TRAFFIC ACCIDENT RESEARCH UNIT

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NOTE: The views expressed in this paper are those of the author, and are not necessarily endorsed by the Department of Motor Transport.

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ABSTRACT

Results of post-mortem blood alcohol data for drivers, motorcycle riders and pedestrians who died as a result of crashes which occurred in the first six months of 1980 in New South Wales were examined, and compared with corresponding Victorian data.

Between 30% and 50% of fatally injured drivers and riders in N.S.W. were found to have a blood alcohol level of more than 0.08 g/100 ml (the legal limit at the time of data-collection). The blood alcohol levels of drivers and riders were similar in N.S.W. and Victoria for the first six months of 1980. The blood alcohol levels of pedestrians, however, were much lower in Victoria than in N.S.W.

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CONTENTS

1. INTRODUCTION

Since 1971, blood alcohol information relating to people killed in road traffic crashes was forwarded to the Traffic Accident Research Unit (TARU) by Clerks of Petty Sessions at court houses where Coroners' papers are filed. As the results of blood alcohol analyses were not available from the courts until the completion of the coronial enquiries, there were often delays of several months in obtaining the data, and therefore it was not practicable to link the blood alcohol results with other details of crashes recorded from police reports. As a result, an alternative source of post-mortem blood alcohol data was sought.

The City Coroner's Office has advised that post-mortem blood samples are taken for analysis from all traffic crash victims, except those aged less than seven years or those who survived more than 24 hours after a crash. Almost all post-mortem blood samples are analysed by the Health Commission's Division of Analytical Laboratories, situated at Lidcombe. In July, 1979, TARU approached the Health Commission to arrange for blood sample analysis results to be provided by the Division of Analytical Laboratories directly to TARU. Following approval from the Minister of Justice, the Division has been providing details, since the beginning of 1980, for all traffic crash fatalities for whom blood samples have been analysed.

This report summarises the results of post-mortem blood alcohol data for drivers, motorcycle riders and pedestrians who died as a result of crashes which occurred in the first six months of 1980 in New South Wales, and compares these data with results found in Victoria.

2. N.S.W. RESULTS

Summary results of the 413 drivers, motorcycle riders and pedestrians who died in the first half of 1980 are given in Figure 1. It can be observed from this diagram that the blood alcohol levels (BAL's) of 32 drivers, 8 riders and 50 pedestrians were unknown. It is quite possible that the BAL's of these 90 people may have generally been higher or lower than that of the tested crash victims. In order to allow for the possibility of statistical bias in the untested group, estimates of the proportion of people with BAL's over the then legal limit of 0.08 g/100 ml can only be given as a range.

For example, the most extreme case of bias in the group of untested drivers would have existed if all of the 32 drivers had BAL's of less than 0.08, or all had BAL's of greater than 0.08. For the first case, the overall

proportion of drivers with BAL's greater than 0.08 would have been 72 ÷ 227 = 0.32 . For the second case, the proportion of drivers with BAL's greater than 0.08 would have been (72+32) ÷ 227 = 0.46.

Using this method for all three groups of road users, the following ranges of people with blood alcohol levels over 0.08 and over 0.05 were found:

	0.08 and over	0.05 and over
Drivers	32% - 46%	36% - 50%
Motorcycle riders	35% - 47%	39% - 52%
Pedestrians	25% - 67%	28% - 70%
Drivers and riders	32% - 46% .	37% - 50%

The blood alcohol tests which have been used to arrive at the above ranges include tests made on people who died up to 24 hours after a crash. Blood samples taken from people who die several hours after a crash are expected to have a lower alcohol level than would have been present at the time of the crash.

It has been estimated that the average rate of clearance of alcohol from the blood is 0.015 g/100 ml per hour (Dubowski, 1963). The clearance rate varies considerably from one individual to another, but for any one person is reasonably constant over time. Blood alcohol levels have been adjusted at the rate of 0.015 g/100 ml for each hour of survival after the crash. This adjustment is an approximation only, and is an attempt to remove a bias towards low blood alcohol levels in the post-mortem results.

The number of cases affected by this manipulation is small : four drivers and three pedestrians were likely to have had a blood alcohol level of 0.08 or more at the time of the crash when their survival times are taken into account. (The corresponding figures for the 0.05 level are three drivers, two riders and one pedestrian). For a further three drivers, three riders and four pedestrians it is possible that a blood alcohol level of 0.08 or more may have been present at the time of the crash (these ten people died more than eight hours after their crashes, and had no alcohol present in their blood at the time of testing). The corresponding figures for the 0.05 level are seven drivers, four riders and seven pedestrians.

A further factor which can be considered in reducing the bias of the results is the age of the road users. All of the drivers and motorcyclists who died in the first six months of 1980 were old enough to have been drinkers. Fifteen of the pedestrians, however, were of such a tender age that alcohol involvement was clearly unlikely. Most of these pedestrians met the exclusion criteria, but one eight year old, although not tested, was included in the category that should have been tested since the age criterion for inclusion is seven years old or more. It is unlikely that any child aged eight or less would have been drinking prior to crash-involvement, and the range for pedestrians has been adjusted accordingly.

The final ranges, adjusted for survival times and young ages, for people with blood alcohol levels over 0.08 and over 0.05 were as follows:

	0.08 and over	0.05 and over
Drivers	33% - 49%	37% - 54%
Motorcycle riders	35% - 52%	42% - 61%
Pedestrians	28% - 60%	29% - 64%
Drivers and riders	34% - 49%	38% - 56%

A detailed breakdown of the blood alcohol levels of tested road accident victims is given in Table 1.

3. VICTORIAN RESULTS

Blood alcohol levels of road users killed in Victoria in the first six months of 1980 are given in Table 2 (Strang, 1980).

Ranges for the proportion of Victorian fatalities with blood alcohol levels over 0.08 and 0.05 are as follows:

	0.08 and over	0.05 and over
Drivers	30% - 54%	32% - 57%
Motorcycle riders	32% - 48%	40% - 56%
Pedestrians	17% - 52%	19% - 54%
Drivers and riders	34% - 53%	33% - 56%

These ranges have not been adjusted in a similar way to that done with the N.S.W. data.

4. COMPARISON OF N.S.W. RESULTS WITH VICTORIAN RESULTS

By assuming that similar biases existed in the untested groups in both States, it is possible to compare the blood alcohol levels of fatally injured drivers, riders and pedestrians. Because of the small number of motorcyclists killed in the first six months of 1980 in Victoria, motorcyclists and drivers are considered together for the comparison between the two States.

(i) Drivers and riders.

A summary of blood alcohol levels of tested drivers and motorcycle riders in N.S.W. and Victoria is given in Table 3. There was no significant difference at the 5% level in the blood alcohol levels of fatally injured drivers and riders in N.S.W. and Victoria ($\chi^2 = 2.324$, 2 d.f., $p = 0.31$).

(ii) Pedestrians

Table 4 gives the blood alcohol levels of fatally injured pedestrians in N.S.W. and Victoria. There was a significant difference ($p < 0.05$) between the blood alcohol levels of pedestrians killed in N.S.W. and Victoria ($\chi^2 = 8.464$, 2 d.f., $p = 0.015$). Each State had approximately the same proportion of tested pedestrians with BAL's over 0.15, but N.S.W. had a much larger proportion of pedestrians in the BAL category 0.050 - 0.149 than had Victoria.

5. CONCLUSIONS

For the first six months of 1980, it was found that between 34% and 49% of all drivers and motorcycle riders killed in N.S.W. had a blood alcohol level greater than or equal to the then legal limit of 0.08 g/100 ml. As these figures may vary slightly depending on the time period under examination, it is generally concluded that between 30% and 50% of all drivers and riders killed in N.S.W. had a blood alcohol level over the legal limit of 0.08 g/100 ml.

For the first six months of 1980, the legal limit for blood alcohol concentrations for drivers and motorcyclists was 0.05 g/100 ml in Victoria and 0.08 g/100 ml in N.S.W. In addition, a form of random breath testing was operating in Victoria and not in N.S.W. It is, therefore, surprising to find that the distributions of blood alcohol levels in fatally injured riders and drivers were not substantially different in the two States, while the blood alcohol levels for pedestrians were different.

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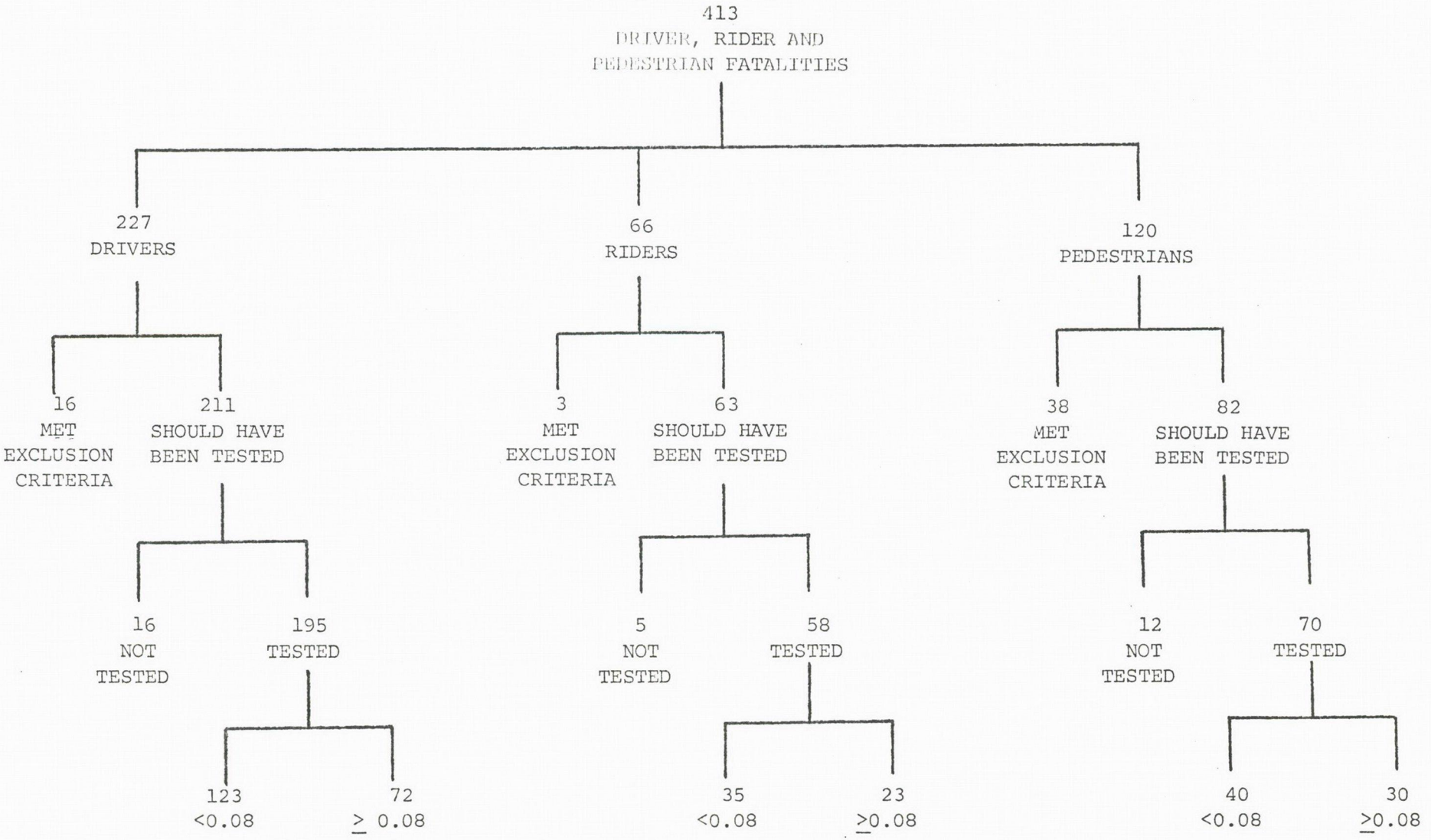

Figure 1. RESULTS OF BLOOD-ALCOHOL ANALYSES FOR FATALLY INJURED DRIVERS, RIDERS AND PEDESTRIANS, JANUARY-JUNE 1980, N.S.W.

Recorded BAL	Drivers	Riders	Pedestrians
NIL	101	30	33
0.005 - 0.049	13	2	3
0.050 - 0.079	9	3	4
0.080 - 0.099	3	4	3
0.100 - 0.149	20	5	10
0.150 - 0.199	17	8	8
0.200 - 0.249	18	4	5
0.250 - 0.299	8	1	2
0.300 - 0.349	5	1	1
> 0.350	1	0	1
Total tested fatalities	195	58	70
Untested	32	8	50
Total	227	66	120

Table 1: Blood alcohol levels of drivers, motorcycle riders and pedestrians killed in the first six months of 1980 in N.S.W.

Recorded BAL	Drivers	Riders	Pedestrians
NIL	50	8	36
0.005 - 0.049	3	3	2
0.050 - 0.079	3	2	2
0.080 - 0.099	2	2	0
0.100 - 0.149	4	1	1
0.150 - 0.199	19	1	3
0.200 - 0.249	8	3	6
0.250 - 0.299	1	1	3
0.300 - 0.349	1	0	1
> 0.350	1	0	0
Total tested fatalities	92	21	54
Untested	30	4	29
Total	122	25	83

Table 2: Blood alcohol levels of drivers, motorcycle riders and pedestrians killed in the first six months of 1980 in Victoria.

BAL	N.S.W.	VICTORIA	TOTAL
< 0.050	146	64	210
0.050 - 0.149	44	14	58
≥ 0.150	63	35	96
Total tested drivers and riders	253	113	366

Table 3: Blood alcohol levels of fatally injured drivers and motorcyclists

BAL	N.S.W.	VICTORIA	TOTAL
< 0.050	36	38	74
0.050 - 0.149	17	3	20
≥ 0.150	17	13	30
Total tested pedestrians	70	54	124

Table 4: Blood alcohol levels of fatally injured pedestrians