

DECLINE IN DRINKING AND DRIVING CRASHES, FATALITIES AND INJURIES IN GREAT BRITAIN

*Andrew Clayton, British Institute of Traffic Education Research, Birmingham; and
Julian T. Everest, Transport Research Laboratory, Crowthorne UK*

INTRODUCTION

Great Britain introduced breath-testing of suspected drink/drivers in 1967, creating an offence of driving with more than 80mg of alcohol per 100ml of blood. This level (and the equivalents for alcohol in breath and urine) have remained unchanged. However, during the 1970s, the drink/driving laws had little effect on driver behaviour and drink-related accidents. Since the early 1980s therefore, a series of governmental measures have been introduced which were designed to improve the enforcement of these laws, or to revise the penalties on conviction. These include:

- The introduction of evidential breath testing devices, resulting in increased police enforcement levels; in fact the number of police screening breath tests increased from 206,000 in 1982 to 530,000 in 1992.
- Clarification of anomalies in the drink/driving laws.
- The introduction of the "High Risk (drink/driving) Offender" scheme, which requires offenders to pass a medical test before driving licences are recovered.
- Increased penalties, including imprisonment, for drinking drivers who caused death by careless driving.

Schemes for the rehabilitation of drink/driving offenders have also been developed. There are no plans to introduce random breath testing. In parallel with the legislative changes, a continuous programme of anti-drink/driving publicity has been sustained, aimed at changing public attitudes to drink/driving.

This paper outlines the profile of known drink/drivers, and indicates how trends in alcohol related road accidents developed through the 1980s and early 1990s. Although the number of injury accidents involving drinking has fallen substantially over this period, it is nevertheless estimated that over twenty thousand road casualties still result annually in Great Britain from such behaviour; of these approximately seven hundred are fatal, (Department of Transport, 1992). Public attitudes to drink/driving and enforcement have also changed markedly since the early 1980s, and the findings of research designed to monitor these developments are presented.

GENERAL ACCIDENT TRENDS

Trends in the overall distribution of road accident fatalities and injuries (extracted from a Department of Transport publication, 1993) are listed in Table 1; the fatality statistics, which include accidents to children, have fallen markedly through the decade. In view of the increasing traffic levels on Britain's roads, this is a most encouraging result, which in part reflects improvements in vehicle and road design, as well as changes in legislation and training. Certainly the requirement to use seat belts (for front seat occupants since 1983, and for all passengers since 1991) had a significant impact on injury levels to car users - as did the revised motorcycling regulations introduced in 1982.

Estimates of the number of accidents involving illegal alcohol levels, and the associated injuries, are shown in Table 2. (These data have recently been revised, and incorporate different grossing assumptions than were previously employed by the Department of Transport, 1993). In total, road user fatalities are estimated to have fallen by over 60 per cent between 1982 and 1992, serious injuries having fallen by 59 per cent. The reduction among those slightly injured, although significant, was less marked (at 38 per cent). Although the causes of the general decrease in the injury statistics outlined above will have been important in achieving this result, there is no doubt that a significant reduction in the scale and level of drink/driving has also been witnessed.

The results of an analysis of the blood alcohol concentrations of various categories of road users killed in road accidents in 1990 is given in Table 3; data for earlier years, although not presented, are available. The information was obtained from Coroners and Procurators Fiscal, and is summarised in a Transport Research Laboratory (TRL) leaflet (1993), which also outlines the age distributions of the victims.

TABLE 1 Trends in road accident casualties: Great Britain, 1981 -1991

Year	Killed					Injured ('000s)
	Pedes- trians	Pedal Cyclists	TWMV * Users	Others	All	
1981	1,874	310	1,131	2,531	5,846	319
1982	1,869	294	1,090	2,681	5,934	328
1983	1,914	323	963	2,245	5,445	303
1984	1,868	345	967	2,419	5,599	319
1985	1,789	286	796	2,294	5,165	312
1986	1,841	271	762	2,508	5,382	316
1987	1,703	280	723	2,419	5,125	306
1988	1,753	227	670	2,402	5,052	317
1989	1,706	294	683	2,690	5,373	336
1990	1,694	256	659	2,608	5,217	336
1991	1,496	242	548	2,282	4,568	307

* Two wheeled motor vehicles

TABLE 2 Estimates of casualties in accidents involving illegal alcohol levels: Great Britain, 1982 - 1992

Number

Year	Accidents				Casualties			
	Fatal	Serious	Slight	Total	Fatal	Serious	Slight	Total
1982	1,300	5,420	12,070	18,800	1,550	8,010	20,660	30,220
1983	950	4,750	11,430	17,130	1,110	6,800	18,610	26,520
1984	1,000	4,790	11,540	17,330	1,170	6,820	19,410	27,390
1985	900	4,900	11,460	17,260	1,040	6,810	19,380	27,220
1986	850	4,590	11,510	16,940	990	6,440	19,220	26,650
1987	780	4,220	10,560	15,560	900	5,900	17,670	24,470
1988	680	3,660	10,190	14,520	790	5,100	16,860	22,740
1989	700	3,390	10,300	14,390	810	4,790	16,620	22,220
1990	650	2,910	9,650	13,210	760	4,090	15,550	20,400
1991	570	2,590	8,530	11,690	660	3,610	13,610	17,880
1992*	510	2,400	7,940	10,840	610	3,280	12,840	16,720

* Provisional data

TABLE 3 Blood alcohol levels in fatalities in Great Britain, 1990

Total killed aged 16 and over		Percentage with BAC exceeding (mg/100ml)					
		9	50	80	100	150	200
Motor vehicle drivers (excl 2-wheelers)	1584	29	20	18	17	13	8
Motorcycle riders	587	28	21	19	17	12	7
Vehicle passengers	976	38	28	23	21	11	6
Pedestrians	1452	49	35	32	30	25	17
Pedal cyclists	197	16	8	8	7	6	6
All road users	4796	33	22	22	21	15	10

ALCOHOL LEVELS AMONG CAR DRIVERS

Driver Fatalities in 1992

The most recent data relating to car drivers (also obtained from Coroners) are given below. In 1992, 30.4 per cent of fatally injured car and taxi drivers had been drinking prior to their accident, (i.e. they had blood alcohol concentrations (BACs) $>9\text{mg}/100\text{ml}$), while 19.0 per cent were over the legal limit of $80\text{mg}/100\text{ml}$, and 6.8 per cent were over $200\text{mg}/100\text{ml}$. Expressed another way, among known drinkers, 63 per cent had BACs above the legal limit of $80\text{mg}/100\text{ml}$, and 22 per cent above $200\text{mg}/100\text{ml}$; of drivers over the legal limit, 64 per cent had BACs over $150\text{mg}/100\text{ml}$ and 36 per cent over $200\text{mg}/100\text{ml}$.

Trends in Fatalities During the Last Decade

The proportion of car drivers over the legal limit when killed has fallen significantly through the 1980s, from a high of 38.2 per cent in 1982 to 19.0 per cent in 1992. A similar reduction has been observed among those over $200\text{mg}/100\text{ml}$ BAC, the proportion falling from 15.4 in 1980 to 6.8 per cent in 1992 (see Figure 1). The associated reduction in the estimated total numbers of drinking driver fatalities are also shown. These figures are subject to some uncertainty however as they are based on totals grossed proportionately to represent cases where BACs were not known - possibly because of exsanguination or blood transfusion, or where death occurred long after the accident.

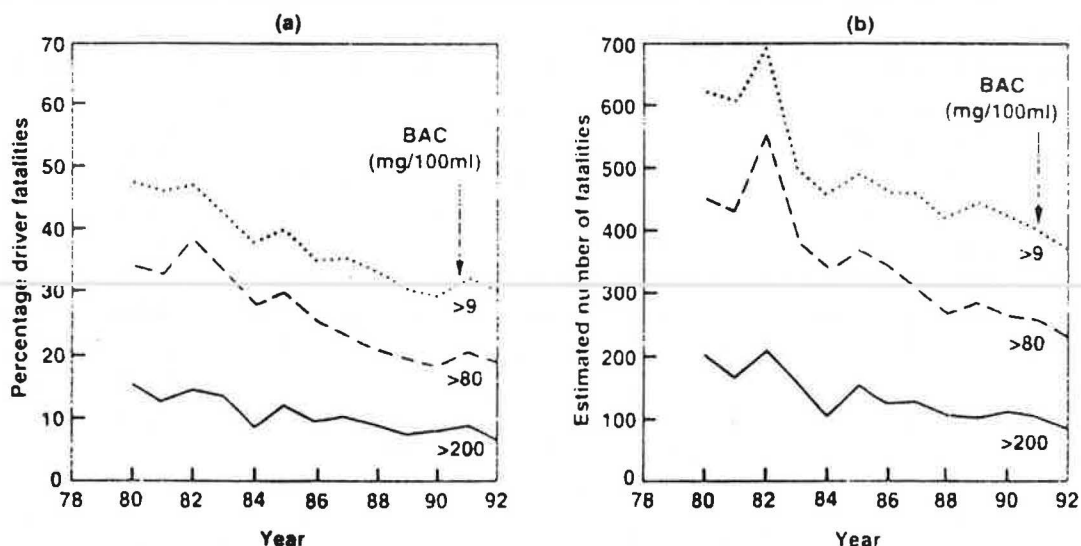


FIGURE 1 Trends in the percentages and numbers of car/taxi driver fatalities, as a function of blood alcohol concentration.

Distributions of car drivers' fatalities as a function of blood alcohol concentrations are illustrated in Figure 2 for periods at the beginning and towards the end of the last decade; a distribution of the most recent data available (for 1991 and 1992) is also illustrated. At very low BAC levels there is some evidence of a modest increase in the number of driver fatalities over the decade. At all other levels the number of drinking drivers reduced significantly, the proportionate reductions being most marked for BACs between the legal limit and twice this level. Moreover in the 1991/1992 data, the incidence of fatalities among drivers having BACs between 200 and $300\text{mg}/100\text{ml}$ is also seen to have fallen markedly.

The proportion of all car driver fatalities having BACs in the bands between 80 and $200\text{mg}/100\text{ml}$ fell from approximately 25 per cent to 10 per cent over the decade (i.e. 330 to 150 fatalities per annum). With the exception of those with BACs less than $20\text{mg}/100\text{ml}$, the peak incidence over the 1988-90 period was approximately $180\text{mg}/100\text{ml}$ BAC. This bimodal distribution, with a minimum just over the legal limit ($80\text{mg}/100\text{ml}$), was initially

those who chose to flout it. However the most recent evidence, in indicating a reduction in fatality rates among heavy drinkers with BACs in excess of 200mg/100ml, suggests that some accelerated improvement among this group may also have occurred in the last year or so. It is concluded that a combination of legislative measures, including the introduction of the new High Risk Offender Scheme in 1990, together with sustained publicity, has been effective in informing the public of the dangers and consequences of driving after drinking - even after having drunk quite modest quantities of alcohol.

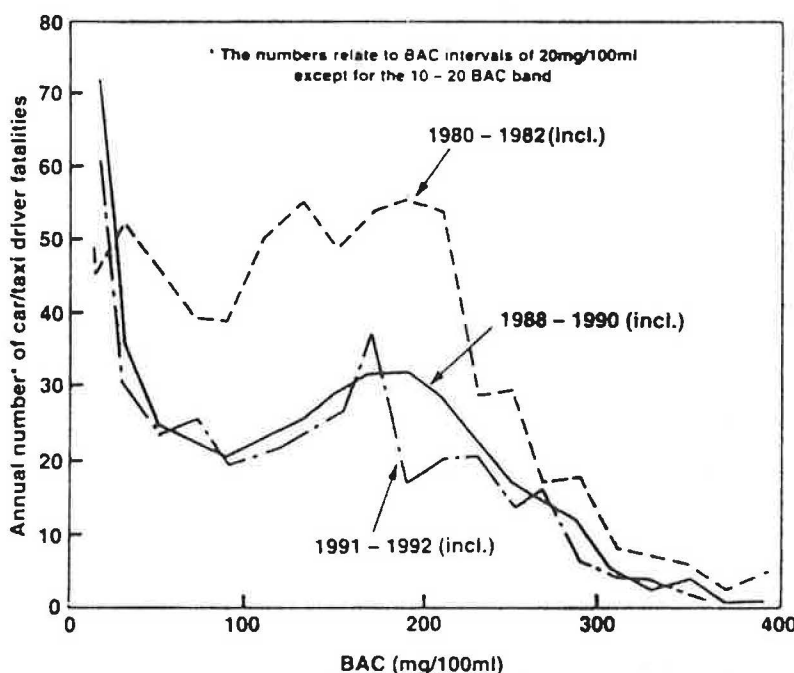


FIGURE 2 Distribution of driver fatalities by BAC.

Age Distributions

The numbers of car driver fatalities with BACs above the legal limit are illustrated in Figure 3a as a function of age; corresponding percentages are shown in Figure 3b. Although the number of drink/driving fatalities is greater among those in their early or mid twenties, the highest percentage of fatalities which involved drinking above the legal limit tended to occur among slightly older age groups. Marked reductions in the number of driver fatalities, and also in the percentage of drivers over the legal limit, have occurred during the 1980s; the reductions were particularly significant between 1982 and 1986, and also among drivers under twenty-five years of age. Among car drivers in their thirties, although major reductions in drink/driving fatality rates occurred between 1982 and 1986, the improvement in the late 1980s was modest. However the most recent data suggest that a newly developed reduction in drink/driving has occurred among this group; it is clearly too early to speculate whether it will be sustained. The annual number of drink/driving fatalities for drivers aged over fifty is relatively small. However, although a general reduction had been observed through the 1980s in the proportion of such drivers over the legal limit, the statistics suggest a modest increase occurred in 1991.

Estimates have also been made of mean fatality rates for drivers over the legal limit per 10⁸km driven; the results are presented in Figure 3c. In interpreting these data however it must be stressed that the distance driven for each age band considered was based on known behaviour of all drivers of that age; unfortunately the more relevant data describing the distances driven by those injured in drink/driving accidents are not available. Within this limitation it is seen that in general the greatest risk per kilometre driven of being killed when over the legal limit occurred among those under twenty years of age. However the incidence of such an event has fallen significantly over the decade, particularly among younger drivers. Indeed data for 1991 suggest that the peak incidence per kilometre driven now occurs for drivers in their early twenties.

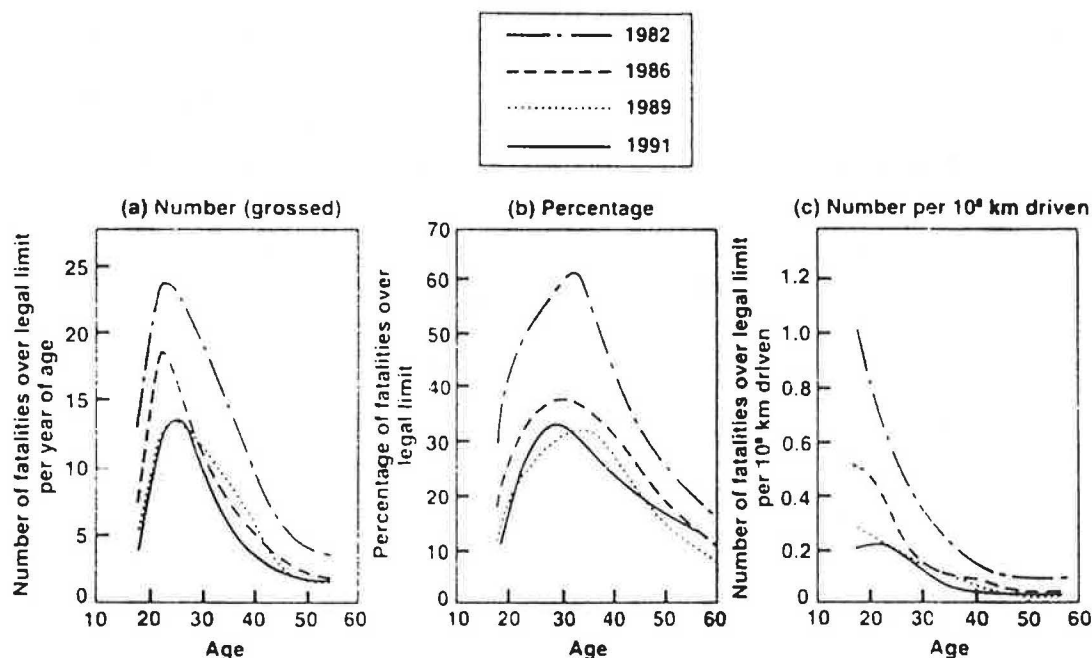


FIGURE 3 Driver fatalities over the legal limit.

Drivers Involved in Injury Accidents

Data from breath tests of car/taxi drivers suspected of drinking show that although the accident involved driver population increased by 21 per cent between 1980 and 1991, and the testing rate has almost trebled, the number of positive screening tests has reduced by 30 per cent over this period; the greatest reductions occurred among drivers under twenty five years of age, and those over fifty. The distribution of positive breath tests in 1990, as a function of age, is illustrated in Figure 4a. The peak incidence occurred for drivers in their low twenties. Also shown are results for drivers breath tested, but who were found to be below the legal limit. It is clear that there is a lower likelihood of a positive test result being registered for drivers in their teens or aged over about forty.

Drivers Breath Tested at the Roadside

Roadside surveys conducted on weekend nights throughout England and Wales, which sampled drivers at random, have defined the underlying patterns of drink/driving (Everest et al., 1991). The work was carried out during the summer of 1990 on Thursday, Friday and Saturday nights (and early the following mornings) between 7 pm and 2 am. More than 13½ thousand drivers were approached, and valid breath samples were obtained from 98.4 per cent of the total. Of these, there was evidence of alcohol being present in 11.7 per cent; 3.2 per cent were over half the legal limit, 1.02 per cent were over the legal limit, and 0.17 per cent over twice the legal limit. Only eleven per cent of those over the legal limit were female. Age distributions of those tested are illustrated in Figure 4b. Although a large number of drivers in their early twenties were breath tested, the peak incidence of drink/driving was observed for drivers in their late twenties; a significant proportion of drivers in their thirties having breath alcohol (BrACs) exceeding 65µg/100ml (equivalent to 150mg/100ml BAC) were also recorded.

The proportion of car drivers over the legal limit was established in detail for the hours of the survey, reaching a peak rate of over four per cent of the drivers involved in the early hours of Saturdays and Sundays, when traffic volumes were very low; no information is available to describe drink/driving levels at other times of day. Although smaller scale surveys were carried out in different areas in 1988 and 1989, no relevant information is available from which to establish reliable trends; there are no plans at present for further roadside surveys in the future. This implies that drink/driving trends will necessarily have to be monitored on the basis of fatality data as already discussed, in conjunction with information which can be derived from police reports of injury accidents. Since police breath testing criteria vary from force to force, and also through time, the use of drink/driving prosecution records

is not entirely reliable for establishing trends; nevertheless the monitoring of drink/driving prosecution records, and also hospital reports, offer additional information on drink/driving behaviour - albeit subject to difficulties of interpretation due to sampling. Space does not allow a detailed statement of the results of such studies. However a brief summary of the age profiles of drink/drivers derived has already been reported (Everest J T and Lynam D A, 1992).

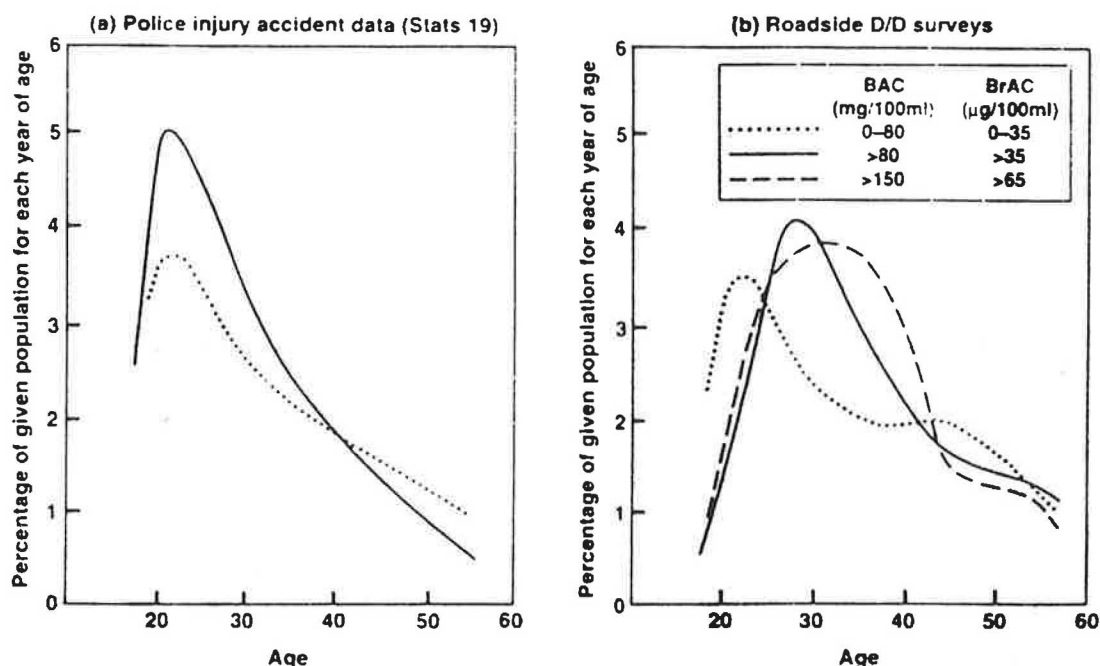


FIGURE 4 Age distribution of drivers.

ALCOHOL LEVELS AMONG PEDESTRIANS

The role of alcohol in pedestrian accidents has been recognised for over thirty years since the pioneering work of Haddon et al. (1961). A major controlled study in Birmingham (Clayton et al., 1977) attempted to quantify the risk of fatal accident-involvement at various BAC levels. Using a similar methodology to that employed in Borkenstein's Grand Rapids study, it was found that, at BACs within the range 120-159mg/100ml, the relative risk of accident involvement was around three times that for a sober pedestrian, and rose to nearly 15 times for BACs at or above 160mg/100ml. Impaired pedestrians ($BAC \geq 120\text{mg}/100\text{ml}$) comprised 27% of the male and 7% of the female pedestrian fatalities. Amongst males, impairment appeared to be over-represented amongst unmarried, divorced or separated persons and semi-skilled or unskilled workers.

Unlike drink/driving casualties, there appears to be an increasing alcohol involvement amongst adult pedestrian casualties (Table 4). In an aggregate analysis of data for the period 1985-1989, Everest (1991,1992) found that nearly 40% of pedestrians killed had been drinking prior to their accident; 30% had BACs above 80mg/100ml and 16% were in excess of 200mg/100ml. The greatest incidences of alcohol-related fatalities occurred between 10pm and midnight on Fridays and Saturdays. The peak age groups tended to be 16-21 and 33-44 years, 80-85% of the drink-related fatalities being males. Although fatality rates among elderly pedestrians are very high overall, the proportion who had been drinking was relatively low. Results from an associated hospital study in Oxford showed that amongst injured pedestrians, 27% had BrACs above 35µg/100ml compared to 6% for drivers. This difference became even more marked at higher BrACs. Other results suggested that the problem was most severe amongst single men, and those in the age range 30-40. These latter results were broadly confirmed by Bradbury (1991) who found that pedestrian injuries comprised 28% of road traffic accident injuries admitted to an Accident and Emergency Department in Edinburgh. The group affected by alcohol were predominantly male and young whereas the group unaffected by alcohol included a considerable number of elderly people.

TABLE 4 Percentage of adult fatalities exceeding stated BAC level, by road user category

Year	Vehicle drivers*		Pedestrians	
	>80 mg/100ml	>150mg/100ml	>80 mg/100ml	>150mg/100ml
1982/83	34	22	28	21
1986	25	18	31	23
1990	18	13	32	25

* Excluding motor cycle riders

Source: Road Accidents Great Britain.

REASONS FOR THE CHANGES

Any attempt to identify precisely the reasons for the decline in drink/driving casualties is fraught with difficulties. In simple terms, a model may be conceived by which legislative and enforcement changes, coupled with increasingly effective publicity, led to changes in knowledge and attitudes and, eventually, behaviour amongst the target group. Overlaying this model are the general changes in drinking habits that have occurred.

Legislation and Enforcement

Over the past decade, the main significant change in legislation has been the introduction of evidential breath testing in 1983 together with a general simplification of enforcement procedures. These changes appeared to stimulate the police enforcement effort substantially. The annual number of police screening tests increased by more than 2½ times between 1982 and 1992.

Although the imprisonment of a drink/driving offender for up to six months has been possible for many years, longer prison sentences for drivers have recently been introduced for causing death by careless driving when under the influence of alcohol. This offence carries a maximum prison sentence of five years, which is shortly to be increased to ten years. However Government has so far firmly rejected proposals for Random Breath Testing (RBT), arguing that the police already have sufficient enforcement powers, and that their resources will be put to better use if targeted on those whose behaviour give reasonable grounds for suspicion of drink/driving.

Publicity

In parallel with the changed enforcement patterns, the Department of Transport has maintained a steady programme of anti-drink/drive publicity, initially mainly over Christmas periods. More recently, campaigns have been extended to include other times of the year, particularly the summer. Pressure groups such as the Campaign Against Drink/Driving (CADD) have also been effective in pressing their points of view. In addition, there has also been a great deal of local publicity generated by various road safety organisations and the police, much of it designed to influence school children and the young. The work of the Portman Group, in promoting sensible drinking on behalf of the brewing industry, has also been most valuable in changing public attitudes.

Public Attitudes

There is increasing evidence of a hardening of reported attitudes towards drinking and driving; this can be illustrated using unpublished data collected for the Department of Transport through the 1980s, primarily to monitor the effectiveness among male drivers of Christmas drink/driving publicity campaigns. However the material presented below, having been collected prior to any given campaign programme, could not have been influenced by that campaign.

A summary of leading trends for the period 1980 to 1992 is given in Figure 5. In 1980, almost half of all males surveyed stated that they drove after drinking; by the early 1990s the proportion was a third. More significantly, while fifteen per cent of the total in 1980 stated that they had driven after drinking more than six units of alcohol in a given

session, the proportion who had recently done so had fallen to nine per cent by 1992. Assessments were also made of changes in the driving habits of these sub populations of drinkers who stated that they drank more than six units of alcohol; in 1980, 35 per cent of these declared that they would drive after six units, but the proportion had fallen to four per cent by 1992. Although there is some volatility in the data, in general the trends have been consistently downward. These changes mirror those found in surveys of reported actual drink-driving behaviour, undertaken in 1987 and 1989 (Goddard, 1991). However, these latter findings could be due, at least in part, to an increased reluctance to admit to driving after drinking. Such a reluctance would, in itself, mark a change in attitudes.

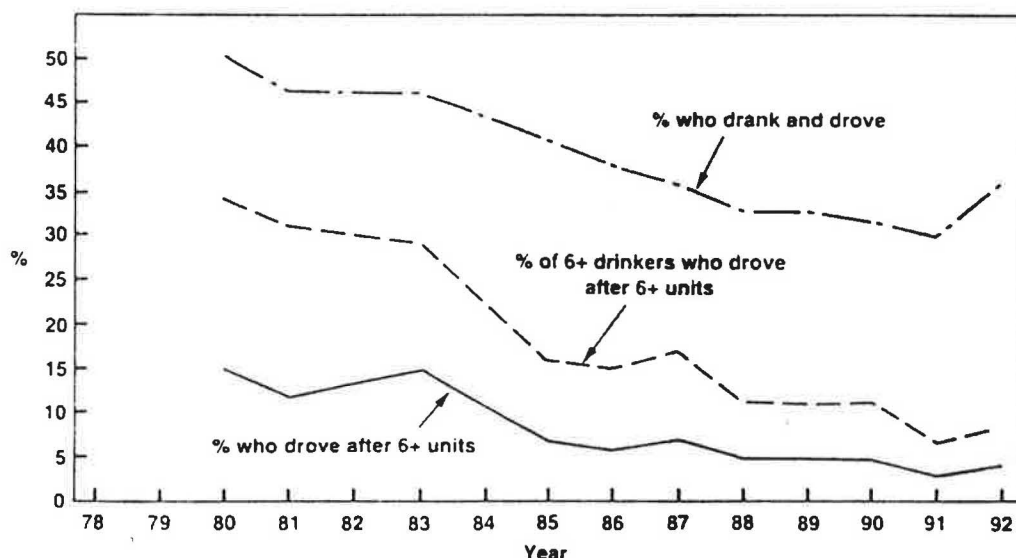


FIGURE 5 Drink/driving trends among males (based on interview statements).

Changes in drivers' attitudes are summarised in Table 5. Since detailed differences were introduced as the questionnaire developed, the intervals considered are variable, ranging between four and fourteen years. Nevertheless those aspects chosen for inclusion in the Table demonstrate that significant changes in attitudes to drink/driving have occurred in recent years. For example, it is clear that there is now an increased recognition that police enforcement has improved, that accident risk increases after drink, and that drink/driving is both unnecessary and anti-social; by 1992, over two thirds of those interviewed declared that people who drink and drive should be sent to prison - in fact such an outcome would be most unlikely except in extreme cases involving fatality or after repeated offences where drivers were already disqualified.

It is believed that the attitudes expressed reflect a change in social pressure felt by potential drink/drivers, which undoubtedly represents a major deterrent. Even among hardened offenders, it is likely to reduce the incidence and scale of the journeys made, and thence reduce accident risk. Methods of increasing the social pressure generated by the members of an offender's family, particularly close relatives such as wives and partners, have been central to government publicity programmes in recent years, and the evidence presented suggests that this contribution to the reduction of drink/driving has been particularly effective. However to work, the publicity has to be credible and has to be supported by a range of other countermeasures - particularly efficient police enforcement.

Changes in Drinking Habits

The past decade has been marked by some major changes in the drinking habits of adults. Estimates of per capita alcohol consumption suggest that it rose quite markedly during the 1970s but less so during the 1980s. However, in the early 1990s, recessionary influences appear to have caused a slight downturn (The Brewers' Society, 1992). A more detailed analysis of individual drinking habits suggested that between 1978 and 1987 consumption fell amongst younger men but increased slightly amongst older men. For all age groups of women, except the youngest, consumption rose. (Goddard, 1991).

TABLE 5 Changes in attitudes to drink/driving in the 1980s among males

Statement tested	Initial year tested	Percentage agreeing	Percentage agreeing in 1992	Number of years between surveys	Change in percentage agreeing
The Police are catching more drinking drivers	1980	60	74	12	+14
If I drive more carefully after drinking, I am not likely to be caught	1980	39	20	12	-19
I think it's bad luck if someone is caught drinking and driving because lots of people do it	1978	54	18	14	-36
It is difficult to avoid some drinking and driving if you are going to have any kind of social life	1979	61	29	13	-32
When you're out drinking it can spoil your evening if you have got to drive	1984	64	50	8	-14
People I know seem to criticise drinking drivers more often these days	1983	58	81	9	+23
Drinking a little over the legal limit does not really make me more likely to have an accident	1979	33	21	13	-12
Most car accidents that happen to people who have been drinking would probably happen anyway	1978	32	13	14	-19
If you feel all right to drive it is probably quite safe, even if you have drunk a bit over the limit	1987	18	13	5	- 5
I think people who drink and drive should be sent to prison	1978	29	68	4	+39

More importantly, perhaps, the past decade has seen a major shift in the place of drinking, away from the public house, to the drinker's own home (Goddard and Ikin, 1988). Although this effect may be due in part to concerns about drinking and driving, economic factors have also played their part. The cost of alcohol in a public house has increased substantially more than the cost of purchasing the same drink in a supermarket or off-licence. Whatever the reasons, alcohol consumption at home has become identified as a leisure pursuit in its own right, often combined with eating or television or a video (Key Note Market Review 1993).

Other Initiatives

A limited programme of voluntary rehabilitation schemes, some of which have been run by the probation service for offenders on probation, have been operating for some years. However following legislation in 1991, Government approved rehabilitation schemes were initiated for an experimental period early in 1993 in selected Court areas, which are likely to run until the end of 1997. Research is currently being carried out to establish changes in re-conviction rates; in addition, improvements in offenders' attitudes towards drink/driving and knowledge of the effects of alcohol are being monitored. However at this early stage these developments can have had little effect on drink/driving behaviour; they will nevertheless enable the anti-drink/driving message to be sustained into the future.

CONCLUSIONS

It is clear that substantial savings in the scale of alcohol related road accidents and trauma in Great Britain have been achieved in recent years. It would seem that the savings resulted from a fundamental change in public opinion regarding the hazards of heavy drinking and of drink/driving. The mechanism for this change is not clear, although in part it may reflect trends towards more healthy living generally. Certainly the media took an active interest in the topic and generated a wide public debate of the issues involved. In fact, it has been suggested that a "virtuous spiral" developed in which the increase in successful drink/driving prosecutions convinced magistrates of the magnitude and seriousness of the alcohol problem, which in turn led to greater press comment and public pressure demanding further increases in enforcement and higher maximum sentences.

The problem of alcohol and the pedestrian continues to cause concern. Legislation would appear to be an inappropriate option. Rather it may be necessary to rely upon the promotion of sensible drinking by means of publicity, education and training, coupled with more effective treatment programmes for alcohol misusers. Care must

be taken to ensure that any countermeasures against the drinking pedestrian do not adversely affect the present reduction in drink/driving casualties.

The approach adopted by Government in supporting the commendable results referred to earlier has been steady and sustained. The balance between enforcement and publicity has been designed to lead public opinion while avoiding excessive conflict with powerful lobbies or pressure groups. In a phrase, the timing has been right. However there is no room for complacency, and sustained efforts to target the hard core of persistent offenders remain imperative. It is also vital that young drivers are encouraged to retain their generally good drink/driving records as they enter middle age, and that the next generation of young drivers are trained and educated to maintain that tradition.

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