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October 26, 2017

Mayor Mary Casillas Salas, and
Members of the City Council
City of Chula Vista

Re: Cannabis Policy Workshop

HAND DELIVERY

Dear Mayor and City Council:

The purpose of my letter is to provide information to you and the City Council in reference to the Cannabis Workshop on October 26, 2017.

We strongly support the City's approval of a program to allow licensed commercial cannabis facilities in conformance with Proposition 64 AUMA passed by the voters in November, 2016, and the subsequent passage of SB94 by the California Legislature which merges AUMA and MCRSA (now referred to as the Medical and Adult Use Cannabis Regulation and Safety Act or "MAUCRSA"). The following information is submitted on behalf of my clients – US Veterans, Cannabis Nurses and individuals in the Chula Vista business community who seek local approval to participate in California's legal commercial cannabis industry

As you know, our state leaders have spent the past three (3) years working on legislation and voter initiatives to now arrive at a comprehensive commercial cannabis program now known as MAUCRSA or SB 94. It was passed by 88% of the Senate and 90% of the Assembly, and signed into law by Governor Brown. In essence, SB 94 confirms the scientific conclusion that all cannabis is medical cannabis and everyone who uses cannabis uses it for a medical reason whether they know it or not. As such, all cultivation and manufacturing for medical or adult use will be licensed and regulated the same; finished flower or infused products will be distributed to either M License Retailers (Medicinal) or A License Retailers (Adult) with the primary distinction depending upon qualifications for access (medical recommendation v. age) and taxation.

The Bureau of Cannabis Control just released its 500 page program analysis for CEQA compliance on September 5, 2017. It can be found at www.bmcr.ca.gov . **It concludes that all aspects of the program fall within the negative declaration provisions of CEQA.** In its summary, it concludes that in regards to Public Services, **PS-1: Police Protection Services**, the finding is "LTS" or **Less Than Significant**. This is consistent with the findings in all 46 states and 2 US Territories that currently provide some form of legal cannabis program, i.e., that the crime rate is unaffected by regulated cannabis facilities, or it actually goes down, and the findings of respected, neutral thinktanks, like the CATO Institute. An excerpt from

the CATO Institute analysis is contained herein. In 16 of those states, the only patients who can legally use cannabis are kids.

The organizations I represent – veterans and cannabis nurses – favor expanded access to licensing opportunities in Chula Vista to ensure an adequate supply of cannabis medicine (whether purchased as a patient with a recommendation or over-the-counter as adult use) to service the Chula Vista/San Diego supply chain. Your undersigned has represented them in several landmark cases that proved the safety and efficacy for the use of cannabis for traumatic brain injury, movement disorders and post-traumatic stress disorder in evidentiary trials. San Diego County is home for largest veteran population with nearly 30% of the population comprised of veterans or their family members. Certified cannabis nurses represent the best informed and most effective health professionals to provide the appropriate type of cannabis, method of administration and dosage for the medical use of cannabis for patients.

These constituents respectfully request that the City of Chula Vista adopt a reasonable commercial cannabis program allowing *cultivation, manufacture and retail sales of cannabis products so that patients and adult users can safely access their products in Chula Vista, and Chula Vista residents can enjoy the profits, jobs and taxes generated by such businesses..*

An reasonable commercial cannabis industry in Chula Vista will help fill the gap between supply and demand. As you know, the new Adult Use (over-the-counter) will increase the existing demand under medical-only by a **30 fold increase**, not including the adult portion of the 38 million out-of-state visitors to the San Diego area.

Economic Impact:

- When fully operational, 8 Tier 3 mixed light grows will generate about $8 million in local tax revenues, more if ancillary use (manufacturing) is also allowed, assuming @ 8% tax (per San Diego Measure N, 2019). An average dispensary will generate at least $800,000 in local taxes annually.
- Jobs Creation: Est. 150 FTE jobs and 50 part time jobs at minimum $20/hour, on average, or more: $6M/year.
- New construction to retrofit and equip facilities @ minimum $25 sq. ft. x (up to) 200,000 sq. ft.
- Indirect Impacts (happens as dollars the local business spent at other area businesses re-circulate) and Induced Impacts (spending by business and employees): $2.20/$1.00
- Importantly, the economic impact of cannabis commercialization is tied to the community as the license is secured to an Chula Vista location and license, and can't be exported to another locale, region or state.

In addition, in many of the dispensaries, manufacturers and cultivation facilities, our veteran organization has been able to secure a commitment from the owners to contribute to the welfare of our veterans by providing free or reduced cost cannabis products for their service-related injuries and/or a commitment to adopt hiring policies that favor local veterans first, local workers, or veterans in nearby communities.

In the absence of an expanded licensing program as I have described, above, Chula Vista and our adult visitors will continue to purchase substantially all of its cannabis and cannabis products from outside Chula Vista with the loss of jobs and the revenues associated with real estate and construction industry as well as the multipliers involved as these investments re-circulate through our local economy. **Our loss would become the Emerald Triangle gain** as their farmers will supply local dispensaries with the cannabis flower and products to meet the demand.

Over the course of the last few months, I'm sure you have heard from speakers who support prohibition and will use "protecting our kids" as their rationale. Please consider a few points as those citizens express their views.

1. The same issue was raised in 1996 when California became the first state to allow medical cannabis use, and has been raised at least 45 times (or more) in 45 states in the ensuing twenty (20) years. In thirty (30) states the voters or legislatures adopted a full medical cannabis programs, in eight (8) of those states the voters or legislators adopted adult or over-the-counter program, and in the remaining 16 states the voters or legislators adopted a limited medical cannabis program. The limitation? The only patients who can legally use cannabis in those 16 states are....kids! Currently, 95.6% of all US residents live in states that have some form of legal medical or adult use cannabis. In addition, the entire North American continent has a medical or adult legal program with Canada having both on a federal level and Mexico on a medical level. [Recently, I reviewed a contract between a Jamaican cannabis company to supply a Mexican cannabis company with cannabis flower and products as Mexico launches its new program. Last week, a Canadian company signed a contract with a German company to sell cannabis products there].
2. The entire structure of MAUCRSA has significant protections for use including an age 18 threshold to acquire a medical recommendation; an 21 age threshold to buy cannabis over-the-counter.
3. In the 3 ½ years that the City San Diego has had a regulated dispensary program, there is not one reported age-related diversion citation against any of the 15 approved dispensaries. Compare that to the number of reported incidents where alcohol was provided to a minor.
4. Notice that not one of the speakers for Prohibition will ever mention science, i.e., the existence of the human endocannabinoid system or eCS. If they did, their argument would be over. The highest level of production of endocannabinoids (THC produced in our body from birth) occurs in a nursing new mother who provides the essential cannabinoids necessary for her child's survival and development. Cannabis from the plant or phytocannabinoids are a nutritional supplement that are virtually identical to the endocannabinoids produced within our body. [Colorado is a good example. Thousands of people have re-located to Colorado in order to legally obtain cannabis for their children's medical needs. They are often referred to as cannabis refugees and are documented in Dr. Sanjay Gupta's series on cannabis].

Lastly, In addition to the foregoing, we have attached some relevant materials – primarily from independent think tanks or peer reviewed sources – that fairly present the realities of cannabis, and proving that the economic and health gains from cannabis commercialization in Chula Vista far outweigh any perceived (and unfounded) social harms.

Should you have any questions, comments or concerns, please don't hesitate to contact me.

With kind regards, I am
Very truly yours,

/KS/
Ken Sobel

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GREEN STATE

California was known as a major marijuana-producing state before it legalized recreational use. Just how big of a producer may surprise you.

By KURT SNIBBE | *Southern California News Group*

LOCALLY GROWN

As of Nov. 9, adults in California were allowed to grow up to six marijuana plants per household as long as the area is locked and not visible from a public place. Rules may vary depending on municipal restrictions. Purchasing marijuana for recreational use will not be allowed until 2018.

Major growth

One indication of how much marijuana is grown in California is the number of plants seized by law enforcement on federal lands. Here are some of the largest areas where trespass cultivation occurred in 2013 in national forests.

Why on public lands?

A lot of outdoor cannabis cultivation in California occurs on public lands, where cultivators take advantage of remote areas to avoid risk of forfeiture of property.

Outdoor growing can yield more per plant and have less overhead than indoor growing.

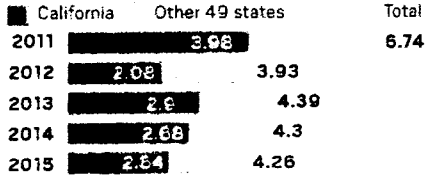
California has 1.3 million acres of state park land and more than 8 million acres of national forest and wilderness.

Estimated market total

The United Nations World Drug Report estimates that law enforcement around the world seizes only 10 to 20 percent of drugs produced. If the marijuana plants seized in 2015 (2.64 million) are considered to be 20 percent of California's production, the state would have had 13.2 million plants. If each plant produced a conservatively estimated 1 pound with a market price of $1,765 per pound, the total value would equal about $23.3 billion.

Millions of plants

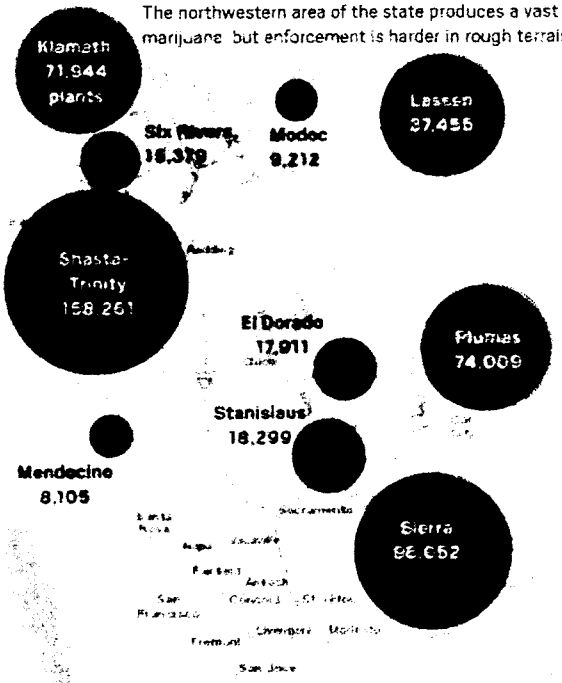
California leads the nation every year for total illegal plants seized indoors and outdoors.



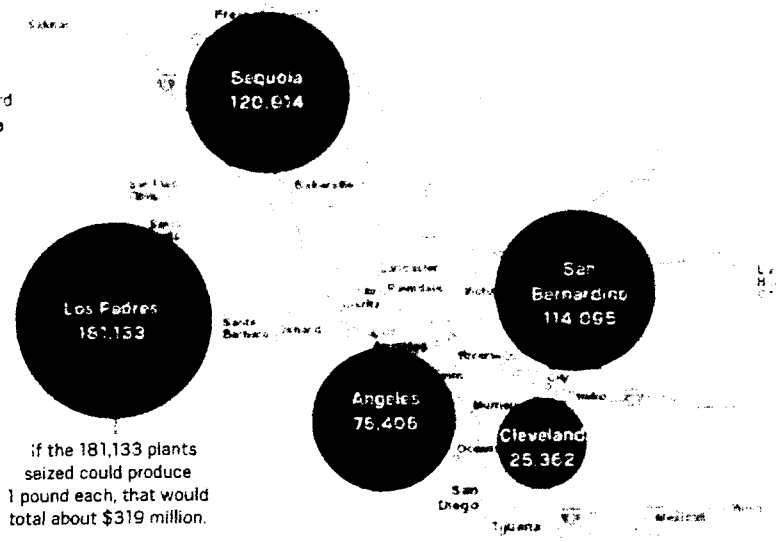
Top crops in 2015

Plants seized in national forests in 2013

The northwestern area of the state produces a vast amount of marijuana, but enforcement is harder in rough terrain.



About one-third of the marijuana plants seized in the state were grown on public lands.



If the 181,133 plants seized could produce 1 pound each, that would total about $319 million.

CALIFORNIA'S NO. 1

California leads the nation by total plants seized every year. Here are the top two states from 2011 to 2015:

2011
1. California, 3.98 million
2. Tennessee, 600,259

2012
1. California, 2.08 million
2. Kentucky, 414,378

2013
1. California, 2.9 million
2. Kentucky, 443,788

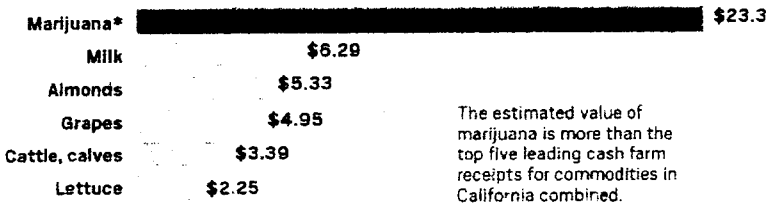
2014
1. California, 2.68 million
2. Kentucky, 461,543

2015
1. California, 2.64 million
2. Kentucky, 571,340

The map below uses data from the website PriceOfWeed.com, which tracks prices on the black market and at legal dispensaries. It shows that the states that legalized recreational marijuana have the lowest prices, whereas states such as North Dakota, where marijuana is strictly prohib-

California's Department of Food and Agriculture says the state's farms and ranches totaled $47 billion in cash farm receipts for 2015. Here are the top commodities compared with the estimated amount for marijuana.

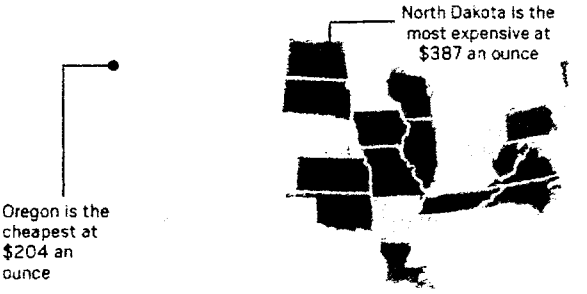
In billions of dollars



*Estimated

The estimated value of marijuana is more than the top five leading cash farm receipts for commodities in California combined.

ited, have the highest.



Marijuana legal for recreational sale: Colorado, Oregon and Washington
Prices for Dec. 15

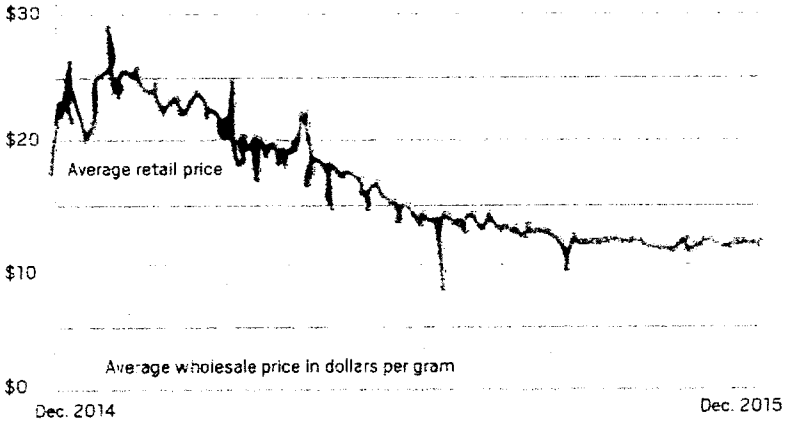
Price per ounce
Lowest
Highest

WHAT'S HAPPENED IN OTHER STATES

Colorado voted in 2012 to legalize recreational use of marijuana, which led to legalization in 2014. The charts below show how prices for marijuana declined in the state, while the taxes raised from it increased. California is likely to have the same situation but on a much larger scale.

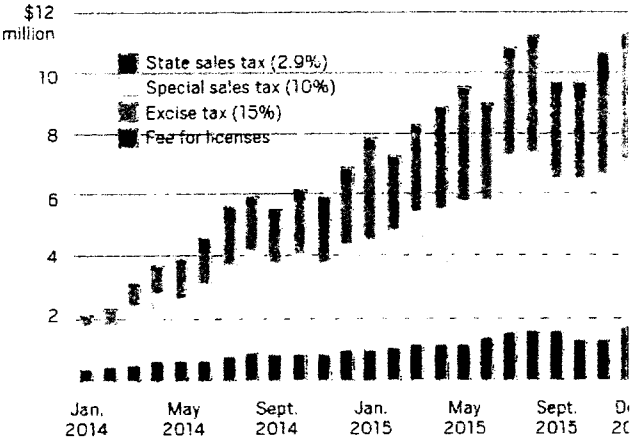
Prices down

After-tax prices for recreational cannabis in Washington state after legalization show the cost to consumers was nearly cut in half.



Tax revenue rises

Monthly revenue from retail sales tax, excise tax, and fees for licenses and applications in Colorado. Note: California has more than seven times the population of Colorado.



Sources: California Department of Agriculture, Drug Enforcement Agency, Leafly.com, U.S. Department of Justice, Washington State Liquor and Cannabis Board, Priceofweed.com

CATO INSTITUTE

"The absence of significant adverse consequences of Cannabis is especially striking given the sometimes dire predictions made by legalizing opponents"

POLICY ANALYSIS NO. 799

Dose of Reality: The Effect of State Marijuana Legalizations

By *Angela Dills, Sietse Goffard, and Jeffrey Miron*

September 16, 2016

EXECUTIVE SUMMARY

In November 2012 voters in the states of Colorado and Washington approved ballot initiatives that legalized marijuana for recreational use. Two years later, Alaska and Oregon followed suit. As many as 11 other states may consider similar measures in November 2016, through either ballot initiative or legislative action.

Supporters and opponents of such initiatives make numerous claims about state-level marijuana legalization. Advocates think legalization reduces crime, raises tax revenue, lowers criminal justice expenditures, improves public health, bolsters traffic safety, and stimulates the economy. Critics argue that legalization spurs marijuana and other drug or alcohol use, increases crime, diminishes traffic safety, harms public health, and lowers teen educational achievement. Systematic evaluation of these claims, however, has been largely absent.

This paper assesses recent marijuana legalizations and related policies in Colorado, Washington, Oregon, and Alaska.

Our conclusion is that state marijuana legalizations have had minimal effect on marijuana use and related outcomes. We cannot rule out small effects of legalization, and insufficient time has elapsed since the four initial legalizations to allow strong inference. On the basis of available data, however, we find little

support for the stronger claims made by either opponents or advocates of legalization. The absence of significant adverse consequences is especially striking given the sometimes dire predictions made by legalization opponents.

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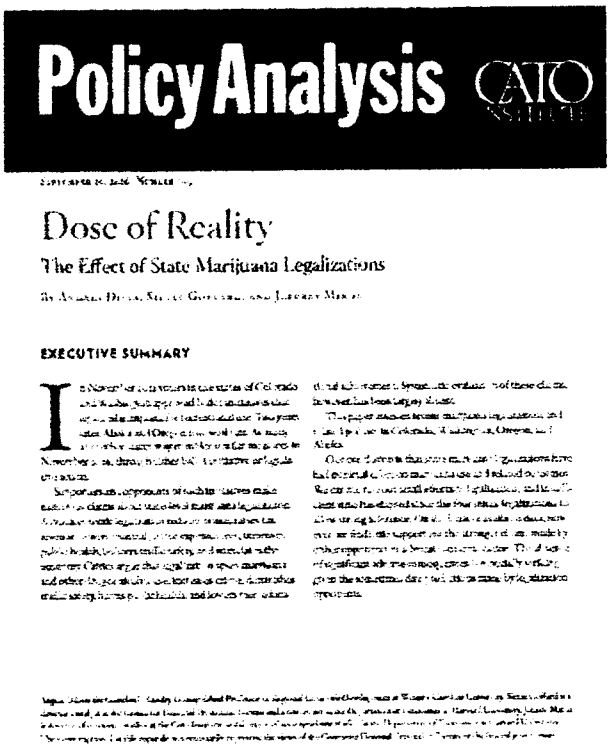

Policy Analysis CATO

Dose of Reality

The Effect of State Marijuana Legalizations

EXECUTIVE SUMMARY

Downloads

PDF (3.75 MB)
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Introduction

In November 2012 the states of Colorado and Washington approved ballot initiatives that legalized marijuana for recreational use under state law. Two years later, Alaska and Oregon followed suit.[1] In November 2016 as many as 11 other states will likely consider similar measures, through either ballot initiative or state legislative action.[2]

PLOS ONE

"State Medical Marijuana Licenses may be correlated with a reduction in homicide and assault rates"

- Tulane University School of Public Health

RESEARCH ARTICLE

The Effect of Medical Marijuana Laws on Crime: Evidence from State Panel Data, 1990-2006

Robert G. Morris, Michael TenEyck, J. C. Barnes, Tomislav V. Kovandzic

Abstract

Background

Debate has surrounded the legalization of marijuana for medical purposes for decades. Some have argued medical marijuana legalization (MML) poses a threat to public health and safety, perhaps also affecting crime rates. In recent years, some U.S. states have legalized marijuana for medical purposes, reigniting political and public interest in the impact of marijuana legalization on a range of outcomes.

Methods

Relying on U.S. state panel data, we analyzed the association between state MML and state crime rates for all Part I offenses collected by the FBI.

Findings

Results did not indicate a crime exacerbating effect of MML on any of the Part I offenses. Alternatively, state MML *may* be correlated with a reduction in homicide and assault rates, net of other covariates.

Conclusions

These findings run counter to arguments suggesting the legalization of marijuana for medical purposes poses a danger to public health in terms of exposure to violent crime and property crimes.

Citation: Morris RG, TenEyck M, Barnes JC, Kovandzic TV (2014) The Effect of Medical Marijuana Laws on Crime: Evidence from State Panel Data, 1990-2006. PLoS ONE 9(3): e92816. doi:10.1371/journal.pone.0092816

THE TRUTH ABOUT CANNABIS AND KIDS

*Cannabis has been used as medicine for all of recorded history as documented by Chinese medicine 5,000 years ago.

*Evidence of an endocannabinoid system (Ecs) has been found in organisms dated 70 million years ago"

*Old Testament, Genesis 1:29 provides that God gave all plants to man to use for food and nutrition

*Cannabis was used as medicine by Jesus called "kaneh-bosem", extracted using olive oil and applied as anointing for feet and skin conditions (leprosy). Science proves that the skin is chock full of CB2 receptors which explains why the topical application of cannabis oil provides healing benefits to the feet and skin

*Cannabis was listed in the American Pharmacopeia for 80 years (1860 – 1940) and was only removed because of federal prohibition (note: The American Medical Association testified against Cannabis Prohibition in 1937)

*Farmers, like George Washington and Thomas Jefferson, grew American Cannabis ("hemp"). It was such an important commodity in the Revolutionary War period that farmers were required to grow it and could use it instead of currency to pay taxes

*Cannabis is now legal in 46 states, Washington, D.C., and 2 US Territories.

***In 16 states the ONLY patients who can legally use cannabis are....KIDS!**

*As legalization in the US goes up, cartels go out of business. More than a 10%+ decline in illegal cannabis coming through the US/Mexico border in each of the past 7 years

*The rate of cannabis use by teenagers in states that legalize it generally goes down or stays about the same after prohibition is lifted

*No overdose death due to cannabis in all of recorded history...it's a safe and gentle plant medicine that fits perfectly with our endocannabinoid system

*The highest level of human endocannabinoid production occurs in a lactating mother who is nursing her baby as the cannabinoids are vital to the health and well-being of the child

*An observational study found that children born from mothers who used cannabis were as healthy at birth (if not more so) than the same from mothers who did not use it

***State Law (MCRSA & AUMA) have strict regulations that prevent diversion of cannabis to underage users (MCRSA – medical – requires proof of age 18; AUMA – Adult Use – requires proof of age 21 and over**

***No evidence of diversion of cannabis to minors by cannabis dispensaries in San Diego after 3 years of operating a regulated program**

***No evidence of discipline or license suspension for diversion to minors by dispensaries in Arizona after 5 years of operations**

KEN SOBEL, ESQ., VICE PRESIDENT, GROW FOR VETS US; CALIFORNIA CANNABIS NURSES ASS'N GENERAL COUNSEL, 619.208.2439; kennysocal711@gmail.com

*Smoking Cannabis is Not Harmful. Standing next to someone smoking cannabis is safe. Not the same as cigarettes. On April 21, 2016, the FDA approved a controlled study of whole plant cannabis using smoked cannabis to study the effects of cannabis on post-traumatic stress disorder for returning Iraq and Afghanistan veterans.

*Cannabis is defined as an "Agricultural Commodity" in California under the Medical Cannabis Regulation & Safety Act (MCRSA) passed by the California Legislature and signed by Governor Brown in September 2015

*80% of the Assembly voted "Yes"; 77% of the Senate voted "Yes"; the Governor signed the bill.

*55% of California voters voted for Adult Use of Marijuana Act ("AUMA"); 65% of Encinitas voters voted "Yes"

*When legal, regulated cannabis comes in, illegal marijuana from Mexican cartels goes down. More than a 10%+ drop year-over-year for the past 7 years!

*Cannabis cultivation is supported and endorsed by the San Diego County Farm Bureau

*Cannabis is safe and effective for the treatment of opiate addiction (heroin)

*Opiate overdose death has declined 25% in states with full medical cannabis program

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The Washington Post

Wonkblog

Teen marijuana use falls to 20-year low, defying legalization opponents' predictions

By Christopher Ingraham September 7

In 2016, rates of marijuana use among the nation's 12- to 17-year-olds dropped to their lowest level in more than two decades, according to federal survey data released this week.

Last year, 6.5 percent of adolescents used marijuana on a monthly basis, according to the latest National Survey on Drug Use and Health. That represents a statistically significant drop from 2014, when the nation's first recreational marijuana shops opened in Washington state and Colorado.

The last time monthly teen marijuana use was this low was 1994, according to the survey.

Public health experts tend to worry more about adolescent than adult drug use because adolescent brains are still developing. Teen drug use is linked to a host of health problems later in life, including addiction, criminal behavior and cognitive deficits.

The marijuana trend defies the warnings of those who oppose its legalization, who have long predicted that loosening restrictions on marijuana would "send the wrong message" to teens and increase teen drug use.

The federal data show that adult marijuana use, on the other hand, is rising. Last year 20.8 percent of Americans between the ages of 18 and 25 used marijuana at least monthly, the highest number since 1985. Among adults ages 26 to 34, 14.5 percent used marijuana monthly in 2016, also the most since 1985.

Those numbers have been rising for several decades, well before the advent of legal recreational and medical marijuana. The survey didn't provide trend data for older age groups, but other studies have shown that marijuana use is growing the fastest among middle-aged and older adults.

While marijuana use increased among adults, past-month alcohol use fell, according to the survey. Last year 55 percent of adults ages 18 and older drank alcohol at least monthly, compared with 56 percent in 2015. While small, that drop was statistically significant, lending some credence to the notion that some adults may be substituting marijuana for alcohol.

Public health research has generally shown that alcohol use is more harmful to individuals and society than marijuana use, although marijuana still poses a number of risks to its users.

Nationwide, over 60 percent of American adults say marijuana use should be legal, according to an August 2017 Quinnipiac poll.

15 Comments

Christopher Ingraham writes about politics, drug policy and all things data. He previously worked at the Brookings Institution and the Pew Research Center. Follow @_cingraham

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Viewing Options

Donna K 2 days ago

Simple, really. Do you know many teenagers that like to do the things their parent's generation does? Uncool! Might as well take up golf!

What will you do?

APHA PRESS

Crash Fatality Rates After Recreational Marijuana Legalization in Washington and Colorado

Jayson D. Aydelotte MD, **Lawrence H. Brown** PhD, **Kevin M. Luftman** MD, **Alexandra L. Mardock** BA, **Pedro G. R. Teixeira** MD, **Ben Coopwood** MD, and **Carlos V. R. Brown** MD

[+] Author affiliations, information, and correspondence details

Accepted: April 11, 2017 Published Online: July 12, 2017

Objectives. To evaluate motor vehicle crash fatality rates in the first 2 states with recreational marijuana legalization and compare them with motor vehicle crash fatality rates in similar states without recreational marijuana legalization.

Methods. We used the US Fatality Analysis Reporting System to determine the annual numbers of motor vehicle crash fatalities between 2009 and 2015 in Washington, Colorado, and 8 control states. We compared year-over-year changes in motor vehicle crash fatality rates (per billion vehicle miles traveled) before and after recreational marijuana legalization with a difference-in-differences approach that controlled for underlying time trends and state-specific population, economic, and traffic characteristics.

Results. Pre–recreational marijuana legalization annual changes in motor vehicle crash fatality rates for Washington and Colorado were similar to those for the control states. Post–recreational marijuana legalization changes in motor vehicle crash fatality rates for Washington and Colorado also did not significantly differ from those for the control states (adjusted

difference-in-differences coefficient = +0.2 fatalities/billion vehicle miles traveled; 95% confidence interval = −0.4, +0.9).

Conclusions. Three years after recreational marijuana legalization, changes in motor vehicle crash fatality rates for Washington and Colorado were not statistically different from those in similar states without recreational marijuana legalization. Future studies over a longer time remain warranted.

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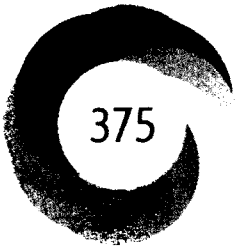

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ARTICLE CITATION

Jayson D. Aydelotte et al. "Crash Fatality Rates After Recreational Marijuana Legalization in Washington and Colorado", *American Journal of Public Health* 107, no. 8 (August 1, 2017): pp. 1329-1331.

DOI: 10.2105/AJPH.2017.303848

PMID: 28640679

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on Media, Politics and Public Policy

Marijuana legalization: Research review on crime and impaired driving

(Pixabay/public domain)

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In November 2016, voters in nine states decided whether to legalize marijuana for medical or recreational use, according to a running tally by *The Cannabist*, a project of *The Denver Post*. Recreational use of the drug is already permitted in a handful of states, and can be prescribed by doctors in over half, though it remains banned under federal law.

Reports on the issue suggest voters were concerned: does marijuana use affect crime rates?

A growing body of research addresses the question, tackling arguments used often by opponents and advocates of marijuana liberalization.

Opponents often claim that people who use marijuana are more likely to move on to harder drugs — the "gateway drug" theory — and that users of hard drugs engage in predatory crimes to feed their habits. Critics of legalization also argue that increasing accessibility means more youth will smoke or eat weed, that marijuana shops and growers are attractive targets for criminals, that marijuana use encourages alcohol abuse, and that stoned drivers are a public menace.

On the flip side, advocates for legalization argue it will undercut the black market, which is associated with criminals and violent elements. Crime may fall as police resources are reallocated to other pressing issues, they argue. Researchers have found, moreover, that some people substitute marijuana for alcohol, which means they drink less. And legalization of marijuana may reduce racial disparity in drug arrests. Black men, according to federal data collated by the American Civil Liberties Union and widely cited by scholars, are almost four times more likely to be arrested for marijuana possession than whites, even though both groups use the drug at roughly the same rate.

Most research on the link between marijuana and crime finds that medical marijuana laws (often abbreviated as MML) cause a general uptick in the use and availability of marijuana — beyond the patients who are prescribed the drug. "The legalization of marijuana for medicinal purposes approaches de facto legalization of marijuana for recreational purposes," write D. Mark Anderson of Montana State University and Daniel I. Rees of the University of Colorado Denver in the *Journal of Policy Analysis and Management*. By examining pre- and post-legalization in these MML states, they can "make predictions about what will happen in" states that legalize marijuana for recreational use.

Impact on crime

Several studies have found reductions in crime after marijuana is legalized for medical use, demonstrating a relationship, but not necessarily causation.

Showing a "clear connection between medicinal use and reductions in non-drug crime," Arthur Huber III, Rebecca Newman and Daniel LaFave of Colby College link medical marijuana to a 4 percent to 12 percent reduction in property crimes such as theft and burglaries. Crime has fallen across the United States in recent years, but in states with MML it has fallen approximately 5 percent more. Contrariwise, Huber and his colleagues find that depenalization — lowering penalties and, thus, the risk of possession — is linked to an increase in such crimes by 6 percent to 11 percent. That effect is similar to the amount crime would rise during an uptick in unemployment of 2 percent to 3 percent.

In widely cited research, Robert G. Morris of the University of Texas and colleagues see crime fall in every state that has introduced MML. Using FBI data on seven types of crime across states with and without MML, they dismiss concerns about rising crime.

"MML is not predictive of higher crime rates and may be related to reductions in rates of homicide and assault," Morris and colleagues write in the study, published in *PLoS One* in 2014. That may be because people seem to use alcohol less when they have access to pot: "Given the relationship between alcohol and violent crime, it may turn out that substituting marijuana for alcohol leads to minor reductions in violent crimes."

Moreover, contrary to concerns that marijuana dispensaries become magnets for crime, the shops may diminish crime in their immediate vicinity because of their heightened security, cameras and lights.

Economists Edward M. Shepard and Paul R. Blackley of Le Moyne College find that medical marijuana is associated with significant drops in violent crime. Looking at crime data from 11 states in the west, seven of which had medical marijuana laws before 2009, they see "no evidence of significant, negative spillover effects from MMLs on crime." Instead, they suspect a fall in the involvement of criminal organizations after marijuana is legalized for medical use and conclude, "MMLs likely produce net benefits for society."

Looking at crime data before and after the depenalization of marijuana in the United Kingdom in 2004, Nils Braakmann and Simon Jones of Newcastle University suggest most types of crime, risky behavior and violence fall. But they observe a 5 percent to 7 percent increase in property crimes among 15- to 17-year-olds.

More/less alcohol consumption

Katarina Guttmannova of the University of Washington and colleagues examined 15 studies on the relationship between alcohol and marijuana use. Their analysis indicates mixed results, suggesting both substitution — when marijuana is more readily available, people use it and drink less — and complementation — people drink more when they use marijuana.

Substitution would have positive public health implications, assuming, as some researchers do, that alcohol is a more destructive drug with higher costs for society.

Driving under the influence

Alcohol accounts for over 30 percent of motor-vehicle fatalities in the U.S. each year — almost 10,000 deaths — according to the U.S. Centers for Disease Control and Prevention.

In the first year after a medical marijuana law comes into effect, traffic fatalities decrease between 8 percent and 11 percent, according to research published in 2013 in *The Journal of*

Law & Economics: "The impact of legalization on traffic fatalities involving alcohol is larger and estimated with more precision than its impact on traffic fatalities that do not involve alcohol. Legalization is also associated with sharp decreases in the price of marijuana and alcohol consumption, which suggests that marijuana and alcohol are substitutes."

In their *Journal of Policy Analysis and Management* paper, Anderson and Rees describe the relative dangers of driving while intoxicated or stoned: "While driving under the influence of marijuana is associated with a twofold increase in the risk of being involved in a collision, driving with a blood alcohol concentration (BAC) of 0.08 or greater is associated with a 4- to 27-fold increase in this same risk." The active ingredient in marijuana, tetrahydrocannabinol (THC), impairs driving ability, but users tend to overcompensate and drive slower, whereas alcohol consumers tend to drive faster and take more risks, they write.

Huber and his colleagues at Colby College also chart a fall in DUIs in states with MML laws.

A team of researchers at Stanford University is developing a "potalyzer" to detect THC molecules in drivers' saliva. The portable test could produce results in three minutes, they reported in *Analytical Chemistry* in July 2016.

More people will use weed

There is growing evidence that as marijuana is legalized, more people use it. Legal medical marijuana increases both the supply of the drug as well as demand.

Braakmann and Jones see a 4.6 percent increase in cannabis consumption among 15- to 17-year-olds after depenalization, which they suspect may be partially an increase in the number of first-time users. They do not see an increase among older groups.

Relatedly, a 2014 paper in the *American Journal of Public Health* finds a negative relationship between marijuana and suicide. In states with MML, legalization is associated with a 10.8 percent reduction in the suicide rate of men between ages 20 and 39 — another indication of increased usage, and possibly of decreased alcohol consumption.

Gateway drug

Are teenagers who use pot more likely to begin using harder drugs like cocaine and heroin? Research is largely inconclusive and the issue is addressed in many of the studies listed above.

A related question is how MML affect the use and abuse of opioids for pain. Writing in *JAMA Internal Medicine*, Marcus Bachhuber of the Philadelphia Veterans Affairs Medical Center and colleagues find "medical cannabis laws are associated with significantly lower state-level opioid overdose mortality rates." Patients seem to be using these as substitutes, and

marijuana is far less addictive and dangerous than drugs derived from the opium poppy. A 2016 study by Columbia University researchers confirmed those findings and observed that states with MML had fewer opioid-related car accidents.

Racial justice

Significant research has shown that young black men are arrested at a much higher rate than white men for the same marijuana-related crimes.

Economists Wesley Austin of the University of Louisiana and Rand W. Ressler of Georgia Southern University explore the relationship between marijuana crimes and arrest in a 2016 paper for *Applied Economics Letters*. They find arrest much more likely if the offender is poor and black, compared with perpetrators who are either poor or black or poor and a member of another race.

Racial profiling is the topic of a 2016 paper by Frank R. Baumgartner of the University of North Carolina at Chapel Hill and colleagues. They discover black men far more likely than white men to be searched during traffic stops, yet less likely to be found with contraband. "This discrepancy points strongly toward racial bias in the policing of [North Carolina] motorways," where police use their discretion to decide of a search is warranted. "Blacks in North Carolina appear to have good reasons to be mistrustful of the police, and that these trends appear to be growing over time."

Related research:

A 2016 paper profiled by Journalist's Resource finds the U.S. could reap up to $12 billion in new tax revenues by regulating recreational marijuana. It also finds that access to marijuana is associated with greater usage.

The number of American cannabis users is rising. According to an August 2016 Gallup Poll, 13 percent of Americans say they use the drug, up from 7 percent in 2007. Slightly older data from the U.S. Department of Health and Human Services shows that over 22 million Americans aged 12 or older have used marijuana in the past month. That is 8.4 percent of the population.

Bloomberg Businessweek estimates that edible weed may have made up half the $5.4 billion in legal marijuana sales in the U.S. in 2015.

The National Institutes of Health (NIH) publishes research on the health impact of cannabis consumption.

According to the Marijuana Policy Project, an advocacy group, there are over 2 million marijuana patients in the U.S.

CannabisWire.com and *High Times* magazine are among the news outlets that cover the growing legal marijuana business.

Citations

"Cannabis Control and Crime: Medicinal Use, Depenalization and the War on Drugs"
Huber III, Arthur; Newman, Rebecca; LaFave, Daniel. *The B.E. Journal of Economic Analysis & Policy, 2016.* doi: 10.1515/bejeap-2015-0167.

Abstract: "To date, 27 states and the District of Columbia have passed laws easing marijuana control. This paper examines the relationship between the legalization of medical marijuana, depenalization of possession, and the incidence of non-drug crime. Using state panel data from 1970 to 2012, results show evidence of 4-12 percent reductions in robberies, larcenies, and burglaries due to the legalization of medical marijuana, but that depenalization has little effect and may instead increase crime rates. These effects are supported by null results for crimes unrelated to the cannabis market and are consistent with the supply-side effects of medicinal use that are absent from depenalization laws as well as existing evidence on the substitution between marijuana and alcohol. The findings contribute new evidence to the complex debate surrounding marijuana policy and the war on drugs."

"Cannabis Depenalisation, Drug Consumption and Crime – Evidence from the 2004 Cannabis Declassification in the UK"
Braakmann, Nils; Jones, Simon. *Social Science & Medicine*, 2014. doi: 10.1016/j.socscimed.2014.06.003.

Abstract: "This paper investigates the link between cannabis depenalization and crime using individual-level panel data for England and Wales from 2003 to 2006. We exploit the declassification of cannabis in the UK in 2004 as a natural experiment. Specifically, we use the fact that the declassification changed expected punishments differently in various age groups due to thresholds in British criminal law and employ a difference-in-differences type design using data from the longitudinal version of the Offending, Crime and Justice Survey. Our findings suggest essentially no increases in either cannabis consumption, consumption of other drugs, crime and other forms of risky behavior."

"The Effect of Medical Marijuana Laws on Crime: Evidence from State Panel Data, 1990-2006"
Morris, Robert G.; et al. *PLoS ONE*, 2014. doi: 10.1371/journal.pone.0092816.

Abstract: "Background: Debate has surrounded the legalization of marijuana for medical

purposes for decades. Some have argued medical marijuana legalization (MML) poses a threat to public health and safety, perhaps also affecting crime rates. In recent years, some U.S. states have legalized marijuana for medical purposes, reigniting political and public interest in the impact of marijuana legalization on a range of outcomes. Methods: Relying on U.S. state panel data, we analyzed the association between state MML and state crime rates for all Part I offenses collected by the FBI. Findings: Results did not indicate a crime exacerbating effect of MML on any of the Part I offenses. Alternatively, state MML may be correlated with a reduction in homicide and assault rates, net of other covariates. Conclusions: These findings run counter to arguments suggesting the legalization of marijuana for medical purposes poses a danger to public health in terms of exposure to violent crime and property crimes."

"The Legalization of Recreational Marijuana: How Likely Is the Worst-Case Scenario?"
Anderson, D. Mark; Rees, Daniel I. *Journal of Policy Analysis and Management*, 2013. doi: 10.1002/pam.21727.

Summary: This literature review looks at the concerns of those opposing legalization. It concludes that legal recreational marijuana is a net benefit for society because it is associated with a reduction in alcohol-related traffic deaths and alcohol use more generally, and thus also a reduction in crime. The usage of marijuana will increase, though, the authors expect.

"Medical Marijuana and Crime: Further Evidence From the Western States"
Shepard, Edward M.; Blackley, Paul R. *Journal of Drug Issues*, 2016. doi:10.1177/0022042615623983.

Abstract: "State medical marijuana programs have proliferated in the United States in recent years. Marijuana sales are now estimated in the billions of dollars per year with over two million patients, yet it remains unlawful under federal law, and there is limited and conflicting evidence about potential effects on society. We present new evidence about potential effects on crime by estimating an economic crime model following the general approach developed by Becker. Data from 11 states in the western United States are used to estimate the model and test hypotheses about potential effects on rates of violent and property crime. Fixed effects methods are applied to control for state-specific factors, with adjustments for first-order autocorrelation and cross-section heteroskedasticity. There is no evidence of negative spillover effects from medical marijuana laws (MMLs) on violent or property crime. Instead, we find significant drops in rates of violent crime associated with

state MMLs."

"Impacts of Changing Marijuana Policies on Alcohol Use in the United States"
Katarina Guttmannova; et al. *Alcoholism: Clinical and Experimental Research*, 2015. doi: 10.1111/acer.12942.

Abstract: "Results: The extant literature provides some evidence for both substitution (i.e., more liberal marijuana policies related to less alcohol use as marijuana becomes a substitute) and complementary (i.e., more liberal marijuana policies related to increases in both marijuana and alcohol use) relationships in the context of liberalization of marijuana policies in the United States. Conclusions: Impact of more liberal marijuana policies on alcohol use is complex, and likely depends on specific aspects of policy implementation, including how long the policy has been in place. Furthermore, evaluation of marijuana policy effects on alcohol use may be sensitive to the age group studied and the margin of alcohol use examined. Design of policy evaluation research requires careful consideration of these issues."

"A Micro-Temporal Geospatial Analysis of Medical Marijuana Dispensaries and Crime in Long Beach, California"
Freisthler, Bridget; et al. *Addiction*, 2016. doi: 10.1111/add.13301.

Abstract: "Aims: To determine whether the density of marijuana dispensaries in California, USA, in 2012-13 was related to violent and property crimes, both locally and in adjacent areas, during a time in which local law enforcement conducted operations to reduce the number of storefront medical marijuana dispensaries. Design: Data on locations of crimes and medical marijuana dispensaries as well as other covariates were collected for a sample of 333 Census block groups. [...] Findings: After adjustment for covariates, density of medical marijuana dispensaries was unrelated to property and violent crimes in local areas but related positively to crime in spatially adjacent areas [incident rate ratio (IRR) = 1.0248, CI (1.0097, 1.0402) for violent crime, IRR = 1.0169, CI (1.0071, 1.0268) for property crime. Conclusions: Using law enforcement to reduce medical marijuana dispensaries in California appears to have reduced crime in residential areas near to, but not in, these locations."

"Medical Cannabis Laws and Opioid Analgesic Overdose Mortality in the United States, 1999-2010"
Bachhuber, Marcus A.; et al. *JAMA Internal Medicine*, 2014. doi:

10.1001/jamainternmed.2014.4005.

Conclusions and Relevance: "Medical cannabis laws are associated with significantly lower state-level opioid overdose mortality rates. Further investigation is required to determine how medical cannabis laws may interact with policies aimed at preventing opioid analgesic overdose."

"Medical Marijuana Laws, Traffic Fatalities, and Alcohol Consumption"
Anderson, D. Mark; Hansen, Benjamin; Rees, Daniel I. *The Journal of Law & Economics*, 2013. doi: 10.1086/668812.

Abstract: "To date, 19 states have passed medical marijuana laws, yet very little is known about their effects. The current study examines the relationship between the legalization of medical marijuana and traffic fatalities, the leading cause of death among Americans ages 5-34. The first full year after coming into effect, legalization is associated with an 8-11 percent decrease in traffic fatalities. The impact of legalization on traffic fatalities involving alcohol is larger and estimated with more precision than its impact on traffic fatalities that do not involve alcohol. Legalization is also associated with sharp decreases in the price of marijuana and alcohol consumption, which suggests that marijuana and alcohol are substitutes. Because alternative mechanisms cannot be ruled out, the negative relationship between legalization and alcohol-related traffic fatalities does not necessarily imply that driving under the influence of marijuana is safer than driving under the influence of alcohol."

"Medical Marijuana Laws and Suicides by Gender and Age"
Anderson, D. Mark; Rees, Daniel I.; Sabia, Joseph J. *American Journal of Public Health*, 2014. doi: 10.2105/AJPH.2013.301612.

Conclusions: "Suicides among men aged 20 through 39 years fell after medical marijuana legalization compared with those in states that did not legalize. The negative relationship between legalization and suicides among young men is consistent with the hypothesis that marijuana can be used to cope with stressful life events. However, this relationship may be explained by alcohol consumption. The mechanism through which legalizing medical marijuana reduces suicides among young men remains a topic for future study."

"Who Gets Arrested for Marijuana Use? The Perils of Being Poor and Black"
Austin, Wesley; Ressler, Rand W. *Applied Economics Letters*, 2016. doi: 10.1080/13504851.2016.1178838.

Abstract: "We explore the relationship between income, race and the probability of being arrested. Our data set is comprised of individuals who have all violated federal marijuana laws, some of whom have been arrested. We reason that the cost of arresting a poor individual with diminished social status is lower. Our empiricism reveals that the probability of arrest is higher when the law breaker is poor and African American."

"Targeting Young Men of Color for Search and Arrest During Traffic Stops: Evidence from North Carolina, 2002–2013"
Baumgartner, Frank R.; et al. *Politics, Groups, and Identities*, 2016. doi: 10.1080/21565503.2016.1160413.

Abstract: "North Carolina mandated the first collection of demographic data on all traffic stops during a surge of attention to the phenomenon of 'driving while black' in the late 1990s. Based on analysis of over 18 million traffic stops, we show dramatic disparities in the rates at which black drivers, particularly young males, are searched and arrested as compared to similarly situated whites, women, or older drivers. Further, the degree of racial disparity is growing over time. Finally, the rate at which searches lead to the discovery of contraband is consistently lower for blacks than for whites, providing strong evidence that the empirical disparities we uncover are in fact evidence of racial bias. The findings are robust to a variety of statistical specifications and consistent with findings in other jurisdictions."

Keywords: Cannabis, medical marijuana laws, recreational marijuana, crime, anti-social behavior, gateway theory, risk-taking, legalization, weed, pot, dope, edibles

Drug Policy, Health Care, Inequality, Public Health Alcohol, crime, Drunk driving, Medical marijuana, Suicide

Writer: David Trilling | Last updated: September 23, 2016

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SD County farmers: Let them grow pot

TOPICS: california pot cannabis farming medical mrijuana New Frontier online community journalism San Diego County san diego marijuana science/environment

Fallbrook marijuana, 2014.

Posted By: Anthony Wagner January 19, 2017

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> **For local jurisdictions, cannabis farming can generate significant new tax revenues, create jobs and help reverse course for the region's declining agricultural sector.**

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In the weeks and months ahead, county and local officials will be taking steps to implement medical and recreational marijuana regulations, including cannabis farming.

US ON TWITTER

The Voices of San Diego

The local farmers I've talked to think the time is ripe.

In the last 16 months, the state has enacted two laws that create a legal path forward for commercial cannabis farming – the Medical Cannabis Regulation and Safety Act, and the Adult Use of Marijuana Act. The state is scheduled to issue its first licenses in January 2018.

While that's hopeful, farmers still need zoning approval from the county – or any local jurisdiction – before they can apply for a state license. In effect, the supervisors are holding the keys an economic muscle car. The question is: Can we convince them to turn the key?

There's a lot at stake, and not just for farmers.

Under the law, jurisdictions that give the industry a path toward legitimacy will be eligible for more state tax revenues than those that don't. In addition, communities that bar cannabis will receive virtually no additional local revenues because they will have no farms or other cannabis businesses to tax.

These are important facts given that cannabis sales in California are **expected to climb to $6.4 billion by 2020**, according to New Frontier, a cannabis research

firm. As a result, the state could collect more than $1 billion in annual tax and licensing revenues.

Farmers know policy conversations at the local level are critical. Residents should know it, too.

That's why a group of us recently came together to create the Responsible Growers Council. Today it has more than 80 members – including more than 40 San Diego County farmers, land owners and business entrepreneurs who want to establish legal, sustainable farms in the county's rural residential and commercial agricultural zones.

Right now, other communities across California are scrambling to harness this newly legitimized, $2 billion-a-year industry. Our new group wants San Diego County to do the same.

For local jurisdictions, cannabis farming can generate significant new tax revenues, create jobs and help reverse course for the region's declining agricultural sector.

Pot shops now open in North County.

Growers are subject to two separate state taxes – a $9.25-per-ounce tax on cannabis flowers, and a $2.75-per-ounce tax on cannabis leaves, at the wholesale level. The state also collects a 15 percent sales tax at the retail level.

Local jurisdictions may also impose their own taxes. In November, Humboldt County established a tax ranging from $1 to $3 per square foot of growing space (based on type of license) and is projected to collect $7.3 million annually.

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POPULAR POSTS

Allowing farmers to grow cannabis gives them the ability to diversify their crop portfolio, and to grow a new cash crop that relies **on less water than most traditional crops**.

Farming is a risky business in the best of times. Factor in declining acreage and rising water costs and you'll see why having a new cash crop is important – especially one that is expected to be in high demand (no pun intended).

Allowing more people to grow cannabis also creates good living-wage jobs.

On average, cannabis farm employees make between $40,000 to $90,000 annually. A part-time gardener's annual wages are typically between $20,000 and $25,000. Garden managers and others can be as high as $150,000 on a cannabis farm.

By comparison, full-time farm workers in America make just **$30,000 a year on average**, according to the U.S. Bureau of Labor Statistics.

In San Diego County, the average worker involved in farming, fishing or forestry **makes just over $19,000 per year**, according to the Living Wage Calculator. That's well below the living wage in our region.

If the region sees an influx of cannabis farms, job growth could be significant. A 5,000 to 10,000-square-foot, farm typically employs between 20 to 30 full-time workers, while a 22,000 square-foot farm would require 25 to 45 workers.

North County avocados in the news

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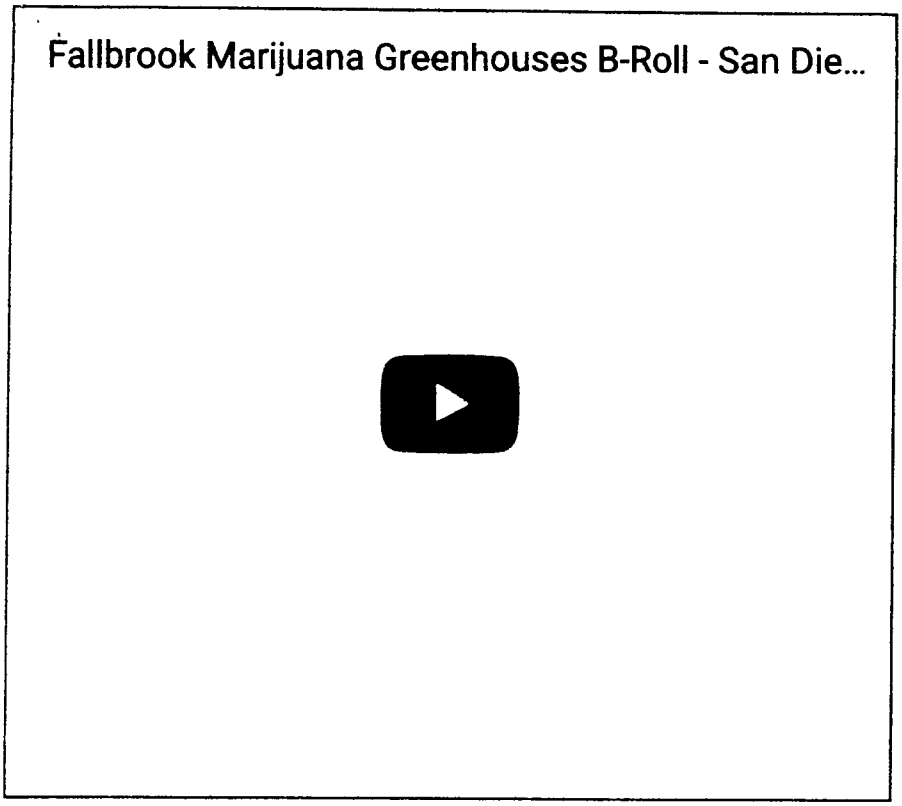

We all have a stake in the discussion ahead. We're not naïve; we know legalization has been a controversial, often emotional issue for some time, but it doesn't have to be.

Members of our group are real people. Some are families that have farmed in San Diego County for generations. Others are new entrepreneurs. All are people who just want to farm their lands legally and in a way that is acceptable and beneficial to communities.

The next step is for local agencies and communities to establish legitimate, sustainable farms. Sustainable means being good neighbors, having minimal impact on local communities, working with public safety agencies and protecting the environment.

I hope you'll consider helping, too, by contacting your supervisor and expressing your support for cannabis farming in San Diego County.

This appeared first in non-profit Voice of San Diego. By agreement, The Grapevine sometimes publishes Voice columns. Anthony Wagner is the executive director of the Southern California Responsible Growers Council and a

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A BEGINNER'S GUIDE TO CANNABIS AND THE HUMAN ENDOCANNABINOID SYSTEM

In the future, perhaps 20 years from now, cannabis-based medicines will have a prominent place in the worldwide pharmacopeia again. Indeed, we might have even gotten there much faster if it hadn't been for the draconian interference of the U.S. government. To this day, they are still blocking researchers from accessing cannabis to study. Countless thousands have died suffering and millions more continue to be denied access to plant-based medications that could not only mitigate their misery, but also possibly even cure them.

Cannabis medications work so efficiently because of the endocannabinoid (EC) system, present in all humans and many animals as well. This system consists of a series of receptors that are configured only to accept cannabinoids, especially tetrahydrocannabinol (THC) and cannabidiol (CBD). Not enough research has been done on the other ones, cannabinol (CBN) and cannabigerol (CBG) plus others, to know much about their mechanisms of effect.

This system, an integral part of our physiologies, was discovered in the mid-1990s by Israeli researcher Dr. Ralph Mechoulam who also identified THC as the main active ingredient in cannabis in the early 1960s. Israel has been one of the most progressive nations for cannabis research and currently has one of the most advanced medical marijuana programs in the world. They are international leaders in advanced greenhouse technology, routinely producing flowers with 20 percent or greater THC.

Dr. Mechoulam's world-changing research discovered two main receptors, cannabinoid 1 (CB1) and cannabinoid 2 (CB2), that are keyed to both the endocannabinoids that our body naturally produces and phytocannabinoids (plant-based) like THC and CBD. Our bodies actually produce the ECs similar to how our body produces narcotic-like endorphins. Synthetic cannabinoids, like the ones found in Marinol, also fit the receptor sites but don't work as efficiently as the natural ones.

This research barely created a stir when first published as the whole world was still wrapped up in drug war madness. A prominent scientist discovers that our bodies not only have receptor sites cued just for cannabinoids but that our bodies actually produce them internally. The next step was to figure out how this affects our body's functioning.

CB1 receptors are primarily found in the brain, although they are also both present in the male and female reproductive organs. Current research shows that THC is specifically keyed to the CB1 site. Therefore it is responsible for the feeling of intoxication that is the most familiar aspect of cannabis. From a therapeutic standpoint, it's most important effect is to modulate and moderate the perception of pain. For example, touching a finger to a hot stove sends an electrical impulse that goes from the finger to the brain. The brain replies, "ouch, hot" and the finger is pulled away.

THC moderates pain; this doesn't mean we leave our finger on the stove, but that the intensity of the painful feeling is reduced when THC is present in the CB1 site. This mechanism of action is why THC-rich medicines are so prized by people with intense pain issues. Cannabis and narcotics are also co-agonists, which means that each of them magnifies the effect of the other. This allows people to take lower doses and still have it be effective. Additionally, CB1 receptors are not present in the part of the brain that regulates heart rate and respiration, so unlike narcotics, there is no lethal dosage threshold for THC, allowing someone to consume as much is needed for its palliative effects.

KEN SOBEL, ESQ., VICE PRESIDENT, GROW FOR VETS US; CALIFORNIA CANNABIS NURSES ASS'N GENERAL COUNSEL, 619.208.2439; kennysocal711@gmail.com

CB2 receptors are primarily found in the immune system with the highest concentration located in the spleen. There is some evidence that the receptors might also be in the micro parts of the brain's basal ganglia, or nerve bundles. Again, a lack of comprehensive research has left many without the knowledge that should be widely available.

The CB2 receptors are keyed to CBD and works as an anti-inflammatory agent. The immune-boosting functions of CB2 are far less understood as research into CBD is just really beginning. It's only been about five years since CBD re-emerged in the medical cannabis scene and was identified through Steephill Labs. The benefits of CBD-rich medicine, with its anti-spasmodic qualities, is one the most exciting and promising areas of cannabis medical research currently happening. One of the other effects of CBD is that it moderates the effects of THC. It actually knocks THC off the CB1 receptor, so if someone is experiencing THC intoxication, a strong dose of CBD can counteract those effects. The future of CBD-rich medicines is almost limitless. Indeed, we have just barely scratched the surface of planet cannabis.

THC and CBD are the two main cannabinoids that are focused on, however there are dozens and possibly hundreds more. Some of the ones that have been identified and studied include CBG, which binds to both CB1 as well as CB2 and is an antagonist to CB1, meaning that it moderates the effects of THC. Cannabichromene (CBC) is non-psychoactive and has both anti-inflammatory and analgesic properties. CBN occurs when THC degrades. For this reason, it is rarely seen in fresh cannabis and is only mildly psychoactive, having a mostly sleepy effect. Tetrahydrocannabivarin (THCV) is another cannabinoid usually found in central Asian and southern African strains that also acts as a THC antagonist. There are more cannabinoids than can be listed here and they all have the potential to be as life changing as CBD is turning out to be.

The fact that there is a system in our body that produces cannabinoids, and is specifically designed to accept just them, should be overwhelming proof of cannabis' efficacy as a medicine. From the pain-killing effects of THC to the anti-spasmodic and anti-inflammatory properties of CBD, we have just scratched the surface of a world of possibilities. People are waking up to the benefits of these medicines as more researchers are exploring the infinite possibilities inherent in this seemingly simple plant. Future generations will look back and wonder why it took so long to figure this out.

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Endocannabinoid system

From Wikipedia, the free encyclopedia

The **endocannabinoid system** (**ECS**) is a group of endogenous cannabinoid receptors located in the mammalian brain and throughout the central and peripheral nervous systems, consisting of neuromodulatory lipids and their receptors. Known as "the body's own cannabinoid system",[1] the ECS is involved in a variety of physiological processes including appetite, pain-sensation, mood, and memory, and in mediating the psychoactive effects of cannabis.[2] The ECS is also involved in voluntary exercise[3] and may be related to the evolution of the runner's high in human beings and related aspects of motivation or reward for locomotor activity in other animals.[4]

Two primary endocannabinoid receptors have been identified: CB1, first cloned in 1990; and CB2, cloned in 1993. CB1 receptors are found predominantly in the brain and nervous system, as well as in peripheral organs and tissues, and are the main molecular target of the endocannabinoid ligand (binding molecule), Anandamide, as well as its mimetic phytocannabinoid, THC. One other main endocannabinoid is 2-Arachidonoylglycerol (2-AG) which is active at both cannabinoid receptors, along with its own mimetic phytocannabinoid, CBD. 2-AG and CBD are involved in the regulation of appetite, immune system functions and pain management.[1][5][6]

Contents

Basic overview

ScienceDirect

Trends in Pharmacological Sciences
May 2015, Vol.36(5):277–296, doi:10.1016/j.tips.2015.02.008

Feature Review

Endocannabinoid signaling at the periphery: 50 years after THC

Dedication: This review is dedicated to the authors' dear colleague and friend Itai Bab, sorrowfully missed October 2014.

Mauro Maccarrone, Itai Bab
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Highlights

- Fifty years ago the psychoactive ingredient of *Cannabis sativa*, THC, was isolated.
- We critically review the current status of eCB function in peripheral organs.
- We discuss the relevance of the peripheral ECS in human health and disease pathogenesis.
- We highlight emerging challenges and therapeutic hopes.

In 1964, the psychoactive ingredient of *Cannabis sativa*, Δ^9-tetrahydrocannabinol (THC), was isolated. Nearly 30 years later the endogenous counterparts of THC, collectively termed endocannabinoids (eCBs), were discovered: *N*-arachidonoylethanolamine (anandamide) (AEA) in 1992 and 2-arachidonoylglycerol (2-AG) in 1995. Since then, considerable research has shed light on the impact of eCBs on human health and disease, identifying an ensemble of proteins that bind, synthesize, and degrade them and that together form the eCB system (ECS). eCBs control basic biological processes including cell choice between survival and death and progenitor/stem cell proliferation and differentiation. Unsurprisingly, in the past two decades eCBs have been recognized as key mediators of several aspects of human pathophysiology and thus have emerged to be among the most widespread and versatile signaling molecules ever discovered. Here some of the pioneers of this research field review the state of the art of critical eCB functions in peripheral organs. Our community effort is aimed at establishing consensus views on the relevance of the peripheral ECS for human health and disease pathogenesis, as well as highlighting emerging challenges and therapeutic hopes.

Keywords

bone; cardiovascular system; gastrointestinal tract; immune system; liver; localization; muscle; female and male reproductive system; signaling pathways; skin

 Table 1

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