

Traffic safety impacts of marijuana legalization

In 2012, Colorado and Washington became the first states to legalize recreational marijuana. This note summarizes the effects observed in these states on marijuana use overall, use by drivers on the road and involved in arrests and crashes, crash rates, and the public's views regarding marijuana. Details on each topic may be found in the references. In this note, marijuana refers to any form of cannabis while THC refers to its active component delta 9-tetrahydrocannabinol.



While THC presence increased in Colorado and Washington drivers, there are no firm conclusions whether crash rates changed.

SUMMARY

After Colorado and Washington legalized recreational marijuana:

- » Marijuana use increased according to data from Colorado and Washington.
- » THC presence increased in drivers on the road and in arrested and crash-involved drivers according to data from Washington. THC-positive drivers may not necessarily be impaired.
- » There are no firm conclusions on whether crash rates changed in either state.
- » Fatal crashes involving marijuana increased in both Colorado and Washington.
- » Surveys in Colorado and Washington show that many regular marijuana users believe that marijuana doesn't affect their driving. Most regular users will drive "high" frequently.

IMPACT

Use overall: Marijuana use increased in both Colorado and Washington.

- » In Colorado, marijuana use in the past month by youth age 12-17 increased 12% from the three years (2010-2012) before Colorado legalized recreational marijuana to the three years after legalization (2013-2015). Use by young adults age 18-25 increased 16% and use by adults age 26 and above increased 71% (RMHIDTA, 2017).
- » In Washington, marijuana use in the past 30 days by adults age 18 and above increased slightly, from 8% in 2011 to 10% in 2014, but the increase was not statistically significant (WSOFM, 2016).

Use by drivers: Marijuana presence among drivers increased in Washington.

- » In roadside surveys in Washington conducted immediately before and 6 and 12 months after legal sales began in July 2014, the proportion of THC-positive drivers increased from 14.6% to 19.4% and then to 21.4%, though the increases were not statistically significant (NHTSA, 2016; Ramirez et al., 2016). The increase was concentrated in the daytime: from 8% THC-positive before sales began to 19% afterwards, compared to nighttime proportions of 18% before and 22% afterwards.

Arrests and crashes: Marijuana presence in arrested and crash-involved drivers increased in Washington.

- » In Washington, the proportion of suspected impaired driving cases that tested positive for THC averaged 19.1% from 2009-2012, then rose to 24.9% in 2013 (Couper and Peterson, 2014) and to 28.0% in 2014 and 33% in preliminary data from the first four months of 2015 (Couper, 2015).
- » Between 2005 and 2014, the proportion of Washington DUI and collision cases tested by toxicology that involved THC, excluding those positive for alcohol, increased significantly, from 20% to 30%. The median THC level increased significantly from 4.0 ng/mL in 2005 to 5.6 ng/mL (Banta-Green et al., 2016).

Fatal crashes: Fatal crashes involving marijuana increased in both Colorado and Washington.

- » Marijuana-related traffic deaths increased 66% in the four-year average (2013-2016) since Colorado legalized recreational marijuana compared to the four-year average (2009-2012) prior to legalization. During the same time period, all traffic deaths increased 16%. In 2009, 9% of traffic fatalities involved drivers who tested positive for marijuana. By 2016, that number more than doubled to 21% (RMHIDTA, 2017).
- » From 2010 through 2013, the estimated number and proportion of drivers involved in fatal crashes in Washington who had a detectable concentration of THC in their blood ranged from 48 to 53 (7.9% to 8.5%). The number and proportion both approximately doubled to 106 (17.0%) in 2014 (Tefft et al., 2016).

Crash rates: No firm conclusions yet available.

- » A study comparing overall traffic fatality rates per travel mile in Colorado, Washington, and eight control states between 2009 and 2015 found that fatality rate changes in Colorado and Washington were similar to changes in the control states (Aydelotte et al., 2017).

- »» A study of marijuana-related traffic fatalities in Colorado, Washington, and control states between 2000 and 2016 concluded that marijuana-related fatality rates increased similarly in Colorado, Washington, and the control states (Hansen et al., 2018).
- »» Police-reported crash rates per registered vehicle increased by about 5.2% after retail sales of marijuana began in Colorado, Oregon, and Washington compared to neighboring control states (IIHS, 2018).
- »» Collision claim frequencies increased by about 6% after retail sales began in Colorado, Nevada, Oregon, and Washington compared to neighboring control states (IIHS, 2018).

Driver views on marijuana and driving: Marijuana users believe that marijuana doesn't affect their driving and will drive "high" regularly in both Colorado and Washington.

- »» In surveys and focus groups in Colorado and Washington after legalization, almost all regular marijuana users believed that marijuana doesn't impair their driving and some believed that marijuana improves their driving (CDOT, 2014; PIRE, 2014; Hartman and Huestis, 2013). Most of these regular marijuana users drove "high" on a regular basis. They believed it is safer to drive after using marijuana than after drinking alcohol. They believed that they have developed a tolerance for marijuana's effects and can compensate for any effects, for instance by driving more slowly or by allowing greater headways.
- »» In a September 2014 survey of drivers in Colorado and Washington who reported any marijuana use in the past month, 43.6% reported driving under the influence of marijuana in the past year and 23.9% had driven within one hour of using marijuana at least five times in the past month (Davis et al., 2016).

References

- Aydelotte, J.D., Brown, L.H., Lutman, K.M., et al. (2017). Crash fatality rates after recreational marijuana legalization in Washington and Colorado. *American Journal of Public Health*. doi:10.2105/AJPH.2017.303848
- Banta-Green, C., Rowhani-Rahbar, A., Ebel, B.E. et al. (2016). Cannabis Use among Drivers Suspected of Driving Under the Influence or Involved in Collisions: Analyses of Washington State Patrol Data. Washington DC: AAA Foundation for Traffic Safety. <https://www.aaafoundation.org/cannabis-useamong-drivers-suspected-driving-under-influence-orinvolved-collisions-analysis>.
- CDOT (2014). *Drive High, Get a DUI: CDOT Marijuana Impaired Driving Campaign*. Powerpoint presentation. Denver, CO: Colorado Department of Transportation.
- CDOT (2018). *Marijuana-involved Fatalities in Colorado, by THC Type*. Denver, CO: Colorado Department of Transportation. <https://www.codot.gov/safety/alcohol-and-impaired-driving/druggeddriving/drugged-driver-statistics>
- Couper, F. (2015). Analysis of suspected impaired driving cases (DUI & DRE) received at the Washington State Toxicology Laboratory (statewide data from blood results): Preliminary data shown for 2015. media.npr.org/assets/news/2015/08/THC-1.pdf
- Couper, F. and Peterson, B. (2014). The prevalence of marijuana in suspected impaired driving cases in Washington state. *Journal of Analytical Toxicology*, 38, 569-574.
- Davis, K.C., Allen, J., Duke, J. et al. (2016). Correlates of marijuana drugged driving and openness to driving while high: Evidence from Colorado and Washington. *Plos One*. <https://doi.org/10.1371/journal.pone.0146853>
- Hansen, B., Miller, K., and Weber, C. (2018). *Early Evidence on Recreational Marijuana Legalization and Traffic Fatalities*. NBER Working Paper No. 24417. National Bureau of Economic Research. <http://www.nber.org/papers/w24417>
- Hartman, R. L. and Huestis, M. A. (2013). Cannabis effects on driving skills. *Clinical Chemistry* 59(3), 478–492.
- IIHS (2018). *Legal Pot: Crashes Are Up in States with Retail Sales*. IIHS Status Report 53 (6). Arlington, VA: Insurance Institute for Highway Safety. <http://www.iihs.org/iihs/sr/statusreport/sr>
- NHTSA (2016). Drivers' Use of Marijuana in Washington State. Traffic Tech. DOT HS 812 307. www.nhtsa.gov/staticfiles/nti/pdf/812307-TT-Marijuana_Use_in_WA.pdf
- PIRE (2014). *Washington State Roadside Survey, October 2014*. Calverton, MD: Pacific Institute for Research & Evaluation.
- Ramirez, A., Berning, A., Carr, K., et al. (2016). Marijuana, Other Drugs, and Alcohol Use by Drivers in Washington State. DOT HS 812 299. Washington, DC: National Highway Traffic Safety Administration. www.nhtsa.gov/staticfiles/nti/pdf/812299-WashingtonStatedrugstudy.pdf.
- RMHIDTA (2017). *The Legalization of Marijuana in Colorado: The Impact; Vol. 5 Rocky Mountain High Intensity Drug Trafficking Area*. <https://rmhidta.org/default.aspx?menuitemid=781&menugroup=RMHIDTA+Public+Overview>
- Tefft, B.C., Arnold, L.S., and Grabowski, J.G. (2016). Prevalence of Marijuana Involvement in Fatal Crashes: Washington, 2010 – 2014. Washington DC: AAA Foundation for Traffic Safety. <https://www.aaafoundation.org/sites/default/files/PrevalenceOfMarijuanaInvolvement.pdf>
- WSOFM (2016). *Monitoring Impacts of Recreational Marijuana Legalization, 2015 Update Report*. Olympia, WA: Office of Financial Management. <https://sac.ofm.wa.gov/impacts-recreational-marijuana-legalization-washington>
- WTSC (2016). *Driver Toxicology Testing and the Involvement of Marijuana in Fatal Crashes, 2010-2014*. Washington Traffic Safety Commission. <http://wtsc.wa.gov/research-data/traffic-safety-studies/>.

Published October 2018

©2018 Governors Highway Safety Association