

## The prevalence of alcohol and other drugs in fatal road crashes in Victoria, Australia

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### Abstract

Alcohol and other drugs are known risk factors for road traffic crashes. We performed a population-based review of road trauma deaths in Victoria between 01 July 2006 and 30 June 2016 using data from the Victorian State Trauma Registry and the Victorian Institute of Forensic Medicine. While road traffic fatalities declined in motor vehicle drivers, motorcyclists and pedestrians, we observed increases in the prevalence of opioids, amphetamines and ketamine in motorcyclists. These data provide important insights that can be used to inform testing regimes and targeted interventions to reduce alcohol and other drug use in all road users.

### Background

Being under the influence of alcohol or other drugs is a well-established risk factor for road traffic crashes, injuries and deaths. The prevalence of alcohol and other drugs in fatal road crashes has been studied in other international settings (Brady & Li, 2014; Elliott, Woolacott, & Braithwaite, 2009; Poulsen, Moar, & Troncoso, 2012). However, there is a paucity of current data on the prevalence of alcohol and other drugs, including prescription medication, in fatal road traffic crashes in Victoria, Australia. This study aimed to address this knowledge gap and explore how the presence of alcohol and other drugs has changed over time.

### Methods

We performed a population-based review of out-of-hospital and in-hospital road trauma deaths over the period of 01 July 2006 to 30 June 2016 in Victoria, Australia, using data from the National Coronial Information System and the Victorian State Trauma Registry (VSTR). Passengers and occupants out of the vehicle were excluded from this study. Toxicology data were linked from the Victorian Institute of Forensic Medicine. Nine drug classifications were used: alcohol, cocaine, amphetamine, ketamine, opioids, Delta-9-tetrahydrocannabinol (THC), benzodiazepines, antidepressants and antipsychotics. Individual Poisson regression models were used to determine whether the incidence rate increased or decreased over the study period for each road user group and for each drug type. The incidence rate ratio (IRR) and 95% confidence intervals (CI) were calculated.

### Results

Over the study period, there were 2,410 road traffic fatalities, excluding passengers and occupants out of the vehicle. These constituted 1,399 (58%) motor vehicle drivers, 511 (21%) pedestrians, 417 (17%) motorcyclists and 83 (3%) pedal cyclists. Road traffic fatalities declined in motor vehicle drivers (IRR=0.95; 95% CI: 0.94, 0.97), motorcyclists (IRR=0.95; 95% CI: 0.92, 0.99) and pedestrians (IRR=0.94; 95% CI: 0.91, 0.97) but there was no change in pedal cyclists (IRR=0.98; 95% CI: 0.91, 1.06).

A blood alcohol concentration  $\geq 0.05$  g/100mL was present in 18% of all road traffic fatalities. The prevalence of alcohol declined 7% per year in motor vehicle drivers (IRR=0.93, 95% CI: 0.90,

0.97) and 7% per year in pedestrians (IRR=0.93; 95% CI: 0.87, 0.99), but did not change in motorcyclists or pedal cyclists.

For all road traffic fatalities, opioids were detected in 16% of cases, THC in 13% of cases, antidepressants in 9% of cases, benzodiazepines in 8% of cases, amphetamines in 7% of cases, ketamine in 3% of cases, antipsychotics in 1% of cases and cocaine in 0.2% of cases. The prevalence of opioids increased 12% per year in motorcyclists (IRR=1.12, 95% CI: 1.02, 1.24) but not in other road user groups. The prevalence of amphetamines increased in motorcyclists (IRR=1.18; 95% CI: 1.06, 1.33) but not in other road user groups. The prevalence of ketamine increased in motor vehicle drivers (IRR=1.38, 95% CI: 1.22, 1.57), motorcyclists (1.80, 95% CI: 1.07, 3.03) and pedestrians (IRR=1.29; 95% CI: 1.07, 1.55), but not in pedal cyclists. There were no changes over time in the prevalence of THC, benzodiazepines, antidepressants or antipsychotics.

### Conclusions

These data provide important insights into changes over time in the prevalence of alcohol and other drugs in road traffic crashes. These findings can be used to inform testing regimes and to develop targeted interventions to reduce alcohol and other drug use in all road users.

### References

- Brady, J. E., & Li, G. (2014). Trends in Alcohol and Other Drugs Detected in Fatally Injured Drivers in the United States, 1999–2010. *American Journal of Epidemiology*, 179(6), 692-699.
- Elliott, S., Woolacott, H., & Braithwaite, R. (2009). The prevalence of drugs and alcohol found in road traffic fatalities: a comparative study of victims. *Science and Justice*, 49(1), 19-23.
- Poulsen, H., Moar, R., & Troncoso, C. (2012). The incidence of alcohol and other drugs in drivers killed in New Zealand road crashes 2004–2009. *Forensic Science International*, 223(1-3), 364-370.