CANNABIS REGULATION: IMPACT ON HEALTH AND SAFETY
THE EVIDENCE TO DATE

By Paul Armentano
NORML Deputy Director
Author: Marijuana Is Safer: So Why Are We Driving People to Drink?
Faculty: Oaksterdam University
Contributor: San Francisco Chronicle, The Hill, AlterNet.org
EVERYONE HAS A RIGHT TO THEIR OWN OPINION...

- “We're seeing real violence around that (marijuana legalization). Experts are telling me there's more violence around marijuana than one would think.”
  - United States Attorney General Jeff Sessions

- “Youth past month marijuana use increased 20 percent in the two year average since Colorado legalized recreational marijuana compared to the two year average prior to legalization.”
  - RMHIDTA 2016 report

- “Research proves the terrible carnage out there on the roads caused by marijuana.”
  - Former US NIDA Director Robert DuPont, M.D.

- “Marijuana legalization involves significant downsides to existing businesses.”
  - Smart Approaches to Marijuana, October 2016 report
Regulated, legal cannabis access – either for medical or adult use – is *not* associated with:

- Increased criminal activity
- Increased cannabis use or access by teens
- Negative impacts on traffic safety
- Negative impacts in the workplace
OUR OPPONENTS HAVE OPINIONS, WE HAVE EVIDENCE
CANNABIS REGULATION DOES NOT ADVERSELY IMPACT CRIME

  - Researchers assessed the relationship between the passage of medical cannabis regulatory laws and crime rates using FBI UCR data compiled between the years 1988 and 2013, as well as agency-level data from cities of 50,000 people or greater
  - Assessed state and city-specific crime data in the 7-year period prior to legalization and in the 7-year-period post legalization
  - Investigators found “no causal effects of medical marijuana laws on violent or property crime at the national level … [or] within individual states. … Our results suggest that liberalization of marijuana laws is unlikely to result in the substantial social cost that some politicians clearly fear.”
CANNABIS REGULATION DOES NOT ADVERSELY IMPACT CRIME

  - Investigators compared UCR crime data in all 50 states
  - Assessed the relationship between the enactment of statewide medical cannabis regulatory programs and state crime rates for all ‘Part 1’ offenses (homicide, rape, assault, burglary, larceny, auto theft), while controlling for other time-varying explanatory variables
  - "Medical marijuana laws were not found to have a crime exacerbating effect on any of the seven crime types. On the contrary, our findings indicated that MML (medical marijuana legalization) precedes a reduction in homicide and assault."
  - “In sum, 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.”
CANNABIS RETAILERS DO NOT ADVERSELY IMPACT CRIME

- Kepple and Freisthier. 2012. Exploring the ecological association between crime and medical marijuana dispensaries. *Journal of Studies on Alcohol and Drugs*
  - “Density of medical marijuana dispensaries was not associated with violent or property crime rates. ... These findings run contrary to public perceptions.”

  - The closure of medical cannabis dispensaries was associated with an increase in larceny, property crimes, and other criminal activities
  - “Contrary to popular wisdom, we find an immediate increase in crime around dispensaries ordered to close relative to those allowed to remain open.”
  - “An open dispensary provides over $30,000 per year in social benefit in terms of larcenies prevented.”
CANNABIS RETAILERS DO NOT ADVERSELY IMPACT CRIME

- **Retail facilities provide geographical guardianship**
  - Retailers increase neighborhood foot-traffic
  - Retailers utilize cameras
  - Retailers hire their own security
  - Retailers try to make the space around the perimeter of their location welcoming to customers
  - Successful retailers attract other businesses to the same neighborhoods
CANNABIS REGULATION AND CRIME – CONCLUSIONS

- Cannabis regulation is not associated with either the increased prevalence of violent crimes or property crimes, and may play a role in the reduction of certain types of violent criminal activities.

- Cannabis retailers are not associated with either an increase in the prevalence of violent crimes or property crimes in their local vicinity, and are associated with reductions in the prevalence of certain types of property crimes, such as larceny.
CANNABIS REGULATION IS NOT ASSOCIATED WITH INCREASED YOUTH USE

- Colorado
  - “For adults and adolescents, past-month marijuana use has not changed since legalization either in terms of the number of people using or the frequency of use among users. Based on the most comprehensive data available, past month marijuana use among Colorado adolescents is nearly identical to the national average.” (Colorado Department of Public Health, 2017. Monitoring Health Concerns Related to Marijuana in Colorado)
  - During the years 2009 to 2015 in the percentage of Colorado youth reporting having used marijuana either recently (within the past 30 days) or within their lifetimes declined. (Colorado Department of Public Health, 2016. Marijuana Use Among Youth in Colorado: Healthy Kids Colorado Survey 2015)
CANNABIS REGULATION IS NOT ASSOCIATED WITH INCREASED YOUTH USE

- Oregon
  - “Recent trends in youth use have been stable” during the period following the enactment of adult use regulations. (Oregon Health Authority, 2016. Marijuana report: Marijuana use, attitudes and health effects in Oregon)

- Washington
  - “[A]cross grades 6, 8, 10, and 12, cannabis use indicators have been stable or fallen slightly since I-502’s enactment.” (Washington State Institute for Public Policy, 2017. I-502 Evaluation and Benefit-Cost Analysis: Second Required Report)
CANNABIS REGULATION IS NOT ASSOCIATED WITH INCREASED YOUTH USE

- Monitoring the Future, data compiled as of December 2016
  - Lifetime cannabis use among 8th graders fell 35% between the years 1996 and 2012. Use fell another 15% between 2012 and 2016
  - Lifetime cannabis use among 10th graders fell 15% between the years 1996 and 2012. Use fell another 12% between 2012 and 2016
  - Lifetime cannabis use among 12th graders remained unchanged between 1996 and 2016
  - Current cannabis use among 8th graders fell 46% between the years 1996 and 2012. Use fell another 17% between 2012 and 2016
  - Current cannabis use among 10th graders fell 21% between the years 1996 and 2012. Use fell another 15% between 2012 and 2016
  - Current cannabis use among 12th graders remained unchanged between 1996 and 2016
CANNABIS REGULATION IS NOT ASSOCIATED WITH INCREASED YOUTH USE – IMPACT OF MEDICALIZATION

  - “Of 17 large surveys … spanning different states, periods, and specifications, 16 indicated no MML (medical marijuana legalization) effects on adolescent use.”

- Hasin et al., 2015. Medical marijuana laws and adolescent marijuana use in the USA from 1991 to 2014: results from annual, repeated cross-sectional surveys. *Lancet Psychiatry*
  - [T]he results of this study showed no evidence for an increase in adolescent marijuana use after the passage of state laws permitting use of marijuana for medical purposes. … [C]oncerns that increased marijuana use is an unintended effect of state marijuana laws seem unfounded."

- Dirisu et al., 2016. Influence of legal status on the uptake of cannabis in young people. *Current Opinion in Psychiatry*
  - "There is no conclusive evidence to show that policies in favor of medical and recreational cannabis use increase uptake by young people.”
CANNABIS REGULATION IS NOT ASSOCIATED WITH INCREASED YOUTH USE – PROBLEMATIC USE

- Grucza et al., 2016. Recent trends in the prevalence of marijuana use and associated disorders in the United States. *JAMA Psychiatry*
  - “There was a net decrease in the conditional prevalence of marijuana use disorder” among those ages 18 or older between the years 2002 to 2013

  - "Among youth cannabis users, the prevalence of past-year CUD (cannabis use disorder) decreased from 27.0 percent in 2002 to 20.4 percent in 2014."
CANNABIS REGULATION IS NOT ASSOCIATED WITH INCREASED YOUTH USE – PROBLEMATIC USE

- Williams et al. 2017. Loose regulation of medical marijuana programs associated with higher rates of adult marijuana use but not cannabis use disorder. *Addiction*
  - *No increase in the prevalence of cannabis use disorder was found for either adults or adolescents* residing in medical cannabis states during the study period (2004-2013)

  - “[D]ata indicate that the number of state-funded admissions for cannabis abuse in Washington has fallen since 2008.”
CANNABIS REGULATION IS NOT ASSOCIATED WITH INCREASED YOUTH ACCESS - IMPACT OF RETAIL DISPENSING

- Harpin et al. 2017. Adolescent marijuana use and perceived ease of access before and after recreational marijuana implementation in Colorado. *Substance Use & Misuse*
  - “[T]he presence of recreational marijuana retail store(s) [in Colorado] was not associated with perceived easy access to marijuana. … There was no significant change in past 30-day marijuana use [in adolescents].”

- Buller et al., 2016. Pseudo-underage assessment of compliance with identification regulations at retail marijuana outlets in Colorado. *Journal of Studies on Alcohol and Drugs*
  - Among state-licensed Colorado retailers, "Compliance with laws restricting marijuana sales to individuals age 21 years or older with a valid ID was extremely high and possibly higher than compliance with restrictions on alcohol sales…. The retail market at present may not be a direct source of marijuana for underage individuals.”
CANNABIS REGULATION IS NOT ASSOCIATED WITH INCREASED YOUTH ACCESS - IMPACT OF RETAIL DISPENSING

  - “[W]e did not find empirical evidence showing the availability of medical marijuana dispensaries is associated with [the] current use of marijuana among adolescents.”

- US Centers for Disease Control. *National estimates of marijuana use and related indicators – National Survey on Drug Use and Health, United States, 2002-2014*
  - The perceived ability of those between the ages 12 to 17 to obtain marijuana has declined 13 percent [nationwide] since 2002
CANNABIS REGULATION AND USE – CONCLUSIONS

- Neither medical cannabis access nor adult use cannabis regulation is associated with increased use by young people.
- Neither medical cannabis access nor adult use cannabis regulation is associated with the increased prevalence of marijuana abuse/problematic use by young people.
- The establishment of cannabis retailers is not associated with either increased use or access by adolescents.
- Cannabis retailers are not selling to underage customers; their product does not appear to be being diverted to the underage market.
CANNABIS REGULATION DOES NOT ADVERSELY IMPACT TRAFFIC SAFETY

  - Using data from the 1985–2014 Fatality Analysis Reporting System, investigators examined the association between the enactment of medical cannabis laws and traffic fatalities in all 50 states
  - "On average, MML (medical marijuana legalization) states had lower traffic fatality rates than non-MML states."
  - "Medical marijuana laws were associated with immediate reductions in traffic fatalities in those aged 15 to 24 and 25 to 44 years, and with additional yearly gradual reductions in those aged 25 to 44 years."
  - "Dispensaries were also associated with traffic fatality reductions in those aged 25 to 44 years."
CANNABIS REGULATION DOES NOT ADVERSELY IMPACT TRAFFIC SAFETY

  - Investigators evaluated motor vehicle crash rates in years immediately prior to and after the enactment of adult use regulations in Colorado and Washington and compared these rates with those of eight control states
  - "We found no significant association between recreational marijuana legalization in Washington and Colorado and subsequent changes in motor vehicle crash fatality rates in the first three years after recreational marijuana legalization."
  - "[W]e also found no association between recreational marijuana legalization and total crash rates when analyzing available state-reported nonfatal crash statistics."
CANNABIS REGULATION DOES NOT ADVERSELY IMPACT TRAFFIC SAFETY

- NHTSA, 2015, *Drug and Alcohol Crash Risk*
  - First ever large-scale case-control crash risk study in the United States to assess the impact of drugs other than alcohol
  - Investigators used odds ratios to estimate the risk of motor vehicle crash involvement after marijuana exposure in fatally and seriously injured drivers
  - Marijuana exposure (no adjustment): OR=1.25
    - Marijuana exposure (post-adjustment): OR=1.05
  - Alcohol exposure within legal limits (no adjustment): OR=3.25
    - Alcohol exposure within legal limits (post-adjustment): OR=3.22

- NHTSA, Fatality Analysis Reporting System
  - Total number of fatal motor vehicle crashes has fallen 14 percent between the years 1996 and 2015 (the last year for which data is available)
CANNABIS REGULATION DOES NOT ADVERSELY IMPACT TRAFFIC SAFETY – ODDS RATIOS

- McEvoy et al., 2007. The contribution of passengers versus mobile phone use to motor vehicle crashes resulting in hospital attendance by the driver. *Accident Analysis and Prevention*
  - OR = 2.20

- Redelmeier et al., 2014. Pregnancy and the risk of traffic crash. *CMAJ*
  - OR = 1.42

- Phillips et al., Official blame for drivers with very low blood alcohol content: There is no safe combination of drinking and driving. *Traffic Injury*
  - OR = 1.46
CANNABIS REGULATION AND TRAFFIC SAFETY - CONCLUSIONS

- Cannabis exposure is associated with, at most, a nominal increase in motor vehicle accident risk compared to drug-negative drivers.
- Alcohol-exposure, including the ingestion of alcohol within legal limits, is associated with a far greater increased risk of accident than is cannabis exposure.
- Cannabis regulation is not associated with an increase motor vehicle accidents, and may be associated with lower rates of accidents among some younger (under 44 years of age) drivers.
CANNABIS REGULATION AND WORKPLACE PERFORMANCE

- National Academy of Sciences, Engineering, and Medicine, 2017, *The Health Effects of Cannabis and Cannabinoids*
  - "There is no or insufficient evidence to support ... a statistical association between cannabis use and ... occupational accidents or injuries."

- Price. 2014. Marijuana and workplace safety: an examination of urine drug tests. *Journal of Addictive Diseases*
  - Employees who test positive for marijuana in workplace drug tests are no more likely to be involved in occupational accidents as compared to those who test negative.
  - "This study fell short of finding an association between marijuana use and involvement of workplace accidents. ... This study cannot be taken as definitive evidence of absence of an association between marijuana and work related accidents but the findings are compelling."

- Investigators studied the effect of state medical cannabis laws on labor supply and health outcomes among older adults for the period 1992 to 2012.
- Among those over the age of 50, the enactment of medical cannabis laws was associated with a "9.4 percent increase in the probability of employment and a 4.6 percent to 4.9 percent increase in hours worked per week."
- "Medical marijuana law implementation leads to increases in labor supply among older adult men and women."
CANNABIS REGULATION AND WORKPLACE PERFORMANCE - ABSENTEEISM

  - “[T]he study identifies that absences due to sickness decline following the legalization of medical marijuana.”
  - “The effect is stronger in states with (broader) medical marijuana regulations, for full-time workers, and for middle-aged males, which is the group most likely to hold medical marijuana cards.”
CANNABIS REGULATION AND WORKPLACE PERFORMANCE -- CONCLUSIONS

- Off-the-job cannabis use is not associated with an increased risk of occupational accidents or injuries
- Cannabis regulation is likely associated with a decrease in workplace absenteeism
- Cannabis regulation is likely associated with an increase in workforce participation among those over 50 years of age
OTHER NOTABLE HEALTH AND SAFETY IMPLICATIONS

- Cannabis regulation is associated with:
  - Decreased rates of opioid-related mortality
    - Bachhuber et al., 2014. Medical cannabis laws and opioid analgesic overdose mortality in the United States, 1999-2010. *JAMA Internal Medicine*
    - "Examination of the association between medical cannabis laws and opioid analgesic overdose mortality in each year after implementation of the law showed that such laws were associated with a lower rate of overdose mortality that generally strengthened over time."
    - 33% reduction in opioid-related mortality by year six
  - Decreased rates of opioid-related hospitalizations
    - Shi. 2017. Medical marijuana policies and hospitalizations related to marijuana and opioid pain reliever. *Drug and Alcohol Dependence*
    - “Medical marijuana legalization was associated with 23% and 13% reductions in hospitalizations related to opioid dependence or abuse and OPR (opioid pain reliever) overdose, respectively.”
OTHER NOTABLE HEALTH AND SAFETY IMPLICATIONS

- Decreased rates of opioid-related traffic fatalities
  - Kim et al., 2016. State Medical Marijuana Laws and the Prevalence of Opioids Detected Among Fatally Injured Drivers. *American Journal of Public Health*
  - “Operational MMLs (medical marijuana laws) are associated with reductions in opioid positivity among 21- to 40-year-old fatally injured drivers.”
- Decreased prescription drug spending
  - Bradford and Bradford. 2016. Medical marijuana laws reduce prescription medication use in Medicare Part D. *Health Affairs*
  - “National overall reductions in Medicare program and enrollee spending when states implemented medical marijuana laws were estimated to be $165.2 million per year in 2013.”
- Decreased rates of obesity-related medical costs
  - “[T]he enforcement of MMLs (medical marijuana laws) is associated with a 2% to 6% decline in the probability of obesity. ... Our estimates suggest that MMLs (medical marijuana laws) induce a $58 to $115 per-person annual reduction in obesity-related medical costs.”
THIS IS WHY WE ARE WINNING

Do you think the use of marijuana should be made legal, or not?

% Yes, legal

GALLUP
ABOUT ME

- Paul Armentano’s writing and research has appeared in over 750 publications, scholarly and/or peer-reviewed journals, as well as in more than two dozen textbooks and anthologies. He is the author of multiple books on the subject of cannabis and cannabis policy, and he is the 2013 Alfred R. Lindesmith award recipient in the achievement in the field of scholarship. He also frequently provides assistance to criminal defense attorneys involved in criminal and civil litigation.

- CONTACT – paul@norml.org