

Cannabis and Health

Module 4

Lecture 5: Public Health Data

Cannabis & Driving

- Several systematic and meta-analytic reviews conducted on motor vehicle risks
- Rogeberg & Elvik gathered evidence from 21 studies of driving under the influence of cannabis (DUIC)
 - Self-reported cannabis use and THC metabolites linked to 20%-30% increase in odds of motor vehicle crashes
 - Effects are weaker after accounting for alcohol intoxication
- Limitation: unclear when cannabis was used
 - Other factors may increase accidents among individuals who use cannabis

Cannabis & Driving

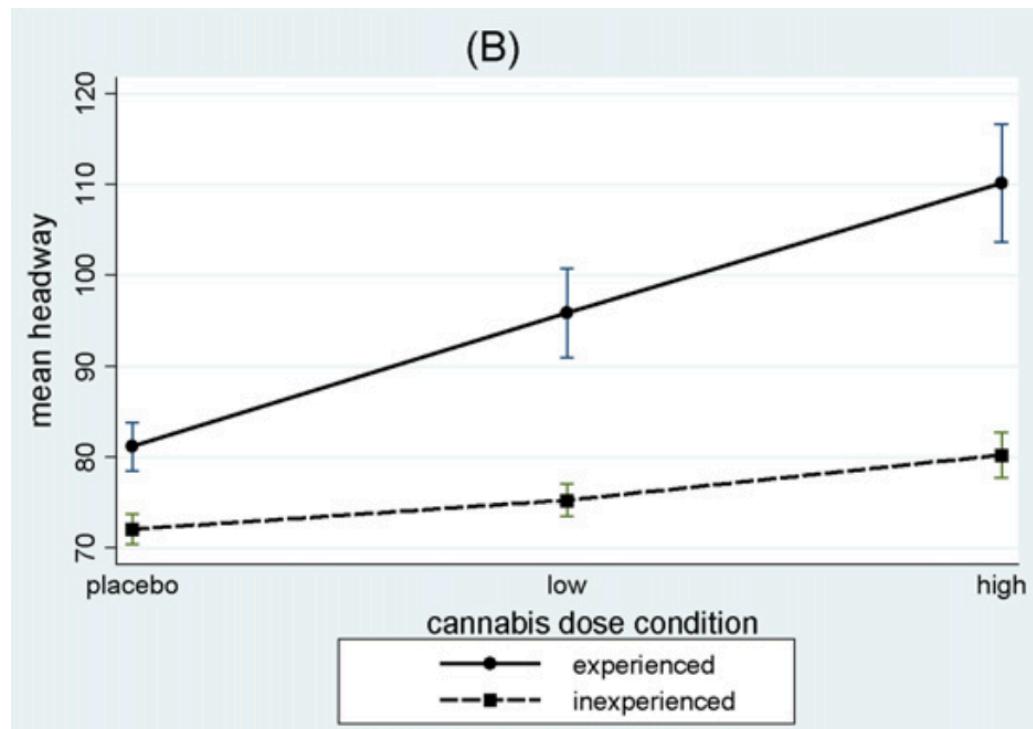
- Laboratory studies on the acute effects of cannabis date back to the 1970s.
 - Typically studied in a laboratory using a standardized smoking procedure
 - After use, participants use a driving simulator
- Studies have typically assessed acute effects of low-potency cannabis (1.80%-2.90% THC)
 - Occasionally higher potencies (11.0-12.5%)
 - Some have used dronabinol (10-20 mg THC pills)

Driving Simulator (car inside)



Cannabis & Driving

- Studies have observed modest effects on:
 - visual tracking
 - weaving (side-to-side)
 - poorer signal adherence
 - greater variability in headway (space between cars)
 - Slower speed
 - general driving impairment



Lenne et al., 2010

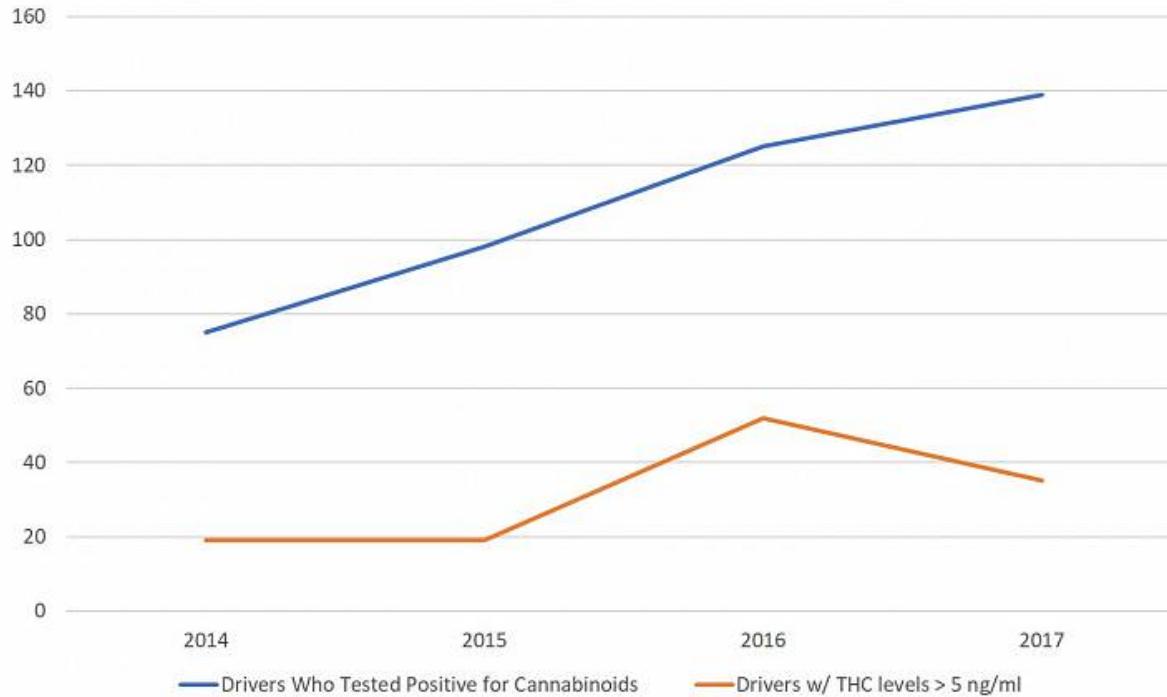
Cannabis and Driving Performance

- Summary
 - Acute administration of marijuana impairs driving ability and underlying cognitive functions
- So, how have cannabis-related driving fatalities changed since legalization?

Cannabis & Driving

- Greater number of drivers positive for cannabis since legalization in CO/WA
 - But, a relatively small increase in fatalities involving drivers with $\text{THC} > 5 \text{ ng/ml}$

Marijuana and Traffic Fatalities in Colorado



Latest studies with control groups

- Slight increase in fatalities right after legalization and then decrease in fatalities in legal states (Lane & Hall, 2019)
 - Perhaps due to increase in naïve users right after legalization?
 - But also true for neighboring states – could be unrelated to legalization or could be cannabis use increased in neighboring states
- 3 years after legalization no difference between CO and WA and neighbor states (Aydelotte et al., 2017)
- No difference between CO and WA and control states in fatalities (Hanson et al., 2019)
- Most recent and well controlled studies do not suggest association between fatalities and cannabis legalization

Physical Harm or Death via Cannabis

- Instances of death directly linked to cannabis are rare
 - Among all phone calls to U.S. poison centers involving a single substance, death occurred in:
 - 2 cases in 2012
 - 0 cases in 2013
 - 1 case in 2014
 - Unclear if cannabis was contributing factor in these cases

Pediatric Harm

- After CO legalization, pediatric cannabis-related calls to poison control increased (from 0.9 to 2.3 / 1000)
- The most common symptoms in pediatric cases of accidental exposure are:
 - Cardiovascular
 - Respiratory problems
 - Lethargy
 - Dizziness
- Taken together, National Academy of Science concluded that, among pediatric cases, there is:
 - “moderate evidence of a statistical association between cannabis use and increased risk of overdose injuries”

Harm to pets

- Similar, veterinary cases of likely/accidental ingestion of cannabis have been noted
 - Many symptoms appear to be the same as in children (lethargy, respiratory problems, dizziness)
 - Rare cases of death due to ingestion of “butter” from medical-grade products (2 noted in 125 cases of ingestion)



Retrospective Study

Journal of Veterinary Emergency and Critical Care 22(6) 2012, pp 690–696
doi: 10.1111/j.1476-4431.2012.00818.x

Evaluation of trends in marijuana toxicosis in dogs living in a state with legalized medical marijuana: 125 dogs (2005–2010)

Stacy D. Meola, DVM, MS; Caitlin C. Tearney, DVM; Sharlee A. Haas, DVM, MS; Timothy B. Hackett, DVM, MS, DACVECC and Elisa M. Mazzaferro, MS, DVM, PhD, DACVECC

Prenatal exposure



Preventive Medicine
Volume 116, November 2018, Pages 1-5



Review Article

An epidemiological, developmental and clinical overview of cannabis use during pregnancy

Hanan El Marroun ^{a, b, c}  , Qiana L. Brown ^{d, e, f}, Ingunn Olea Lund ^g, Victoria H. Coleman-Cowger ^h, Amy M. Loree ⁱ, Devika Chawla ^j, Yukiko Washio ^k

- Smoking cannabis during pregnancy associated with lower birthweight (2016 NAS report)
- Data are not clear on any other outcomes
- Until more data are collected, should not assume it is safe

Exposure via breastfeeding

- Finally, infant exposure via breastfeeding has also been a concern.
 - The National Academy of Sciences did not identify any “good” or “fair” quality reviews of this literature
- One issue is the many confounders of maternal cannabis use, including accuracy of self-report (e.g., some mothers may under report or deny use)
- Thus far, studies have yet to document a link between cannabis use in breastfeeding mothers and:
 - Motor function/development
 - Physical growth

Conclusions

- Driving while high increases odds of being in an accident
 - By less than alcohol use or texting but about the same (1.5 – 2x) as other drugs (e.g., prescription drugs like painkillers and benzodiazepines)
 - Message should be clear – dangerous to yourself and others to drive when high
 - **No clear data** suggesting that accidents and fatalities are increasing as a result of cannabis legalization
- No evidence that overdose of cannabis can cause death
 - But it is linked with hospital admissions
 - “Start low and go slow” – important public health message
- Accidental ingestion by children and pets is a problem and also linked with hospital admissions
 - Products must be kept away from children and pets
- Thus far, the literature suggests no link between cannabis use in breastfeeding mothers and negative outcomes (but should not assume it is safe!) – no reason to take that risk