ABSTRACT
Drivers with prior DHI convictions are overrepresented among drivers involved in fatal crashes and the relative risk of fatal crash involvement is far greater for these repeat offenders. Only about 3 percent of all licensed drivers have a prior DHI arrest within the past three years, yet close to 12 percent of intoxicated drivers in fatal crashes have had at least one prior DHI conviction within three years of their crash. However, while repeat DHI offenders are at a substantially higher risk of fatal crash involvement, the vast majority of intoxicated drivers in fatal crashes are not repeat offenders (7 out of 8) according to available national records. It is recommended that local jurisdictions use the methods described in this paper to determine the magnitude of the repeat offender problem in their area so that appropriate decisions can be made with regard to assessments, treatment, and sanctions in dealing with these drivers.

BACKGROUND
According to the U.S. Department of Justice, law enforcement agencies made an estimated 14.2 million arrests in 1990 for all criminal infractions excluding traffic violations. More people were arrested for driving under the influence (DUI) or driving while intoxicated (DWI) than any other reported criminal infraction. Over 1.8 million drivers were arrested for DUI or DWH compared to 1.6 million people for larceny or theft and 1.1 million people for drug abuse violations [1]. Ignoring repeat offenders, this means that approximately 1 out of every 100 licensed drivers in the U.S. is arrested for DUI/DWI in any given year. But we know that we cannot ignore repeat offenders. There is much evidence that repeat offenders, as a group, are high risk problem drinker drivers [2].

Are these drivers with prior DHI's overrepresented as drivers involved in fatal crashes according to national data? Is the relative risk of fatal crash involvement greater for these repeat offenders? These questions will be addressed in the next sections.

METHOD AND DATA AVAILABLE
The U.S. Department of Justice reported that an estimated 1,810,800 drivers were arrested for DUI/DWI in 1990 [1]. DWI arrests for 1989 were 1,736,200 and for 1988 they were 1,792,500. So, over the three year period from 1988-1990, approximately 5,339,500 drivers were arrested for DWI.
The Federal Highway Administration reported that there were 167,015,250 licensed drivers in the U.S. in 1990 [3]. The National Highway Traffic Safety Administration's Fatal Accident Reporting System (FARS) indicated that 58,796 drivers were involved in fatal crashes in 1990 [4]. A total of 14,558 of these crash involved drivers (24.8 percent) were estimated to have been intoxicated (i.e. their blood alcohol concentration (BAC) was greater than or equal to .10 g/dl) and another 4373 drivers had been drinking alcohol (BAC's were .01 to .09 g/dl). The remaining 39,865 drivers did not have any estimated alcohol involvement (BAC's were .00 g/dl).

The 1990 FARS data also indicated that 1721 (11.8%) of the 14,558 intoxicated drivers in fatal crashes had a prior DWI conviction within the past three years. A total of 244 drivers (5.6%) of the 4373 drinking drivers had prior DWI convictions within the past three years, while 687 (1.7%) of the 39,865 zero BAC drivers were reported as having a prior DWI conviction in the past three years. All of these data are summarized in TABLE 1.

**TABLE 1**

<table>
<thead>
<tr>
<th>1990 Drivers Arrested for Driving Under the Influence (DUI-DWI)</th>
<th>1,810,800</th>
</tr>
</thead>
<tbody>
<tr>
<td>Licensed Drivers</td>
<td>167,015,250</td>
</tr>
<tr>
<td>Drivers Involved In Fatal Crashes</td>
<td>58,796</td>
</tr>
<tr>
<td>Drivers Involved In Fatal Crashes With Prior DWI-DHI Conviction in Past Three Years</td>
<td>2,652</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Drivers Involved In Fatal Crashes:</th>
<th>14,558</th>
</tr>
</thead>
<tbody>
<tr>
<td>With BAC's &gt; .10 With Prior DWI's</td>
<td>1,721</td>
</tr>
<tr>
<td>With BAC's = .01 - .09 With Prior DWI's</td>
<td>4,373</td>
</tr>
<tr>
<td>With BAC's = .00 With Prior DWI's</td>
<td>39,865</td>
</tr>
<tr>
<td></td>
<td>687</td>
</tr>
</tbody>
</table>
In order to address the question of overrepresentation of drivers with prior DWI's in fatal crashes, several proportions will be compared.

First, a comparison will be made of the percent of all licensed drivers with a prior DWI in the past three years with the percent of all drivers involved in fatal crashes (drinking and non-drinking) with prior DWI's. If drivers involved in fatal crashes are no different from all licensed drivers, one would expect the same percentage of prior DWI's for these two groups. If drivers involved in fatal crashes, and especially drunk drivers, have a larger percent of drivers with prior DWI's in the past three years, there is an overrepresentation.

Second, given certain assumptions and limitations of the data, we can calculate the risk of a driver with a prior DWI being involved in a fatal crash relative to the risk of a driver with no prior DWI's being involved in a fatal crash. This is called the "relative risk" of fatal crash involvement. This is calculated as follows:

\[
\begin{align*}
\text{Relative Risk} & = \frac{P(\text{Involvement: Prior DWI})}{P(\text{Involvement: No Prior DWI})} \\
& = \frac{\frac{\# \text{ Drivers in Fatal Crashes with Prior DWI in past 3 years}}{\# \text{ Drivers Arrested for DWI in past 3 years}}}{\frac{\# \text{ Drivers in Fatal Crashes with No Prior DWI in past 3 years}}{\# \text{ Licensed Drivers with No Prior DWI in past 3 years}}} 
\end{align*}
\]

These calculations were made using 1990 data.

RESULTS

- The proportion of all licensed drivers in 1990 (167,015,250) who had a prior DWI arrest within the past three years (5,339,500) was 3.2%.

- In 1990, the proportion of all drivers involved in fatal crashes (58,796) who had a prior DWI conviction within the past three years (2652) was 4.5%.

- The proportion of all drivers involved in fatal crashes in 1990 with a BAC = .01-.09% (4373) who had a prior DWI conviction in the past three years (244) was 5.6%.

- The proportion of all drivers involved in fatal crashes in 1990 who were intoxicated (BAC = .10+) (14,558) and had a prior DWI conviction in the past three years (1721) was 11.8%.
The proportion of all drivers involved in fatal crashes in 1990 whose BAC was zero (39,865) who had a prior DWI conviction in the past three years (687) was 1.7%.

The relative risk of being involved in a fatal crash for drivers with prior DWI convictions within the past three years was the following:

Relative Risk of Fatal Crash Involvement with Prior DWI in 1990\[\frac{P(\text{Involvement: Prior DWI})}{P(\text{Involvement: No Prior DWI})} = \frac{5,339,500}{161,675,750} = 0.00347\]

Relative Risk of Intoxicated Driver Fatal Crash Involvement with Prior DWI in 1990\[\frac{P(\text{Intox.Inv. with Prior DWI})}{P(\text{Intox.Inv. No Prior DWI})} = \frac{12,837}{161,675,750} = 0.000079\]

CONCLUSIONS

At a minimum, drivers with prior DWI convictions are overrepresented as drivers in fatal crashes. While 3.2% of all licensed drivers had a prior DWI arrest within the past three years in 1990, 4.5% of drivers in fatal crashes had a prior DWI conviction within the past three years. So drivers with prior DWI's are overrepresented by a factor of 1.4 (i.e. 4.5%/3.2%).

Drivers with prior DWI's are also overrepresented as drinking drivers in fatal crashes with low BAC's (.01-.09) by a factor of 1.8 (5.6%/3.2%). Drivers with prior DWI's are overrepresented as Intoxicated drivers in fatal crashes by a factor of 3.7 (11.8%/3.2%).

Drivers with prior DWI'S are underrepresented as drivers in fatal crashes with zero BAC'S by a factor of 0.5 (1.7%/3.2%).

Drivers with prior DWI convictions within the past three years have 1.4 times the risk of being involved in a fatal crash as drivers without prior DWI's.

Intoxicated drivers with prior DWI convictions have 4.1 times the risk of being in a fatal crash as Intoxicated drivers without prior DWI's.
DISCUSSION

The limitations in the data should be noted. For the population-at-risk data, we only have information on prior DWI arrests within the past three years. For fatal crash involved drivers, we only have prior DWI convictions within the past three years from the State where the driver was licensed. This excludes most of the drivers who had prior DWIs in other States. This renders the overrepresentation and relative risk calculations as conservative since all DWI arrests do not result in DWI convictions. Some jurisdictions in the U.S. report that only about 20-30% of DWI arrests result in conviction. Other jurisdictions report an 80-90% conviction rate. Consequently, these overrepresentations and relative risks should be qualified by the statement: "At a minimum...."

For example, if the nationwide conviction rate for DWI arrests was 50%, then the relative risk of being involved in a fatal crash for drivers with a prior DWI conviction in the past three years would be:

\[
\begin{align*}
\text{P Involvement} & = \frac{2652}{56.144} \\
\text{Prior DWI Conviction} & = \frac{5,339,500(x.50)}{161,675,750 - 5,339,500(.5)} \\
\text{No Prior DWI Conviction} & = \frac{2652}{56,144} \\
\text{Involvement} & = \frac{56,144}{159,006,000}
\end{align*}
\]

This is twice the relative risk when using DWI arrest data only. The fact that only 1.7% of the zero BAC drivers in fatal crashes had a prior DWI conviction probably reflects the nationwide conviction rate in the U.S. (i.e. 1.7% convicted/3.2% arrested = .5 to .6)

Finally, while it is true that drivers with prior DWI's most certainly are overrepresented as drinking drivers in fatal crashes and have a much greater risk of fatal crash involvement than drivers without prior DWI's, it is also clear that the vast majority of intoxicated drivers involved in fatal crashes do not have prior DWI convictions, at least within the past three years. The data indicate that about 7 out of 8 intoxicated drivers in fatal crashes have no reported DWI convictions within the past three years. The proportion of intoxicated drivers involved in fatal crashes with prior DWI's would certainly increase if one looked at records for the past 5 or 10 years, if all out of State records were checked for each driver, and if one looked at DWI arrests rather than the convictions. Unfortunately, those data are not available on a national basis. Studies conducted by individual States indicate that about 20% to 30% of drivers arrested each year for DWI are repeat offenders.
RECOMMENDATIONS

It is recommended that local highway safety officials determine these proportions and relative risks associated with their own jurisdictions at issue. Better decisions can then be made regarding the magnitude of the repeat offender problem in that area and appropriate assessment, treatment and sanctions can then be instituted.

NHTSA believes that effective actions should be taken against repeat offenders' vehicle registrations, license plates, and the vehicles themselves. A series of increasingly severe sanctions should be levied against convicted drunk drivers who either drive while their license is suspended or are caught again for DWI. For example, the vehicle registration could be revoked for driving under suspension; license plates could be confiscated for a second offense of DWI; the vehicle itself could be forfeited for a third offense of DWI, or for a DWI committed while driving under suspension. NHTSA also recommends jail or community service for repeat offenders.

REFERENCES


