5. **Drugs and Road Safety**

5.1 **Background**

The first two terms of reference require the Committee to:

2. Report on the health, social and economic costs of such drug use in relation to road safety.

This chapter first reviews the incidence of drugs other than alcohol in people involved in crashes or detected for traffic offences in Victoria. It then considers the relative crash risk of drug-impaired drivers and puts into perspective the magnitude of the problem.

5.2 **Incidence of Drug Use**

The Committee examined three areas of road safety risk, using Australian and overseas data:

- driver deaths.
- driver injuries.
- drivers detected for traffic offences.

**Driver Deaths**

The Committee found that data available on drug consumption in deceased Victorian drivers was so limited that it was unable to make an appropriate measure of drug consumption by drivers against the total driving population of three million in Victoria.

The Committee had sought to identify the types of drugs being consumed and whether they could be correlated against the age profiles of deceased drivers. These issues would be of importance in the design of countermeasures.
The Victorian Institute of Forensic Pathology was the only source of data available to the Committee to reflect Victorian conditions. Professor Olaf Drummer, Assistant Director of the Institute contributed to the Committee’s First Report reviewing the prevalence of drugs in 1,045 fatal crashes in Victoria, New South Wales and Western Australia over a three-year period from 1990 to 1993.\(^1\)

VicRoads quoted the Institute’s research on Victorian driver deaths in its submission.\(^2\) Only 490, or 58 per cent, of all driver deaths in Victoria during this period were considered as the other 42 per cent of deaths had insufficient information to undertake a crash responsibility analysis. However VicRoads noted that there is no known systematic error to suggest that this data is not representative.\(^3\)

The types of drugs found in the Institute's study are shown in the following table.

**Table 5.1  Drugs Involved in Driver Fatalities, 1990-1993**

<table>
<thead>
<tr>
<th>DRUG</th>
<th>VIC</th>
<th>NSW</th>
<th>WA</th>
</tr>
</thead>
<tbody>
<tr>
<td>drugs other than alcohol</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(without alcohol)</td>
<td>22.0</td>
<td>18.4</td>
<td>27.0</td>
</tr>
<tr>
<td>(with alcohol)</td>
<td>(13.0)</td>
<td>(9.5)</td>
<td>(14.0)</td>
</tr>
<tr>
<td>cannabis</td>
<td>9.6</td>
<td>10.7</td>
<td>13.0</td>
</tr>
<tr>
<td>benzodiazepines-minor tranquillisers</td>
<td>4.5</td>
<td>1.9</td>
<td>1.7</td>
</tr>
<tr>
<td>amphetamines and related stimulants</td>
<td>3.9</td>
<td>4.2</td>
<td>3.1</td>
</tr>
<tr>
<td>opiates</td>
<td>3.3</td>
<td>2.7</td>
<td>1.7</td>
</tr>
<tr>
<td>miscellaneous drugs</td>
<td>5.3</td>
<td>2.7</td>
<td>9.6</td>
</tr>
<tr>
<td>(analgesics)</td>
<td>(1.6)</td>
<td>(3.4)</td>
<td></td>
</tr>
<tr>
<td>(anti-depressants)</td>
<td>(1.2)</td>
<td>(1.0)</td>
<td></td>
</tr>
<tr>
<td>alcohol</td>
<td>32.0</td>
<td>34.0</td>
<td>44.0</td>
</tr>
</tbody>
</table>

*Source: VicRoads\(^4\)*

In May 1996 Professor Drummer provided the Committee with information on a further 287 drivers killed on Victorian roads over the period 1994 to the end of June 1995.\(^5\)
Professor Drummer amalgamated this data and established an indicator for the prevalence of drugs over the entire period of the study, 1990 to mid-1995, combining two sets of Victorian data, 1990-1995 and data from New South Wales and Western Australia, 1990-1993.

Table 5.2 Prevalence of Drugs in Driver Fatalities, Victoria, New South Wales and Western Australia

<table>
<thead>
<tr>
<th>Drug Class</th>
<th>Number (1332)</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drug-free</td>
<td>694</td>
<td>52.0</td>
</tr>
<tr>
<td>Alcohol</td>
<td>455</td>
<td>34.0</td>
</tr>
<tr>
<td>Alcohol-only</td>
<td>333</td>
<td>25.0</td>
</tr>
<tr>
<td>Alcohol plus drug</td>
<td>123</td>
<td>9.2</td>
</tr>
<tr>
<td>Drugs only</td>
<td>182</td>
<td>13.7</td>
</tr>
<tr>
<td>Drugs</td>
<td>305</td>
<td>23.0</td>
</tr>
<tr>
<td>Cannabis</td>
<td>154</td>
<td>11.6</td>
</tr>
<tr>
<td>Benzodiazepines</td>
<td>44</td>
<td>3.3</td>
</tr>
<tr>
<td>Amphetamines/stimulants</td>
<td>49</td>
<td>3.7</td>
</tr>
<tr>
<td>Opiates</td>
<td>35</td>
<td>2.6</td>
</tr>
<tr>
<td>Other drugs</td>
<td>84</td>
<td>6.3</td>
</tr>
</tbody>
</table>

Source: Professor O. Drummer, May 1996

From this overall Australian experience the Victorian situation was explained by Professor Drummer. Drummer’s study showed that for the period 1990-1995:

- 45 per cent of drivers in Victorian fatalities had taken at least one drug including alcohol.
- alcohol was detected in 30 per cent of the drivers.
- drugs other than alcohol were detected in 23 per cent.
- alcohol was present in about one-third of the drivers in which a drug was also present.
- cannabis was the most frequently detected drug other than alcohol at 10 per cent.
### Table 5.3 Comparison of 1990-1993 and 1994-mid 1995 Victorian Data

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Drug-free</td>
<td>262</td>
<td>54.0</td>
<td>162</td>
<td>57.0</td>
</tr>
<tr>
<td>Alcohol</td>
<td>158</td>
<td>32.0</td>
<td>81</td>
<td>28.0</td>
</tr>
<tr>
<td>Alcohol-only</td>
<td>122</td>
<td>25.0</td>
<td>55</td>
<td>19.0</td>
</tr>
<tr>
<td>Alcohol plus drug</td>
<td>36</td>
<td>7.3</td>
<td>26</td>
<td>9.1</td>
</tr>
<tr>
<td>Drugs only</td>
<td>70</td>
<td>14.3</td>
<td>44</td>
<td>15.3</td>
</tr>
<tr>
<td>Drugs</td>
<td>106</td>
<td>21.6</td>
<td>70</td>
<td>24.4</td>
</tr>
<tr>
<td>Cannabis</td>
<td>47</td>
<td>9.6</td>
<td>32</td>
<td>11.1</td>
</tr>
</tbody>
</table>

**Source:** Professor O. Drummer, May 1996

The Committee examined the data for the two periods to determine what changes, if any, had occurred. The data indicated:

- an increase in the incidence of drugs from 21.6 per cent to 24.4 per cent of total driver fatalities.

- a decline in the incidence of alcohol from 32 per cent to 28 per cent of total driver fatalities.

- a slight increase to 11 per cent in the incidence of cannabis detected in drivers.

The size of the most recent sample of 287 cases is considerably less than the earlier sample of 490 cases. The increase in drug presence from 22 per cent to 24 per cent in the second sample may be part of an upward trend but is not yet statistically significant.

Victoria’s success in reducing the involvement of alcohol in fatal crashes from nearly 50 per cent of drivers with over 0.05 blood-alcohol concentration in the late 1970s to 23 per cent in 1995 has highlighted the involvement of drugs.6

An issue of concern to the Committee in interpreting these figures was:

- whether drug presence in the dead drivers merely represented drug use in the general driving population.
• whether particular drug users were over-represented in driver fatalities, such as elderly people taking prescription medicine or young people taking illegal drugs, as a proportion of the total number of people in road fatalities.

Based on the drug use profile established in Professor Drummer's figures could the Committee assume that it was reflective of the total driver population?

Professor Drummer's figures do not give an age profile which the Committee considers essential for the development of countermeasures. Without this profile the Committee could not tell whether the drug-driving population was uniform or separated into various age groups. Future studies need to look at age profile figures to better determine what is occurring.

The Committee sought an age profile of driver fatalities. The Victorian Road Safety Strategy 1995-2000 published in 1994 found that 29 per cent of drivers killed were 17 to 25 years of age and 17 per cent were aged 60 years or over. The strategy established that young drivers and older drivers, given their comparatively lower levels of travel, were over-represented in driver fatalities.

Table 5.4  
Driver Risk of Death - 1994 Fatalities

<table>
<thead>
<tr>
<th>Age of Driver</th>
<th>Risk Relative to Lowest Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>under 20</td>
<td>5</td>
</tr>
<tr>
<td>20-29</td>
<td>2</td>
</tr>
<tr>
<td>30-39</td>
<td>1.5</td>
</tr>
<tr>
<td>40-49</td>
<td>1.0</td>
</tr>
<tr>
<td>50-59</td>
<td>0.8</td>
</tr>
<tr>
<td>60-69</td>
<td>0.5</td>
</tr>
<tr>
<td>70+</td>
<td>0.3</td>
</tr>
</tbody>
</table>

The strategy also showed that a driver’s risk of death could be measured by age group. Drivers aged 70 plus had a risk factor of 15 when measured against drivers aged 30 to 39 who had a risk factor of one. This age relationship is shown in Table 5.4.7

Despite the shortage of other statistical data it is clear that the incidence of drugs other than alcohol in Victorian driver fatalities is increasing.

The Committee gave consideration to whether fatality studies were effective or appropriate given the small number of persons who can be assessed for examination. VicRoads, in its submission, identified a number of advantages in the use of fatality studies:

1. that death is the most serious consequence of road accidents and effective countermeasures identified from fatality studies are most important.
2. the integrity and extent of the data allows for a more detailed investigation of accident causation.
3. the relative ease of obtaining body fluid samples, whereas representative specimens from crash survivors or from the non-crash driver population are more difficult to obtain.8

However VicRoads considered that this approach has two major disadvantages:

1. they provide a limited view of the total road crash population, less than one percent of crash drivers.
2. the causes of fatal crashes may be different to less severe crashes.9

Fatal crashes are more often single vehicle incidents and represent more of the extreme behaviours that have severe consequences. VicRoads therefore argues that drugs are more likely to be a cause in non-fatal crashes, for instance in traffic and at intersections where more urgent decision-making can be required. In such situations impairment due to drugs may be more critical.10

The Committee found that the fatality studies by the Institute of Forensic Pathology are an important indicator of drug-related crashes in Victoria. The Committee also noted that the Western Australian Task Force on Drug Abuse has recently published an analysis of statistics on drug-related traffic fatalities.11
The Victorian studies should continue and where possible be supplemented by data from other States.

**Driver Injuries**

- **Victoria**

The paper, *Drug Use in the Transport Industry*, by the Accident Investigation Section of the Victoria Police in the Committee’s First Report provided information on drug use by 122 drivers surviving life-threatening injuries in 1993. However this was not a representative sample of all injured drivers.

The Committee found that no other information had been maintained in Victoria on drugs found in drivers injured in road accidents.

In his paper in the Committee’s First Report, *A Clinician’s Perspective*, Dr Michael McDonough, Director of the Drug Services Unit at Box Hill Hospital, raised the issue of the detection of drug abusers in Victorian rehabilitation hospitals for road crash patients.

The Committee asked the Transport Accident Commission about its experience as a third-party insurer and provider of benefits to crash victims and their families. The Committee was surprised to find that information from blood samples routinely collected in emergency care hospitals was not being analysed by the Commission to detect possible drug involvement and no system existed to ensure that this information was passed on to their rehabilitation hospitals.

The Committee could not find any evidence that the Commission knew what proportion of persons entering its rehabilitation hospitals had been affected by drugs other than alcohol at the time of their crash. This information would appear essential for the rehabilitation of patients and for the Commission to target drug-taking countermeasures.

The Commission spent $27.5 million on accident prevention programs and grants in the 1994/95 financial year. This expenditure included the successful media and community awareness programs, school and traffic education and contributions to enforcement and research grants.
No expenditure to ascertain what part of the road toll was due to drugs other than alcohol appears to have been made. The Committee’s view is that without such knowledge the Commission would not be able to effectively target any advertising campaigns on drug-driving.

Data on the incidence of drug-impaired drivers may also be held by individual emergency care hospitals and medical centres. This information may not be currently in a readily available form as its collection is considered secondary to the treatment of crash victims in casualty. Blood samples collected by emergency care doctors provide a further source of research data on the involvement of drugs in road crashes. The potential for this information to be collected and integrated into one central database needs to be pursued. The management of this empirical database should be undertaken by VicRoads.

This research information will be of a sensitive personal nature as the blood samples may contain evidence of the illegal consumption of a drug. The legal implications of the database and the privacy and rights of individuals will need to be carefully considered.

- **New South Wales**

The Committee read results of urine tests on seriously injured crash victims made by a road trauma team at Liverpool Hospital in Sydney for the period October 1992 to October 1993. The results comprised drug and alcohol urine profiles from 262 persons, of whom 164 were drivers, 55 passengers, 12 cyclists and 31 pedestrians.

The road trauma team found:

- **sixteen percent of the drivers had an alcohol concentration of greater than 0.08%**;

- **twenty percent of drivers had high drug levels in their urine, principally cannabis (15%) and benzodiazepines (3%).**

In contrast to other studies the team found only four cases where both alcohol and drugs were used.
The team suggested that:

> It is possible that some drivers may take cannabinoids to avoid police detection during random breath tests.\(^\text{17}\)

Ms Rosemary McClean, Senior Policy and Planning Officer with the Australian Drug Foundation, described some of the comments received from probationary drivers in their studies. She said a view held by a number of young people was that they used cannabis instead of alcohol because it would not endanger the keeping of their licence. One comment was:

> I am on P Plates so smoking marijuana is okay; I can’t get breathalysed for it.\(^\text{18}\)

This opinion has been expressed to the Committee on other occasions, although other witnesses have disagreed with the view. The Victoria Police Accident Investigation Section drew this to the Committee’s attention:

> When asked about alcohol consumption they indicate an awareness of the dangers and consequences of drink/driving and limit their consumption accordingly, however this is not so with other drugs which do not have an arbitrary limit. A common answer when asked what effect a drug has on the user’s ability to drive is, ‘It just relaxes me’. Such a response is predictable.\(^\text{19}\)

In the Committee's view, this reinforces the complexity of the issue and the need for a database of similar evidence on injured Victorian drivers before this issue can be resolved.

• **South Australia**

The Office of Road Safety of the South Australian Department of Transport recently conducted a study of the incidence of drugs in injured drivers attending hospitals for treatment.

The first results were reported to the National Road Safety Research and Enforcement Conference in Fremantle in November 1995 by Ms Christine Hunter, Senior Project Officer of the Department of Transport’s Office of Road Safety and Mr Robert L Lokan.\(^\text{20}\)
The Committee received updated figures from the study when in Adelaide in February 1996.21

The results showed that consecutive samples from 749 drivers who survived crashes were screened for alcohol, cannabinoids, various amphetamines including methamphetamine and benzodiazepines. Drugs were screened by radioimmunoassay and alcohol was quantified by gas chromatography.

Alcohol was found in 15 per cent of the drivers, with 13 per cent above the legal limit of 0.05 per cent. Drugs were detected in 21 per cent of the drivers. Alcohol only and cannabis only were each detected in almost 10 per cent of the drivers.155.2

The study is significant in that it is planned to use a responsibility analysis technique to examine the contribution of drugs and alcohol separately and in combination, to non-fatal crashes. This will complement the work on fatalities by Professor Drummer mentioned earlier.

An interesting preliminary result of the study was the significant difference in the incidence of drugs and alcohol in drivers of vehicles and motorcyclists. Alcohol use was found to be extremely rare for motorcyclists but they were three times more likely than vehicle drivers to test positive for cannabis (24% versus 8%).

In the light of these differences it is planned to examine separately for drivers and motorcyclists the incidence of various drug combinations in one-vehicle and two-vehicle crashes. The final results are expected in late 1996.

The Committee considers that the South Australian study would complement work that needs to be conducted in Victoria.

This could be achieved by the establishment of central data collection where information on death and injury and, in particular, drug impairment requiring medical or hospital or police attendance is collected to be forwarded to one common database. The Committee reiterates its view that the collection of this data should be able to produce monthly and yearly figures or any combination of driver statistics.
While this Inquiry is about drugs and driving, future inquiries may need such information and it should be available.

5.3 Drivers Detected for Traffic Offences

Victoria Police publish statistics on traffic offences. In mid-1995 these statistics indicated that in both 1992-1993 and 1993-1994 approximately 240 bookings were made for 'driving under the influence of drugs'. However, when the Committee sought to investigate these figures further there was a paucity of information.

On behalf of the Committee the Department of Justice in October 1995 requested further information from a police district which had reported 27 cases of driving under the influence of drugs other than alcohol but subsequent investigations revealed that only two cases had been recorded.

Victoria Police were asked to determine the true situation and replied:

> The issue of the actual number of cases of this type of offence occurring over any given time period is not known and can only be approximated on the figures given for calendar or financial years. This approximates 240 cases in Victoria. However this figure is based in many cases on the suspicion of a person committing the offence in conjunction with other offences involving driving and therefore must be questioned.22

Police have subsequently revised published statistics and are currently quoting lower figures.

The Committee is concerned about the apparent inaccuracy of police statistics and the lack of an overall statistical picture of the current situation relating to driving under the influence of drugs in Victoria.

Victoria Police in correspondence provided results of analysis of 260 blood samples obtained by its Accident Investigation Section during the section's investigation of motor vehicle collisions for two financial years, 1993-94 and 1994-95.23 For simplicity within this Report the results for the two financial years have been combined and averaged.
The Committee found by subtracting the 26 per cent of sole alcohol users from the 40 per cent frequency of alcohol use, 14 per cent had combined alcohol and other drugs. Throughout the Inquiry the Committee noted both the significant overlap between alcohol and drugs and the use of drug combinations.

5.4 Drug Presence in Road Crashes

Victoria

The Committee sought the best possible assessment of drug presence in drivers in Victorian crashes. It compared three sources of information to estimate the proportion of cases involving drugs and alcohol, both alone and in combination:

- **Crashes:** Fatal and serious crashes investigated by the Victoria Police Accident Investigation Section.

- **Injuries:** As a proxy for Victoria, data from the South Australian Department of Transport on injured drivers attending hospital who had consumed drugs.
Deaths: Data from the Victorian Institute of Forensic Pathology on dead Victorian drivers.

Table 5.6 Comparison of Data on Crashes, Injuries and Deaths

<table>
<thead>
<tr>
<th>Category</th>
<th>Crashes %</th>
<th>Injuries %</th>
<th>Deaths %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drugs</td>
<td>42</td>
<td>21</td>
<td>23</td>
</tr>
<tr>
<td>- without alcohol</td>
<td>28</td>
<td>16</td>
<td>15</td>
</tr>
<tr>
<td>- with alcohol</td>
<td>14</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>Alcohol</td>
<td>40</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td>- alone</td>
<td>26</td>
<td>10</td>
<td>23</td>
</tr>
<tr>
<td>- Drugs &amp;/or alcohol</td>
<td>68</td>
<td>31</td>
<td>45</td>
</tr>
</tbody>
</table>

Source: Compiled by Committee from above sources.

The Committee stresses that the different sources of the data and the small number of cases involved prevent any firm conclusions being drawn at this time for Victoria. However it does indicate that the incidence of drugs in drivers killed or injured is relatively high and comparable to the incidence of alcohol.

Western Australia

The Committee heard evidence in Perth from Dr David Joyce, an expert pharmacologist at the University of Western Australia. Dr Joyce conducted for the Traffic Board of Western Australia an analysis of drug-impaired drivers detected by police over five years.\(^{24}\) IS 5.3

The analysis was based on 513 drivers who had shown a degree of intoxication not explained by alcohol and then had tested positive for one or more drugs other than alcohol.

Almost 40 per cent of the drivers had been involved in road crashes. Dr Joyce found on average, drivers were regarded as severely impaired and clearly had difficulty with speech and/or walking.
Multiple use of drugs was evident in almost three-quarters of the drivers. The most common drug was cannabis in 400 drivers but in more than 300 of these cases it had been taken in conjunction with alcohol and/or amphetamines, opiates or benzodiazepines.

In 96 drivers, cannabis was the sole intoxicant. Dr Joyce said:

*That gives us one of the largest groups of purely cannabis-affected drivers available for study anywhere in the world.*

The incidence of amphetamines usually with other drugs including alcohol was also surprisingly large in comparison with other statistics on the general use of amphetamines in the general driving-age population which was typically 1 per cent in the previous 12 months.

In discussions with the Committee, Dr Joyce stated that:

- drivers in the sample were so grossly affected for it to be obvious.
- they represent only a small proportion of the overall problem.
- a policeman or member of the public has to observe or report their behaviour. Hence, many drug-affected drivers go undetected.
- 70 per cent had used more than one drug and often a cocktail of many drugs.
• among drivers involved in crashes there is a higher rate of drug usage and drug intoxication than we currently believe.26

The significance of Dr Joyce’s work is that he is not observing volunteers given low dosages of cannabis or medications but high-dose users.

Contrary to some scientific opinion, drivers grossly impaired by cannabis were likely to speed as well as exhibit poor vehicle control. The likelihood of increased risk-taking behaviour appeared to rise with the cannabis metabolite concentration. Dr Joyce’s findings:

.... contrasted with the image of cannabis as a drug which does not cause severe driving impairment, .... 27

The publication of Dr Joyce’s research conducted for the Traffic Board of Western Australia will greatly assist other researchers in assessing the incidence of drug-impaired driving within their own communities.28 No similar study has been done in Victoria but it can be deduced that what is true for Western Australia could be true for Victoria. When examined with Professor Drummer’s fatality studies the magnitude of drug involvement in dangerous driving becomes more apparent.

5.5 Drug Presence in Overseas Road Crashes

Many studies overseas have indicated the presence of drugs in road crashes.

The Committee sought to determine whether the use of drugs by drivers in Victoria was comparable to experience overseas and whether that experience could inform the Committee in developing its recommendations to the Parliament.

Two examples are:

Chicago

The Victorian Department of Human Services in its submission provided information on a study in Chicago reported in 1994.29
The study used a review of the medical charts of hospitalised drivers, police reports and blood-alcohol levels and urine-drug screens. From a sample group of 625 patients over 32 per cent were legally drunk and had greater than 0.10 per cent blood-alcohol concentration and 22 per cent had positive drug screens, with cocaine the drug most prevalent.

The study concluded that an extremely high level of drug impairment existed in this sample of seriously injured motorists. The majority were not charged.\textsuperscript{30}

**European Union**

A comprehensive survey of drugs and driving in the European Union was led by Dr Johan de Gier of the University of Limburg, Maastricht, the Netherlands, using comparable information from experts in eight countries in the Union.\textsuperscript{15} The study provided information to the European Community Commission General Directorate VII (Transport) in Brussels.\textsuperscript{31}

The Committee recognised that there would be differences between Australia and Europe but felt that there was sufficient commonality on the outcome of the study for it to be relevant to this Inquiry.

The study was published in April 1995 and presented to the Committee in Maastricht. Key results were:

- Psychotropic medication use varied significantly, for example, 5.7 per cent of the population in Spain (used in the past two weeks) and 23 per cent in the Netherlands (used in the past year). Differences were partly due to different groups of medications used for assessment and whether use was occasional or constant.

- Medicinal drug use varied from 1.2 per cent in Denmark and Germany to 2.5 per cent in Spain.

- Illicit drug use in the past year varied from approximately 5 per cent in Germany, Denmark, the Netherlands and Sweden to approximately 15 per cent in Spain.
• Cocaine and cannabis use increased in some countries, revealing marked differences between countries in drug use patterns.

Despite the limited availability of directly comparable information, the overall conclusion of Dr de Gier's study was that:

... very conservatively and excluding illicit drug use an average of 10% of the presumed driving population regularly drives under the influence of impairing drugs. Only an average of 1.5% of those taking psychotropic medication are considered to be 'addicted' (in other words taking drugs chronically for many years). A much smaller percentage (1-2%) is using illicit drugs, but drivers taking these are over-represented amongst drivers detained on suspicion of driving under the influence of drugs other than alcohol.\(^3\)

The Committee noted a paucity of directly comparable data in Europe which was similar to the situation in Australia.

5.6 Problem Groups of Drug-Impaired Drivers

A key question for the Committee was which group of drivers drove while impaired. The Committee asked witnesses at its hearings in Australia:

> From your knowledge of the drug-taking population to what extent do you believe that driving while impaired by drugs is contributed to by the following groups:

(a) drug/addicts/abusers;
(b) occasional recreational users;
(c) people using stimulants to combat fatigue; and
(d) people on prescription drugs, possibly affected by inappropriate doses or by drug interaction with alcohol.

The Committee found that nobody could answer this question. Yet it is an important question since the issue affects the allocation of both research and countermeasure resources.

The only significant quantitative information on the presence of drugs in impaired drivers currently available is drug analysis results for drivers detected by police in New South Wales and Western Australia and preliminary results from the South Australian Department of Transport study of injured drivers.
Table 5.8 shows for each of these groups of drivers, a proportional breakdown by drug group of drivers who had drugs other than alcohol in their blood samples.

### Table 5.8 Prevalence of Drugs in Drug-impaired Drivers

<table>
<thead>
<tr>
<th>Drug Group</th>
<th>A %</th>
<th>B %</th>
<th>C %</th>
<th>D %</th>
<th>Average Incidence %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cannabis</td>
<td>68</td>
<td>80</td>
<td>78</td>
<td>67</td>
<td>65-80</td>
</tr>
<tr>
<td>Stimulants</td>
<td>22</td>
<td>34</td>
<td>25</td>
<td>13</td>
<td>20-30</td>
</tr>
<tr>
<td>Benzodiazepines</td>
<td>28</td>
<td>25</td>
<td>21</td>
<td>28</td>
<td>20-30</td>
</tr>
<tr>
<td>Narcotics</td>
<td>32</td>
<td>47</td>
<td>19</td>
<td>NT</td>
<td>20-40</td>
</tr>
<tr>
<td>Anti-depressants</td>
<td>NL</td>
<td>3</td>
<td>3</td>
<td>NT</td>
<td>0-5</td>
</tr>
<tr>
<td>Others</td>
<td>23</td>
<td>8</td>
<td>7</td>
<td>NT</td>
<td>5-20</td>
</tr>
</tbody>
</table>

NT: means ‘not tested’   NL: means ‘not listed’

**Source:** Developed by Committee from police and accident statistics

The 'average incidence' column is an estimate by the Committee of the likelihood of each drug being detected in samples obtained by the police or at a hospital. The sum of that column exceeds 100 per cent due to multiple drug use.

The use of cannabis is dominant in the available data. Apart from benzodiazepines the incidence of other general prescription drugs is relatively low. Interestingly much official focus and action to date, including Transport Accident Commission advertising, has concentrated on medications.

The relative significance of the 'occasional users' group is unknown. This is an area where the Committee considers further sociological studies are needed.
5.7 Road Safety Risks

The Committee addressed its reference requiring it to establish road safety risks associated with drug use by examining information on risk factor models that have been developed to assess the difference between persons who are not impaired and those who may be.

The Committee examined a limited number of methods of assessing risk factor. This issue was common to other parts of this Inquiry as very little information has been developed on how road safety risks were affected by drugs. The Committee’s consideration of this issue commences with a crash study that has developed a risk model based on the consumption of prescription drugs by the elderly.

Risk Analysis

• Prescription Drugs and the Elderly

In 1979 a study by D Skegg, Minor Tranquillisers and Road Accidents, identified that tranquillisers are associated with increased crash risk:

The study investigated over 43,000 patients who were given prescriptions over a 2 year period and determined whether they were killed or injured in a traffic accident.

The most important result from this study was that there was a highly significant correlation for fatal accidents and minor tranquillisers, with patients taking tranquillisers being 4.9 times more likely to be killed than the control group.33

In 1992 a study conducted by W Ray on crash risk associated with prescription drugs reaffirmed this view. Ray’s study examined crash records and prescriptions for 16,262 drivers aged between 65 and 84 years in Tennessee, USA.34

VicRoads say that the significance of Ray’s results can be shown by comparing them with the well documented risks for alcohol crashes of a relative risk of 1.5 to 2 for a blood-alcohol concentration (BAC) of 0.06 per cent and 5.5 for BAC greater than 0.10 per cent.35
Table 5.9  Prescription Drugs and the Elderly. Relative Risk of an Accident

<table>
<thead>
<tr>
<th>Drug</th>
<th>Relative risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drug Free</td>
<td>1.0</td>
</tr>
<tr>
<td>Prescription Drugs</td>
<td></td>
</tr>
<tr>
<td>...Any psychoactive drug</td>
<td>1.5</td>
</tr>
<tr>
<td>Cyclic anti-depressants (high doses)</td>
<td>2.2</td>
</tr>
<tr>
<td>Benzodiazepines</td>
<td>5.5</td>
</tr>
<tr>
<td>Anti-histamines</td>
<td>1.1</td>
</tr>
<tr>
<td>Opiate analgesics</td>
<td>1.1</td>
</tr>
<tr>
<td>Alcohol</td>
<td></td>
</tr>
<tr>
<td>BAC 0.06%</td>
<td>1.5 - 2</td>
</tr>
<tr>
<td>BAC &gt; 0.10%</td>
<td>5.5</td>
</tr>
</tbody>
</table>

Source: VicRoads

Table 5.9 shows that drivers using benzodiazepines have a relative crash risk comparable to a BAC of 0.06 per cent and a high dose of cyclic anti-depressants a crash risk comparable to a BAC greater than 0.10 per cent.

Although these results are for American drivers, they would be representative of the older driver population in Australia and the results suggest that elderly drivers need to be warned of the increased risk of injury crashes when taking prescribed psychoactive drugs, particularly anti-depressants.36

Although the two studies investigated different groups of drivers both found that crash risk increased with tranquilliser use.

•  **Stimulants and Heavy Vehicle Drivers**

The Victoria Police State Highway Task Force provided anecdotal evidence in the Committee’s First Report of stimulant use by truck drivers.37 This evidence was supported by Professor Drummer’s figures which found that stimulants were present in 21 per cent of dead truck drivers compared to 3.9 per cent in all dead drivers.38 Professor Drummer calculated that truck drivers with stimulants detected had a 3.7 relative risk factor of being in a fatal crash.
While the number of truck drivers involved in Professor Drummer’s study was not large enough for a statistically significant result his view was supported by other evidence that stimulants are a substantial problem with drivers of heavy vehicles.

Dr Judith Perl of the Clinical Forensic Medicine Unit of the New South Wales Police Service in her paper to the Committee indicated that, of 260 samples processed under New South Wales drug legislation in 1990, 237 or 90 per cent were positive. Of the positive samples 22 per cent were stimulants and half were taken from heavy vehicle drivers. Half of the heavy vehicle drivers had been detected by the police because of erratic driving. This indicates a significant over-representation of stimulant impairment in heavy vehicle drivers. Over 400 samples were processed under New South Wales drug legislation in 1992 and 84 per cent were positive for drugs and stimulants. However the breakdown of these figures to separate heavy vehicle drivers has not been published.

- Responsibility Analysis

A further method of assessing the role of drugs in motor vehicle accidents is by responsibility analysis. The analysis model is based on the concept that if responsibility for a crash can be determined, driver groups who have consumed drugs are more likely to have been involved than drug-free driver groups.

Professor Drummer’s paper in the First Report included a responsibility analysis of 1045 dead drivers in Victoria, New South Wales and Western Australia in the period 1990-1993.

The following table shows the results of the analysis of 1332 drivers updated to represent the period 1990 to mid-1995.
Table 5.10  Responsibility Analysis of Dead Drivers in Victoria, New South Wales and Western Australia 1990 - 1995

<table>
<thead>
<tr>
<th>Drug or drug group</th>
<th>Number</th>
<th>Culpability Ratio</th>
<th>Risk Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drug and alcohol free</td>
<td>694</td>
<td>2.5</td>
<td>1.0</td>
</tr>
<tr>
<td>Alcohol-only</td>
<td>333</td>
<td>15.0</td>
<td>5.7</td>
</tr>
<tr>
<td>Alcohol plus drug</td>
<td>123</td>
<td>21.8</td>
<td>8.6</td>
</tr>
<tr>
<td>Cannabis</td>
<td>55</td>
<td>1.9</td>
<td>0.7</td>
</tr>
<tr>
<td>Benzodiazepines</td>
<td>13</td>
<td>4.5</td>
<td>1.8</td>
</tr>
<tr>
<td>Amphetamines/stimulants</td>
<td>25</td>
<td>4.7</td>
<td>1.9</td>
</tr>
<tr>
<td>Opiates</td>
<td>14</td>
<td>6.0</td>
<td>2.4</td>
</tr>
</tbody>
</table>

Source: Professor O. Drummer, May 1996

The table indicates that compared to a drug and alcohol free driver group the relative risk of being involved in a crash in Professor Drummer’s study is:

- 5.7 times higher for drivers who had taken alcohol.
- 8.6 times higher for drivers who had taken alcohol plus one or more other drugs.

The major advantage of the concept is that it directly addresses the cause of a crash rather than relying on experimental research which may not be relevant to an actual situation.42

The major disadvantage of using responsibility analysis of road fatalities is that large samples are needed to establish a statistically significant information base. VicRoads believes that a sample of as many as 3500 drivers would be necessary to detect drug impairment and then only under ideal conditions.43

The Committee agrees that the sample sizes of Australian fatalities in the Victorian Institute of Forensic Pathology study are small. The results of Professor Drummer’s first study have been confirmed in the later work and this type of statistical study needs to be continued.
• **Significant Relative Risk**

VicRoads stated that relative crash risk can be estimated from responsibility data by assuming that 'non-responsible' drivers comprise a representative sample of drivers on the road. The crash involvement of a particular group can then be compared with 'responsible' drivers to calculate relative crash risk.\(^4^4\)

Some key results quoted by VicRoads are given in Table 5.11.\(^4^5\) The table shows that, for all alcohol and all alcohol-drug combinations, the relative risk of being killed in a fatal crash is significantly greater than for drug-free drivers.\(^\text{IS 5.6}\)

**Table 5.11 Relative Risk in Fatality Studies in Australia and USA**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Relative risk</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Australia</strong></td>
<td></td>
</tr>
<tr>
<td>Drug Free</td>
<td>1.0</td>
</tr>
<tr>
<td>Alcohol-only</td>
<td>6.0</td>
</tr>
<tr>
<td>Alcohol plus drugs</td>
<td>9.0</td>
</tr>
<tr>
<td><strong>USA</strong></td>
<td></td>
</tr>
<tr>
<td>Drug Free</td>
<td>1.0</td>
</tr>
<tr>
<td>Alcohol BAC &lt; 0.10%</td>
<td>1.5</td>
</tr>
<tr>
<td>Alcohol BAC &gt; 0.10%</td>
<td>7.3</td>
</tr>
<tr>
<td>Alcohol + THC</td>
<td>8.4</td>
</tr>
<tr>
<td>Alcohol + Carboxyl THC</td>
<td>6.4</td>
</tr>
<tr>
<td>Alcohol + Cocaine</td>
<td>3.4</td>
</tr>
<tr>
<td>Alcohol + Amphetamines</td>
<td>5.3</td>
</tr>
<tr>
<td>Alcohol + Benzodiazepines</td>
<td>indefinitely large</td>
</tr>
<tr>
<td>Alcohol + 1 other not above</td>
<td>indefinitely large</td>
</tr>
<tr>
<td>Alcohol + 2 or more other</td>
<td>10.6</td>
</tr>
</tbody>
</table>

*Source: VicRoads*

• **Types of Collision**

Vehicle collision patterns may reflect drug impairment. For example drug impairment may be more likely to cause drivers to cross the centre line or move off to the side of the road and be unable to take sufficient corrective action.
Dr Kenneth Terhune studied these types of crashes. Apart from cocaine users all drug groups show collision rates which are substantially higher than the drug-free group. The results involving alcohol plus drugs, apart from alcohol plus amphetamines, were high enough to achieve a statistical significance.

The Terhune study uses different methods of analysis. Terhune concluded that collision type analysis may be more sensitive than responsibility analysis and that both single and multiple drug combinations may be contributing to fatal crashes.

**Drug Users, Traffic Offenders and Road Accidents**

The Committee noted that Victorian authorities are unable to compare crash records with arrests and prosecutions.

In the 1994 report of its Inquiry into the Demerit Points Scheme the Committee quoted the Californian Department of Motor Vehicles and its ability to compare crash records with driving offences to show that crash rates increased with the number of offences. This comparison is possible as the department can link its driver records with the state’s Criminal Justice Department’s records of arrests and prosecutions.

The Department of Motor Vehicles informed the Committee in Sacramento of the results of a study which showed that people convicted of general drug offences also had higher rates of traffic offences and motor accidents. No similar database link exists in Victoria.

**Proposed Study of Collision Types**

Terhune et al state that injury data may better reflect drug impairment effects than fatality data.

While collision type analysis of serious injury and fatality data has been possible in Victoria for many years a recent change in legislation makes possible the chemical analysis of blood for drugs other than alcohol from injured drivers attending a hospital.
Victorian researchers now have injury data and the results of blood analysis of injured drivers to study drug impairment. The only additional costs of such a study would be for additional chemical tests and the comparison of results.

VicRoads says the costs of such a study could be minimised by:

- using basic blood screening methods instead of high-cost confirmation techniques.
- limiting the drug screens to the most important groups, such as amphetamines, cannabis, benzodiazepines and opiates.

VicRoads has estimated that, based on current drug testing costs for the 10 major drugs of abuse using a sample size of 3500 injured drivers, the cost of blood sample tests would be approximately $175,000. The overall cost of the study would be approximately $250,000.50

The Committee supports this proposal as it would increase Victoria’s knowledge of drugs used by injured driver groups, provide their ages and other social profile data and enable better targeting of countermeasures.

### 5.8 The Road Safety Cost of Drugs

The second term of reference to the Inquiry requires the Committee to examine:

\ldots the health, social and economic costs of such drug use in relation to road safety.\ldots

The Committee could not precisely estimate the health, social and economic costs because of the lack of conclusive evidence as to the proportion of the road toll that can be attributed to drug use. The Committee sought an estimation from Federal and State bodies which had collected road crash data over a long period.

Professor D J Collins, Associate Professor of Economics at Macquarie University and Ms H Lapsley, Senior Lecturer in Health Economics at the University of New South Wales, produced the first comprehensive estimates of the costs of alcohol, tobacco and illegal drug abuse in Australia in 1991 as part of the Federal Government’s campaign against drug abuse.51
They estimated the total economic cost of drug abuse as a whole in Australia to be a minimum of $14.4 billion in 1988. The major components of this amount were attributed to alcohol at 42 per cent and tobacco at 47 per cent. The remaining 11 per cent was attributed to illegal drugs. The cost attributed to the abuse of pharmaceutical drugs was considered to be significant but unknown.

Collins and Lapsley highlighted in their paper in the First Report the sources of data for their cost estimates and the theoretical and methodological problems that arise in the estimation of a true cost of drugs and road safety.

The Bureau of Transport and Communications Economics estimated in 1993 that the overall cost to Australia from road crashes was $6,100 million. The Bureau divided these costs as shown in the following diagram:

**Table 5.12  Costs By Category - 1993**

- Vehicle damage 30%
- Pain & suffering 24%
- Family & community losses 10%
- Lost earnings of victims 14%
- Insurance administration 9%
- Other 13%

*Source: Bureau of Transport and Communications Economics*

The total cost for each of these categories was:

- Lost earnings of victims, $829 million.
- Family and community losses, $588 million.
- Vehicle damage, $1868 million.
- Pain and suffering, $1463 million.
- Insurance administration, $571 million.
• Other costs, including re-admission to hospital, medical treatment and rehabilitation, crash investigation, travel delay, losses to non-victims and ambulance and legal services, $817 million.\textsuperscript{56}

In 1993 the average cost of a road fatality was $752,400, a hospital injury $113,100, a medical injury $11,900 and property damage $5,000.\textsuperscript{57}

Adjusted for a 9.6 per cent increase in the Consumer Price Index to June 1996 the average community cost of a fatal crash would be $823,900, a hospital injury $124,000, a medical injury $13,000 with property damage $5,500.

The Committee could not establish if the total cost of road crashes to the Australian community had also increased. Information from the Federal Office of Road Safety\textsuperscript{58} indicated that Australian fatality rates had decreased from an average of 13.66 per 100,000 people in 1990 to 11.17 in 1995. Victorian fatalities for all road users had decreased from 548 persons in 1990 to 418 in 1995, a reduction of approximately 24 per cent. This would dramatically affect costs to the community.

VicRoads, in its submission, made an economic cost estimate based on the proportion of crashes in which drugs and/or drugs and alcohol were involved and the relative risks of such crashes. The estimation process is demonstrated in the following table:\textsuperscript{59}

\begin{table}[h]
\centering
\begin{tabular}{|c|c|c|c|c|}
\hline
\textbf{Group} & \textbf{\% of Drivers Killed in Crashes} & \textbf{Relative Risk Index} & \textbf{Proportion Saved if Risk Reduced to 1} & \textbf{\% of Crashes Saved by Eliminating Alcohol/Drugs} \\
\hline
\textbf{Formulae} & \textbf{Column 1} & \textbf{Column 2} & \textbf{Column 3 equals Col 2 - 1.0 /Col 2} & \textbf{Column 4 equals Col 1 x Col 3} \\
\hline
\textbf{Drug Free} & 51 & 1 & 0 & 0 \\
\hline
\textbf{Alcohol Only} & 27 & 6 & 0.83 & 22.5 \\
\hline
\textbf{Drugs Only} & 13 & 1.4 & 0.28 & 3.7 \\
\hline
\textbf{Drugs plus Alcohol} & 9 & 9 & 0.88 & 8.0 \\
\hline
\end{tabular}
\caption{Estimation of Relative Risk}
\end{table}

\textbf{Source:} VicRoads
The table shows that, if the relative risk of the drug-free driver group is given a value of 1, the relative risk of other driver groups is as shown in column 3.

VicRoads estimated that eliminating all crashes involving drugs alone or with alcohol would save 11.7 per cent of the total Australian road toll cost or $713 million.

Based on national crash incidence statistics the Victorian component of the 1993 Australian road toll was estimated to be 20 per cent and so the potential savings to Victoria by eliminating drugs and drugs with alcohol would amount to $143 million.\textsuperscript{18} 5.9

VicRoads concluded that the road toll could be reduced by one-eighth if successful countermeasures could be identified and implemented.\textsuperscript{60}

The Committee also received estimates from other Australian and international road safety bodies on their estimate of the proportion of the total annual cost of road crashes caused by drugs alone or with alcohol.

Road safety experts from New South Wales, commenting on the VicRoads estimate, gave varying figures for New South Wales.

Dr Michael Henderson, former head of the Road Safety Bureau of the New South Wales Roads and Traffic Authority, believed the cost to be 1 per cent of the total annual cost of road crashes while the Roads and Traffic Authority itself considered the cost to be 7 to 8 per cent.\textsuperscript{61}

The Federal Office of Road Safety (FORS) when it met the Committee suggested that eliminating the contribution of drugs and drugs with alcohol from a fatal crash would lead to savings of no more than 7 per cent.\textsuperscript{62} The Federal Office of Road Safety concluded that the use of recreational, prescription and stimulant drugs without alcohol did not appear to be a major factor in serious road crashes.\textsuperscript{63} However the Office indicated that not all victims of road crashes were tested for drugs and in 1992 about half of the drivers killed did not have toxicology reports undertaken.\textsuperscript{64}
The only quantitative estimate of the cost of road crashes found by the Committee overseas was at a briefing in Maastricht in the Netherlands where Dr de Gier quoted the conclusion of a report he had made to European transport authorities. He said:

* A very conservative estimate is that 10% of the adult population drives under the influence of impairing drugs with twice the risk of being involved in a traffic accident.*

The Committee concluded that, whatever the appropriate estimation of road crashes due to alcohol and drugs, it represents a significant proportion of total road crashes in Australia.

### 5.9 Conclusion and Findings

The Committee finds that the presence of potentially impairing drugs in dead and injured drivers is unacceptably high.

Evidence from Australian fatality studies shows drug and drug-plus-alcohol driver groups to have a higher responsibility rate for crashes than drug-free driver groups. These support American studies which have shown that, for all alcohol and alcohol-drug combinations, the relative risks of being killed in a fatal crash significantly increased six to nine times compared with drug-free drivers.

There is insufficient information presently available to determine an accurate percentage of the overall cost of road crashes related to the use of drugs. Hence it is not possible to determine the true health, social and economic costs of drug use in relation to road safety.

VicRoads' estimate, based on the incidence of drugs in road fatalities and approximate and statistically unreliable relative risk factors, is that the potential savings if all Victorian drug-related crashes were eliminated is $143 million. Thus there is potential to reduce the cost of the road toll by about one-eighth if successful countermeasures can be identified and implemented.
In the context of the overall safety performance of the Victorian road transport system this potential for reduction warrants significant action and resources. The Victorian community at present spends approximately $30 million a year to counter drink-driving and a further $30 million annually to counter speeding. By contrast the allocation to drugs and driving to date is approximately $0.2 million.67

Australian fatality studies need to be continued and supplemented by similar data from injury crashes.

A new investigation of the role of drugs in injury crashes needs to be undertaken by the Committee’s proposed working party described later in this report. The study needs to assess driver injury records and blood samples already taken for alcohol testing to define which driver groups are users of illegal or medicinal drugs that lead to a road crash. The study should then provide guidance on how countermeasures may be implemented.

RECOMMENDATIONS

2. That Victorian crash fatality studies be continued and the co-operation of other Australian States be encouraged so as to increase sample sizes.

3. That an investigation into the role of drugs in injury crashes be undertaken to define which driver groups are users of illegal and medicinal drugs so as to provide guidance in developing countermeasures.

4. That information on the type and amount of illegal and medicinal drugs found in deceased or injured persons obtained by police, coronial services and public hospitals be held in a single database managed by VicRoads to determine the frequency and cause of driver impairment.

Footnotes

1 Drummer, O H, *A Review of the Contribution of Drugs in Drivers to Road Accidents*, Inquiry into the Effects of Drugs (Other than Alcohol) on Road Safety in Victoria, Parliamentary Road Safety Committee, First Report, May 1995, p.3.
Inquiry Into The Effects Of Drugs (Other Than Alcohol) On Road Safety In Victoria

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5 Drummer, O H, Correspondence, 30 May 1996.
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13 McDonough, M, A Clinician's Perspective, Inquiry into the Effects of Drugs (Other than Alcohol) on Road Safety in Victoria, Parliamentary Road Safety Committee, First Report, May 1995, pp.29-41.
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43 Ibid.

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45 Ibid. Table 5, p.21.


50 Ibid.


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56 Ibid. p.2.

57 Ibid.


59 VicRoads, op. cit., p.28.

60 Ibid., p.29.


64 Makeham, P, Minutes of Evidence, Canberra, 4 December 1995, p.158.

65 de Gier, J J, _Drugs other than Alcohol and Driving in the European Union_. op. cit.

66 de Gier, J J, Maastricht, 3 July 1996.

67 VicRoads, op. cit., p.29.