

Marijuana and Gambling Disorder: What's Lying in the Weeds?

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Overview

- Marijuana Overview
- Marijuana Laws in California
- Marijuana and Gambling
 - CalGETS perspectives

Terminology



Cannabis sativa leaf
Image by LPX, © 2002 Erowid.org



- *Cannabis* is the botanical term for the hemp plant *cannabis sativa*.
- *Marijuana* is a cultural term for the cannabis plant.

Terminology

Cannabinoids:

Class of compounds that act on cannabinoid receptors

Endogenous

Plant-derived (THC, CBD; >100)

Synthetic (Marinol, Spice)

How is Cannabis Ingested?



How is Cannabis Ingested?

SMOKED	VAPORIZED	EATEN/DRUNK
Smoked in a pipe, bowl, cigarette	Inhaled through machine that converts active compounds into inhalable form	Consumed as ingredient in baked goods, candies, sodas
Rapid effects	Rapid effects	Takes time to reach brain, so effects are delayed
Burning marijuana releases toxins that can cause pulmonary problems	Does not release toxins that cause pulmonary problems	Does not release toxins that cause pulmonary problems

Cannabinoid Pharmacology

CENTRAL

CB1 Receptor

- Hippocampus: Memory and Learning
- Amygdala: Novelty, Emotion, Appetite
- Cerebellum: Coordination, Time Sense
- Nucleus Accumbens: Reward Mechanism
- Cortex: Executive Functioning

PERIPHERAL

CB2 Receptor

- Spleen, Intestines

Marijuana: Immediate Effects

Altered Mood	Reduced Anxiety
Cognitive Impairment (Attention, Judgment)	Sedation/Drowsiness
Altered Perception	Sensory Intensification
Impaired coordination/balance	Increased heart rate
Hunger	Hallucinations (in large doses)

- Effects can vary by strains
 - *Sativa*: More euphoria, stress relief
 - *Indica*: Relaxation, physical (especially pain) relief
 - *Sativa* and *Indica* often combined, leading to variable effects

Marijuana Impact on Body and Brain (Selected)

IMMEDIATE

- euphoria and relaxation
- slowed reaction time
- distorted sensory perception
- impaired balance and coordination
- increased heart rate and appetite

LONG TERM

- impaired learning and memory
- anxiety, panic attacks, psychosis
- cough, frequent respiratory infections
- possible mental health decline
- addiction

Medical Complications

Lancet 2009; 374:1383-91

- Respiratory Illnesses - Chronic Bronchitis, but not COPD
- Cardiovascular Effects - tachycardia, angina, and increased risk of MI in cardiac patients
- Motor Vehicle Accidents
- Reduced Birthweight, DD, but not IQ

National Trends

VERY POPULAR

- 89% agree on legal use of medical marijuana “if prescribed by a doctor”
 - June 2016, Quinnipiac University Poll
- 60% agree on legal use of cannabis recreationally
 - October 2016 Gallup Poll

Commonly Used

Marijuana is the 3rd most commonly used substance after alcohol and tobacco:

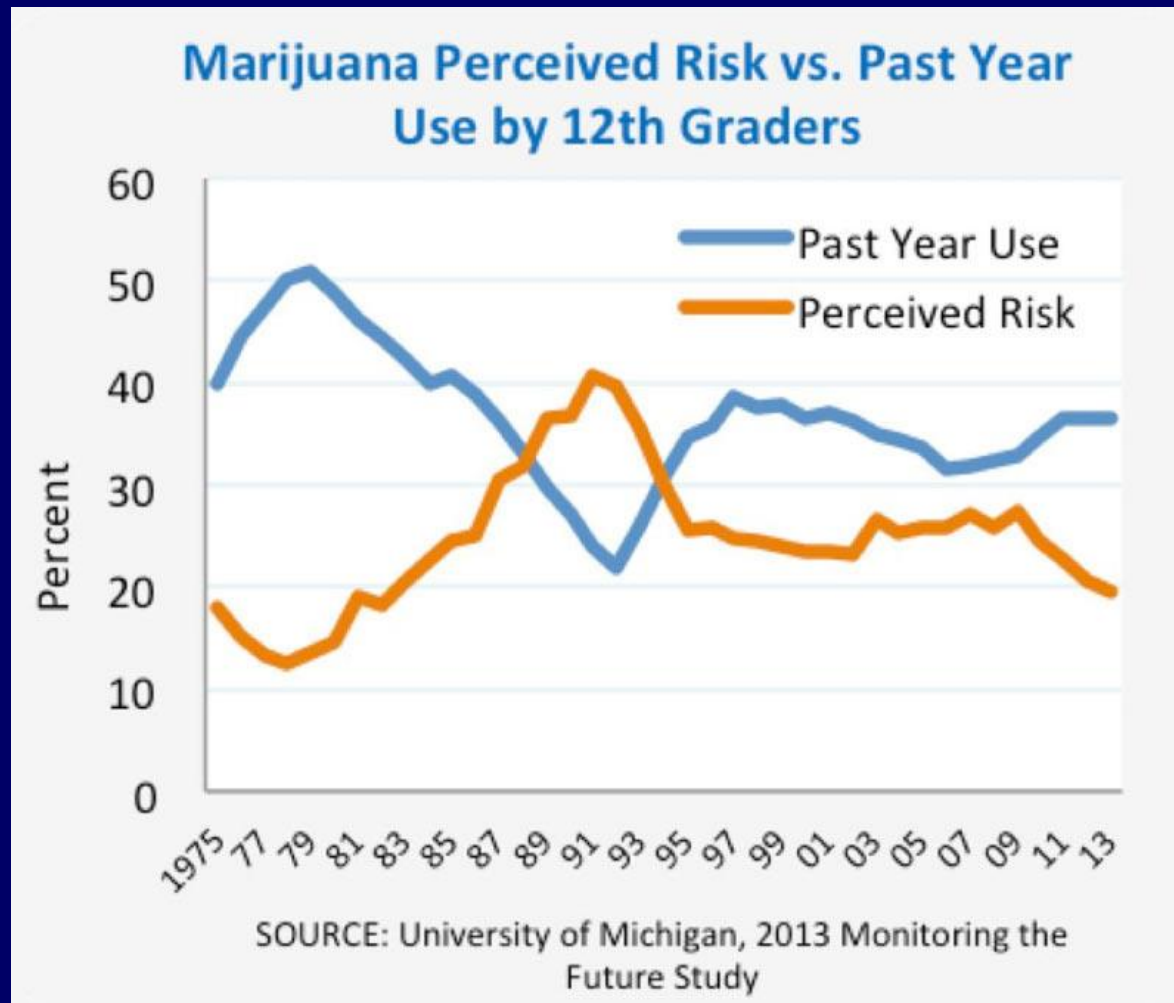
**22 Million Users in the last 30 days
(8% of people 12 years and older)**

2014 National Survey of
Drug Use and Health

National Trends

- Since 2008, perception of harm among 12th graders has decreased (softening)
- Legalization occurring
- Medical Marijuana expanding
- Emergence of “Big Weed”
 - Environmental, economic, political power

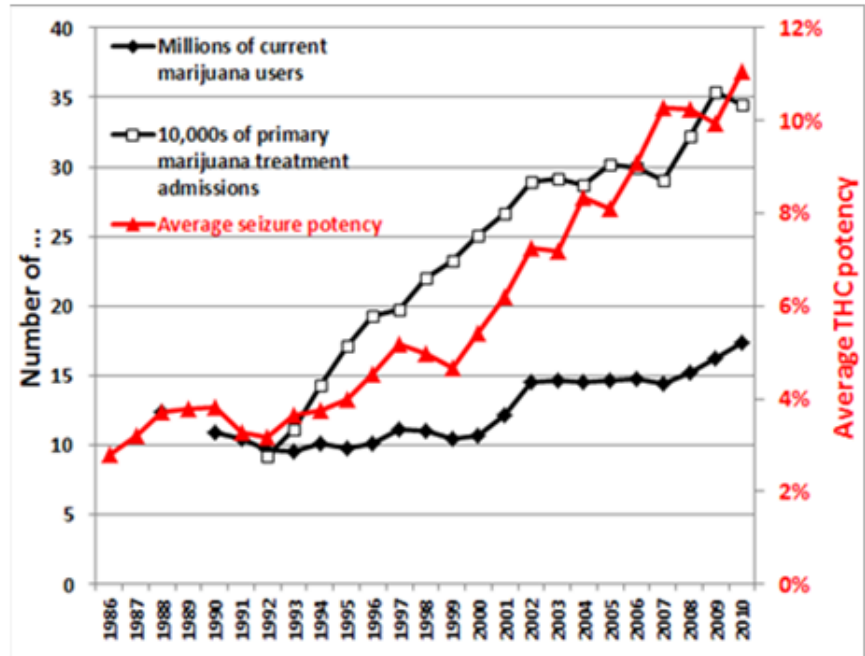
Adolescent considerations



Marijuana potency

- Average potency
 - 3% in 1992
 - 11% in 2010
- coincides with an increase in treatment admissions for cannabis use disorders
- Marijuana concentrates (e.g., butane hash oil) may contain >90% THC

MARIJUANA USERS, TREATMENT ADMISSIONS, AND AVERAGE POTENCY:
1986-2010

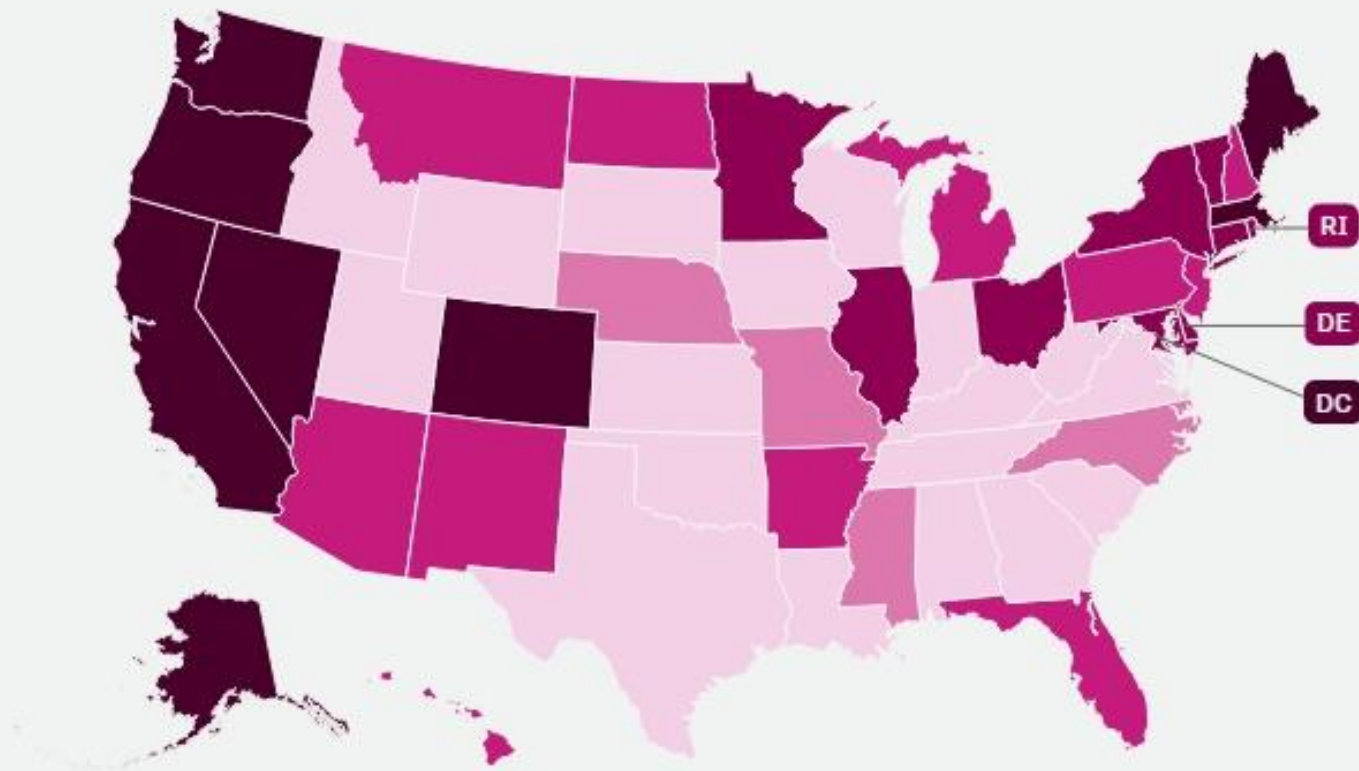


Sources: [NSDUH](#), [TEDS](#), National Seizure System

Marijuana laws in the US

Legalization removes all penalties for marijuana possess up to a certain threshold (usually a few ounces) and may allow sales (not in Washington, DC). Decriminalization removes criminal penalties, including jail time, for possession of a small amount, but typically leaves a civil fine in place.

Legalized Medical and decriminalized Medical Decriminalized Fully illegal



Source: Marijuana Policy Project
Credit: German Lopez

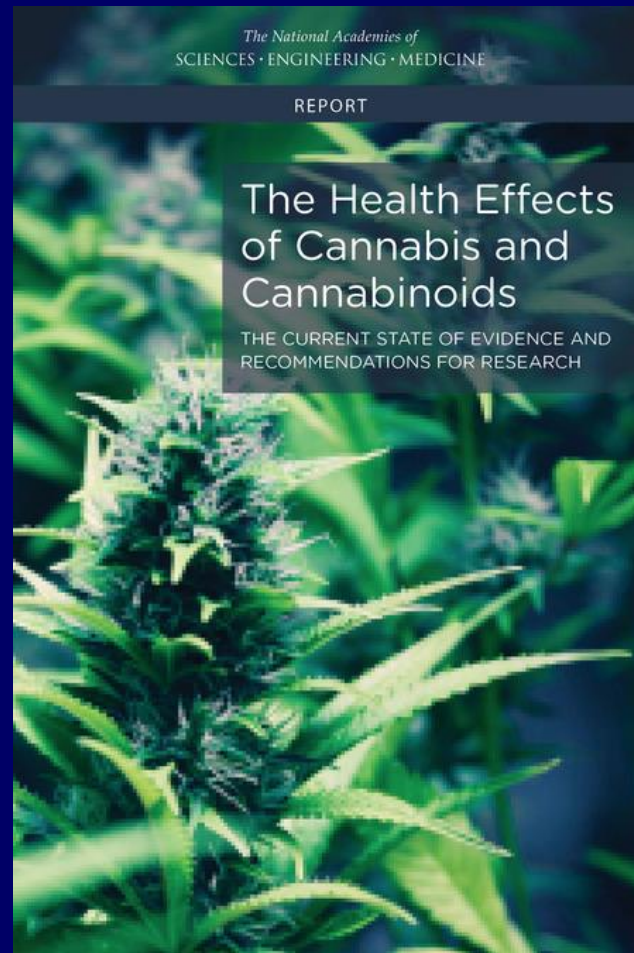
Vox

Marijuana policy: Federal

- Schedule I Controlled Substance by the United States Drug Enforcement Agency
- Substances in this schedule have no currently accepted medical use in the United States,
 - a lack of accepted safety for use under medical supervision, and a high potential for abuse
 - Heroin, (LSD), Ecstasy

What does the science say
about cannabis?

National Academies Press (2017)



National Academies Press

There is “conclusive or substantial evidence” that marijuana or related compounds can effectively treat chronic pain, nausea caused by chemotherapy treatment for cancer, and spasticity caused by multiple sclerosis.

National Academies Press

- “**moderate evidence**” that cannabis helps people with certain sleep disturbances
- “**limited evidence**” for increasing appetite and decreasing weight loss in HIV/AIDS and relieving symptoms of PTSD.

National Academies Press

“substantial evidence” linking early marijuana use with substance abuse later in life and suggesting that cannabis increases the likelihood of respiratory problems, motor vehicle accidents, and low birth weight in infants born to marijuana-smoking mothers.

Cannabis Use Disorder

True or False?

- Cannabis is harmless
- No one dies from cannabis overdose
- Cannabis is not addicting
- Cannabis does not have a withdrawal syndrome
- Cannabis can treat other addictions

Cannabis-Related Disorder

- Cannabis Use Disorder
- Cannabis Intoxication
- Cannabis Withdrawal
- Other Cannabis-Induced Disorders
- Unspecified Cannabis-Related Disorder

Cannabis Withdrawal

- Irritability
- Depression
- Anxiety
- Decreased Sleep Quality
- Perception of Pain

Cannabis Use Disorder

DRUG	LIFETIME RISK OF DEPENDENCE
Nicotine	32%
Heroin	23%
Cocaine	17%
Alcohol	15%
Marijuana	9%

Cannabis Use Disorder

- In Los Angeles County, marijuana use accounts for more substance use disorders treatment admissions (23.3%) than any other drug, including alcohol (22%).

Treatment Options:

- No FDA-approved medications
- Psychotherapy options
 - Similar to other addictive disorders
 - No superior treatment modality
- 12-step support groups
- Nothing specific for cannabis

Marijuana In California

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Medical Marijuana



Medical Marijuana

- Compassionate Use Act (1996)
- SB 420 (2003)
 - Establishes ID Card and “regulation”
- Explosion (2007 – 2010; 439 in LA)
- 2013 – “accepted practice”
- 2016: Recreational legalization

Why do People Use Medical Marijuana?

REASON FOR USE	% REPORTING REASON
Pain Relief	82.6%
To Sleep	70.6%
To Relax	55.6%
Muscle Spasms	41.3%
Anxiety	38.1%
To Stimulate Appetite	38.0%
Nausea	27.7%
Depression	26.1%

Legalization in California

Prop 64: Adult Use of Marijuana Act

Sentencing Reform: Legalizes 1 ounce; 8 grams concentrates; 6 plants for adults (21 and up). Also includes broad retroactive sentencing reform and complete decriminalization and record destruction for minors.

Regulatory Agencies: DCA; DPH; CDFA. Regulatory provisions designed to be flexible and to work with California's new medical marijuana regulatory scheme.

Licensing: 19 types of licenses; MMJ license priority; microbusiness license for small farmers and small businesses; prohibits discrimination against those with drug priors.

Tax: 15% retail; 9.25/dry ounce flower; 2.75 dry ounce leaves. MMJ patients exempt from sales tax.

Revenue: LAO estimates possible \$1 billion raised annually (and \$100 million saved annually) to fund implementation; research (on legalization, medical marijuana, and DUI); communities disproportionately impacted by WOD; youth treatment; environmental remediation; and local law enforcement.

Local Control: Localities can ban all businesses; localities can allow for on-site consumption.

What will happen in California?

Proposition 64 will create:

- 19 license categories for recreational marijuana
- 15% excise tax on retail sales
- Cultivation tax on growers of \$9.25 per ounce for marijuana flowers (or buds) and \$2.75 per ounce for marijuana leaves.

What will happen in California?

- Department of Consumer Affairs Transforms Bureau of Medical Cannabis Regulation to the Bureau of Marijuana Control.
- California's 58 counties and 482 cities will decide on local rules, including whether to accept or ban pot businesses or commercial cultivation.

Bureau of Medical Cannabis Regulation

- Persons 21 and over may purchase nonmedical cannabis when licensing authorities have enacted regulations and have a framework in place.
- Licensing will begin in January of 2018.
- All taxes collected are placed in the Marijuana Tax Fund.

How will legalized recreational
and medical marijuana
impact gambling?

For now, Federal Law Above All

“The tilt is that there’s a federal law and we expect licensees to follow the federal law” – Nevada Gaming Commission

MJ and the Gambling Industry

Essential Question in Casinos

- MJ in hotel rooms?
 - Especially edibles
- Zero, low or high tolerance for MJ using employees?
- The big “buffet” item?
 - How can MJ enhance gaming experience?
 - Cannabis lounge?

Marijuana Money

- As state laws and federal laws don't match up on marijuana, gambling industry are unable to accept money from anyone involved in the medical or recreational marijuana industry, whether it's legal in the state or not.

Impact of marijuana on gambling

Essential Questions

- Does MJ use lead to gambling?
- Does gambling lead to MJ use?
- Impact of MJ on gambling disorder?
- As legalization increases, how will it impact gambling behavior?
- Could MJ treat gambling disorder?

*Effects of various cannabinoid
ligands on choice behaviour in
a rat model of gambling*

Results

- In the group of rats that had poor decision-making skills, cannabinoids increased their choices of slots with a higher probability of reward.
- In the group that made good choices, the study showed that there was no effect either positive or negative.

Leppink, Eric, et al.

"A preliminary comparison of
cannabis use in subsyndromal
gamblers: select
neurocognitive and behavioral
differences based on use."

Journal of addiction medicine

8.6 (2014): 443-449.

Marijuana in Gamblers

- Participants who consumed marijuana/cannabis gambled more often in any given week than the participants who did not consume the drug.
- cannabis users had higher rates for alcohol use disorder,

Marijuana in Gamblers

- gamblers who consumed marijuana/cannabis had higher levels of impulsive behavior than the gamblers who did not use the drug.
- both the cannabis-using gamblers and the non-cannabis-using gamblers had higher impulsivity levels than the members of the comparison group that neither gambled nor consumed MJ

Neuroimaging Data

- Adolescent marijuana users have enhanced neural responses to simulated monetary rewards and losses and relatively subtle differences in effective connectivity.
- Acheson, Ashley, et al. "Functional activation and effective connectivity differences in adolescent marijuana users performing a simulated gambling task." *Journal of addiction* 2015 (2015).

CalGETS: Self-Reported Substance Use (15-16)

Treatment Component	Marijuana Use
PGTI	16%
PGTI (Asian Languages)	0%
Outpatient	20%
IOP	19%
RTP	45%

Tools for Providers

- Screen for MJ use
- Observe how MJ impacts course of gambling and overall mental health
- Discuss expectations of MJ impact with clients
- Pay attention to local MJ rules
- Visit Medical Marijuana Dispensary

A checklist for clinicians

- Screen for cannabis use
- Explore “relationship” with cannabis
 - Distinguish use vs. use disorder
- Explore impact on mental health
- Expand knowledge base about cannabis and culture
- “No cannabis exposure under 21”

Summary

- Cannabis has a long history and future in Western US
- Cannabis and gambling relationship just being explored
- Providers need to include Cannabis in all activities

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