

Cannabis and Road Crashes: A Close Look at the Best Epidemiological Evidence

Michael White

School of Psychology, University of Adelaide

Abstract

A literature search identified eleven epidemiological studies of the relationship between the prior use of cannabis and crashing. The studies were scrutinised to investigate potential bias. Many of the studies were found to be affected by biases that would exaggerate the apparent effect of cannabis. Accounting for the biases, it is concluded that, if cannabis *does* increase the risk of crashing, the increase is unlikely to exceed 30% (equivalent to driving with a BAC of below 0.05). Even the null hypothesis of no increase cannot be rejected.

Background

The ‘Cannabis & Road Safety’ page of the Vicroads road safety website (accessed in February 2017), states that the crash risk for driving after smoking cannabis is equivalent to that of driving with a BAC of about 0.15 (a high-level drink-driving offence in Australia). However, in an ABC news report (Bowden & Sales, 2015), the manager of road safety for New South Wales stated that prior use of cannabis increased the risk of crashing by only about 30% (equivalent to driving with a BAC of below 0.05 – a legal level for most drivers). The confusion about the crash risk is not limited to Australian road-safety authorities. There is much inconsistency in the basic research literature; and a number of reviews have reached conflicting conclusions - with a recent meta-analysis (Rogeberg & Elvik, 2016) exposing serious over-estimation biases in two earlier meta-analyses (Asbridge, Hayden & Cartwright, 2012; Li *et al.*, 2012).

Method

This paper summarises some of the main parts of a detailed review of the epidemiological research on the relationship between the use of cannabis and crashing (White, 2017).

The review did not involve an independent literature search, because such searches formed part of five previously published reviews: Asbridge, Hayden & Cartwright (2012); Elvik (2013); Hartman & Huestis (2013); Li *et al.* (2012); Rogeberg & Elvik (2016). Details of how eleven studies were selected for review are provided in White (2017, pp. 16-18).

The title of this paper identifies the unique characteristics of the review. Only the *best* studies were included (responsibility and case-control studies where the use of cannabis was determined toxicologically through the presence of THC in blood or oral fluid). Each selected study was subjected to a very *close look* to identify the possible involvement of any biases.

Results and Conclusion

Many of the included studies were found to suffer from over-estimation biases. No under-estimation bias was identified. The review does *not* include a meta-analysis because, while meta-analyses can give low weightings to poor research designs, they cannot adequately compensate for a high prevalence of uni-directional biases.

After accounting for the identified biases, it is concluded that, if cannabis *does* increase the risk of crashing, the increase is unlikely to be more than about 30%. Even the null hypothesis of no increase cannot be rejected.

Discussion

Ross Homel, whose early work on deterrence theory (Homel, 1988) was instrumental in the introduction of Random Breath Testing in Australia, considers that the inclusion of cannabis in the Australian Roadside Drug Testing (RDT) protocols is a disingenuous attempt to prosecute the War on Drugs under the guise of road safety (Hall & Homel, 2007). The results of this review support that opinion.

The inclusion of cannabis in the RDT protocols trivializes drug-driving road safety campaigns and government media releases. For example, when there is a news item such as “Drug driving peril: Surge in positive detections among P-plate drivers alarms authorities” (The Adelaide Advertiser, 23 March, 2015), the reader cannot know to what extent the ‘peril’ is due to stimulants such as methamphetamine and of some real danger, or to cannabis and of little or no danger.

References

- Asbridge, M., Hayden, J. A., & Cartwright, J. L. (2012). Acute cannabis consumption and motor vehicle collision risk: Systematic review of observational studies and meta-analysis. *British Medical Journal (BMJ)*, *344*:e536 (Published 9 February, 2012), 1-9.
- Bowden, T. (Writer) and Sales, L (Presenter). (2015, 23 March). *Drug-drivers now more prominent than drink-drivers, with 30pc of fatal road accidents involving drugs, research says* (news report). Sydney, Australia: Australian Broadcasting Commission (ABC).
- Elvik, R. (2013). Risk of road accident associated with the use of drugs: A systematic review and meta-analysis of evidence from epidemiological studies. *Accident Analysis and Prevention*, *60*, 254-267.
- Hall, W., & Homel, R. (2007). Reducing cannabis-impaired driving: Is there sufficient evidence for drug testing of drivers? *Addiction*, *102* (12), 1918-1919.
- Hartman, R. L., & Huestis, M. A. (2013). Cannabis effects on driving skills. *Clinical Chemistry*, *59* (3), 478-492.
- Homel, R. (1988). *Policing and punishing the drinking driver: A study of general and specific deterrence*. New York: Springer-Verlag.
- Li, M-C., Brady, J. E., DiMaggio, J., Lusardi, A. R., Tzong, K. Y., & Li, G. (2012). Marijuana use and motor vehicle crashes. *Epidemiologic Reviews*, *34*, 65-72.
- Rogeberg, O., & Elvik, R. (2016). The effects of cannabis intoxication on motor vehicle collision revisited and revised. *Addiction*, *111*, 1348-1359.
- White, M. (2017). *Cannabis and road crashes: A close look at the best epidemiological evidence*. Adelaide, South Australia: University of Adelaide: School of Psychology. Available at: https://www.researchgate.net/profile/Michael_White24