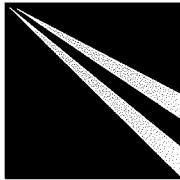


GN 27  
10/11/92



DEPARTMENT  
OF  
ROAD  
TRANSPORT

# OFFICE OF ROAD SAFETY

**REDUCTION OF THE LEGAL  
BLOOD ALCOHOL LIMIT  
AND LATE NIGHT DRINK DRIVING  
IN ADELAIDE**

**McLean AJ and Kloeden CN**

22769

Prepared by the NHMRC Road Accident Research Unit  
for the Office of Road Safety,  
South Australian Department of Transport

Office of Road Safety Report Series 1/92

**REDUCTION OF THE LEGAL  
BLOOD ALCOHOL LIMIT  
AND LATE NIGHT DRINK DRIVING  
IN ADELAIDE**

**McLean AJ and Kloeden CN**

**FINAL REPORT**

**February 1992**

**OFFICE OF ROAD SAFETY**  
**SOUTH AUSTRALIAN DEPARTMENT OF ROAD TRANSPORT**

**DOCUMENT INFORMATION**

---

**REPORT NUMBER:** 1/92      **DATE:** February 1992      **Pages:** 13      **ISBN:** 7243 4730 5

---

**TITLE AND SUBTITLE:** Reduction of the Legal Blood Alcohol Limit and Late Night Drink Driving in Adelaide

---

**AUTHOR(S):** McLean, A.J. and Kloeden, C.N.

**TYPE OF REPORT AND PERIOD COVERED:**

Surveys  
February to May 1991 and  
August to December 1991

---

**PERFORMING ORGANISATIONS(S):**

NHMRC Road Accident Research Unit  
GPO Box 498  
The University of Adelaide  
ADELAIDE SA 5001

**SPONSORING ORGANISATIONS(S):**

Office of Road Safety  
SA Department of Road Transport  
Box 1  
WALKERVILLE SA 5081

---

**AVAILABLE FROM:**

Office of Road Safety  
SA Department of Road Transport  
Box 1  
WALKERVILLE SA 5081

---

**ABSTRACT**

Two roadside breath alcohol surveys were conducted in Adelaide in 1991 to monitor the effect of lowering the legal blood alcohol limit for drivers from 0.08 to 0.05 g/100 ml on 1 July 1991. The surveys were conducted from 10:00 pm to 3:00 am by the NHMRC Road Accident Research Unit.

The percentage of drivers at or above the then legal limit of 0.08 was at its lowest point in 10 years in early 1991, as was the percentage of drivers at or above 0.05.

Soon after the introduction of the lower legal limit there was a 27.2% reduction in the percentage of drivers at or above 0.05. There were also reductions in the proportion of drivers at or above 0.08 (21.4%) and in those who had any level of alcohol in their blood (20.8%).

However the magnitude of these early reductions in drink driving was not sustained. In the last half of the survey conducted after the introduction of the 0.05 limit the percentage reductions in both legal and illegal drink driving were between seven and eight percent compared with the levels measured before the change in the limit.

---

**KEY WORDS:**

(IRRD except where marked \*)

Driver; drunkenness; blood alcohol content; accident prevention; Australia; \* deterrence; \* countermeasure; \* drink driver; breath test; \* random breath test; statistics; alcohol; before and after study; hour; age; research report; behaviour; night; \* sex; \* roadside survey.

---

**DISCLAIMER**

This report is disseminated in the interests of information exchange. The views expressed are those of the author(s) and are not necessarily those of the Office of Road Safety or of the South Australian Government.

---

**REDUCTION OF THE LEGAL BLOOD ALCOHOL LIMIT AND  
LATE NIGHT DRINK DRIVING IN ADELAIDE**

**McLean AJ and Kloeden CN**

**NHMRC Road Accident Research Unit  
The University of Adelaide**

**FINAL REPORT  
February 1992**

**Commissioned by  
The Office of Road Safety  
of the South Australian Department of Road Transport**

## **EXECUTIVE SUMMARY**

Two roadside breath alcohol surveys were conducted in Adelaide in 1991 to monitor the effect of lowering the legal blood alcohol limit for drivers from 0.08 to 0.05 g/100mL on July 1, 1991. The surveys were conducted from 10pm to 3am by the NHMRC Road Accident Research Unit in a similar manner to six previous surveys over the previous 10 years.

The percentage of drivers at or above the then legal limit of 0.08 was at its lowest point in 10 years in early 1991, as was the percentage of drivers at or above 0.05.

Soon after the introduction of the lower legal limit there was a 27.2% reduction in the percentage of drivers at or above 0.05. There were also reductions in the proportion of drivers at or above 0.08 (21.4%) and in those who had any level of alcohol in their blood (20.8%).

However the magnitude of these early reductions in drink driving was not sustained. In the last half of the survey conducted after the introduction of the 0.05 limit the percentage reductions in both legal and illegal drink driving were between seven and eight per cent compared with the levels measured before the change in the limit.

It is therefore recommended that any further change in drink driving be monitored by means of a similar roadside survey early in 1993, and that any changes in alcohol involvement in crashes also be investigated.

## **INTRODUCTION**

The NHMRC Road Accident Research Unit (RARU) has been carrying out late night roadside breath alcohol surveys in Adelaide since 1979 to monitor the rates of drinking and driving at both legal and illegal levels and to evaluate the effects of random breath testing by the police (McLean, Clark, Dorsch, Holubowycz and McCaul, 1984; McCaul and McLean, 1990; McLean, Kloeden and McCaul, 1991). In early 1991, a survey was conducted for 3 months as part of the on-going monitoring of the blood alcohol concentrations of Adelaide night-time drivers. At that time the legal blood alcohol limit was 0.08 g/100mL but was changed to a new limit of 0.05 on 1 July 1991.

The changing of the blood alcohol limit from 0.08 to 0.05 has occurred in other Australian states but the effects of these changes have been hard to determine. However, in South Australia the RARU series of roadside surveys provides a baseline against which the effects of the introduction of the 0.05 limit can be evaluated.

With this in view, the South Australian Office of Road Safety commissioned the NHMRC Road Accident Research Unit to conduct a second survey in 1991 after the introduction of the 0.05 limit had been finalised. This paper reports the results of that second survey and compares it with the previous survey in an attempt to establish the actual effects of the introduction of the new limit on drinking and driving behaviour.

## **METHOD**

The procedure used to obtain breath samples from a representative sample of Adelaide drivers in the Post-0.05 Survey was the same as that which had been used in the Pre-0.05 survey in 1991 as well as in previous surveys (Holubowycz, McLean and McCaul, 1991). Twenty intersections controlled by traffic signals were visited by two teams of RARU research assistants on a rostered basis. The first driver to stop at a red light was approached and asked to blow into a hand-held breath alcohol meter (a Lion Laboratories Alcolmeter SD-2). The sex of the driver was recorded, together with his or her estimated age group (under 21 years / 21-29 / 30-50 / over 50). The driver was also given a reply-paid questionnaire to fill out and mail back. Testing continued in this fashion for approximately 40 minutes after which the team would move to the next survey site.

Sampling was conducted between the hours of 10pm and 3am, allowing each team to test drivers at five different survey sites per night. Every Thursday, Friday and Saturday night was sampled and two of the remaining four nights each week.

The Pre-0.05 survey ran from 14 February to 21 May and the Post-0.05 survey ran from 8 August to 2 December. The Easter period (27 March to 3 April) was not included in the Pre-0.05 survey and the Australian Formula One Grand Prix period (23 October to 6 November) was not included in the second due to possibly atypical drinking patterns during these times.

The twenty sites used in the survey were the same as those used in previous roadside surveys conducted in Adelaide. They were at intersections on major roads and were selected so that no site was near an hotel or licensed premises, thus reducing the chance of testing a driver whose BAC might be overestimated because of the presence of mouth alcohol.

The BAC distributions were weighted on a daily and hourly basis to allow for varying traffic flows. A correction was also made to allow for the estimated BACs of drivers who refused to provide a breath sample using a method developed by Carlson (Wolfe, 1973; Carlson, 1979). All percentages presented in this paper have been weighted and corrected in this manner. Ninety-five per cent confidence intervals were then calculated for the weighted and corrected percentages using the delta method (Bishop, Fienberg and Holland, 1975). These confidence intervals enable a conservative assessment to be made of the statistical significance of differences in percentages.

## **RESULTS**

Six thousand six hundred and twenty seven drivers were approached during the Post-0.05 survey. As in previous surveys it was conducted in two halves, with 3,095 drivers being approached in the first half and 3,532 in the second. The percentage of drivers who refused to provide a breath sample was the lowest of any of the surveys conducted by this Unit (4.9%). In the second half of the survey it was 4.3% (Table 1).

Just over two per cent (2.13%) of drivers were at or above the previous legal limit of 0.08, 4.58% were at or above the new legal limit of 0.05 and 17.59% of drivers had been drinking (Tables 2, 3, 4). When compared with the results of the survey conducted in the first half of 1991 this represents a relative reduction in illegal drink driving of 10.9% in terms of the limit of 0.05 and 13.4% based on 0.08. The proportion of drivers who had been drinking decreased by 12.8%. However the size of these reductions may not be sustained because they were greater in the first half of the second survey than in the second half, as shown later in this section of the report.

It is emphasised that, even with the large sample sizes of these surveys, it is very difficult to demonstrate statistical significance at this level. Similarly, some of the differences noted could have arisen largely by chance. For these reasons the last part of the presentation of the results deals with the general consistency of the differences observed.

### **Drinking Drivers**

In the survey conducted after 0.05 was introduced there was a reduction in the proportion of drivers who had been drinking in all but one of the demographic and temporal subdivisions of the data, as shown in Table 2.

#### *Time of Day*

The size of the reduction varied from 1.8% in the 2am to 3am time period to 25.2% from 1am to 2am. This latter reduction was the only one of the five time of day comparisons that was statistically significant at the five per cent level. In general, the size of the reduction increased with time from 10pm, just as the percentage of drinking drivers tended to increase. The relative reduction for the 2am to 3am time period was the lowest for the five hourly periods but this was likely to have been due mainly to chance, as indicated by the wide confidence interval.



### *Day of Week*

Thursdays and Fridays were clearly the peak nights for drinking in the second survey (Table 2), whereas there was little difference in the percentage of drinking drivers from Wednesday to Saturday inclusive in the survey conducted before the introduction of the 0.05 limit. The highest relative reductions (31.9 and 33.2%) occurred on Wednesdays and Sundays respectively, followed by 17.5% on Saturdays. The sole increase in any of the comparisons listed in Table 2 occurred on Tuesday evenings but this result was clearly not statistically significant nor was it particularly meaningful.

### *Sex of Driver*

As in previous surveys male drivers were more likely to have been drinking than were female drivers (19.37 and 13.65% respectively). However there was no meaningful difference between the relative reductions in these percentages from the pre-0.05 survey for males and females (13.6 and 12.8%, Table 2).

### *Age of Driver*

The percentage of drivers who had been drinking increased steadily from 13.42% for those aged less than 21 years of age to 19.17% for those in the 30 to 50 year age range. It then decreased to 14.84% for those drivers over 50 years of age (Table 2). The relative reductions from the corresponding percentages in the earlier survey in 1991 also increased from the youngest to the 30 to 50 age group (8.5 to 13.8%) and then decreased slightly for the oldest group of drivers.

### **Drivers At Or Above 0.05**

Twenty six per cent of drinking drivers were at or above the new legal limit of 0.05 in the second survey, reflecting virtually no change from the Pre-0.05 result. The relative reduction of 10.9% in the overall percentage at or above 0.05 was not statistically significant at the five per cent level. It is therefore not surprising that none of the changes in the sub categories listed in Table 3 are statistically significant. However the majority of these changes are consistent with the overall reduction in the percentage of drivers at or above the new legal blood alcohol limit.

### *Time of Day*

The largest relative reduction in the percentage of drivers at or above 0.05 from the first to the second survey occurred in the 10pm to 11pm time period. This may well be a chance result but, as noted below, it holds for drivers at or above 0.08 also. The percentage of drivers at or above 0.05 increased steadily from 10pm to 3am, as in the previous survey.

### *Day of Week*

The distribution of drivers at or above 0.05 by day of week was similar to that for all drinking drivers but, of course, at lower percentages (Table 3). The relative changes by day of week from the first to the second survey in 1992 were also similar to those discussed above, although none of the seven changes were statistically significant.

### *Sex of Driver*

The results obtained in the second survey, with respect to the ratio of males to females at or above 0.05, were similar to those from the first survey (Table 3). The difference in the percentages at or above 0.05 for male and female drivers continued to be less when based on drinking drivers rather than all drivers.

### *Age of Driver*

About three per cent of the youngest age group of drivers (those under 21 years) were at or above 0.05 in the second survey. This represented a relative reduction of just over 25%. There was a generally decreasing trend in this relative reduction with increasing age of driver (Table 3).

### **Drivers At Or Above 0.08**

The relative reduction in the percentage of drivers at or above 0.08 was 13.4%, slightly greater, but not meaningfully so, than the figures of 10.9% for drivers at or above 0.05 and 12.8% for all drinking drivers (Table 4). The very small actual percentages of drivers at or above 0.08 mean that it is extremely difficult to demonstrate that a difference between two percentages is statistically significant, even with the large sample size of more than six thousand drivers.

### *Time of Day*

As noted above in relation to those drivers at or above 0.05, the greatest relative reduction in the percentage of drivers at or above 0.08 was in the 10pm to 11pm time period (46.3%). This meant that 5.9% of drinking drivers were at or above 0.08 in this time period in the second survey compared with 9.9% in the first. However there was a change in the opposite direction in the 12 midnight to 1am period: a relative increase of 31% of drivers at or above 0.08 was reflected in a relative increase of 47% when based on drinking drivers rather than all drivers. Once again, it is emphasised that these figures are imprecise for the reasons mentioned above.

### *Day of Week*

The same caveat about the lack of precision of the percentages in Table 4 applies particularly to the results for the percentages of drivers at or above 0.08 by day of week. For example, the relative percentage change from the first to the second survey in 1991 ranged from a reduction of 52.7% on Sundays to an increase of 66.8% on Mondays. On Mondays the estimated percentage of drinking drivers, rather than all drivers, who were at or above 0.08 increased from 11.9% to 22.1%. Clearly much of this variation is likely to have arisen by chance.

### *Sex of Driver*

The estimated percentage of female drivers at or above 0.08 decreased by almost one quarter after the introduction of the 0.05 limit compared to a relative reduction of one seventh for male drivers. As the changes for all drinking drivers were similar for males and females this meant that the proportion of female drinking drivers who were at or above 0.08 decreased whereas there was negligible change in this proportion for male drinking drivers.

### *Age of Driver*

The relative reduction in the percentage of drivers at or above 0.08 ranged from 14.9% for the 21 to 29 year age group to 23.6% for those drivers over 50 years of age. The estimated percentages at or above 0.08 by age ranged from 1.21% in the youngest age group to 2.46% in those in the next oldest group.

## **Drink Driving Changes During The Survey**

As noted in the introduction to this section of the report, the reductions observed in drink driving in the second survey were greater in the first half of the survey than in the latter half. Table 5 shows the percentage of drivers who had been drinking for each half of the two surveys conducted in 1991. It can be seen that there was virtually no change in the total number of drivers who had been drinking between the two halves of the first survey (20.12 and 20.07%). In the second survey however there was initially a marked reduction to 15.90% from 20.07% followed by an increase to 18.72% in the second half of the survey. These changes were statistically significant.

As is clear in the discussion of the two surveys, each taken as a whole, despite the large sample sizes the lack of precision of many of the estimates made it difficult to assess the meaningfulness of many of the comparisons which were attempted. Dividing each sample into two parts has exacerbated this problem because the effective sample sizes are reduced

approximately by half. However, the reliability of any trends in the data can be assessed by an examination of the consistency of these trends across the various sub-classifications presented in Table 5. These trends are indicated by arrows, pointing upwards to indicate an increase etc, together with a hyphen to indicate when any change in either direction was less than five per cent. These symbols are placed between the columns to indicate whether the estimated value for the particular category in, for example, the second column increased or decreased compared to the corresponding estimate in the first column.

#### *Trends in Drink Driving*

It can be seen that between the first and second halves of the survey conducted in 1991 before the introduction of the 0.05 legal limit for drivers there was no consistent trend, as indicated by the virtual absence of change in the estimate of the percentage of drinking drivers for the total sample in each half of the survey. In seven of the sub-classifications shown in Table 5 there was a decrease from the first half of the survey to the second half, in six other categories there was an increase and in five categories, excluding the total, there was no change exceeding 5% (this percentage was selected arbitrarily, as some measure of a change which, if exceeded, was large enough to be of practical interest).

Between the second half of the first survey and the first half of the second survey there was a substantial and statistically significant reduction in the overall percentage of drivers who had been drinking, from 20.07% to 15.90%. It was therefore not surprising to find that in all of the 18 sub-classifications of the data shown in Table 5 there was a corresponding decrease, although in two of these sub-classifications the decrease was less than 5%.

When comparing the second half of the second survey to the first half of that survey, we found a trend almost exactly opposite to that noted in the preceding paragraph. There was a substantial increase which was statistically significant (from 15.90 to 18.72%) and was reflected in all but one of the 18 sub-classifications of the data. The one exception was an increase of less than 5% for Thursdays, a day for which the change was less than 5% throughout the four halves of the two surveys.

#### *Trends in the Percentage of Drivers At Or Above 0.05*

As the percentage of drivers at or above 0.05 was much smaller than that for drinking drivers it was not possible, with one exception, to demonstrate statistical significance of any of the comparisons shown in Table 6. However the increase for the total group from the first to the second half of the first survey (4.84 to 5.33%) was reflected in increases in

13 of the 18 sub-classifications (Table 6). The proportionally much greater decrease from 5.33% to 3.88%, was accompanied by decreases in all but one of the 18 sub-classifications, with one of the reductions being less than 5% in relative terms. Finally, however, as was the case with all drinking drivers there was an almost uniform increase in the percentage of drivers at or above 0.05 from the first to the second half of the second survey. The increase in the percentage for the total group was from 3.88% to 5.00%. All but two of the 18 sub-classification comparisons indicated an increase in the percentage of drivers at or above 0.05, with one of these being an increase of less than five per cent.

#### *Trends in the Percentage of Drivers At Or Above 0.08*

Table 7 shows the changes between the four parts of the two surveys conducted in 1991 with respect to the percentage of drivers at or above a blood alcohol level of 0.08.

There was negligible change in the percentage of drivers at or above 0.08 between the two halves of the first survey. Consequently the number of sub-classifications in which there were increases in this percentage was similar to that in which there were decreases from the first to the second half of the survey. In marked contrast with this there was a large reduction in proportional terms between the second part of the first survey and the first half of the second survey (from 2.38 to 1.87%). This was accompanied by an almost uniform decrease in percentages across the 18 sub-classifications of the data. (The two exceptions each involved comparisons in which the highest or lowest percentage of the 18 sub-classifications occurred.)

During the second survey the trend was similar to that observed for drivers at or above 0.05 and for all drinking drivers; a relative increase, in this case of 18.7%, compared with a reduction following the introduction of 0.05 of 21.4%. A relative increase of more than 5% was observed in 12 of the 18 comparisons based on the sub-classifications listed in Table 7.

*Summary of Relative Percentage Changes*

As indicated by the preceding paragraphs, the first part of the survey conducted after the introduction of the 0.05 blood alcohol limit was accompanied by a marked reduction in legal and illegal drink driving. Much of this reduction was short lived, with only one third of it remaining in the second part of the survey (Table 8).

## DISCUSSION

Throughout the decade of the 1980's there has been a steady reduction in late night drink driving in Adelaide. The percentages observed for drinking drivers and drivers at or above 0.05 were lower at the beginning of 1991 than at any other time since the inception of these road side surveys. The percentage at or above 0.08 had remained at the level observed at the end of the survey in 1989 (McLean, Kloeden and McCaul, 1991).

After the introduction of the 0.05 legal blood alcohol limit on the 1st July 1991 there was a very marked reduction in both legal and illegal drink driving (Table 8). The reduction observed was greatest in relative terms for the percentage of drivers at or above the new legal limit of 0.05 (27.2%) The reduction for drivers at or above the previous legal limit of 0.08 was 21.4% and there was a reduction of 20.8% in the proportion of drivers who had been drinking. It is perhaps not surprising that of these three reductions the one relevant to the new legal limit was the greatest.

Although there were substantial reductions observed in the first half of the survey conducted after the introduction of the 0.05 legal limit was introduced, they were not the largest reductions ever observed in the series of road side surveys conducted by this Unit. They were less than the reductions observed in illegal drink driving in 1987 and 1989. These reductions were thought to have been associated primarily with publicity campaigns; with the former campaign publicising a substantial increase in the level of enforcement of Random Breath Testing by the Police.

The results for the second half of the post 0.05 survey show that much of the relatively large initial reduction was not sustained (Table 8). The residual reduction, based on comparison of the second halves of the two surveys conducted in 1991, showed a uniform reduction of between 6 and 7 per cent for all three categories of drink driving (positive, at or above 0.05, and at or above 0.08). In previous surveys a change of this magnitude has been thought to have been possibly due to seasonal variation (McCaul and McLean, 1990). As we have not previously conducted a survey in the latter half of the year we are unable to comment on the possible effects of such variations in this instance. However, it is notable that in the first survey of 1991 there was negligible variation from the first to the second half of the survey for drink driving and for illegal drink driving (at or above 0.08). For drivers who were at or above 0.05 in that first survey there was a 10% increase from the first half to the second half.

It could be postulated that the Australian Formula One Grand Prix motor race which is conducted in Adelaide in the first week in November may have influenced the readings obtained from drinking drivers in our second survey. We were aware of this possibility and deliberately avoided sampling during or adjacent to the period of the Grand Prix. Similarly the last testing session was conducted on the 2nd of December and therefore any possible increase in drink driving associated with the Christmas season is unlikely to have affected the results.

As shown in Table 1, the refusal rate in the second half of the Post-0.05 survey was 4.3%, the lowest that we have yet recorded. As drivers who refuse to provide a breath sample are believed to have been more likely to have been drinking (Holubowycz, McLean and McCaul, 1991) it might be thought that the reduction in the refusal rate has meant that a larger proportion of drinking drivers were included in the sample than was the case previously. While this is likely to be so, the correction for refusal bias should have compensated adequately for this difference.

The results obtained by time of day showed, as has consistently been the case in previous surveys, that there was a steady increase in illegal drink driving from 10pm to 3am. The results obtained by day of week drew attention yet again to high levels of illegal drink driving on Thursday nights and also on Friday and, surprisingly, Wednesday nights.

The rate of illegal drink driving remained highest among the 21-29 and 30-50 year old age groups. The relative reductions observed in the proportion of drivers at or above 0.05 after the introduction of the 0.05 legal limit were greatest for drivers under 21 years of age and diminished with increasing age of driver.

A larger proportion of male drivers had been drinking than was the case for female drivers. This relative difference in proportion was even greater for drivers at or above 0.05. The changes observed following the introduction of the 0.05 limit were similar for male and females as far as drink driving in general was concerned. The results for reductions at or above 0.05 and 0.08 were inconsistent for male and female drivers, with the former demonstrating the greater reduction at or above 0.05 and the latter a considerably greater reduction at levels at or above 0.08.



## **CONCLUSIONS**

The change in the legal blood alcohol limit for drivers in South Australia on July 1, 1991 was followed by a substantial reduction in both legal and illegal night-time drink driving. The change was greatest for drivers at or above the new legal limit (a reduction of 27.2%). The magnitude of this reduction was not as great as that which was associated with a widely publicised increase in the level of enforcement of Random Breath Testing by Police in 1987 and with a publicity campaign in 1989 but it was nevertheless clearly of considerable practical importance. However this initial substantial reduction in the proportion of drivers at or above the new legal limit was not sustained in the second half of the survey in which a residual reduction of between 6 and 7 per cent was observed in both legal and illegal drink driving.

## **RECOMMENDATIONS**

It is therefore recommended that any further change in drink driving be monitored by means of a similar roadside survey early in 1993, and that any changes in alcohol involvement in crashes also be investigated.

## **ACKNOWLEDGEMENTS**

The support of the Office of Road Safety of the South Australian Department of Road Transport and the National Health and Medical Research Council is gratefully acknowledged.

The roadside survey work was performed by the following staff of the NHMRC Road Accident Research Unit: T. Borgas, G. Dick, A. Indorf, C. Jantke and K. Moss.

## REFERENCES

- Bishop YMM, Fienberg SE, Holland PW. Discrete multivariate analysis: theory and practice. Massachusetts: Massachusetts Institute of Technology Press, 1975.
- Carlson WL. Estimation of nonrespondent BAC using a priori judgement. *Accid Anal and Prev* 1979; 11: 35-42.
- Holubowycz OT, McLean AJ, McCaul KA. A new method of breath testing the general driving population. *J Stud Alcohol* 1991; 52: 474-477.
- McCaul KA, McLean AJ. Publicity, police resources and the effectiveness of random breath testing. *Med J Aust* 1990; 152: 284-286.
- McLean AJ, Clark MS, Dorsch MM, Holubowycz OT, McCaul KA. Random breath testing in South Australia: effects on drink-driving, accidents and casualties. Adelaide: NH&MRC Road Accident Research Unit, University of Adelaide, 1984.
- McLean AJ, Kloeden CN, McCaul KA. Drink-driving in the general night-time driving population: Adelaide, 1989. *Aust J Public Health* 1991; 15: 190-193.
- Wolfe AC. US national roadside breathtesting survey: procedures and results. Ann Arbor: University of Michigan Highway Safety Research Institute, 1973.

**Table 1**  
**Number of drivers approached for a breath sample and refusal rates for each part of the two surveys conducted in 1991**

Survey Period	Number Approached	Number Refused	Refusal Rate (%)
Pre-0.05 (part 1)	3452	189	5.5
Pre-0.05 (part 2)	3337	169	5.1
Post-0.05 (part 1)	3095	171	5.5
Post-0.05 (part 2)	3532	153	4.3

**Table 2**  
**Comparing the percentage of drivers with a positive**  
**blood alcohol concentration before and after the**  
**introduction of the 0.05 limit, Adelaide, 1991**  
**(weighted and corrected for refusal bias)**

Group	1991 Pre-0.05		1991 Post-0.05		% Change		
Total	19.16	<b>20.18</b>	21.19	16.61	<b>17.59</b>	18.56	-12.8
Male	21.11	<b>22.42</b>	23.73	18.13	<b>19.37</b>	20.62	-13.6
Female	14.10	<b>15.66</b>	17.22	12.14	<b>13.65</b>	15.16	-12.8
under 21	11.87	<b>14.67</b>	17.47	10.27	<b>13.42</b>	16.56	-8.5
21-29	18.19	<b>20.02</b>	21.85	15.65	<b>17.55</b>	19.44	-12.3
30-50	20.56	<b>22.24</b>	23.92	17.61	<b>19.17</b>	20.74	-13.8
over 50	14.97	<b>17.11</b>	19.26	12.86	<b>14.84</b>	16.81	-13.3
10pm-11pm	14.54	<b>16.19</b>	17.83	13.02	<b>14.64</b>	16.27	-9.6
11pm-12am	16.55	<b>18.45</b>	20.35	14.11	<b>15.93</b>	17.74	-13.7
12am-1am	23.17	<b>25.69</b>	28.20	20.42	<b>22.90</b>	25.38	-10.9
1am-2am	24.23	<b>27.41</b>	30.59	17.59	<b>20.50</b>	23.40	-25.2
2am-3am	21.52	<b>24.89</b>	28.25	20.86	<b>24.43</b>	28.00	-1.8
Monday	14.58	<b>18.05</b>	21.53	12.94	<b>16.17</b>	19.39	-10.4
Tuesday	13.19	<b>16.15</b>	19.11	13.95	<b>17.31</b>	20.67	+7.2
Wednesday	19.45	<b>22.73</b>	26.01	12.35	<b>15.48</b>	18.60	-31.9
Thursday	20.11	<b>22.62</b>	25.13	19.16	<b>21.52</b>	23.88	-4.9
Friday	19.93	<b>22.05</b>	24.18	19.25	<b>21.42</b>	23.60	-2.9
Saturday	19.39	<b>21.41</b>	23.43	15.79	<b>17.67</b>	19.55	-17.5
Sunday	14.62	<b>17.93</b>	21.25	9.15	<b>11.98</b>	14.80	-33.2

Note: Small numbers indicate the 95% confidence limits of the percentages

**Table 3**  
**Comparing the percentage of drivers with a blood alcohol concentration  $\geq 0.05$  g/100mL before and after the introduction of the 0.05 limit, Adelaide, 1991 (weighted and corrected for refusal bias)**

Group	1991 Pre-0.05			1991 Post-0.05			% Change
Total	4.55	<b>5.14</b>	5.73	4.07	<b>4.58</b>	5.10	-10.9
Male	4.85	<b>6.10</b>	7.36	4.66	<b>5.35</b>	6.03	-12.3
Female	2.41	<b>3.15</b>	3.90	2.17	<b>2.88</b>	3.59	-8.6
under 21	2.45	<b>4.00</b>	5.56	1.49	<b>2.99</b>	4.49	-25.3
21-29	5.10	<b>6.18</b>	7.25	4.09	<b>5.22</b>	6.36	-15.5
30-50	3.95	<b>4.79</b>	5.63	3.75	<b>4.53</b>	5.30	-5.4
over 50	2.64	<b>3.74</b>	4.84	2.46	<b>3.50</b>	4.54	-6.4
10pm-11pm	2.75	<b>3.77</b>	4.78	1.95	<b>2.70</b>	3.44	-28.4
11pm-12am	3.16	<b>4.11</b>	5.05	3.06	<b>4.05</b>	5.05	-1.5
12am-1am	5.68	<b>7.22</b>	8.76	5.38	<b>6.92</b>	8.47	-4.2
1am-2am	6.29	<b>8.27</b>	10.25	5.22	<b>7.15</b>	9.08	-13.5
2am-3am	7.35	<b>9.81</b>	12.26	7.84	<b>10.67</b>	13.50	+8.8
Monday	2.55	<b>4.52</b>	6.50	3.35	<b>5.38</b>	7.42	+19.0
Tuesday	2.13	<b>3.66</b>	5.18	2.15	<b>4.00</b>	5.85	+9.3
Wednesday	4.81	<b>6.70</b>	8.58	3.28	<b>5.16</b>	7.03	-23.0
Thursday	5.13	<b>6.65</b>	8.16	4.49	<b>5.85</b>	7.20	-12.0
Friday	3.76	<b>4.87</b>	5.98	4.08	<b>5.30</b>	6.52	+8.8
Saturday	5.13	<b>6.33</b>	7.52	3.91	<b>4.99</b>	6.06	-21.2
Sunday	2.81	<b>4.65</b>	6.48	1.53	<b>3.06</b>	4.60	-34.2

Note: Small numbers indicate the 95% confidence limits of the percentages

**Table 4**  
**Comparing the percentage of drivers with a blood alcohol concentration  $\geq 0.08$  g/100mL before and after the introduction of the 0.05 limit, Adelaide, 1991 (weighted and corrected for refusal bias)**

Group	1991 Pre-0.05			1991 Post-0.05			% Change
Total	2.04	<b>2.46</b>	2.88	1.77	<b>2.13</b>	2.48	-13.4
Male	2.44	<b>2.96</b>	3.49	2.07	<b>2.54</b>	3.01	-14.2
Female	0.91	<b>1.39</b>	1.87	0.62	<b>1.05</b>	1.48	-24.5
under 21	0.61	<b>1.44</b>	2.27	0.38	<b>1.21</b>	2.03	-16.0
21-29	2.15	<b>2.89</b>	3.64	1.61	<b>2.46</b>	3.32	-14.9
30-50	1.81	<b>2.41</b>	3.02	1.48	<b>1.99</b>	2.49	-17.4
over 50	1.04	<b>1.82</b>	2.60	0.78	<b>1.39</b>	2.00	-23.6
10pm-11pm	0.92	<b>1.60</b>	2.28	0.44	<b>0.86</b>	1.28	-46.3
11pm-12am	1.42	<b>2.11</b>	2.80	1.47	<b>2.23</b>	2.99	+5.7
12am-1am	2.10	<b>3.13</b>	4.17	2.84	<b>4.10</b>	5.37	+31.0
1am-2am	2.95	<b>4.43</b>	5.91	2.31	<b>3.77</b>	5.24	-14.9
2am-3am	3.60	<b>5.49</b>	7.38	2.49	<b>3.96</b>	5.43	-27.9
Monday	0.82	<b>2.14</b>	3.46	1.87	<b>3.57</b>	5.27	+66.8
Tuesday	0.83	<b>1.94</b>	3.04	0.15	<b>1.15</b>	2.16	-40.7
Wednesday	1.77	<b>3.08</b>	4.38	1.86	<b>3.42</b>	4.98	+11.0
Thursday	2.08	<b>3.13</b>	4.18	1.54	<b>2.41</b>	3.28	-23.0
Friday	1.64	<b>2.43</b>	3.21	1.63	<b>2.40</b>	3.17	-1.2
Saturday	1.94	<b>2.76</b>	3.57	1.65	<b>2.42</b>	3.18	-12.3
Sunday	1.38	<b>2.79</b>	4.19	0.29	<b>1.32</b>	2.36	-52.7

Note: Small numbers indicate the 95% confidence limits of the percentages

**Table 5**  
**Percentage of drivers with a positive blood alcohol concentration, Adelaide, 1991**  
**(weighted and corrected for refusal bias)**

Group	1991 Pre-0.05								1991 Post-0.05							
	First Half				Second Half				First Half				Second Half			
Total	18.69	<b>20.12</b>	21.55	-	18.63	<b>20.07</b>	21.50	-	14.55	<b>15.90</b>	17.24	↑	17.34	<b>18.72</b>	20.11	
Male	20.10	<b>21.93</b>	23.76	-	20.51	<b>22.35</b>	24.20	-	16.23	<b>17.96</b>	19.70	↑	18.40	<b>20.15</b>	21.89	
Female	13.77	<b>16.00</b>	18.23	-	12.91	<b>15.09</b>	17.27	-	9.27	<b>11.30</b>	13.33	↑	13.46	<b>15.65</b>	17.85	
under 21	10.78	<b>14.56</b>	18.34	-	9.87	<b>13.55</b>	17.23	-	7.28	<b>10.13</b>	12.97	↑	11.02	<b>15.71</b>	20.39	
21-29	16.76	<b>19.42</b>	22.08	↑	17.93	<b>20.43</b>	22.94	-	14.40	<b>16.96</b>	19.51	↑	15.29	<b>17.98</b>	20.67	
30-50	19.35	<b>21.61</b>	23.88	↑	20.16	<b>22.70</b>	25.24	-	15.72	<b>17.93</b>	20.14	↑	17.73	<b>19.91</b>	22.10	
over 50	13.57	<b>16.55</b>	19.52	-	14.34	<b>17.33</b>	20.32	-	8.83	<b>11.63</b>	14.43	↑	14.36	<b>17.11</b>	19.87	
10pm-11pm	14.58	<b>16.87</b>	19.15	-	12.84	<b>15.19</b>	17.55	-	9.68	<b>11.91</b>	14.13	↑	14.45	<b>16.78</b>	19.11	
11pm-12am	15.87	<b>18.54</b>	21.22	-	15.65	<b>18.35</b>	21.05	-	12.20	<b>14.72</b>	17.24	↑	13.94	<b>16.45</b>	18.96	
12am-1am	22.45	<b>26.08</b>	29.72	-	21.25	<b>24.73</b>	28.22	-	18.12	<b>21.69</b>	25.25	↑	19.78	<b>23.23</b>	26.68	
1am-2am	21.40	<b>25.84</b>	30.28	↑	24.39	<b>28.97</b>	33.54	-	14.70	<b>18.62</b>	22.54	↑	18.37	<b>22.65</b>	26.94	
2am-3am	15.59	<b>19.62</b>	23.65	↑	24.77	<b>29.93</b>	35.09	-	18.37	<b>23.29</b>	28.21	↑	20.21	<b>25.39</b>	30.58	
Monday	14.38	<b>19.66</b>	24.94	-	11.53	<b>16.04</b>	20.55	-	10.82	<b>15.48</b>	20.13	↑	12.09	<b>16.52</b>	20.96	
Tuesday	11.04	<b>14.88</b>	18.73	↑	12.77	<b>17.12</b>	21.46	-	9.34	<b>14.09</b>	18.83	↑	15.20	<b>19.97</b>	24.74	
Wednesday	17.74	<b>22.22</b>	26.70	-	18.24	<b>22.98</b>	27.71	-	7.07	<b>11.30</b>	15.52	↑	13.19	<b>17.59</b>	22.00	
Thursday	19.50	<b>23.23</b>	26.96	-	18.87	<b>22.28</b>	25.69	-	18.10	<b>21.42</b>	24.74	-	17.84	<b>21.15</b>	24.46	
Friday	19.64	<b>22.58</b>	25.53	-	18.15	<b>21.29</b>	24.43	-	15.90	<b>19.02</b>	22.14	↑	20.24	<b>23.21</b>	26.19	
Saturday	16.96	<b>19.73</b>	22.50	↑	20.05	<b>22.98</b>	25.92	-	14.17	<b>16.83</b>	19.49	↑	15.56	<b>18.18</b>	20.80	
Sunday	13.51	<b>18.20</b>	22.89	-	12.39	<b>16.96</b>	21.53	-	5.78	<b>9.57</b>	13.35	↑	9.93	<b>14.06</b>	18.18	

Note: Small numbers indicate the 95% confidence limits of the percentages  
Arrows indicate direction of change in percentages of at least 5%



**Table 6**  
**Percentage of drivers with a blood alcohol concentration**  
**equal to or greater than 0.05 g/100mL, Adelaide, 1991**  
**(weighted and corrected for refusal bias)**

Group	1991 Pre-0.05								1991 Post-0.05							
	First Half				Second Half				First Half				Second Half			
Total	3.95	<b>4.84</b>	5.72	↑	4.42	<b>5.33</b>	6.23	↔	3.19	<b>3.88</b>	4.56	↑	4.23	<b>5.00</b>	5.77	
Male	3.37	<b>5.57</b>	7.76	↑	5.20	<b>6.24</b>	7.29	↔	3.57	<b>4.51</b>	5.44	↑	4.75	<b>5.77</b>	6.79	
Female	2.11	<b>3.15</b>	4.20	↔	2.19	<b>3.27</b>	4.35	↔	1.44	<b>2.43</b>	3.41	↑	2.36	<b>3.42</b>	4.48	
under 21	1.58	<b>3.12</b>	4.66	↑	2.10	<b>4.36</b>	6.61	↔	0.78	<b>2.10</b>	3.41	↑	1.17	<b>3.30</b>	5.43	
21-29	4.21	<b>5.79</b>	7.38	↑	5.12	<b>6.62</b>	8.11	↔	3.93	<b>5.40</b>	6.87	↔	3.38	<b>4.96</b>	6.54	
30-50	3.79	<b>5.01</b>	6.23	↔	3.30	<b>4.44</b>	5.58	↔	2.15	<b>3.06</b>	3.98	↑	4.38	<b>5.60</b>	6.83	
over 50	1.60	<b>2.75</b>	3.90	↑	2.89	<b>4.66</b>	6.43	↔	1.51	<b>3.03</b>	4.55	↑	2.39	<b>3.78</b>	5.16	
10pm-11pm	2.47	<b>4.08</b>	5.70	↔	1.54	<b>3.10</b>	4.66	↔	1.15	<b>2.17</b>	3.19	↑	2.11	<b>3.24</b>	4.38	
11pm-12am	2.76	<b>4.12</b>	5.47	↔	2.70	<b>4.01</b>	5.32	↔	1.55	<b>2.66</b>	3.77	↑	3.32	<b>4.80</b>	6.28	
12am-1am	4.64	<b>6.72</b>	8.79	↑	4.95	<b>7.09</b>	9.24	↔	4.55	<b>6.89</b>	9.23	↔	4.36	<b>6.41</b>	8.47	
1am-2am	4.30	<b>6.88</b>	9.47	↑	6.73	<b>9.76</b>	12.79	↔	3.62	<b>6.31</b>	9.00	↑	5.18	<b>8.01</b>	10.84	
2am-3am	3.56	<b>6.39</b>	9.22	↑	9.81	<b>13.81</b>	17.82	↔	6.30	<b>10.41</b>	14.52	↔	7.06	<b>10.89</b>	14.73	
Monday	1.40	<b>4.03</b>	6.66	↑	0.87	<b>4.42</b>	7.97	↑	2.32	<b>5.34</b>	8.36	↑	2.78	<b>5.70</b>	8.62	
Tuesday	1.07	<b>3.05</b>	5.03	↑	1.83	<b>4.14</b>	6.45	↔	0.41	<b>2.96</b>	5.51	↑	2.21	<b>4.88</b>	7.55	
Wednesday	3.25	<b>5.71</b>	8.18	↑	4.63	<b>7.44</b>	10.24	↔	1.19	<b>4.03</b>	6.86	↑	2.33	<b>4.76</b>	7.19	
Thursday	4.11	<b>6.31</b>	8.51	↑	4.97	<b>7.06</b>	9.15	↔	3.27	<b>5.09</b>	6.91	↑	4.41	<b>6.40</b>	8.38	
Friday	2.90	<b>4.40</b>	5.90	↑	3.39	<b>5.28</b>	7.18	↔	2.68	<b>4.52</b>	6.36	↑	4.33	<b>5.95</b>	7.56	
Saturday	4.88	<b>6.62</b>	8.37	↔	4.34	<b>5.94</b>	7.55	↔	2.74	<b>4.17</b>	5.60	↑	3.93	<b>5.50</b>	7.07	
Sunday	1.71	<b>4.18</b>	6.65	↑	2.03	<b>4.55</b>	7.08	↔	0.63	<b>2.88</b>	5.14	↑	1.16	<b>3.30</b>	5.45	

Note: Small numbers indicate the 95% confidence limits of the percentages  
Arrows indicate direction of change in percentages of at least 5%

**Table 7**  
**Percentage of drivers with a blood alcohol concentration**  
**equal to or greater than 0.08 g/100mL, Adelaide, 1991**  
**(weighted and corrected for refusal bias)**

Group	1991 Pre-0.05								1991 Post-0.05							
	First Half				Second Half				First Half				Second Half			
Total	1.89	<b>2.49</b>	3.09	-	1.62	<b>2.38</b>	3.14	-	1.38	<b>1.87</b>	2.35	↑	1.71	<b>2.22</b>	2.73	
Male	2.12	<b>2.85</b>	3.58	-	2.15	<b>2.87</b>	3.60	-	1.66	<b>2.31</b>	2.97	↑	1.87	<b>2.52</b>	3.18	
Female	0.83	<b>1.53</b>	2.23	-	0.63	<b>1.31</b>	1.99	-	0.26	<b>0.72</b>	1.17	↑	0.69	<b>1.46</b>	2.23	
under 21	0.37	<b>1.34</b>	2.31	-	0.48	<b>1.38</b>	2.29	-	0.25	<b>1.07</b>	1.89	↑	0.03	<b>1.39</b>	2.75	
21-29	1.69	<b>2.87</b>	4.05	-	1.89	<b>2.82</b>	3.74	-	1.39	<b>2.38</b>	3.37	-	1.19	<b>2.38</b>	3.58	
30-50	1.87	<b>2.79</b>	3.71	-	1.21	<b>1.98</b>	2.76	-	0.63	<b>1.19</b>	1.75	↑	1.66	<b>2.51</b>	3.36	
over 50	0.41	<b>1.15</b>	1.89	↑	1.10	<b>2.43</b>	3.76	-	0.37	<b>1.39</b>	2.41	-	0.60	<b>1.36</b>	2.11	
10pm-11pm	0.81	<b>1.76</b>	2.72	-	0.00	<b>1.30</b>	2.76	-	0.22	<b>0.88</b>	1.55	-	0.31	<b>0.85</b>	1.39	
11pm-12am	1.25	<b>2.28</b>	3.30	-	1.00	<b>1.93</b>	2.85	-	0.39	<b>1.11</b>	1.84	↑	1.60	<b>2.74</b>	3.88	
12am-1am	1.95	<b>3.55</b>	5.14	-	1.04	<b>2.23</b>	3.42	↑	2.52	<b>4.50</b>	6.49	-	1.83	<b>3.51</b>	5.18	
1am-2am	1.78	<b>3.78</b>	5.78	↑	2.97	<b>5.25</b>	7.53	-	1.37	<b>3.18</b>	4.99	↑	2.13	<b>4.44</b>	6.76	
2am-3am	1.45	<b>3.73</b>	6.01	↑	4.83	<b>7.99</b>	11.16	-	1.74	<b>3.65</b>	5.57	↑	2.01	<b>4.40</b>	6.80	
Monday	0.84	<b>3.27</b>	5.69	-	0.00	<b>0.92</b>	3.94	↑	1.40	<b>4.13</b>	6.86	-	1.05	<b>3.34</b>	5.64	
Tuesday	0.08	<b>1.66</b>	3.23	↑	0.41	<b>2.10</b>	3.79	-	0.00	<b>0.00</b>	0.00	↑	0.28	<b>1.98</b>	3.69	
Wednesday	0.85	<b>2.58</b>	4.30	↑	1.61	<b>3.59</b>	5.57	-	0.36	<b>3.07</b>	5.78	-	0.68	<b>2.50</b>	4.32	
Thursday	1.76	<b>3.44</b>	5.12	-	1.68	<b>3.01</b>	4.33	-	0.51	<b>1.44</b>	2.37	↑	1.71	<b>3.10</b>	4.49	
Friday	1.33	<b>2.47</b>	3.61	-	0.81	<b>2.25</b>	3.69	-	1.16	<b>2.24</b>	3.33	↑	1.43	<b>2.51</b>	3.59	
Saturday	1.46	<b>2.53</b>	3.59	↑	1.79	<b>3.00</b>	4.21	-	1.13	<b>2.20</b>	3.27	↑	1.50	<b>2.63</b>	3.76	
Sunday	0.64	<b>2.49</b>	4.34	-	0.69	<b>2.57</b>	4.45	-	0.00	<b>1.03</b>	2.41	↑	0.06	<b>1.65</b>	3.24	

Note: Small numbers indicate the 95% confidence limits of the percentages  
Arrows indicate direction of change in percentages of at least 5%

**Table 8**  
**Relative percentage changes from the second half of the Pre-0.05**  
**survey to each half of the Post-0.05 survey, Adelaide, 1991**  
**(weighted and corrected for refusal bias)**

Change from second half of Pre-0.05 survey to:	Blood Alcohol Concentration of Driver		
	Positive	≥ 0.05	≥ 0.08
First half of Post-0.05 survey	-20.8%	-27.2	-21.4
Second half of Post-0.05 survey	-6.7	-6.2	-6.7