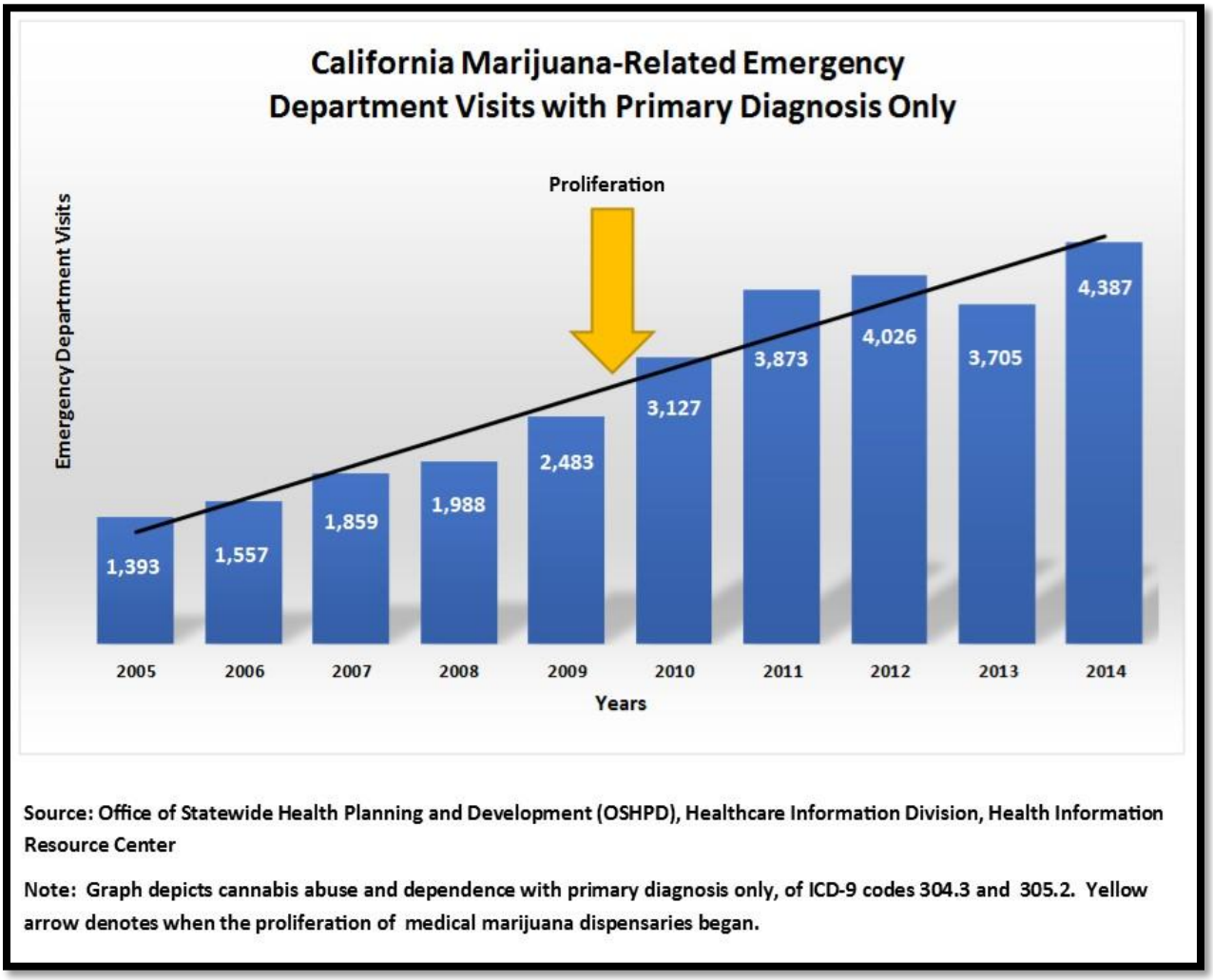
- From 2004 to 2011, there was a 39% increase nationally in the estimated number of visits to emergency departments related to marijuana.[69]
- From 2009-2011 there was a 50% increase in California emergency department visits resulting in admissions for any related cannabis abuse (primary or secondary diagnosis), with a 116% increase from 2010-2014.[70]
- From 2005-2014 there was a 200% increase in California emergency department visits with cannabis as the primary reason for being seen.[71]
- Among children ages 0 to 5, marijuana-related exposures in California resulting in hospital admittance increased by 513% from 2005-2015.[72]
- Among youth 6 to 19, marijuana-related exposures in California resulting in hospital admittance increased by 139% from 2005-2015.[73]
- Between the years of 2005-2009 and 2010-2014, there was a 64% increase in the number of marijuana-related exposures in California resulting in hospital admittance for adults ages 20 and older.[74]



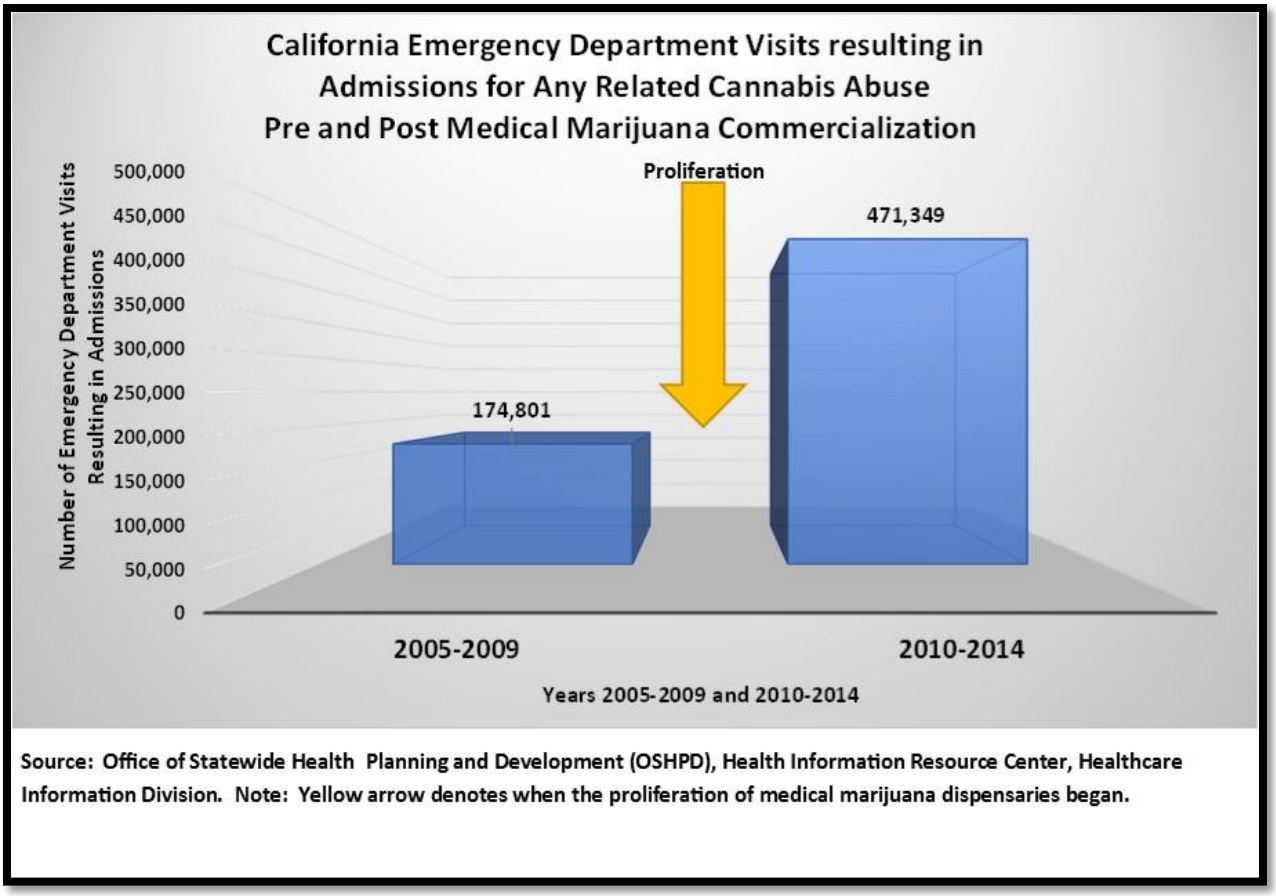
The graph above shows the estimated number of emergency department visits nationally related to marijuana, 2004 to 2011, according to the Substance Abuse and Mental Health Services Administration (SAMHSA), Drug Abuse Warning Network (DAWN).



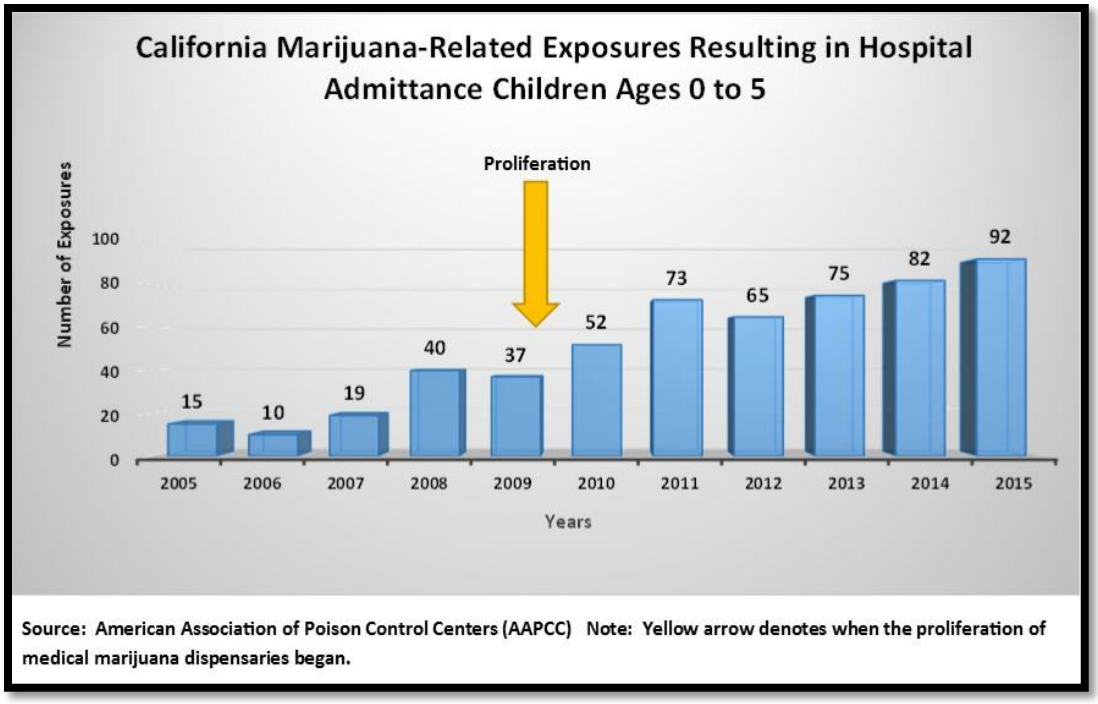
The preceding graph depicts the number of emergency department visits resulting in admissions for any related cannabis abuse for the years of 2005 to 2014. These figures were collected from the Office of Statewide Health Planning and Development (OSHPD), and include ANY ICD-9 code 305.2 (cannabis abuse).[75]



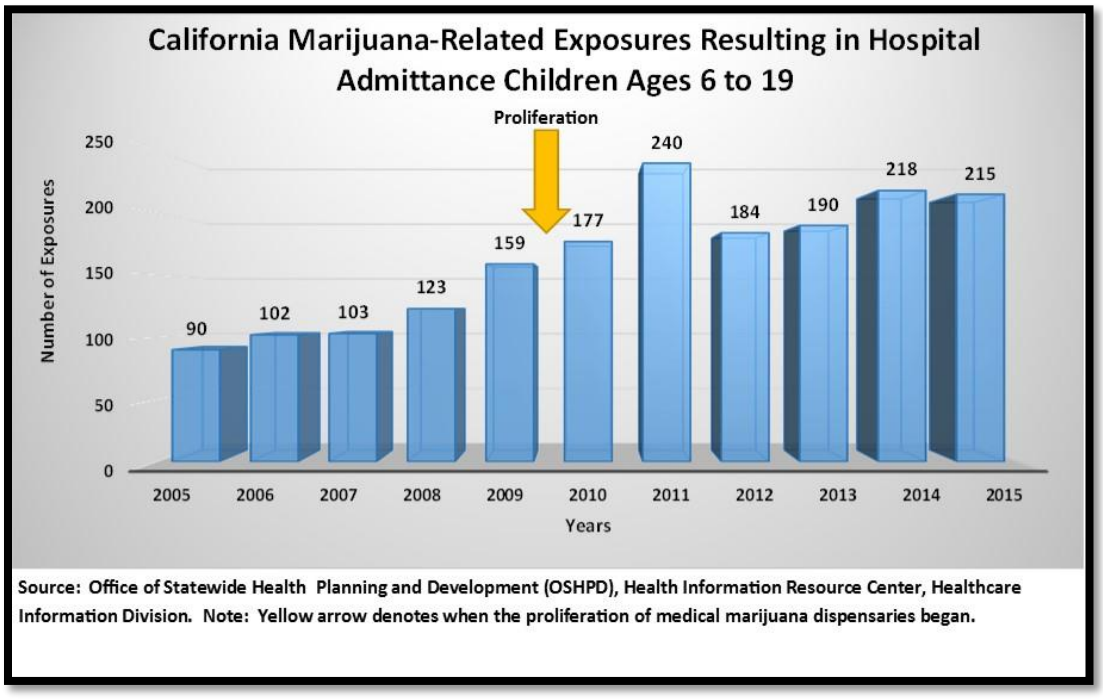
The graph above shows the number of emergency department visits with a primary cannabis diagnosis for the years of 2005 to 2014 (yellow arrow denotes when the proliferation of medical marijuana dispensaries began). These figures were collected from the Office of Statewide Health Planning and Development (OSHPD), and include ANY ICD-9 code 304.3 (cannabis dependence) and 305.2 (cannabis abuse).[76]



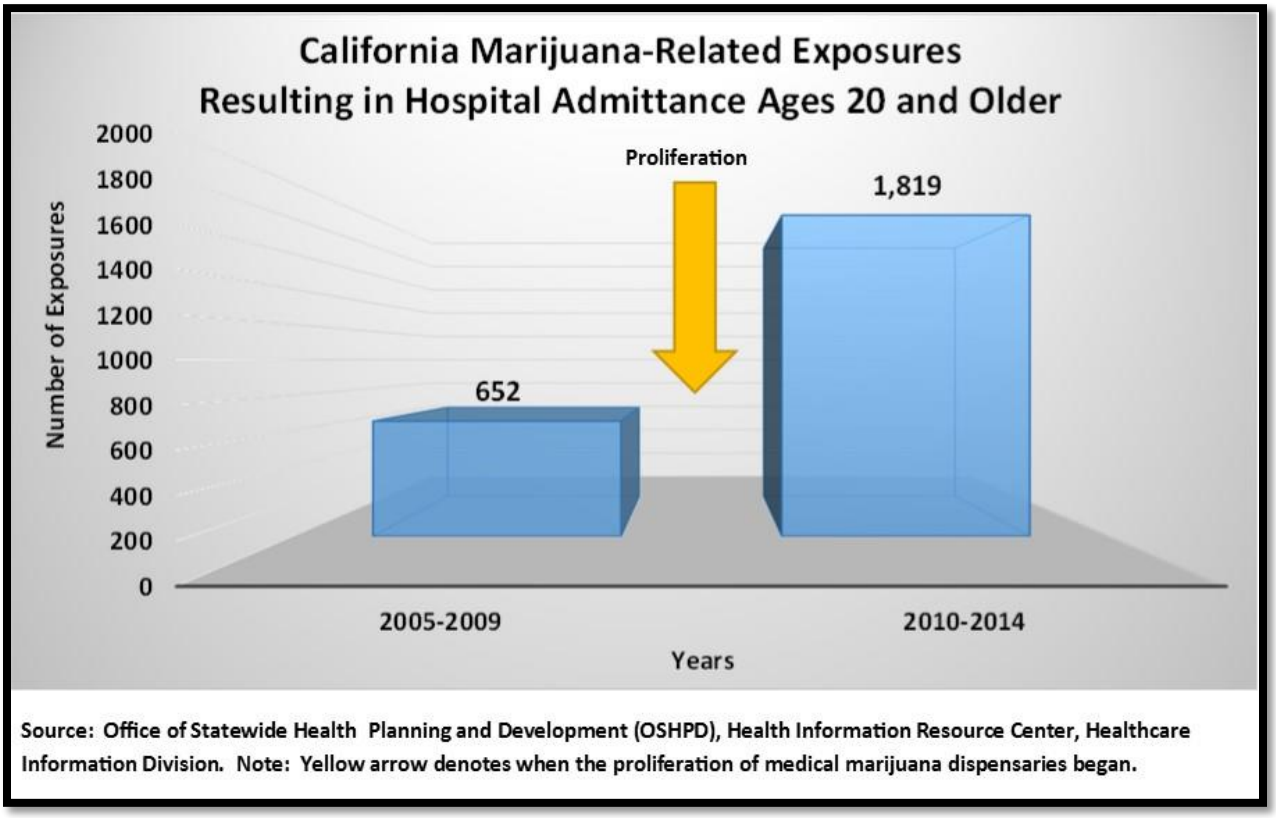
The graph above depicts the number of emergency department visits resulting in admissions for any related cannabis abuse between the years of 2005-2009 and 2010-2014 (yellow arrow denotes when the proliferation of medical marijuana dispensaries began). These figures were collected from the Office of Statewide Health Planning and Development (OSHPD), and include ANY ICD-9 code 305.2 (cannabis abuse).[77]



The graph above shows the number of marijuana-related exposures resulting in hospital admissions for children ages 0 to 5, before and after the proliferation of medical marijuana dispensaries.[78]



The graph above shows the number of marijuana-related exposures resulting in hospital admissions for children ages 6 to 19, before and after the proliferation of medical marijuana dispensaries.[79]



The graph above depicts the number of marijuana-related exposures resulting in hospital admissions for adults ages 20 and older, before and after the proliferation of medical marijuana dispensaries. [80]

Conclusion

As marijuana has become more normalized, and use rates have increased, we have seen an increase at both the national and state levels in the number of emergency department visits related to marijuana. There has been a sharp increase in the number of California emergency department visits resulting in admissions (for any related cannabis abuse) since the proliferation of medical marijuana dispensaries. Marijuana-related exposures in California resulting in hospital admissions among children ages 0 to 5 has increased by 513%, likely due to the increased availability and popularity of marijuana edibles. This number has increased in every reported age group. If marijuana use and availability continues to increase, it is reasonable to assume that we will see more increases in emergency department visits and admissions due to marijuana use or unintentional exposure.

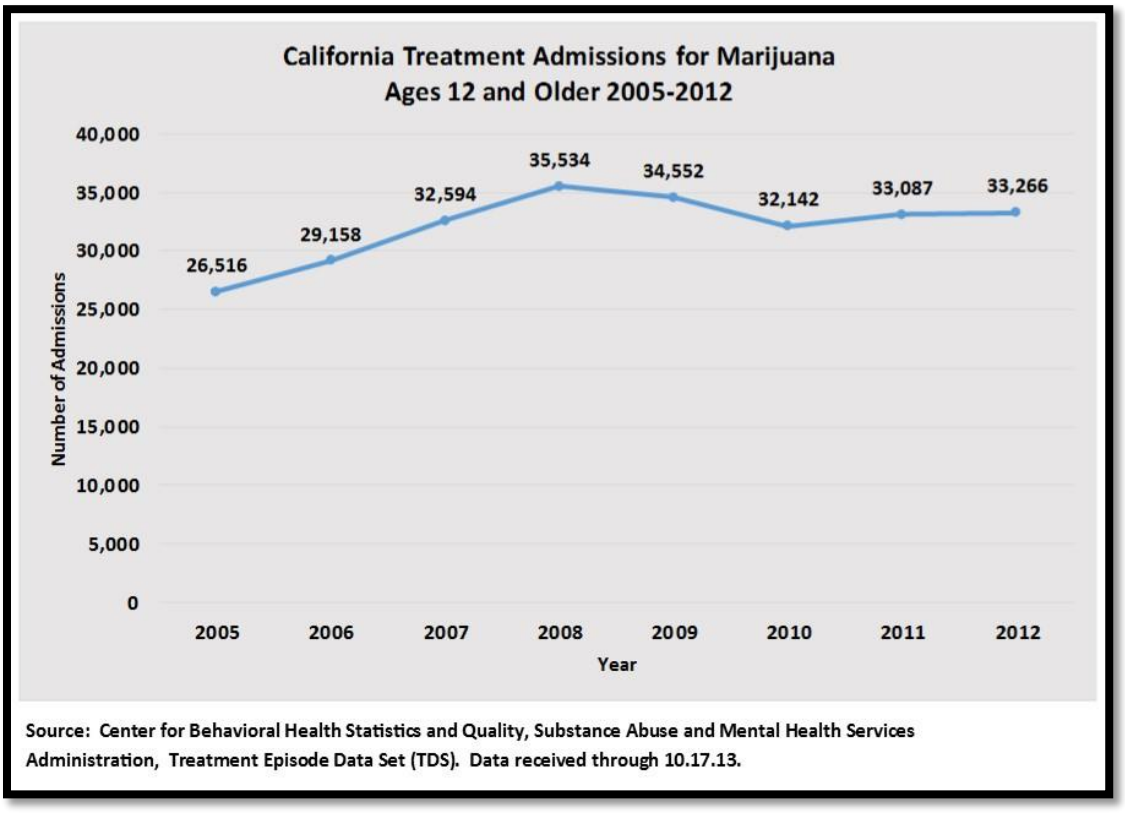
SECTION SIX: Treatment

Overview

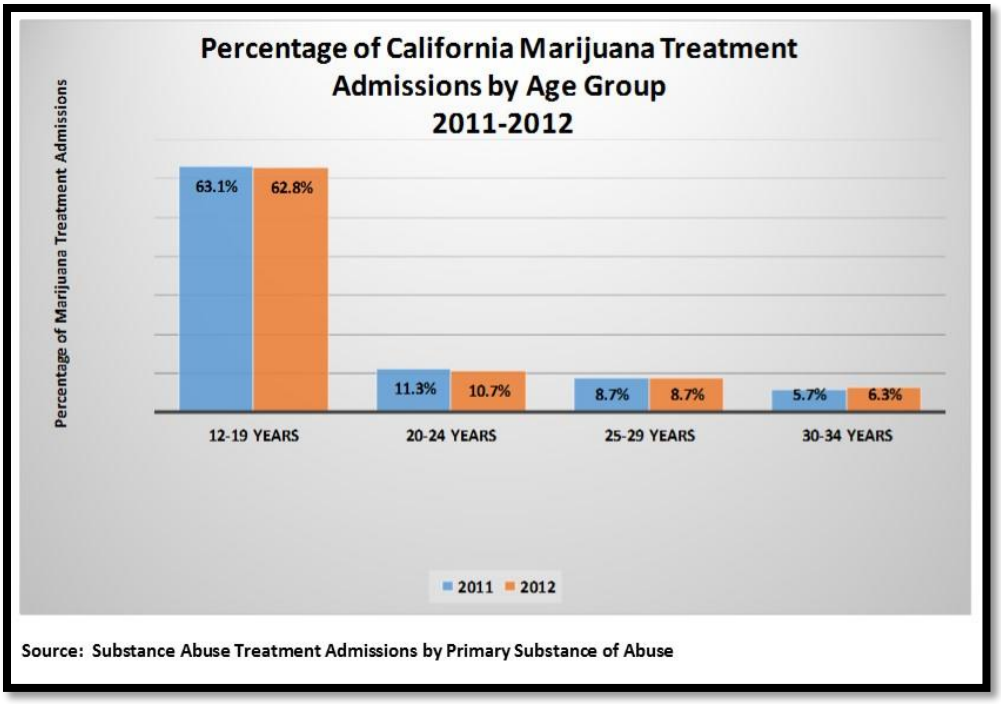
From 2005 to 2015, the rate of admissions to drug treatment programs for marijuana substance use disorder remained relatively steady.

Findings

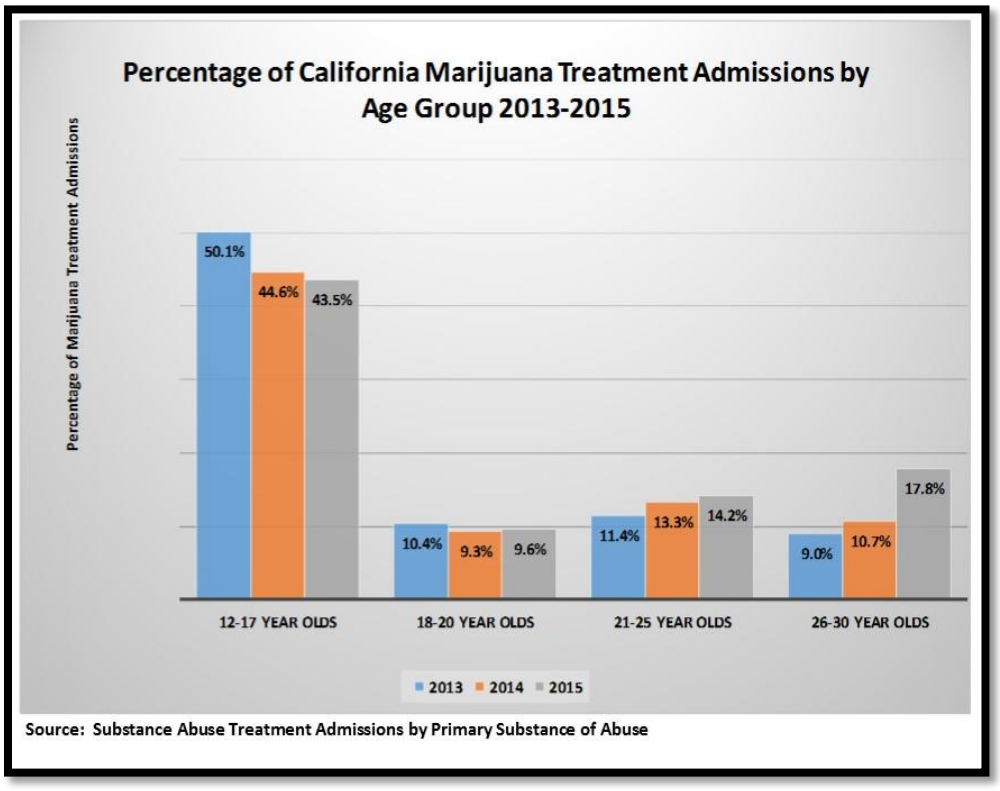
- Methamphetamine/amphetamine use was the highest, alcohol was second, and marijuana was third with relatively steady admittance rates.[81]
- Youth make up the largest percentage of individuals seeking treatment for marijuana in the state of California



The graph above illustrates California admissions for marijuana abuse treatment for ages 12 and older, for the years between 2005 and 2012.[82]



Source: Substance Abuse Treatment Admissions by Primary Substance of Abuse



Source: Substance Abuse Treatment Admissions by Primary Substance of Abuse

The percentage of youth in treatment for a marijuana use disorder is by far the largest of the age groups seen above. Data recording for marijuana treatment admissions changed in 2013, and age groups were defined differently, but both graphs above show that for the years 2011 to 2015, the majority of those in treatment for marijuana abuse were minors.[83]

Conclusion

The normalization of marijuana and increased access to the drug have contributed to an increase in rates of youth use. While the majority of users continue to be young adults, teenagers have consistently been the largest age group seeking treatment for a marijuana use disorder. This is not only a financial and emotional burden on families and communities but also proves that many teens are unfortunately experiencing a higher rate of addiction due to marijuana. It is reasonable to conclude that increased access due to marijuana legalization for recreational use would not improve the marijuana addiction rates.

SECTION SEVEN: California Impaired Driving

Overview

This section examines the auto related fatalities in the state of California from 2005-2014 that involved drivers who tested positive for marijuana.

Information for this section was derived from the National Highway Traffic Safety Administration's Fatalities Analysis Reporting System (FARS).

Findings

- Crash fatalities in California have decreased by 29% from 2005 to 2014, which is consistent with national trends, however crash fatalities in California involving a driver(s) testing positive for marijuana increased by 17% during the same period of time.[84]
- The number of drivers testing positive for any drugs who were involved in a fatal crash decreased by 12% from 2005 to 2014, however drivers testing positive for marijuana increased by 22% during the same period of time.[85]

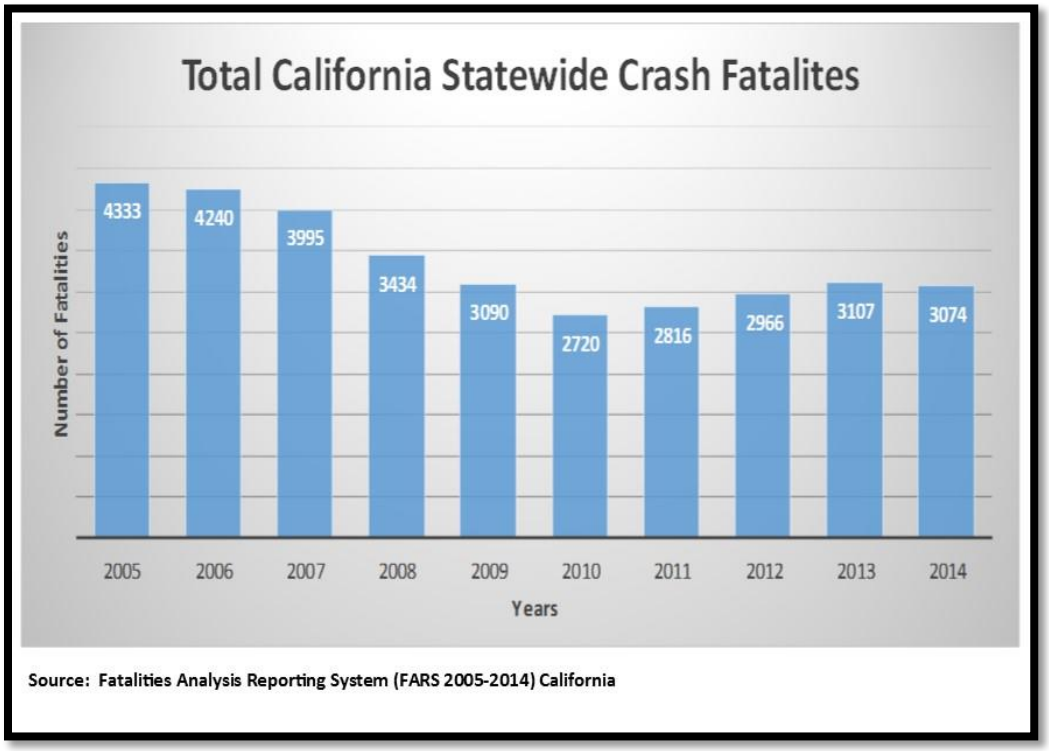
California Fatalities Involving Driver with Positive Drug Test 2005-2014

Crash Year	Total Statewide Crash Fatalities	Total Number of Drivers Involved in a Fatal Crash	Drivers Testing Positive for ANY Drugs, Involved in a Fatal Crash*	Percentage of Drivers Testing Positive for ANY Drugs, Involved in a Fatal Crash*	Drivers Testing Positive for Marijuana, Involved in a Fatal Crash	Percentage of Drivers Testing Positive for Marijuana, Involved in a Fatal Crash	Fatalities Caused by a Driver Testing Positive for Marijuana
2005	4333	2310	527	22.8%	208	9.0%	273
2006	4240	2335	517	22.1%	244	10.4%	318
2007	3995	2243	510	22.7%	246	11.0%	303
2008	3434	2243	450	20.1%	234	10.4%	290
2009	3090	1682	409	24.3%	196	11.7%	222
2010	2720	1459	388	26.6%	192	13.2%	214
2011	2816	1401	368	26.3%	212	15.1%	242
2012	2966	2804	682	24.3%	266	9.5%	302
2013	3107	1606	519	32.3%	272	16.9%	341
2014	3074	1652	465	28.1%	267	16.5%	319

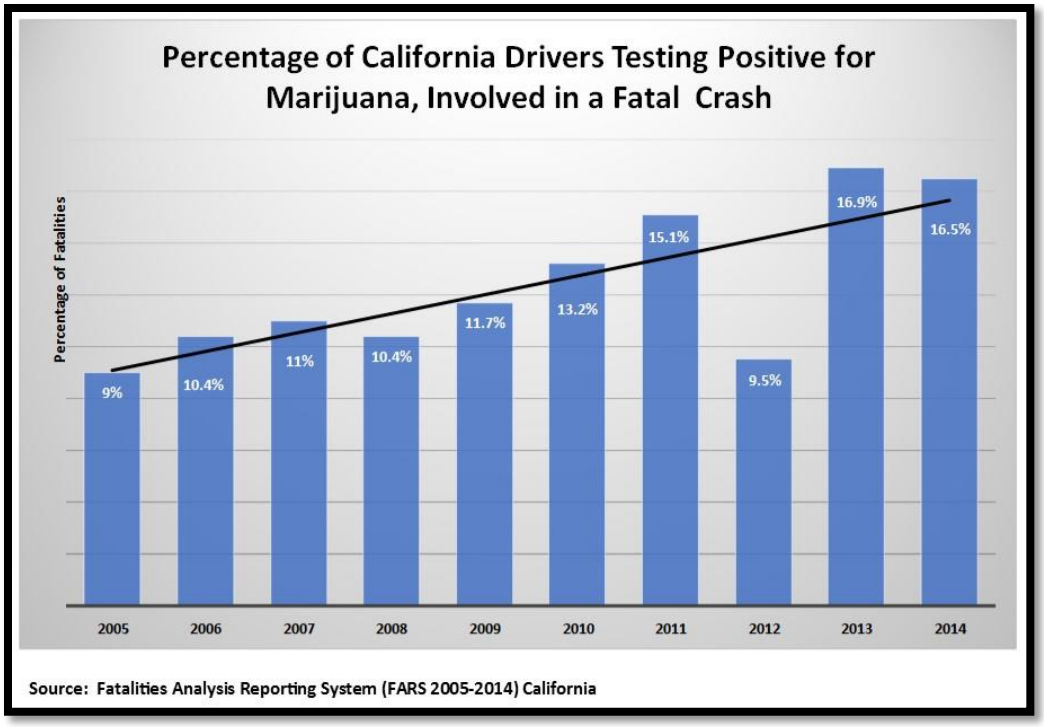
*Does not include Blood Alcohol Content (BAC) tests.

Source: Fatalities Analysis Reporting System (FARS 2005-2014) California

The table above is derived from information collected from the Fatalities Analysis Reporting System (FARS) 2005-2014. This report cites datasets with terms such as marijuana-related or tested positive for marijuana. This does not necessarily confirm that marijuana was the cause of the incident. California has made a number of concerted efforts to reduce the number of crash fatalities throughout the state however the number of driver(s) involved in crash fatalities testing positive for marijuana has continued to increase.[86]



The graph above shows the decrease in the number of overall crash fatalities from 2005-2014.



The graph above depicts the percentage of California driver(s) involved in crash fatalities testing positive for marijuana.

Conclusion

Data from the Fatalities Reporting System (FARS), shows a downward trend in statewide auto fatalities in California, but that the number of marijuana-related auto fatalities is increasing. It also therefore is reasonable to assume that increased availability and normalization of marijuana use is actually counterproductive to state efforts to reduce impaired driving generally. Due to this upward trend, it is predicted that greater access to marijuana as a result of legalization would result in further increases in marijuana-related road crashes and fatalities throughout the state.

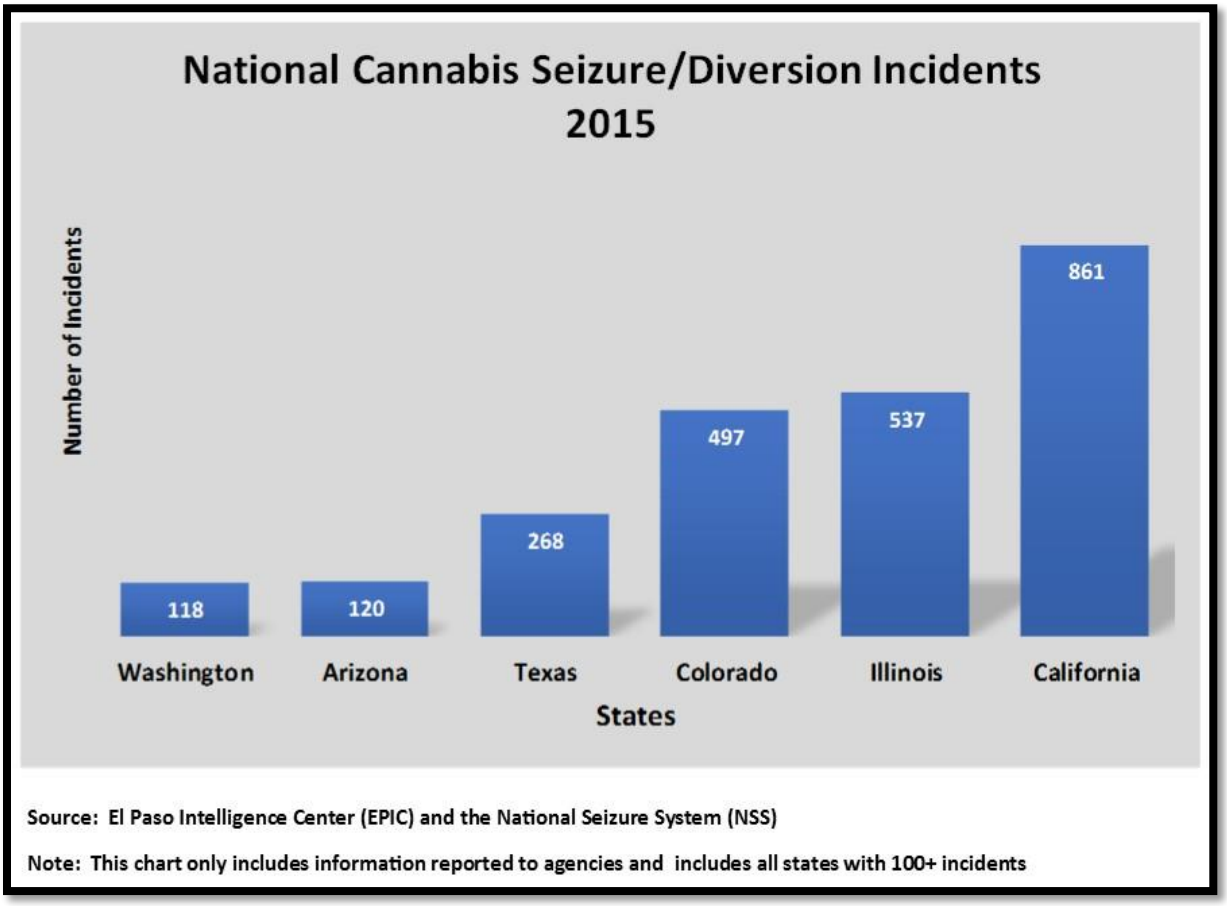
SECTION EIGHT: Diversion

Overview

This section will look at the state of origin for cannabis seizures. We will also look at the number of marijuana seizures reported by the United States Postal Inspection Service (USPIS), San Francisco Division.

Findings

- In 2015, California was the origin for 861 of the nation's 3,057 cannabis seizures (highest ranked state).[87]
- Marijuana was the most seized substance at the San Francisco Division USPIS.



The chart above was derived from information gathered by El Paso Information Center (EPIC) and describes the top six states of origin for nationwide cannabis seizures.

US Postal Inspection Service 2015		
Drug	**Grams**	**# of Seizures**
Marijuana	5,285,149	2881
Meth	94,014	140
Hashish	18,673	33
Cocaine	3,443	12
Heroin	1,260	8
Ecstasy	2,890	6
LSD	7,200	4
*Other	30,248	81

*Other Controlled Substances

Source: United States Postal Inspection Service (USPIS),

San Francisco Division, 2015

The chart above depicts illicit drug parcel seizures by the United States Postal Inspection Service, San Francisco Division in 2015. The overwhelming majority of controlled substance seizures made were marijuana.[88]

Conclusion

In 2013, United States Deputy Attorney General James M. Cole issued a memorandum designed to update federal prosecutors on marijuana enforcement under the Controlled Substances Act (CSA) and to define the point at which they should intervene. The memorandum specifically focused on the eight enforcement priorities of the federal government, one of which is "preventing the diversion of marijuana from states where it is legal under state law in some form to other states."[89] The data collected shows that four of the top seven diversion states of origin are states in which marijuana is legal medically and/or recreationally.

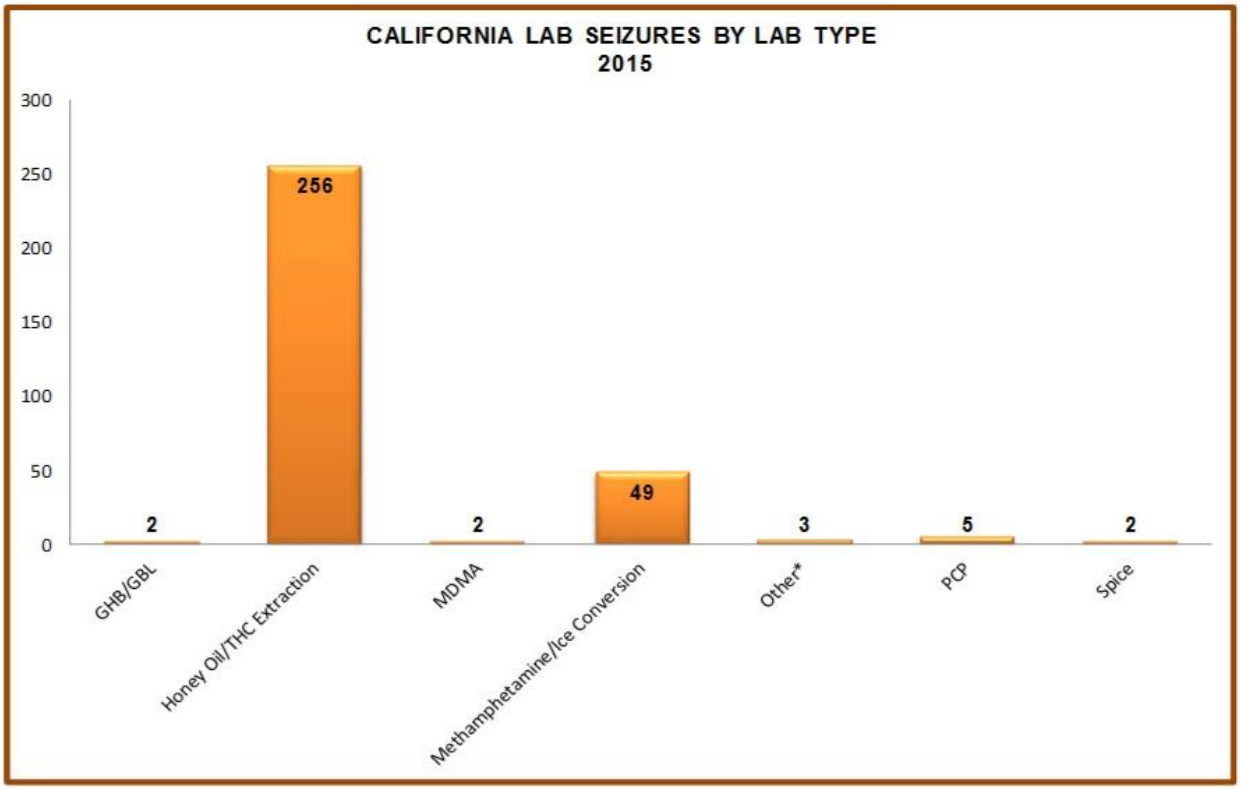
SECTION NINE: THC Extraction Labs

Overview

In 2015, 26 states reported finding 337 THC extraction labs. California has by far the largest number of these labs reporting 294 in 2015, and has been reporting their presence since 2005.[90] Unfortunately it is difficult to gauge the true prevalence of these labs due to inconsistent reporting practices among law enforcement agencies and data collection sources.

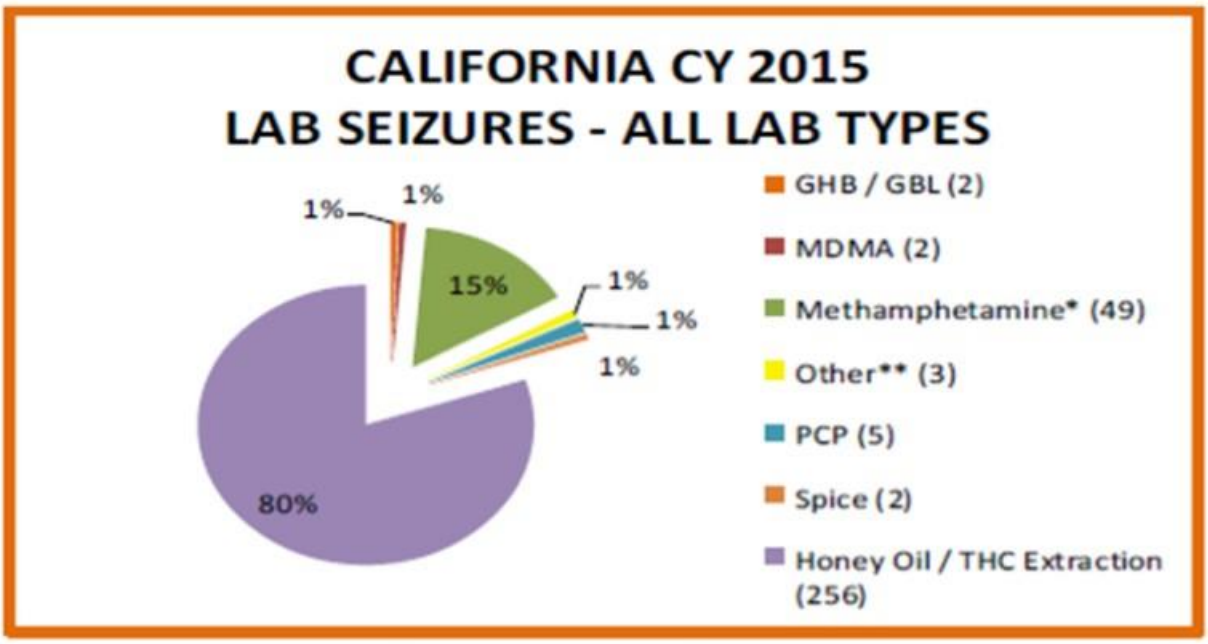
Findings

- In 2015 there were 207 more Honey Oil/THC extraction labs found in California than Meth/Ice (Methamphetamine) conversion labs.[91]
- In 2015, California had 87% of THC extraction lab seizures nationally reported.[92]
- In 2015, THC extraction labs made up 80% of all labs seized in California.[93]



Source: Western States Information Network (WSIN) 2015 Year End Clan Lab Report

The chart above from the Western States Information Network (WSIN) shows the total number of lab seizures in California in 2015 by type.



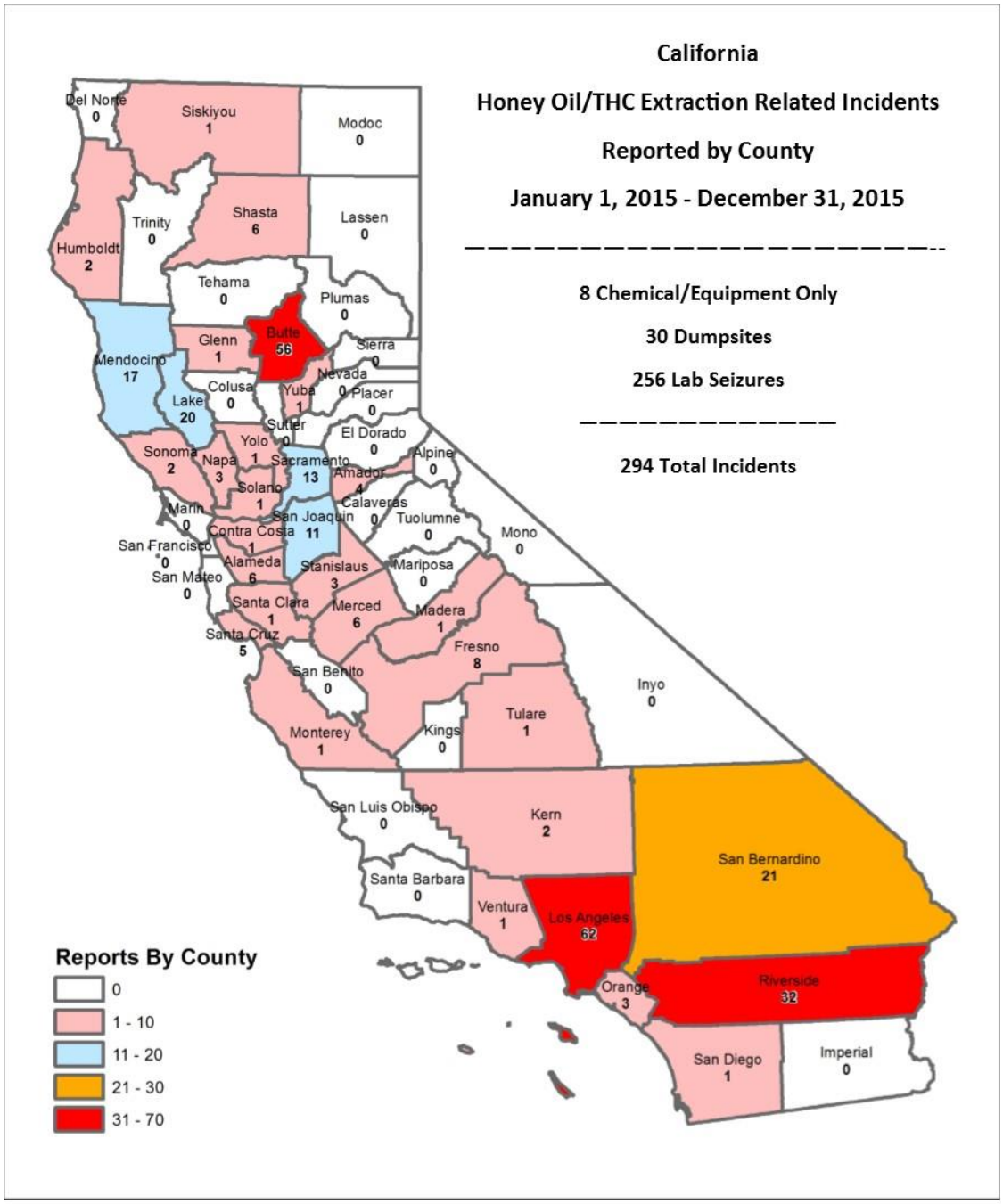
*Methamphetamine includes lab seizures reported as methamphetamine, ice conversion, and tablet extraction

**Other lab seizures include counterfeit prescription pills

Source: Western States Information Network (WSIN) Region 2015

The chart above from the Western States Information Network (WSIN) shows the total number of lab seizures in California for 2015 by drug type.

The map below depicts THC extraction lab reported incidents in California for the year 2015. Areas where marijuana is commonly grown or with high concentrations of dispensaries, show higher numbers of lab incidents. This makes it clear that when marijuana is more readily available, so are the accompanying marijuana extract products. It also suggests that legalized marijuana dispensaries may actually increase black market extraction activity, instead of reducing it. Moreover, these products bring with them their own hazards; in 2015, California reported 34 fires and explosions related to THC extraction labs.[94]



Source: Western States Information Network (WSIN) 2015 Year-End Clan Lab Report

Conclusion

THC extraction labs will continue to threaten neighborhoods, communities and first responders. THC extraction labs are extremely unstable due to the equipment and chemicals used in the extraction process. Often times the chemicals leak from the equipment causing a pooling of gasses that can lead to a catastrophic explosion. As long as there is a demand for high concentration THC products, we will continue to see these labs, especially in areas where there are permissive use laws and easy access to marijuana.

SECTION TEN: Environmental Impacts of Marijuana in California

Overview (See Appendix B)

This section examines the impacts that marijuana cultivation has on California, which is consistently ranked among the highest outdoor cultivators of marijuana in the United States, with some estimates that as much as 60-70% of the marijuana for the whole country is grown in the state.[95] California is currently in the fifth year of a drought, with the central and northern regions affected the most. As a result of the limited water availability, marijuana cultivators illegally siphon water from tributary streams and rivers, often seriously depleting these water sources. Other serious environmental harms of marijuana cultivation include loss and fragmentation of sensitive habitats due to illegal land clearing and logging, as well as illegal grading and burying of streams.

Illegal pond water diversion associated with a marijuana site in Northern California.
Source: High Time for Conservation: Adding the Environment to the Debate on Marijuana Liberalization.

Findings

- Each plant is estimated to need 6-8 gallons of water per day during its growing season (May-September).[96] Even grown legally, marijuana puts a strain on the state's already overtaxed water system, but illegal cultivation exacerbates the problem. The table below compares the water usage of cannabis and other common crops.[97]

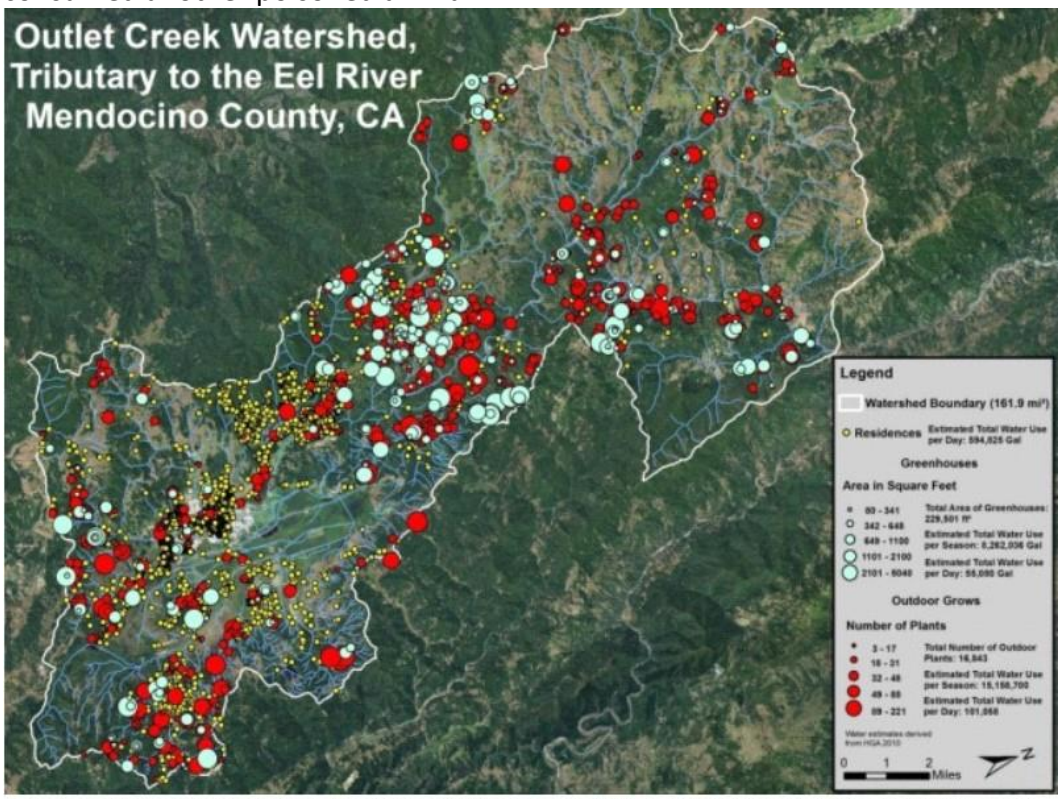
Product	Gallons of Water Req'd to Produce 1 lb.
Soy	216
Wheat	138-240
Corn	98-108
Hops	300-450
Cannabis	450-900

Source: Huffington Post

- Marijuana farms in proximity to watersheds can literally use all of the water during the streams' summer low-flow period, leaving nothing to support fish and wildlife. The

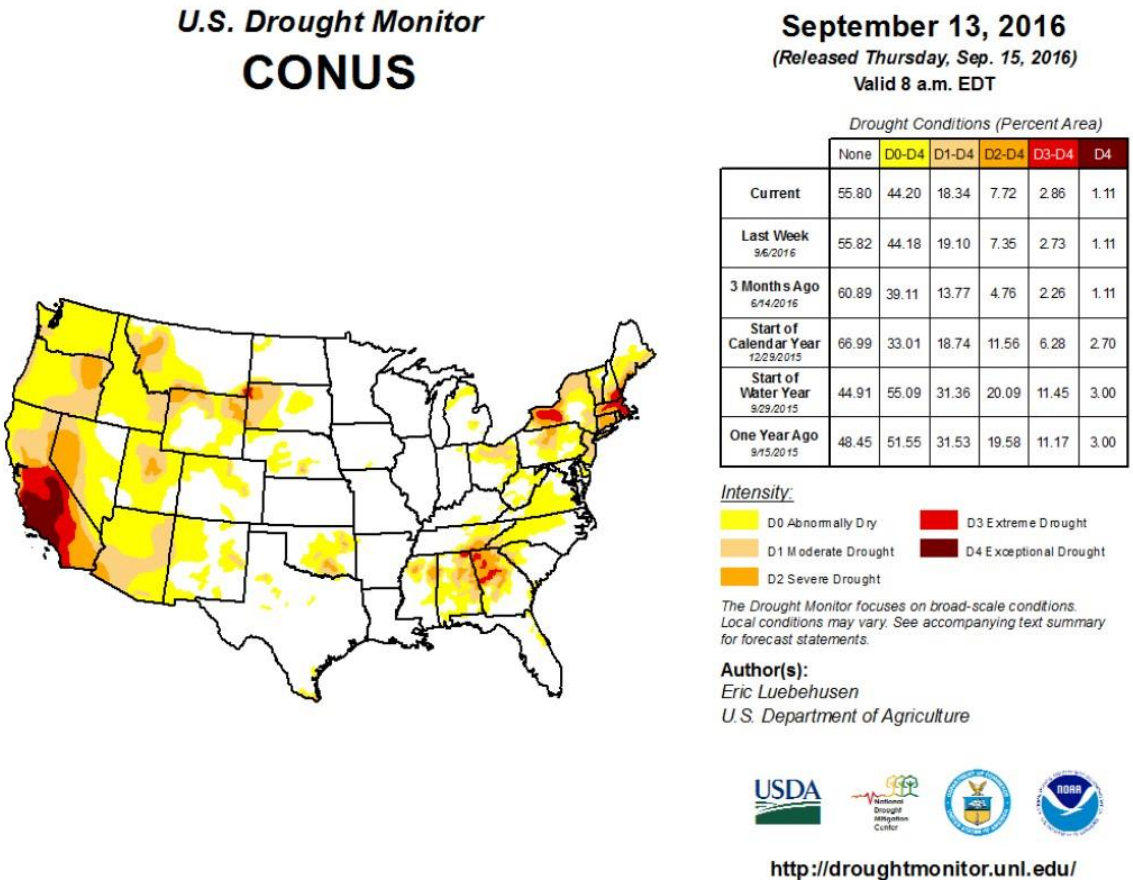
diminished stream-flow is likely to have lethal and sub-lethal effects on the state and federally-listed species of fish.[98]

- Marijuana cultivation, particularly indoors, uses significant amounts of energy.
- Mills stated that California is the top-producing state for indoor cultivation which is responsible for 3% of all electricity use, or 9% of household use throughout the state.[99] This corresponds to the "electricity use of 1 million average California homes, greenhouse-gas emissions equal to those from 1 million average cars, and energy expenditures of $3 billion per year… "As a comparison, energy use for marijuana production for the whole country is only 1%, which is $6,000,000,000 worth of electricity.[100]
- Other environmental harms common to marijuana grow sites are toxic chemical use, deforestation, and the prevalence of trash, irrigation tubing, and other human refuse. It is even possible that these toxins (pesticides, insecticides, fungicides, rodenticides, and herbicides) may eventually reach humans, through eating an animal that has previously consumed another poisoned animal.[101]



Source: Impact of Surface Water Diversions and Marijuana Cultivation on Aquatic Habitat in Four Northwestern California Watersheds, PLOS ONE 10 (art.e0120016).doi:10.1371/journal.pone.0120016

The map above was taken from a study of California watersheds. The study found that water diversion for marijuana cultivation has a substantial negative impact on the state's watersheds.



The map above depicts national drought condition as of September 2016. As you can see, most of California was experiencing exceptional to extreme drought conditions.[102]

Conclusion

Marijuana cultivation continues to negatively impact California. The amount of water necessary to maintain marijuana grow sites is putting additional strain on the state's extreme drought conditions. This water usage also creates lethal and sub-lethal conditions for state and federally-listed species of fish.[103] Indoor marijuana cultivation uses significant amounts of energy. Studies have shown that toxins (pesticides, insecticides, fungicides, rodenticides, and herbicides) used at marijuana grow sites may eventually reach humans, through consumption of an animal that has previously consumed another poisoned animal, but is inherently dangerous to the natural plant and wildlife that are exposed to the illegal toxins.

REPORT CONCLUSION

The analysis of recent trends in the prevalence of marijuana use in youth indicates that youth use continues to rise with its normalization overtime as it becomes more available and more socially acceptable. As noted in the previous chapters, marijuana consumption has many serious consequences to public health and safety, especially to children adolescents and young adults. There are many facts that need to be considered in order to make informed choices regarding marijuana. In this report, several studies have been presented which demonstrate that marijuana is not a benign drug. On the contrary, with ever increasing THC levels it is linked to physical and mental illnesses such as cognitive losses, anxiety, depression, psychotic symptoms, and neuropsychological decline.[104]

Marijuana is also a contributing factor in increased motor vehicle crashes and fatalities. As a result there is an increase in emergency room visits and hospital admissions due to marijuana related incidents.

The economic costs resulting from public health and safety issues, as well as environmental costs in the billions of dollars may continue to grow as more states commercialize and legalize marijuana use.[105] Not only is the quality of life for all citizens of California being jeopardized, the environmental impact of marijuana, including toxic pesticides and herbicides, as well as water availability and water quality are key concerns.

In addition to the risk of exposure to our population, wildlife is also suffering from loss of water, deforestation and an altered habitat. Many avian, aquatic and land animals, including those on the endangered list, are considerably more at risk.

Finally, there needs to be more education on the effects of marijuana and the potential harm it has on individuals and the environment as we move towards commercializing an unregulated product. The proliferation of illegal THC extraction labs near state-legal dispensaries also suggests that the state-legal marijuana stores may actually catalyze associated black market activity nearby, instead of diminishing it.

APPENDIX A: Explaining CBD and Hemp

Recently there have been numerous reports in the media about various cannabidiol (CBD) products and their purported medicinal affects. In Denver, Colorado, where medical and recreational marijuana are legal, such products have been called a miracle cure for Dravet Syndrome, a severe form of epilepsy in the pediatric and adolescent population. Some people are uprooting and relocating their families to the Denver area to gain access to these products for the treatment of their children who are afflicted with Dravet Syndrome and other seizure disorders.[106] Unfortunately, to date, there has been no animal or human testing meeting the Food and Drug Administration (FDA) requirements to substantiate these claims of efficacy for such products. Currently, there are no standards in place for the quality or composition of these unregulated products. This section focuses on the known qualities, effects, laws, and misconceptions surrounding CBD and its relationship to tetrahydrocannabinol (THC), as well as the impact on patients and their families.

Unapproved and illegal CBD products

There are numerous companies that have bypassed the FDA and produce CBD products that are purported to cure or reduce seizures in children. However, there is only one company to date that is undergoing FDA trials with outcomes supporting such claims. The composition of the products from the unregulated suppliers is of uncertain quality and can contain significant amounts of THC and other adulterants.

There is strong evidence that the THC contained in products to treat seizure conditions can act as a pro-convulsant (inducing seizures) in these already sensitive brains.[107] Other research indicates that THC can negatively impair IQ if taken chronically by children and adolescents. Lately, physicians have begun to report instances where their adolescent patients experienced high anxiety, increased seizures, and insomnia due to adulterants in these unregulated products. Recently, parents have taken to the internet to voice their concerns that the batches do not have a consistent effect; that their children are becoming intoxicated or “high”; and, that for some, their children’s seizures are worsening.

The exact ratio of CBD to THC in all unregulated products is unknown, however, one product reportedly contains a 20:1 CBD to THC ratio. To better understand how much THC can be in one of these unregulated products, we can look to an FDA product: Marinol. Marinol is a synthetic form of THC developed in the 1980’s for treatment of nausea and vomiting in cancer chemotherapy patients and, later, for wasting disease in HIV/AIDS patients. Marinol has a standard adult dosage of 10 mg per pill. The common daily dose of CBD in FDA-approved trials for an average-size child/adolescent (110 pounds) with Dravet Syndrome is 400 mg, which, at 20:1 ratio would expose a child to 20 mg of THC, the equivalent of a multiple adult dose of Marinol.

“Be sure to tell your doctor if you have a history of seizure disorders and /or seizure-like activity because this has occurred in people taking MARINOL. If you experience a seizure, stop taking

MARINOL and seek medical attention immediately."[108]

A recent Wall Street Journal article titled "Marijuana Extract for Children with Epilepsy is Questioned," by Arian Campo-Flores, states that early research shows that in some cases the substance failed to help and even worsened others. Kevin Chapman, a neurologist at Children's Hospital Colorado and co-author of a study released at an American Epilepsy Society meeting in December said, "We don't have enough data at this point to recommend marijuana products for families."109 Most anecdotal claims of the positive effects of CBD on patients have reportedly been from those who moved to Colorado for treatment and may in part be experiencing a placebo effect.

The American Epilepsy Society's Position on CBD

The American Epilepsy Society reports that they do not know if marijuana is a safe and effective treatment for epilepsy, which is why they support studies using the well-founded research methods that all other effective treatments have undergone. Such safety concerns, coupled with a lack of evidence of efficacy in controlled studies, result in a risk-benefit ratio that does not support use of crude or adulterated marijuana products for treatment of seizures at this time.110

What is CBD?

CBD is one of the more than 66 cannabinoids found in the marijuana plant.111 Unlike THC, CBD does not cause psychoactivity; in fact, only the THC in marijuana gives the drug its intoxicating effects. CBD is largely bred out of high-potency, modern recreational cannabis, however there has been recent interest in its therapeutic qualities. As a result, a number of breeders claim to produce "high CBD" strains, which are being used in unregulated CBD products. The suppliers of CBD products proclaim that THC enhances the healing effects of CBD, but there is no valid research to support this claim. A possible reason for this claim is that it is extremely expensive and difficult to extract pure CBD.

How does CBD work?

CBD works through a number of complex mechanisms. Preclinical studies indicate that CBD has analgesic (pain-relieving), anti-convulsant, anti-psychotic, and neuroprotective effects. Unlike THC, it does not readily bind to the CB1 or CB2 cannabinoid receptors in the human brain, which is why it does not cause psychoactivity.112

What is the legal status of CBD?

CBD is a cannabinoid of the cannabis (marijuana) plant and is therefore a Schedule I substance under the federal Controlled Substances Act (CSA). The FDA has recently confirmed that CBD is a Schedule I substance. Schedule I includes those substances that have a high potential for abuse; have no currently accepted medical use in treatment in the United States; and lack accepted safety for use under medical supervision.113 While CBD oil on its own is not considered legal, there are some companies researching the potential of medications that incorporate cannabinoids, and going through the proper FDA approval process to ensure that their products are safe and effective.

What is hemp and what is its legal status?
Hemp is a variety of cannabis that is grown for its fiber, seeds, or both. Under European law, true hemp has 0.3 percent (3/10 of 1 percent) THC, and very low levels of CBD (1.5-2 percent). The cannabinoids (including CBD) are contained in small, hair-like appendages called trichomes. A few of these are found on (not in) the stalk of the hemp plant. However, the greatest concentrations of CBD are found in the flowers and leaves of the plant. Therefore, it would take a great deal of hemp plant material to produce a meaningful amount of CBD. "High CBD cultivars" very likely contain too much THC to qualify as hemp, as it is very difficult to breed a plant that has more than a 20:1 CBD to THC ratio.114

Under the Controlled Substances Act, marijuana is defined as: "all parts of the plant Cannabis sativa L., whether growing or not; the seeds thereof; the resin extracted from any part of such plant; and every compound, manufacture, salt, derivative, mixture, or preparation of such plant, its seeds or resin. This does not include the mature stalks of such plant fiber produced from stalks, oil or cake made from the seeds of such plant, any compound, manufacture, salt derivative, mixture, or preparation of such mature stalks (except the resin extracted therefrom), fiber, oil, or cake, or the sterilized seed of such plant is incapable of germination."115

What is hemp seed oil?
True hemp seed oil contains virtually no cannabinoids, which is why it can be sold legally in the United States as a dietary supplement. The US Department of Agriculture indicates that hemp seeds can be used directly as a food ingredient or crushed for oil and meal.116

What is CBD hemp oil? Is it a legal dietary supplement?
Since true hemp contains very low levels of CBD and hardly any THC, so called "CBD hemp oil" is most likely produced from high CBD plants, which would not qualify as hemp because they would have more than 0.3% THC. It could also be made from massive quantities of hemp flowers, which still falls within the definition of marijuana. These high CBD plants also contain varying amounts of THC (e.g., CBD to THC ratios of 1:1, 10:1, 20:1, etc.), therefore any hemp oil containing a significant amount of CBD is being manufactured and sold illegally.117 Even CBD extracted from true hemp flowers and diluted with hemp oil is still a Schedule I substance.

The U.S. Code of Federal Regulations provides that certain processed cannabis plant material or animal feed mixture that contain THC are exempted from the CSA if they are 1) made from the part of the plant excluded from the definition of marijuana and 2) not used or intended for human consumption. This clearly indicates that any products containing THC (even small amounts) that are used or intended for human consumption are illegal. It is entirely false to claim that CBD-rich hemp oil products are legal nutraceuticals.118

Are unregulated CBD products safe?
High CBD plant material contains varying levels of THC, sometimes significant amounts. Most simple extraction processes can't reliably remove most or all of this THC, because extremely complex and expensive equipment is required to adequately remove THC and produce a pure CBD extract. Research demonstrates that, in many cases, large doses of CBD are needed to achieve a specific therapeutic

effect, so most products made for this purpose would also include dangerously high levels of THC.

Conclusion

The use of marijuana in pediatric populations remains an ongoing concern due to the known medical, psychological, and cognitive side effects it can cause. In many cases, purportedly high CBD products may also be contaminated by pesticides, synthetic fertilizers, heavy metals, and dangerous microbes, which can all be quite hazardous. Legislators, policy makers, law enforcement, and the public need to be made aware of these unregulated CBD products that are being marketed as medication but actually contain high levels of THC. These products can be unsafe and may cause seizures and other adverse effects. Support should be given to companies that go through the FDA process, such as GW Pharmaceutical.

True hemp seed oil does not contain cannabinoids and therefore is legal and can be used as a dietary supplement. CBD-hemp seed oil is being fraudulently sold as a legal substance despite the fact that containing any substantial amount of CBD is illegal under the Controlled Substances Act.

APPENDIX B: Detail on Environmental Impacts of Marijuana Cultivation

A recent research study looked at four watershed areas where salmon and trout are known to spawn. The three watersheds being used by marijuana farms literally used all of the water during the streams' summer low-flow period, leaving nothing to support fish and wildlife. The diminished stream-flow is likely to have lethal and sub-lethal effects on the state and federally-listed species of fish.[119]

The situation has become severe enough that the California State Assembly passed a bill in June 2015, entitled "The Watershed Protection Act." This bill is aimed at curbing the environmental destruction caused by marijuana cultivation. Some of the key elements of the bill are

- Requirements that growers follow state and local laws regarding land conservation, grading, water usage, etc.
- The prohibition of outdoor cultivation within 100 feet of homes or schools
- A requirement that all outdoor cultivation sites be out of public view and behind a fence at least six feet high.[120]

Another effect of marijuana cultivation is significant energy use, particularly for cultivators who grow indoors. Electricity is used for lighting; dehumidification; space heating, cooling, and drying; pre-heating irrigation water; generating carbon dioxide; and ventilation and air conditioning. In a study Mills estimates that "In California… indoor cultivation is responsible for about 3% of all electricity use, or 9% of household use."[121]To put that in perspective, this corresponds to the "electricity use of 1 million average California homes, greenhouse-gas emissions equal to those from 1 million average cars, and energy expenditures of $3 billion per year… From the perspective of individual consumers, a single Cannabis cigarette represents 1.5 kg (3 pounds) of CO2 emissions, an amount equal to driving a 44 mpg hybrid car 22 mile or running a 100-watt light bulb for 25 [hours]."[122] As a comparison, energy use for marijuana production for the whole country is only 1%, which is $6,000,000,000 worth of electricity.[123]

Other environmental harms common to marijuana grow sites, particularly illegal operations, are toxic chemical use, deforestation, and the prevalence of trash, irrigation tubing, and other human refuse. Many farmers of marijuana use various pesticides, insecticides, fungicides, rodenticides, and herbicides to keep predators away from their crops. These chemicals are often spread liberally around grow sites and harm not only the intended predators but also other animals who may eat them, or may eat animals that have consumed the chemicals. It is even possible that the toxins may eventually reach humans, through eating something that has previously consumed another poisoned animal.

Marijuana farmers also often clear large tracts of land for their use. This not only needlessly eliminates trees, it also destroys animal habitats, can contribute to soil erosion, and ultimately to landslides. When law enforcement and volunteer teams move into clean up grow sites, they also find plastic irrigation tubing, garbage, chemicals, and human waste, all of which damage the environment. All of these actions taken by growers effect not only their own grow sites, but have

the potential to effect much larger segments of our natural habitats. For example, toxic chemicals can leak into ground water or streams, harming many more animals (and people) than those at the site.[124]

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