THE RELATIONSHIP BETWEEN ACCIDENT CULPABILITY AND THE PRESENCE OF DRUGS IN BLOOD
SAMPLES TAKEN FROM PEOPLE INJURED IN MOTOR VEHICLE COLLISIONS
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INTRODUCTION
The escalating use of drugs in Australia has focused the attention of the road safety community on the risks associated with driving in the presence of drugs other than alcohol. There has been limited research into the relative risk of non-fatal collisions associated with drugs other than alcohol. Data pooled from coronial investigations has shed light on the relative risk of fatal collisions. This project aims to document the relationship between responsibility for injury collision and the presence of drugs in injured drivers in Victoria. In time this will enable relative risk to be quantified.

METHODS
Any person over 15 years of age who is taken to hospital as a result of a road collision in Victoria is required to furnish a blood sample for analysis (Road Safety Act Victoria 1986). There are three samples – one given to the patient, one used as a ‘screening sample’ and the third is subject to evidential continuity in case of prosecution. Once the ‘screening sample’ has been processed for the presence or absence of alcohol, it was analysed for the presence of drugs. Blood samples were screened for the presence of alcohol, cannabis, methamphetamines and benzodiazepines. The sample is linked to the police traffic incident database in order to extract the characteristics of the collision. All identifying personal information was removed.

The project team examined the police collision reports and performed a responsibility analysis using the method developed by Terhune (USA) and Drummer (Australia) to determine the relative importance of various drugs in collisions in which the driver is fatally injured.[1-2] Collision analysis provides a rating of the driver’s relative responsibility. Using drug and alcohol free drivers as the control group, an odds ratio gives an estimate of the relative risk associated with the identified drugs.

RESULTS AND DISCUSSION
This paper describes the results of a feasibility study conducted from December 2008 through March 2009. Blood results from 431 drivers were matched with the collision details from the Victoria Police Traffic Incident System (TIS) database.

The collision data was contained in the Police Traffic Incident System. The collision data was then scored for culpability using the method developed by Robertson & Drummer (1994).[2] Drivers are allocated to one of three groups - responsible, contributory or not-responsible. This analysis was performed without the knowledge of the toxicology in order to eliminate potential bias.

70 per cent of drivers in this study were male with an average age of 35 years.

There is a significant bias in the selection of subjects in this feasibility study. In 1990 when the focus of enforcement was on alcohol, police negotiated a code of practice with emergency physicians which allowed the doctors to use preliminary breath testing to select which patients were required to provide blood samples for alcohol estimation. The coroner also required samples to be obtained from drivers in serious collisions. Clinical practice means that patients who appear drug affected were also subject to blood sampling. This Code of Practice means that drivers taken to hospital from minor collisions who were not obviously impaired were not subject to blood sampling. It is estimated that this represents 40% of all injury collisions.

This selection bias has reduced the ‘control’ alcohol and drug free sample. Longo’s sample is a larger, state-wide sample with a better collection of alcohol and drug free samples. Ch’ng’s sample is derived from a trauma centre with a bias to collisions associated with more severe injury. Only continuation of the project and improved blood sampling will determine regional differences with Longo’s study and severity bias with Ch’ng and Drummer’s studies.

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<tbody>
<tr>
<td>Drug &amp; alcohol free</td>
<td>77.4%</td>
<td>50.1%</td>
<td>45%</td>
<td></td>
</tr>
<tr>
<td>Cannabinoids</td>
<td>7.1%</td>
<td>46.7%</td>
<td>4.4%</td>
<td>15%</td>
</tr>
<tr>
<td>Benzodiazepines</td>
<td>3%</td>
<td>15.6%</td>
<td>1.0%</td>
<td>20%</td>
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<tr>
<td>Amphetamines</td>
<td>1%</td>
<td>4.1%</td>
<td>1.6%</td>
<td>7%</td>
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13 drivers in this study were below the legal driving age, with all of these drivers responsible for the collision. 10 of the 13 drivers had a positive blood alcohol concentration (mean 0.093%). Cannabis, amphetamines and...
Benzodiazepines were also detected in the underage drivers.

The most common days of the week collisions occurred was on a Friday, Saturday and Sunday. The majority of collisions occurred between the hours of midday and midnight, with 61 per cent occurring during this time period.

Alcohol was the most frequently detected drug which may simply reflect the selection bias. The alcohol group was predominantly male with mean age of 35 years. 95 per cent of injured drivers that tested positive for ‘alcohol only’ were responsible for the collision, with the majority of these drivers recording a BAC level ≥0.08. The highest recorded BAC level in the study was a driver at 0.312%. 91% of drivers with a positive BAC contributed to or were responsible for the collision.

Alprazolam has become popular as a recreational drug and is subject to misuse. 100% of the drivers with alprazolam present (n=12) were responsible for the collision and half of these drivers had levels in the ‘toxic’ range as clear evidence of abuse.

13% of samples contained an amphetamine-type stimulant (amphetamine, methamphetamine, MDMA). 96% of the drivers with a stimulant present were responsible for the collision.

CONCLUSIONS

This study has established the methodology for performing responsibility analysis in non-fatal collisions using the same analysis technique that has been used for fatal collisions.

The relationship between alcohol and responsibility for collision is well established. This study highlights the relationship between abuse of benzodiazepines and use of illicit drugs and increased risk of collision.

This preliminary study provides good evidence that drugs other than alcohol are associated with increased risk of injury collision.

REFERENCES