The Hard Core Drinking Driver
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1.0 Background

During the 1980s unprecedented attention and resources were directed at the problem of drinking and driving in North America. There is evidence that this concerted effort resulted in a change not only in public attitudes but in drinking-driving behaviour itself, as reflected in the modest but significant decreases that occurred in the incidence of alcohol-related crashes (e.g., Beirness et al. 1991). Continued progress may, however, depend on an improved understanding of the characteristics of the problem as it exists today.

In this regard, it has been suggested (e.g., Moskowitz 1990) that the declines witnessed in the past decade may reflect the "easy gains", since the more responsible, law abiding drivers have been deterred leaving a small group who are less law-abiding and are more willing to take risks (Glad 1987). A similar perspective has been offered by L'Hoste and Papoz (1985), who observed that "there is a 'hard core' of drivers with high alcohol levels who are impervious to legal measures of dissuasion" (p. 842). Similarly, Andenaes (1988) has suggested that this "hard core" may explain the apparently paradoxical finding that extremely low frequencies of drinking and driving in the population at risk do not necessarily result in correspondingly low numbers of alcohol-related crashes. Recently, Ross (1992) came to similar conclusions from a comparison of international data on the incidence of drinking and driving in the population at risk and alcohol detected among collision-involved drivers.

The primary purpose of the work reported here was to document as fully as possible what is known about this hard core -- individuals who drive after consuming large amounts of alcohol.

2.0 Study Method

The major report on which this paper is based (Simpson and Mayhew 1991) included original data analyses, supplemented by findings from other published research in the literature. Owing to space limitations, the present paper reports only on the findings from the original analyses. These analyses made extensive use of data from the Fatal Accident Reporting System (e.g., NHTSA 1989) primarily because this database contains both reliable information on the presence of alcohol found in persons involved in road crashes and a large numbers of cases -- necessary for stable estimates when data for various subgroups are examined. The major study focused on the BACs of drivers fatally
injured in collisions during 1988. The present paper provides an update of this information using 1990 data.

3.0 Results and Discussion

While some gains in reducing the incidence of alcohol in fatally injured drivers have occurred over the past decade (Fell 1990), an examination of recent data reveals that a significant problem still exists. To illustrate, 48% of all drivers fatally injured in road crashes in the United States during 1990 had been drinking. And, among these drinking drivers the overwhelming majority (82%) had BACs in excess of the legal limit (100 mg% in most states).

A more refined examination of the distribution of alcohol among fatally injured drinking drivers is provided in Figure 1. These data were obtained from the 29 states that have a high testing rate for alcohol (80% or more). As can be seen the vast majority of fatally injured drinking drivers have BACs over the legal limit. Indeed, the average BAC among these fatally injured drinking drivers was 170 mg%. Moreover, BACs of 200 mg% or above were not uncommon -- in fact, 40% of all drinking drivers and nearly 80% of those who were legally impaired had BACs in excess of 200 mg%. Indeed, many drivers had BACs in excess of 250 mg%.

![Figure 1. BAC Distribution Among Fatally Injured Drivers in the United States, 1990](image-url)

These data underscore the fact that high BACs are common among fatally injured drivers and suggest that this issue warrants attention.
3.1 Comparisons with Other Countries

The findings are also not unique to the United States, suggesting that the issue of high BACs has international relevance. For example, the distribution of BACs among fatally injured drivers in Canada is remarkably similar to that for the United States. The average BAC among fatally injured drivers in Canada is 170 mg%; identical to that in the U.S.

Comparisons with other countries also reveal that the proportion of fatally injured drivers with BACs in excess of 150 mg% is quite similar. While there is some variability across jurisdictions, the issue of high BACs is certainly not restricted to North America.

3.2 Crash Risk among Drinking Drivers

Numerous risk factor studies have been conducted in several different countries and the results show a remarkable consistency. As BAC increases, the risk of collision increases, the severity of the collision (from property damage to fatal injury) increases, and the rate of increase in these relationships accelerates (Allsop 1966; Borkenstein et al. 1964; Hurst 1973; Perrine, Waller and Harris 1971; Mayhew et al. 1986). Thus, the risk of fatal collision is substantially higher at elevated BACs.

Contemporary U.S. data were examined to determine the risk of collision for drivers at different BAC levels. To accomplish this requires two sets of data: one on the presence of alcohol among drivers on the road (the population at risk) and one on the presence of alcohol among fatally injured drivers.

BACs among the population at risk are usually determined by means of roadside surveys. The most recent national roadside survey was conducted in the U.S. in 1986 (Lund and Wolfe 1991). To determine the relative risk of collision involvement for drinking drivers, it is necessary to compare the BACs among drivers in the population at risk to the BACs among drivers involved in crashes. However, the data representing the population at risk come from a survey of motorists who were driving at night (10 p.m. to 3 a.m.) on weekends (Friday and Saturday) in the spring of 1986. If the BACs among these drivers are to be compared to those among drivers who were killed, then the sample of fatally injured drivers should be matched as closely as possible to the characteristics of the "at-risk" group. Accordingly, the sample of fatally injured drivers extracted from FARS was restricted to drivers of similar vehicle types, involved in crashes between 10 p.m. and 3 a.m., on Friday or Saturday, in the spring of the year. These selection criteria severely limited the number of cases in the fatality sample, so it was necessary to include data from two years -- 1985 and 1986.

It should be noted that the drivers from the roadside survey and the fatally injured drivers were not matched in terms of actual crash locations, as is done in classic case/control studies. This may introduce some bias but it is nominal. Indeed, Warren
and Simpson (1980) demonstrated that the "matching" approach adopted here provided results equivalent to those of case-control methods.

Standard statistical procedures (relative odds ratios) were applied to the data to calculate the relative risk of fatal crash for drivers in the different BAC categories. This procedure involves comparing the incidence of alcohol among crash-involved drivers to that among drivers on the road to determine the likelihood (or risk) of crash involvement at a given BAC, relative to the likelihood of a crash at zero (or very low) BAC. Figure 2 plots the results of the relative risk computations for the U.S. data described above. Consistent with previous research, the findings show that the risk of fatal collision increases with increases in BAC, particularly for levels above .10. Beyond these levels, risk of fatal crash increases rapidly. A driver with a BAC of .15 or greater has a fatal crash risk that is over 200 times that of the average non-drinking driver.

3.3 Characteristics of Fatally Injured Drivers with High BACs

The attributes and characteristics of the high-BAC group, including their demographics, drinking problems, driving-related problems as well as the type of collisions in which they are involved were explored in detail in the major study (Simpson and Mayhew 1991). A few selected findings are considered here.

3.3.1 Drinking Problems.

FARS data indicate that only about 7% of all fatally injured drivers had a DWI conviction during the three years preceding their fatal crash. However, there is a clear relationship between BAC and the likelihood of having a previous DWI conviction -- the
The proportion of drivers with DWI convictions increases as BAC increases. Nearly 20% of fatally injured drivers with BACs of 200 mg% or above had a previous DWI conviction. It is very likely that the number of previous DWI convictions among high BAC drivers would be even greater if complete driver record data were available and not just information on the past three years.

As well very few of the drivers with previous DWI convictions were sober at the time of crash — indeed, 85% of the fatally injured drivers with a previous DWI conviction were positive for alcohol at the time of the crash (this is in marked contrast to the general group of fatalities among whom less than half were positive for alcohol). Among the DWI group who had been drinking, high BACs predominate -- 80% of the drinking drivers who had a previous DWI conviction had BACs that exceeded 150 mg%; 55% had BACs of 200 mg% or above. This means that 47% of all the fatally injured drivers with a previous DWI conviction had a BAC of 200 mg% or above.

These findings suggest that persons who evidence high BACs are likely to have a history of driving after consuming large quantities of alcohol.

### 3.3.2 Driving Problems.

Substantial differences were found in the levels of alcohol detected among fatally injured drivers whose license was valid, suspended or revoked at the time of their crash. Among fatally injured drivers whose license was valid at the time of crash, 46% were found to have been drinking; and among those who were drinking, about 63% had high BACs -- 25% had BACs between 150 mg% and 190 mg% and 38% had BACs of 200 mg% or greater. By contrast, among fatally injured drivers whose license was suspended at the time of the fatal crash, 72% had been drinking; of these, 24% had BACs between 150 and 190 mg% and 47% had BACs of 200 mg% or greater. Most strikingly, among drivers whose license had been revoked, 89% had been drinking at the time of their fatal crash; 23% of these had BACs between 150 mg% and 190 mg% and a significant proportion (55%) had BACs of 200 mg% or greater.

These findings suggest that the likelihood of finding a driver who does not have a valid license increases with increases in BAC. Indeed, a considerable number of high BAC drivers are driving illegally -- over 20% of drivers with BACs of 200 mg% or more had their license either suspended or revoked. Moreover, among drivers with a suspended or revoked license, the vast majority had been drinking and most of these drinking drivers had high BACs. Indeed, among all fatally injured drivers who had a revoked license, about 50% had BACs of 200 mg% and over; and, 54% of drinking drivers with a revoked license had high BACs.
The major purpose of the report by Simpson and Mayhew (1991) was to document the magnitude and characteristics of the problem, so its review of program and policy implications was neither exhaustive nor comprehensive. However, it did offer some guidance by indicating the diversity of tactics available to address the issue of high BAC drivers.

An effective countermeasure strategy aimed at the problem of high BAC drivers will need to embrace a variety of tactics including primary, secondary and tertiary prevention programs. An overall strategy to address this significant problem would: (1) assess the problems evidenced by convicted impaired drivers and use this screening method to match their needs (e.g., drinking problems) with appropriate treatment and remediation (see Wells-Parker et al. 1990); (2) view both punitive and treatment programs as appropriate and complementary countermeasures; (3) tie the level and type of sanction to the BAC of the driver (graded or tiered systems); and (4) use methods that effectively keep repeat suspended and revoked DWI offenders from driving during their period of license suspension (e.g., confiscating the license plate and/or impounding the vehicle), and permit DWI offenders who have alcohol problems to continue to drive after the period of suspension but only when they are sober (e.g., ignition interlock, auto timer).

Many other prevention measures currently available may also have potential but will likely need to be modified, expanded, or adapted in order to have some impact with the high BAC driver.

4.0 Policy and Program Implications

7.0 References


