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State Cannabis Policy Landscape: Effects on Public Health

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Outline

Goal: Summarize public health effects of state cannabis policy

Cannabis use, addiction, and poisoning	Other substance use
Physical health (e.g., CVD)	Mental health
Criminal legal outcomes	Motor vehicle crashes

Other: e.g., educational attainment, perinatal outcomes

Cannabis use

Adult use has increased following state medical and recreational cannabis laws. Unclear whether this is attributable to the laws, secular trends, or endogeneity (cannabis use already on upward trajectory in states that legalize).

- 35.4% past-year prevalence among ages 18-25, 2021
- 17.2% past-year prevalence among ages 26+, 2021

Mixed

Youth use Medical cannabis laws are generally not associated with increased prevalence use among youth, but some evidence suggests these laws may increase youth initiation and days of cannabis use. Evidence on recreational cannabis laws is mixed.

- 10.5% past-year prevalence among ages 12-17, 2021
- Perceived risk of cannabis has declined

1. Substance Abuse and Mental Health Services Administration. (2022). Key substance use and mental health indicators in the United States: Results from the 2021 National Survey on Drug Use and Health (HHS Publication No. PEP22-07-01-005, NSDUH Series H-57). Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration. https://www.samhsa.gov/data/report/2021-nsduh-annual-national-report.
2. Hall et al. (2019). Public health implications of legalizing the production and sale of cannabis for medicinal and recreational use. *Lancet,* 394: 1580-90.
3. Chiu et al. (2021). Public health impacts to date of the legalization of medical and recreational cannabis use in the USA. *Neuropharmacology*, 193 (108610).
4. Smart & Pacula (2019). Early evidence of the impact of cannabis legalization on cannabis use, cannabis use disorder, and the use of other substances. *American Journal of Drug and Alcohol Abuse,* 45 (6).

Cannabis use disorder

Mixed

Adult cannabis use disorder: Evidence is limited and mixed but strongest studies are suggestive of increases attributable to both medical and recreational laws.

- 14.4% past-year prevalence among ages 18-25, 2021
- 4.6% past-year prevalence among ages 26+, 2021

Youth cannabis use disorder: Limited evidence suggests that recreational cannabis laws are associated with increases among youth.

- 4.8% past-year prevalence among ages 12-17, 2021

1. Substance Abuse and Mental Health Services Administration. (2022). Key substance use and mental health indicators in the United States: Results from the 2021 National Survey on Drug Use and Health (HHS Publication No. PEP22-07-01-005, NSDUH Series H-57). Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration. https://www.samhsa.gov/data/report/2021-nsduh-annual-national-report.
2. Hall et al. (2019). Public health implications of legalizing the production and sale of cannabis for medicinal and recreational use. *Lancet,* 394: 1580-90.
3. Chiu et al. (2021). Public health impacts to date of the legalization of medical and recreational cannabis use in the USA. *Neuropharmacology*, 193 (108610).
4. Smart & Pacula (2019). Early evidence of the impact of cannabis legalization on cannabis use, cannabis use disorder, and the use of other substances. *American Journal of Drug and Alcohol Abuse,* 45 (6).
5. Cerda et al (2019). Association between recreational marijuana legalization in the United States and Changes in marijuana use and cannabis use disorder from 2008 to 2016.
6. O'Grady (2022). Is legalization of recreational cannabis associated with levels of use and cannabis use disorder among youth in the United States? A rapid systematic review. *European Child & Adolescent Psychiatry*, online ahead of print.

Cannabis poisoning

State medical and recreational laws have been associated with increased cannabis poisoning, with largest magnitude among young children.

- Unintentional poisonings are driven by cannabis edibles.

1. Allaf et al (2023). The impact of cannabis legalization and decriminalization on acute poisoning: A systematic review. *Addiction,* Online ahead of print. https://doi.org/10.1111/add.16280
2. Myran, DT et al (2023). Pediatric hospitalizations for unintentional cannabis poisonings and all-cause poisonings associated with edible cannabis product legalization and sales in Canada. *JAMA Health Forum,* 4(1):e225041.
3. Image: https://abc7ny.com/cannabis-edibles-warning-snacks/11170044/

Other substance use

	Opioids	Alcohol	Tobacco
Medical Laws	No association	Mixed	No association
Recreational Laws	Mixed	Mixed	No association

- Early studies suggested a reduction in prescription opioid use and mortality attributable to medical cannabis laws. Recent studies using strong designs and focusing on the population with chronic pain suggest no association.

- Challenges disentangling state cannabis laws from state and local opioid, alcohol, and tobacco policies.

1. Tormohlen et al (2021). The state of the evidence on the association between state cannabis laws and opioid-related outcomes: A review. *Current Addiction Reports,* 8 (538-545).
2. Pacula RL et al (2022). Relationship of cannabis policy liberalization with alcohol use and co-use with cannabis: A narrative review. *Alcohol Research,* 42(1): 6.
3. Athanassiou, M et al. (2023). The clouded debate: a systematic review of comparative longitudinal studies examining the impact of recreational cannabis legalization on key public health outcomes. *Frontiers in Psychiatry, D0I 10.3389.*

Physical health

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Lack of Evidence

Medical cannabis law qualifying conditions

Pain, multiple sclerosis, cachexia, epilepsy, nausea, others.

- Evidence on the effectiveness of cannabis for these conditions is limited and mixed. Absence of evidence on changes in these conditions attributable to cannabis laws.

Physical health consequences of cannabis use

Cardiovascular and respiratory disease

- Cannabis use increases risk of heart disease, stroke, chronic bronchitis (COPD, asthma are unclear).
- Limited evidence suggests that medical cannabis laws may be associated with increased cardiac-related mortality (Abouk)

1. Abouk R, Adams S. (2018). Examining the relationship between medical cannabis laws and cardiovascular deaths in the U.S. *International Journal of Drug Policy,* (53), 1-7.
2. National Academies of Sciences, Engineering, and Medicine; Health and Medicine Division; Board on Population Health and Public Health Practice; Committee on the Health Effects of Marijuana: An Evidence Review and Research Agenda. *National Academies Press*.
3. Page RL, et al (2020). Medical marijuana, recreational cannabis, and cardiovascular health: A scientific statement from the American Heart Association. *Circulation, 142.*

Mental health

Mixed

Suicide: A study of medical cannabis laws from 1990-2007 found no association, except a reduction in suicide among men 20-29 (Anderson). A study of laws from 2000-2019 found increases in suicide among females aged 12-25 and males aged 14-16 attributable to medical and recreational cannabis laws (Hammond).

No association

Psychosis: No association between medical or recreational cannabis laws from 2003-2017 and healthcare utilization for psychosis (Elser).

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PTSD: **Lack of Evidence**

1. Anderson, DM et al (2014) Medical marijuana laws and suicides by gender and age. *American Journal of Public Health,* 104, 2369-2376.
2. Hammond et al (2023). Association between marijuana laws and suicide among 12- to 25-year-olds in the United States from 2000 to 2019. *Journal of the American Academy of Child & Adolescent Psychiatry,* online ahead of print.
3. Elser et al (2023). State cannabis legalization and psychosis-related health care utilization. *JAMA Network Open,* 6(1): e2252689.

Criminal legal outcomes

Arrests: Decriminalization, medical, and recreational cannabis laws have likely reduced arrests (difficult to disentangle).

No association

Violent crime: No association between medical or recreational cannabis laws and assault or other violent crime.

Mixed

Non-violent crime: Limited studies suggest no effects of medical cannabis laws on property crime (Chu) and potential increase in property crime and burglaries following recreational cannabis laws in Colorado and Washington (Lu).

1. Mathay EC et al (2021). Evaluation of state cannabis laws and rates of self-harm and assault. *JAMA Network Open,* 4: e211955.
2. Hall et al. (2019). Public health implications of legalizing the production and sale of cannabis for medicinal and recreational use. *Lancet,* 394: 1580-90.
3. Lu R et al (2019). The cannabis effect on crime: time-series analysis of crime in Colorado and Washington State. *Justice Q,* 38: 565-95.
4. Athanassiou, M et al. (2023). The clouded debate: a systematic review of comparative longitudinal studies examining the impact of recreational cannabis legalization on key public health outcomes. *Frontiers in Psychiatry, DOI 10.3389.*
5. Morris et al, the Effect of Medical Marijuana Laws on Crime: Evidence from State Panel Data, 1990-2006. *PLOS One, https://doi.org/10.1371/journal.pone.0092816.*
6. Chu, YW & Townsend, W (2019). Joint culpability: the effects of medical marijuana laws on crime. *Journal of Economic Behavior and Organization,* 159, 502-525.

Motor vehicle crashes

Evidence is mixed, with studies showing increases, decreases, an no effects of medical and recreational cannabis laws on motor vehicle crashes.

Mixed

- State contextual factors (e.g., rurality, other driving laws) may moderate effects of cannabis laws on crashes.

- Data on cannabis-impaired driving is limited due to toxicology testing limitations in the fatal accident reporting system (FARS) and difficulty setting a threshold for impairment, which varies across individuals due to factors like tolerance and differences in absorption of THC.

1. Athanassiou, M et al. (2023). The clouded debate: a systematic review of comparative longitudinal studies examining the impact of recreational cannabis legalization on key public health outcomes. *Frontiers in Psychiatry, D0I 10.3389.*
2. Wilkinson ST, et al (2016). Marijuana legalization: impact on physicians and public health. *Annual Reviews of Public Health,* 67:453-66.
3. Chiu V et al (2021). Public health impacts to date of the legalization of medical and recreational cannabis use in the USA. *Neuropharmacology,* 193: 108610.

Other public health outcomes

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Lack of Evidence

Long-term outcomes of adolescent cannabis use

- Educational attainment
- Unemployment
- Income
- Life and relationship satisfaction

Mixed, Emerging Evidence

Perinatal outcomes

- No changes in cannabis use during pregnancy attributable to recreational cannabis laws (Skelton)
- Increase in maternal hospitalizations with cannabis use disorder attributable to recreational (but not medical) cannabis laws (Meinhofer)
- No changes in newborn health (Meinhofer)

1. Skelton KR et al (2021). Association of recreational cannabis legalization with maternal cannabis use in the preconception, prenatal, and postpartum periods, 4(2): e210138.
2. Meinhofer A et al (2021). Marijuana liberalization policies and perinatal health. *Journal of Health Economics,* 80: 102537.

Key considerations across studies

- Study design: pre/post comparison group, cross-sectional vs. longitudinal.
- Population: youth/adults.
- Operationalization of cannabis laws – date effective? Date dispensary opens?
- Cannabis law provisions
  - "Medicalization" of medical cannabis laws
- All states with recreational cannabis laws had a medical cannabis law in place first.
- Data limitations, e.g., lack of information about prescription opioid and medical cannabis use in administrative claims data.
- State recreational cannabis laws are relatively new; long-term effects still emerging.

Thank you!

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