Alcohol Involvement in Motor Vehicle-related Child Fatalities and Injuries

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Recent research on child motor vehicle fatalities indicates that the decrease in fatalities that could be expected from the increase in safety restraint use has not fully materialized (Chorba & Klein, 1993). One possible explanation is that restraint use has not increased among the children of high risk drivers, resulting in little effect on the children exposed to high risk situations, such as riding with alcohol-impaired drivers.

The potential contribution of alcohol-related motor vehicle injuries to the general problem of injuries for children is substantial. Using rates obtained from 1979-82 North Carolina data, Margolis et al. (1986) projected that in the U.S. approximately 615 children are killed and another 30,000 injured in alcohol-related motor vehicle crashes each year. If this projection was reasonably accurate, more children were killed in this way than by falls, poisoning, suffocation, unintentional firearm injury, aspiration, electrocution, farm machinery, homicide, or several other less common injury causes of death during 1985 (Baker & Waller, 1989).

Public concern over alcohol-related motor vehicle mortality and morbidity reached a high point in the early 1980s, when nearly 60% of motor vehicle fatalities were associated with alcohol use by at least one person involved in the crash (Vegega et al., 1990). Interventions in response to this concern included raising the minimum legal drinking age to 21, implementing illegal per se BAC laws (first at 100 mg/dL and more recently reduced in many states to 80 mg/dL), and enactment of administrative license suspension among others.

Due in part to these efforts, alcohol-related motor vehicle fatalities have declined markedly. In 1982, 57% of motor vehicle fatalities involved alcohol. That had declined to 49% by 1989 and 41% in 1995. If the decline in alcohol-related motor vehicle crashes has been spread
evenly across all segments of the driving population, we would expect to find a decrease in
the proportion of child motor vehicle fatalities in which alcohol use by a driver was involved.
However, increased driving and driving after drinking by women may have contributed to a
sustained involvement of alcohol in child motor vehicle fatalities and injuries. Age-stratified
analysis of North Carolina data indicates that drinking and driving is on the increase for
young females - those in the prime child-bearing age group (Popkin, 1991). Other data
suggest that, whereas excessive drinking by males tends to occur late at night on weekends,
female drinking-driving is spread more evenly across time of day and day of week (FARS,
1992), occurring with greater frequency at those times when children are more likely to be in
the vehicle with them.

The present study was conducted to document the current extent of alcohol involvement in
child fatalities and injuries in motor vehicle crashes in the U.S.

PROCEDURES

This study focuses only on children below the age of 15 involved in motor vehicle crashes, to
exclude individuals who may have been a driver. In the present study two questions are
addressed: (1) What is the present rate of alcohol-involvement in child motor vehicle-related
fatalities and what characterizes these crashes, and (2) how has alcohol involvement in child
injury crashes changed over the past fifteen years? Two sources of data were used: North
Carolina Crash files (1979-1982; 1991-94) and the US Fatal Accident Reporting System
(FARS) data for 1990-93.

Incidence of alcohol involvement in child fatalities.

During the four year period from 1990 through 1993, 19% of child motor vehicle fatalities
involved a drinking driver. This is substantially lower than the alcohol involvement rate for
all motor vehicle fatalities during that period (40%), but is still remarkably high. This
represents a mean of 579 children killed each year in the U.S. in crashes involving a drinking
driver.

Figure 1 presents basic characteristics of these crashes. About _ of fatally injured children
were vehicle occupants, _ were pedestrians and ten percent were bicyclists. Children ages 12-
15 were overrepresented (33%) among those killed as were males (58%).
The victim’s position in a crash is clearly and significantly associated with alcohol involvement. Whereas 26% of crashes in which a child occupant died involved a drinking driver, only 9% of crashes where a child bicyclist or pedestrian was killed involved a drinking driver. Although this finding is partly a reflection of time of day it is also consistent with previous findings that the most likely involvement of alcohol in child motor vehicle fatalities is with the child’s driver rather than drivers of other vehicles.

Fatal child crashes involved a drinking driver more often when the vehicle in which the child road was relatively old. For children riding in relatively new vehicles (model year 1985-93) alcohol was involved in 17% of fatalities, compared with 20% for 1981-84 vehicles and 25% for vehicles manufactured prior to 1981. This finding is likely an indication of both the socioeconomic status of the driver and the crash protection afforded by newer vehicles.

Time of day was strongly related to alcohol involvement, as is shown in Figure 2. Perhaps most surprising is the high rate of alcohol involvement between 6-9 pm (23%).
Interestingly, both child sex and age were related to drinking by a driver in child fatality crashes (see Figure 3). Both younger and older victims were more likely to have been killed when a driver had been drinking. For all but the youngest age group (< 3 years), fatally injured females were more likely than males to have been killed in a crash where a driver had been drinking. Both these findings probably reflect that the fact that alcohol is less commonly involved in child pedestrian and bicyclist fatalities, which are more common among males and those between the ages of 3 and 12.
Alcohol involvement in North Carolina child crashes.

To examine other than fatal crashes we examined recent North Carolina crash data. Measurement of alcohol involvement in non-fatal crashes in these data is based on judgment of the investigating officer. Accordingly, minor involvement of alcohol is likely underrepresented.

Figure 4 shows a comparison of alcohol involvement by crash severity for 1979-82 and 1991-94 data. For crashes in which children were involved but not killed alcohol involvement has declined substantially. However, for child fatality crashes there appears to have been no change in the proportion that involve a drinking driver.

Figure 4

An examination of alcohol involvement by age of child’s vehicle in the NC data compared with FARS data provides some evidence that officer judgement of alcohol involvement is reasonably reliable. A highly similar relationship between vehicle age and alcohol involvement appears in the NC data on all crashes. On the other hand, there is some evidence to suggest that officers’ assessment of alcohol involvement may have improved in more recent years. This is shown in Figure 5, which expands the data shown in Figure 4 to compare alcohol involvement for different crash positions of the child (occupant vs. pedestrian). It is clear that alcohol involvement has declined for fatally injured child occupants, but increased for children killed as pedestrians. The latter is inconsistent with the general and fairly marked decline in alcohol-involvement among drivers in crashes since the early 1980s. Hence it seems more likely that assessment of drivers’ drinking has become better. Both the
knowledge that alcohol may be involved in daytime crashes, when child pedestrians are most likely to be killed, and the technology to assess drivers’ BAC are substantially better now than was the case 15 years ago.

**Figure 5**

**DISCUSSION**

Since 1978 there has been tremendous progress in traffic safety in the US. Numerous initiatives to reduce drinking-driving have been undertaken, hundreds of new and stricter laws have been enacted. There has been a substantial change in the public knowledge about and attitude toward drinking-driving and drinking in general. These have accompanied a dramatic decline in alcohol-involved crashes. During the past 20 years tremendous progress has also been made in the area of occupant protection, including the enactment of child occupant restraint and adult seat belt laws. And belt use is a great deal higher than was the case in the late 1970s.

Despite this progress on these two important fronts, the present findings indicate that there continues to be a large number of children dying in crashes involving a drinking-driver. The number of alcohol-involved child fatalities in the early 1990s is nearly the same as was projected based on data from 1979-82 before major traffic safety gains in occupant restraint and drinking-driving had begun to materialize. The direct comparison of recent North Carolina data with that from the early 1980s illustrates that especially little change has occurred for fatally injured child occupants of motor vehicles, while some encouraging
progress has been made with respect to alcohol-involvement in less serious crashes. These findings point to a problem that clearly needs both more research and more programmatic attention.

REFERENCES


