

Recreational Marijuana and
Medical Marijuana:
What We Have Learned

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Disclosures

Over the last three years, I have had: editing payments from: Wolters-Kluwer, Elsevier; consulting fees from: Pear Therapeutics, Fast Track Drugs and Biologics, Otsuka Pharmaceutical Development and Commercialization, Inc., Cerevel; medical devices supplied to my institution for research: Masimo; and have conducted medical-legal consultations. I have also served on the board of directors (unpaid) for a treatment program: Ashley Addiction Treatment.

Outline for this talk

- I. Use of the terms “marijuana” and “recreational”
- II. Recreational marijuana use
- III. Medical marijuana use
- IV. Final thoughts

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The term “marijuana” (and cannabis)

Cannabis – Products derived from the plant Cannabis Sativa

Marijuana – Parts from Cannabis Sativa that have relatively high concentration of THC

The term “marijuana” is linked to racist approaches to drug control in US in much of 20th century, so people in US have been using term “cannabis” instead

BUT, not true in other parts of the world, so the term “marijuana” still used (preferred?)

The term “recreational”

A term often used with cannabis (marijuana) use to suggest it is non-problematic use

Can be used with other drugs as well, again to suggest non-problematic use

Normalizes drug use – suggests it is like other recreational activities (going for a hike, playing tennis, playing a board game)

The term “recreational”

Generally try to avoid referring to this as “recreational” drug use

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Recreational marijuana use

Legalization of cannabis has occurred in the United States
(started in 2014)

Is at the state level, but not at the federal level

Recreational marijuana use

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Has legalization resulted in increased use?

Recreational marijuana use

Has legalization resulted in increased use?

Yes

JAMA Psychiatry | [Original Investigation](#)

Association Between Recreational Marijuana Legalization in the United States and Changes in Marijuana Use and Cannabis Use Disorder From 2008 to 2016

Magdalena Cerdá, DrPH; Christine Mauro, PhD; Ava Hamilton, BA; Natalie S. Levy, MPH;
Julián Santaella-Tenorio, DrPH; Deborah Hasin, PhD; Melanie M. Wall, PhD;
Katherine M. Keyes, PhD; Silvia S. Martins, MD, PhD

JAMA Psychiatry 2019

Recreational marijuana use

This study looked at results from the annual U.S. National Survey on Drug Use and Health (“NSDUH”)

Looked at states with versus without Recreational Marijuana Legalization (RML) over time

Also looked at various amounts of use (self-reported), and different age groups

Recreational marijuana use

RESULTS The study included 505 796 respondents consisting of 51.51% females and 77.24% participants 26 years or older. Among the total, 65.43% were white, 11.90% black, 15.36% Hispanic, and 7.31% of other race/ethnicity. Among respondents aged 12 to 17 years, past-year CUD increased from 2.18% to 2.72% after RML enactment, a 25% higher increase than that for the same age group in states that did not enact RML (odds ratio [OR], 1.25; 95% CI, 1.01-1.55). Among past-year marijuana users in this age group, CUD increased from 22.80% to 27.20% (OR, 1.27; 95% CI, 1.01-1.59). Unmeasured confounders would need to be more prevalent in RML states and increase the risk of cannabis use by 1.08 to 1.11 times to explain observed results, indicating results that are sensitive to omitted variables. No associations were found among the respondents aged 18 to 25 years. Among respondents 26 years or older, past-month marijuana use after RML enactment increased from 5.65% to 7.10% (OR, 1.28; 95% CI, 1.16-1.40), past-month frequent use from 2.13% to 2.62% (OR, 1.24; 95% CI, 1.08-1.41), and past-year CUD from 0.90% to 1.23% (OR, 1.36; 95% CI, 1.08-1.71); these results were more robust to unmeasured confounding. Among marijuana users in this age group, past-month frequent marijuana use and past-year CUD did not increase after RML enactment.

Cannabis
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Recreational marijuana use

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Increases in
cannabis
use seen for
persons 26+
years old as
well

Recreational marijuana use

The report concluded there was an increase (“small”) in risk for Cannabis Use Disorder in younger persons, with legalization

While not the focus, also shows that “recreational use” appears to increase (again, can argue these are small increases)

Recreational marijuana use

A second study to look at this question...

Recreational marijuana use

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RESEARCH REPORT

ADDICTION

SSA

Impacts of recreational cannabis legalization on cannabis use: a longitudinal discordant twin study

Stephanie M. Zellers¹  | J. Megan Ross²  | Gretchen R. B. Saunders¹  |
Jarrod M. Ellingson^{2,3}  | Jacob E. Anderson¹ | Robin P. Corley³ |
William Iacono¹ | John K. Hewitt^{3,4} | Christian J. Hopfer^{2,3} | Matt K. McGue¹ |
Scott Vrieze¹

Recreational marijuana use

Analyses that capitalized on prospectively collected data from a twin study

Looked to see if cannabis use frequency changed as a function of legal status in two states (one legal, one not), with legalization occurring in 2014

Also, had the opportunity to look at genetic influence on use (monozygotic twin pairs that were discordant for state legality)

Recreational marijuana use

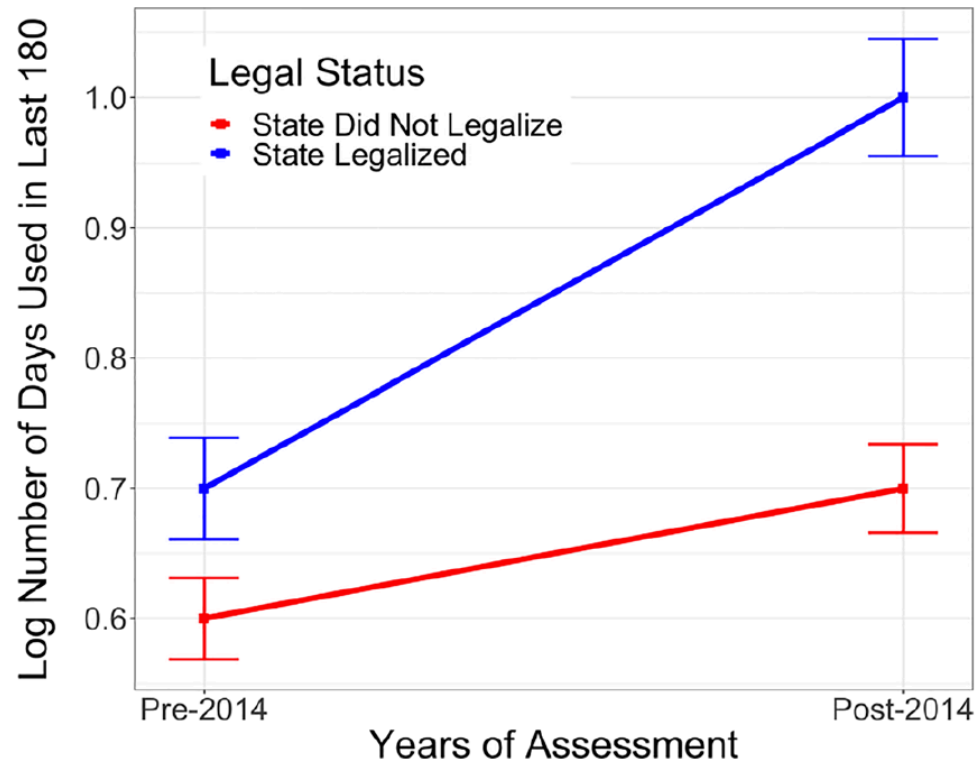


FIGURE 1 Line graph depicting mean differences in the continuous measure of cannabis use prior to and after the first recreational legalization event, split by participant residence at the post-2014 assessment. Bars represent \pm one standard error

Recreational marijuana use

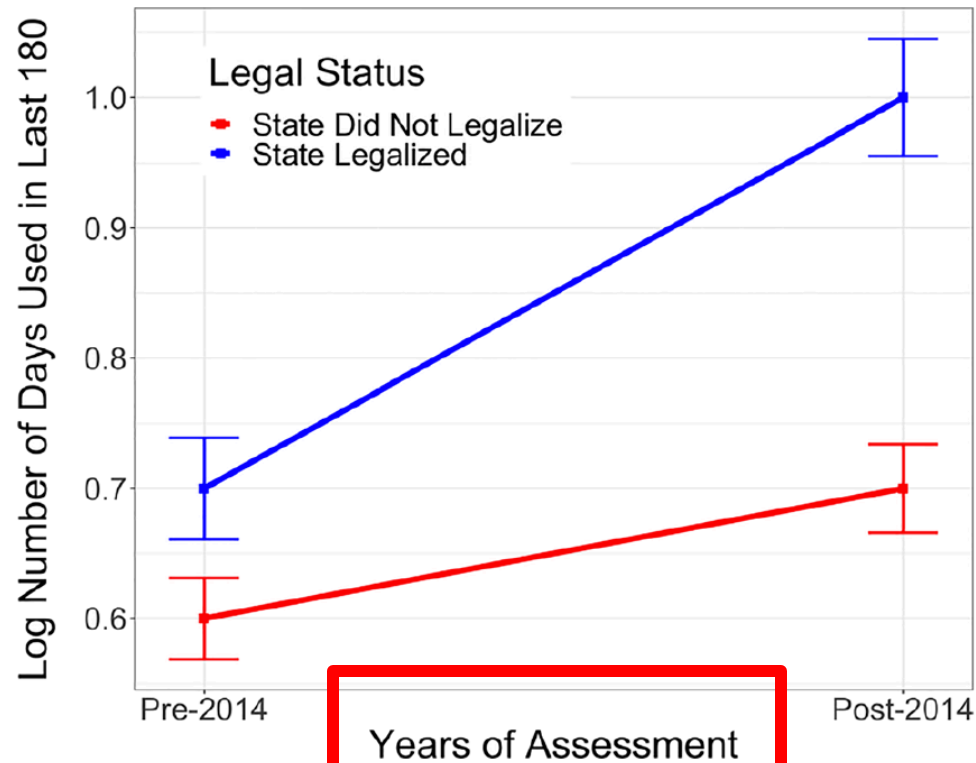


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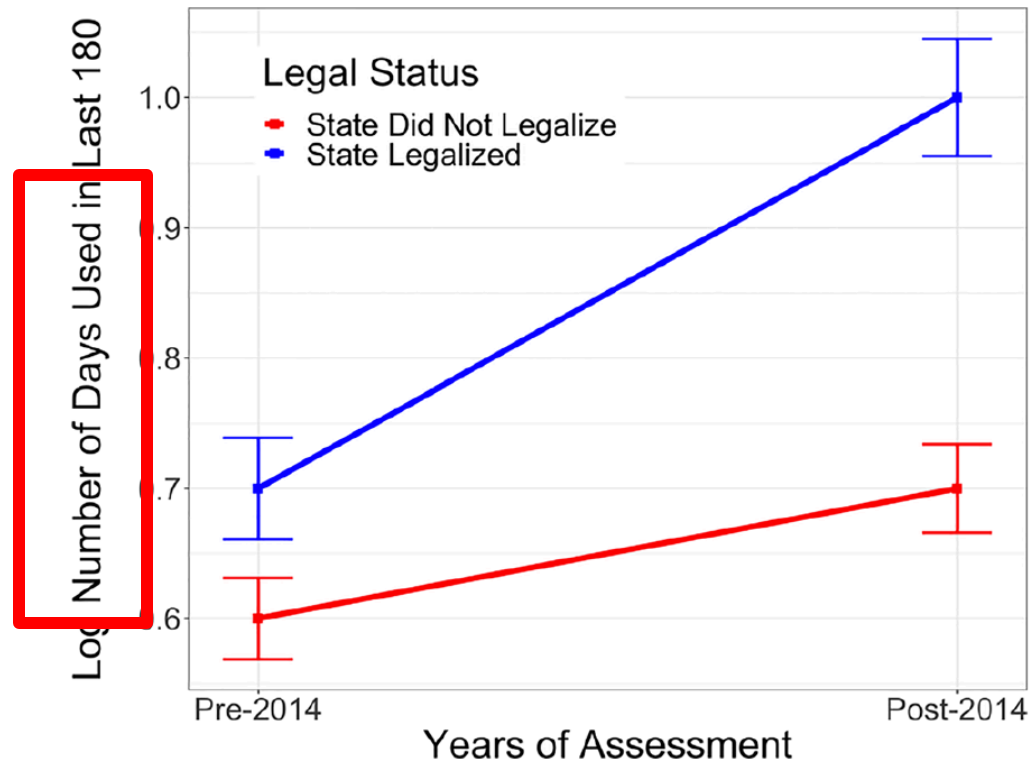
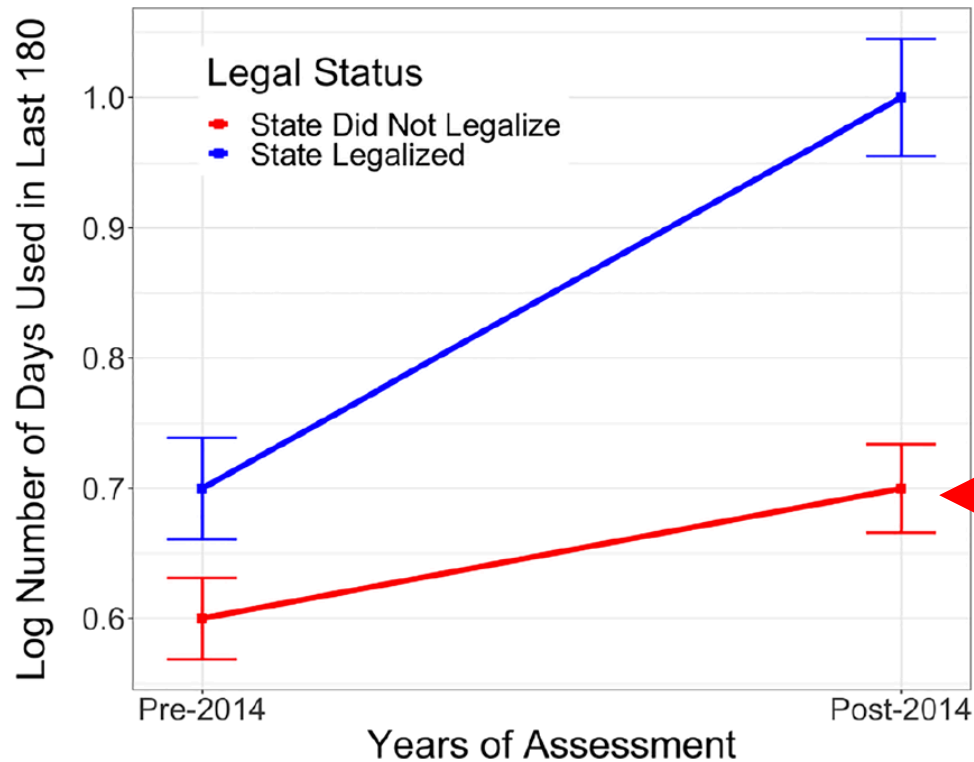


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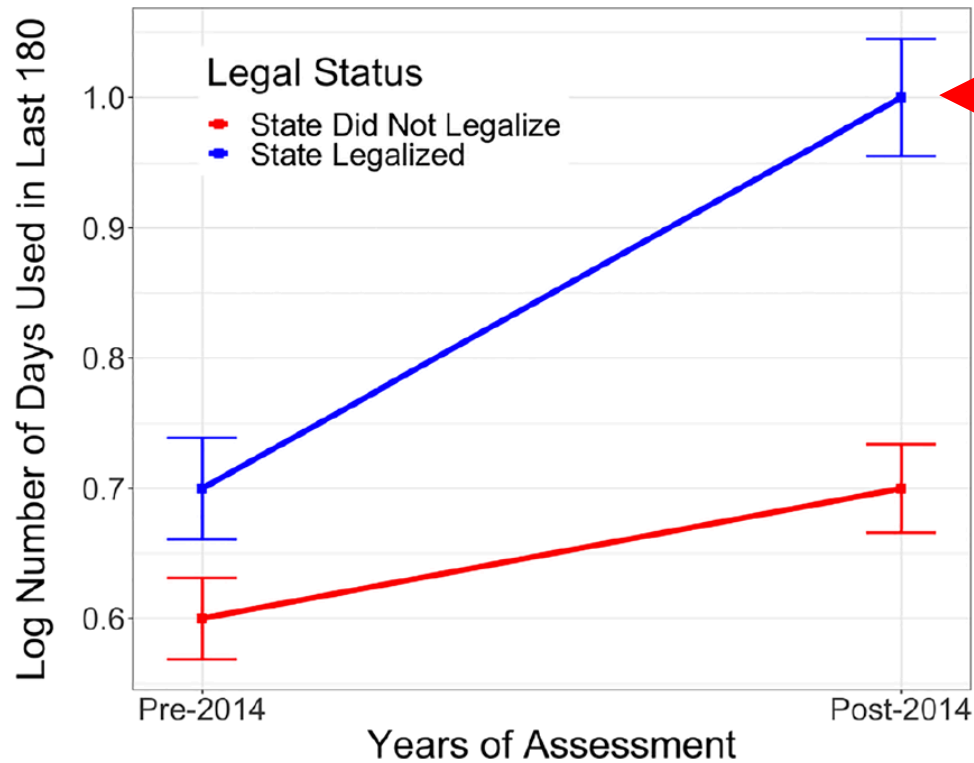
Recreational marijuana use



State that did not legalize, relatively flat in number of days used

FIGURE 1 Line graph depicting mean differences in the continuous measure of cannabis use prior to and after the first recreational legalization event, split by participant residence at the post-2014 assessment. Bars represent \pm one standard error

Recreational marijuana use



State that did legalize, significant increase in number of days used cannabis

FIGURE 1 Line graph depicting mean differences in the continuous measure of cannabis use prior to and after the first recreational legalization event, split by participant residence at the post-2014 assessment. Bars represent \pm one standard error

Recreational marijuana use

Furthermore, looked at genetic influence

Genetic influences moderated by legal environment

Conclude about a 20% average increase in cannabis use frequency with legalization, and genetic influence of cannabis use is moderated by legalization

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(May be a modest increase, and probably not surprising –
make a drug easier to access, and use goes up...)

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Medical marijuana

In U.S., dramatic increase in availability of medical marijuana

My state (Maryland) initially passed legislation to set up an elaborate system of growers, dispensaries and providers to permit persons to get medical marijuana

After few years, Maryland now has passed further legislation allowing cannabis to be purchased and used (no need for “medical” indication)

(This is a big business...)

Medical marijuana

When referring to “medical marijuana”, need to keep in mind that this is a large and heterogenous group of drugs that generally can include smoked cannabis (which can be of various strains), THC, nabiximols, Sativex, etc.

I will try to provide some general findings/conclusions, but these generalizations are generalizations – I am aware that there can well be exceptions and anecdotal responses

Medical marijuana

Medical marijuana generally promoted for:

Pain

Seizures

Spasticity/Multiple Sclerosis

Appetite

Anxiety

Medical marijuana

Medical marijuana generally promoted for:

Pain

Seizures

Spasticity/Multiple Sclerosis

Appetite

Anxiety

Medical marijuana

Medical marijuana for pain

Cochrane review in 2023 (Häuser et al.) did not find sufficient evidence to support use (moderate evidence of ineffective) for moderate to severe refractory **cancer pain**

Insufficient good evidence (randomized controlled trials) to make a statement about use for **acute pain** (such as acute low back pain)

Medical marijuana

Medical marijuana (nabiximols) for spasticity/multiple sclerosis

Cochrane review in 2022 (Filippini et al.) found some support for **short-term use** in spasticity but no evidence available for long-term use

Medical marijuana

Medical marijuana (cannabidiol) for pediatric seizures

Use for refractory epilepsy in patients with Dravet syndrome (DS), Lennox-Gastaut syndrome (LGS), and tuberous sclerosis complex (TSC)

Reviews show **effective** as a stand-alone as well as adjunct treatment for these seizures

(Not clear if there is a need to use smoked cannabis)

Medical marijuana

Downsides to marijuana/cannabis use

Hyperemesis (rare)

Psychosis (rare but worrisome)

Abuse

Breathing issues

Increased heart rate

Memory impairment, motor incoordination

Uncertain long-term consequences to use

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What have we learned about marijuana? (I of III)

Legalization is associated with increased use

While not reviewed in detail today, as general use increases, rates of a Use Disorder increase

While availability in U.S. was initially for medical reasons, now extensive use for non-medical (recreational) reasons

What have we learned about marijuana? (II of III)

Cannabis being marketed in U.S. now very different from what was marketed 30 years ago (higher potency of THC)

Variable evidence for medical use – best for some seizure disorders, maybe spasticity, low level of support for pain

Better evidence of therapeutic use for medications rather than smoked products

Smoked (or ingested) marijuana contents highly variable

What have we learned about marijuana? (III of III)

Bottom line:

Still a lot we don't know

But in U.S. (and other parts of world) we are on a major social and medical experiment with the increased availability now occurring

Thank you.

Questions?