SYNOPSIS

We discuss the extent of alcohol involvement in road crashes in the Australian State of Victoria and show that the percentage of drivers killed or injured and admitted to hospital is decreasing. Finally, we document the major drink-driving countermeasures introduced in Victoria in the last decade, including random breathtesting.

The involvement of alcohol in crashes in Australia at times seems an intractable problem, a consequence of the drinking customs and the need for private transport in a sparsely populated country. Nevertheless, considerable advances have been achieved in the Australian State of Victoria. Victoria in the last decade has introduced a variety of countermeasures to reduce alcohol involvement in crashes. The purpose of this paper is to describe the extent of the problem, the trends in the incidence of drinking-driving and alcohol related crashes, and the alcohol countermeasures introduced in Victoria.

THE ROLE OF ALCOHOL IN VICTORIA ROAD CRASHES

There are a number of criteria from which to judge whether the incidence of alcohol in killed drivers has decreased:

(i) The proportion of positive blood alcohol concentrations (BAC's) between 1977 and 1982. There has been a 32% decrease in the proportion of drivers killed with positive BAC's. (The term "driver" throughout this paper refers to motorcyclists and car drivers. It excludes drivers of emergency vehicles and bicyclists).

(ii) The proportion of drivers killed with a BAC greater than .05g/100ml. Between 1977 and 1982 the proportion of such drivers and motorcyclists has decreased 26%.

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(iii) The proportion of drivers killed with a BAC greater than .15g/100ml. The proportion of such drivers between 1977 and 1982 has decreased 30% (see Table 1).

Although the incidence of alcohol in samples of drivers killed has been known for some time, it has only been possible in the last few years to quantify its involvement in crashes where persons are injured. The Road Traffic Authority has now established a system where blood alcohol readings for drivers and pedestrians killed and those injured in road crashes and tested in hospital casualty departments are regularly obtained and matched with data from police accident report forms. The file contains details of all drivers and pedestrians involved in casualty crashes, including their BAC readings, age, sex, type of license, as well as details of the accident, including location, time of day, and number of vehicles involved. The creation of this matched data file is providing a sound data base for development and evaluation of alcohol countermeasures.

The establishment of the file has been made possible as a result of legislation which, since 1974, has required all road users 15 years and over presenting at hospital casualty departments in Victoria following a road accident to have a blood sample taken for alcohol testing. The distribution of BAC readings of drivers admitted to hospital, as a result of a road crash in Victoria, shows that for these drivers:

(i) The proportion of positive BAC's has decreased 24.3% in the period 1977-1982.

(ii) The proportion with BAC's greater than .05g/100ml has decreased 24.3% in the period 1977-1982.

(iii) The proportion with BAC's greater than .15g/100ml has decreased 25.1% in the period 1977-1982.

(iv) Average positive BAC's showed no trend over this 6-year period. However, the 1979 average (.099g/100ml) was significantly lower than all other years (Student-Newman-Keuls t-test, p < .05), (see Table 2.)

Figures 1 and 2 illustrate 12 months moving average figures for drivers killed and drivers presenting at hospital. Drivers presenting at hospital are not necessarily admitted. Consequently, Figure 2 is not directly comparable to Table 2. These figures illustrate the decline in the percentage of those tested with BAC's over .05g/100ml and .15g/100ml.
POSSIBLE FACTORS IN THE REDUCTION OF ALCOHOL INVOLVEMENT IN KILLED AND INJURED DRIVERS

This reduction in drink-driving may be due to the operation of 4 main factors:

A. The General Deterrent Effects of Random Breath Testing

In July 1976, what is commonly known as "random breath testing" was introduced in Victoria. This legislation empowers police to set up preliminary breathtest stations, where uniformed police stop motorists and require them to take a preliminary (screening) breathtest. During the subsequent 2 years, the extent of random breathtesting operations was generally at a low level, totalling less than 15 hours per week. However, on October 26, 1978, a 7-week period of intensified random breathtesting commenced in Melbourne. This involved the deployment of up to 8 stations on each Thursday, Friday, and Saturday night in specified sectors of Melbourne, according to a predetermined evaluation plan. The total operating time was approximately 100 hours per week.

An evaluation study of these operations showed statistically significant reductions in the risk of fatalities and serious casualty accidents at night in the areas tested, with residual effects for at least 2 weeks afterwards. There were smaller reductions over the whole Metropolitan Area as well as decrease in the percentage of drivers, tested at hospitals after a road crash, with BAC readings over .05g/100ml (Cameron & Strang, 1982). South and Stuart (1983) also reported an increase in the public's perceived risk of detection by the police for drink-driving which may be attributed to random breathtesting. Fourteen random surveys were carried out between June 1976 and July 1981 to determine respondents perceived risk of detection by police for 3 driving offences: (i) driving while obviously intoxicated; (ii) driving while over .05g/100ml but where the driving was not obviously effected; and (iii) speeding.

The results of these surveys show that the perceived risk of detection of "driving while over .05g/100ml but not obviously effected" increased relative to both driving while obviously intoxicated and speeding. Given that these 2 conditions may represent changes in general police practices, it seems likely that the relative increase in the perceived risk in "drink-driving while not obviously effected" is due to random breathtesting.

In the Australian State of New South Wales random breath test operations commenced in December 1982. In the first 12 months close to 1,000,000 people had been
breath-tested and the total number of fatalities in NSW reduced by approximately 350 people from about 1,100 down to 750 persons. It is claimed that random breath-testing is largely responsible.

B. Increased Minimum License Disqualification Period

In December 1978, the prescribed minimum mandatory period of license disqualification for exceeding 0.05g/100ml was doubled from 3 to 6 months. Minimum periods of license disqualification for exceeding 0.10g/100ml and 0.15g/100ml were also doubled to 12 months and 2 years, respectively. For second and subsequent offences, the minimum periods of disqualification were increased to double these periods. This increase was extremely well publicized.

C. Changes in Attitudes Towards Drink-Driving

One possible reason for the reduction in alcohol related crashes may be changes in attitudes towards drinking-driving. Over the past decade, there has been a dramatic increase in the general public's concern with alcohol as a major cause of accidents. Drink-driving as a problem has been thrust before the public very frequently, due largely to the efforts of several media groups since 1970, and to the fact that road safety initiatives, initially the compulsory wearing of seat belts and later countermeasures in the drink driving area, have reflected well on the governments who introduced them.

One of the factors behind the increase of media attention to road safety is that the Road Traffic Authority and the police have provided a constant stream of information on road accidents. Since 1978, the Road Traffic Authority has undertaken a series of mass media publicity campaigns relating to drink-driving. Each year, about $A500,000 worth of drink-driving commercials appear on television in Victoria, mainly as community service announcements.

D. Changes in Patterns of Alcohol Consumption

Changes in patterns of alcohol consumption may have led to reductions in driving after drinking. Australia since the 1930's has been predominantly a nation of beer drinkers, with drinking by all-male groups in the public bars of hotels being a very important pattern. Four major changes in alcohol consumption patterns have occurred in Australia in the last 15 years:

(i) The post-war increase in per adult absolute consumption ceased in 1974/75.
(ii) Between 1970/71 and 1980/81, the proportion of wine in total absolute alcohol consumption increased from 15.61 to 26.8%. The availability of cheap white wine in 4-liter containers may have contributed to this change in drinking preferences.

(iii) Between 1979/71 and 1980/81, the proportion of beer in total alcohol consumption decreased from 72.14 to 62.71%. Since 1974/75, the actual amount of beer consumed has decreased.

(iv) Victorian beer sales figures between 1976/77 to 1980/81 show a total decline in sales of 7.2%. Nearly all of this decline is due to a fall in draught sales. Ninety seven per cent of draught beer is sold to hotels.

Such changes may have had a considerable effect on the incidence of drink-driving. For example, the switch from beer to wine consumption may reflect changes in the type of drinking occasion, the social context for the alcohol consumption, the amount of food eaten at the same time, and the site or local in which the consumption occurs. Such changes could affect the number of drink-driving occasions and the BAC of drink-drivers. The change from draught to packaged beer may mean more alcohol is now consumed in the home vs the hotel. This, again, may affect the amount of drink-driving.

In the last months of 1978, the excise on beer was greatly increased, leading to a significant increase in the cost of beer. It may have been that this change, together with the penalty increase, and the beginning of well-publicised random breathtesting blitzes combined to change the usual drinking pattern, so that there was less beer drinking in hotels. Further, there was at this time a "price war" for bottled beer; it became -- and has remained -- much cheaper to drink at home rather than in hotels.

CURRENT ANTI-DRINK DRIVING ACTIVITIES

Although significant gains have been made, drink-driving is still the most important single factor in serious road accidents. There is no one single countermeasure that will solve the problem. However, there are a number of measures that can have an impact:

A. Education in Schools

The logical first step in developing responsible attitudes towards drink-driving is to develop appropriate
educational programs for school children. An alcohol curriculum unit with a values clarification orientation has been developed for use in secondary schools. The possibility of this unit leading to increased use of alcohol by students taught is presently being examined. If such "side effects" are not found, the unit will be released to secondary schools.

B. Publicity and Promotional Activities

Early publicity efforts (to the late 1970's) concentrated on giving advice on the amount of alcohol which a drinker could consume and stay below .05mg/100ml and reasons why one should not exceed the legal limit. A theme used was: "Turn off before .05." Now a more "positive" approach is also being used. This approach emphasizes the fun one can have without excessive drinking. Also being used are advertisements which attempt to reinforce appropriate behavior among drink/drivers and their companions (e.g., refusing "one for the road") and to encourage alternatives to drink/driving (e.g., use of taxis, inviting a friend to stay for the night). Additionally, with increased police random breathtest activity, the use of a threat that drink-drivers may be caught at any time -- which translates into loss of license, heavy fine, possibility of loss of job, and so on -- has been used extensively. Promotional activities include the use of personalities to provide information through the mass media.

C. Random Breathtesting and General Deterrence

In October 1983 an intensive 8-week period of random breathtesting throughout Victoria started. The Road Traffic Authority is providing extensive supporting mass media publicity.

D. Alcohol Treatment/Rehabilitation

There are currently at least 18 treatment/rehabilitation courses run for convicted drink-drivers in Victoria, with additional courses being provided for alcoholics (many of whom are drink-drivers). It is estimated that over 2,500 Victorians will attend a drink/driving course during 1983. Most drivers are referred to a course by a magistrate when applying for restoration of their drivers license after a period of disqualification. Magistrates have the power to ask for evidence of reformed drinking behavior when hearing applications for license restoration.

There is at present no substantial objective evidence that any drink-driver program is effective in reducing the subsequent accident rate of participants (Nichols, 1981) or
in reducing the likelihood of other alcohol related problems. However, it is the common experience of those running such courses that large numbers of participants have a changed attitude by the end of the course.

South and Key (1983) estimated that if all convicted drinking drivers were completely prevented from having subsequent drink driving accidents, the results would be a reduction of 8.5% in the number of fatal accidents each year. The total cost to the community of road accidents involving drinking drivers who have a prior conviction for drinking driving was estimated to have been $A21.26 million in 1981. South and Key concluded that this represents the maximum cost of administering rehabilitative programs if they were 100% effective. Less effective programs would yield proportionally higher cost benefits.

The Authority is currently involved in studies which will attempt to measure the effects of one course and is involved in the planning of evaluation of several other courses. There are major problems, however, in establishing adequate control groups.

At the present time, all courses run independently. It is hoped in the future to develop an assessment and referral system which will ensure that people are directed to courses most likely to be of benefit to them.

E. Alcohol Interlock Devices

This type of device, when fitted to a vehicle, is designed to prevent, or discourage from driving, anyone whose BAC exceeds a certain limit. A number of devices have been developed, with varying degrees of success. Recently, the Road Traffic Authority was involved in a joint project with the U. S. National Highway Traffic Safety Administration to evaluate the Drunk Driving Warning System (Bodi et. al., 1983). The Road Traffic Authority has also examined a locally-developed breathtest interlock and is developing another. Possible applications include fitting the device to cars of identified problem drinkers when they are re-licensed after a period of license disqualification and voluntary fitting by members of the public, perhaps with consequent reductions on insurance premiums.

CONCLUSION

The involvement of alcohol in serious road accidents in Victoria has declined over the period 1977 to 1982. It may be that this decline is part of a longer term, cyclic pattern, but even if that is so, a decline that is sustained
over a period of 6 years is unlikely to be random; rather, it seems likely that something which occurred during that period is responsible. A number of countermeasures that should have reduced the incidence of alcohol in road crashes were introduced during this period. It has not been possible to measure the effect of these measures on lower alcohol involvement in serious road accidents. Nevertheless the overall effect has been demonstrated. There is, however, no guarantee that that package of measures would be effective in any other country. Nevertheless, the Victorian experience is seen as providing some hope that significant reductions in drink driving accidents can be achieved, and sustained over several years.

ACKNOWLEDGEMENTS

The views expressed in this paper do not necessarily represent the views of the Road Traffic Authority.

REFERENCES


### Table - 1

BAC's of Drivers and Motorcyclists killed In Victoria, 1977-82

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Average BAC and standard deviation of positive readings

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Table - 2

BAC's of Drivers admitted to Hospital in Victoria, 1977-82
Figure 1.

12 MONTH MOVING AVERAGE DRIVER FATALITIES - PERCENTAGE OF THOSE TESTED WITH BAC OVER

- 0.050 gm / 100ml
- 0.150 gm / 100ml
JANUARY 1977 - DECEMBER 1982 (Prelim)
VICTORIA.

Figure 2.

12 MONTH MOVING AVERAGE DRIVERS PRESENTING AT HOSPITALS - PERCENTAGE OF THOSE TESTED WITH BAC OVER

- 0.050 gm / 100ml
- 0.150 gm / 100ml
JANUARY 1977 - DECEMBER 1982 (Prelim)
VICTORIA.