Drug and Alcohol Use Among Car Drivers in Norway. Data Collection Problems and Some Preliminary Results

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Background
Although many drugs are considered to increase accident risk for motor vehicle drivers, more knowledge is needed as to the relative risk of the many drugs available legally or illegally. A meta-analysis (1) of research reports on this issue shows that the relative risk of impairment by drugs and medicines is 1.58. For drugs assumed to be abused the relative risk is 1.96, for medicines assumed to be used as prescribed 1.58, as compared to 2.0 for alcoholism or abuse of alcohol.

As part of work package 4.2 of the IMMORTAL programme, financed by the EU Fifth Framework programme, the TOI has been in charge of collecting samples from killed and injured drivers as well as from the general driver population in Norway to assess the relative risk of driving under the influence of one or more of 6 drugs specified below.

Objectives
The objective of the projects is to assess the relative risk for drivers impaired by drugs or medicines, alone or in combination with alcohol.

Methodology
The principal methodology is a case/control study, i.e. to compare data from killed and injured drivers on the hand and from the general driver population on the other hand from the same places and same times to make sure no other factors confound the computation of relative risk. The classical case/control study in this field is the Grand Rapids study (2), which describes “the role of the drinking driver in traffic accidents”. The Grand Rapids study describes alcohol only. In our project the focus is on drugs, but alcohol is also included, as drivers impaired by drugs will often combine drugs and alcohol. This project includes the following drugs:

- Amphetamine
- Benzodiazepines
- Cannabis
- Cocaine
- Ecstasy
- Opiates

alone or in combination with alcohol.

Data Collection Problems
For practical reason blood samples were taken from injured and killed drivers and oral fluid samples of the general driver population, even though the question of comparability of blood and oral fluid samples can be discussed. Oral fluid or “oral mucosal transudate….” is a serous rich fluid. It is NOT saliva and, unlike saliva, it contains substances that “mirror what is found in blood serum” according to the supplier of the sample equipment (3).

Only severely injured and killed drivers are included in the data, as the emergency rooms admitting the slight injured drivers would not cooperate.
Also for practical reasons it was impossible to collect samples from the general driver population from the exact same times and places as the accidents of the killed and injured drivers. However, samples of the general driver population were taken more or less in the same time period May 2003 – June 2004 and in the same areas, the counties of Hordaland, Oslo, Akershus and Østfold in Norway, as where the accidents occurred. Samples were taken from drivers on the roads where most accidents happen in these counties.

Comparing blood and oral fluid samples and of collecting samples from killed and injured drivers and from the general driver population from the exact same times and places have proved to be difficult. These problems will be discussed more thoroughly in the final report.

The number of killed drivers to be included in the study was not available at the time of writing. Neither were the analysis results from killed drivers available.

By the time of writing samples had been collected from 22 injured drivers, 11 from each cooperating hospital, but these samples were not yet analysed. One of the two cooperating hospitals has provided the information presented in table 1.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Injured drivers admitted to hospital Aug-Dec 2003</th>
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<tbody>
<tr>
<td>Injured drivers admitted to hospital</td>
<td>39</td>
</tr>
<tr>
<td>Passenger rather than driver</td>
<td>1</td>
</tr>
<tr>
<td>Patient left hospital before agreement was obtained</td>
<td>11</td>
</tr>
<tr>
<td>Impossible to obtain agreement for use of sample (unconscious when transferred to other hospital, dead, suicidal)</td>
<td>6</td>
</tr>
<tr>
<td>Proper sample not taken</td>
<td>5</td>
</tr>
<tr>
<td>Other reasons for no sample</td>
<td>5</td>
</tr>
<tr>
<td><strong>Samples for analysis</strong></td>
<td><strong>11</strong></td>
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</tbody>
</table>

Table 1 shows that the hospital has been able to obtain blood samples from 11 out of 38 admitted drivers, or 29 per cent. The main reason for this low percentage is that the medical-ethical committee of Norway demanded positive written consent from the injured drivers as to their blood samples being used for this study, even if the hospitals collect blood samples for therapeutic reasons anyway. The 11 drivers left the hospital before the written consent was obtained and six others left the hospital unconscious or died before the consent was obtained. For the remaining 10 drivers blood samples were not properly taken. Table 1 shows that it was the practical problem of obtaining the consent rather the actual refusal from the injured drivers that was the problem.

The other cooperating hospital found the collection of samples from injured drivers so difficult, that by March 2004 it is still unclear whether this hospital will continue the collection of samples.

In Norway only the police and the officers of the National Public Roads administration are allowed to stop cars driving along the public roads. The National Police Directorate expressed their willingness to cooperate with the TOI for this project. Nevertheless, it took a lot of time and efforts to have the police actually collect the samples. One example of the problems met with, may be mentioned. During the negotiations with the Police Directorate, the officers expressed the preference of the directorate that Oslo police should not be involved, as they are so many and have many and various duties. However, as most road accidents happen in densely populated areas, it was necessary to include
the emergency department of one of the bigger Oslo hospitals to obtain a sufficient number of injured drivers. Consequently, it was necessary to have samples from the general driver population in Oslo as well. However, finding a solution for this problem took quite some time. The collection of samples from Oslo drivers started in February 2004.

Oral fluid samples were obtained from 196 road-side drivers during the period of May – November 2003. Data collection from the general driver population started again in February 2004 and will continue until the end of June 2004. Nevertheless the planned number of samples from 2200 road-side drivers will not be achieved.

Results and Analysis
The samples from road-side drivers are analysed shortly after the collection, and the results of the first 196 samples are shown in table 2.

Table 2. Road-side drivers by test results for 6 drugs and alcohol and by area. Norway May – November 2003

<table>
<thead>
<tr>
<th>N</th>
<th>Negative for all drugs tested</th>
<th>Positive screening</th>
<th>Positive confirmation analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>196</td>
<td>191</td>
<td>5</td>
<td>3</td>
</tr>
</tbody>
</table>

The three samples positive by confirmation analysis are one positive for benzodiazepines, one for cannabis and one for opiates.

Providing an oral fluid sample for drug analysis is voluntary, but so far the police reported only one refusal, allegedly due to the driver “being in extreme hurry”. The police also tested alcohol by breathalyser. This test is mandatory when carried out by the police as part of an alcohol check. No driver was positive for alcohol.

More complete data will be presented in August 2004.

Discussion
By March 2004 the data collection was not completed and analyses were not ready for presentation, but some conclusions may be drawn as to the problems of collecting data for this kind of case/control study.

Samples from injured and killed drivers in Norway can only be obtained through hospitals and forensic institutes. The analysis results of samples of injured drivers can only be used for this kind of research with the written consent of each driver. As the above results describe, obtaining this consent is a major obstacle for practical reasons rather than for refusal from the injured drivers.

The slow collection of samples from the general driver population may have been improved if more time had been spent planning the data collection in detail with the police or if the police had only stopped the cars and a research team had taken the samples. However, both these alternatives would have been much more costly.

Conclusion
Even if the hospitals and the police expressed their interest in the project and their willingness to cooperate, the conclusion may be drawn that this kind of data collection is the primary task of neither. Consequently, both institutions need detailed planning and close follow-up to succeed in data collection.
This study has shown that practical data collection problems must be considered thoroughly and solved in a better way if valid case and control data are to be collected in a proper way. The only solution seems to be more detailed planning and more detailed advance agreement with the police and the hospitals.

Whether enough data will be collected to establish the relative risk of any of the drugs considered in this study, is too early to say. Hopefully, some preliminary results may be presented in August 2004. However, what is already quite obvious is that the original goals as to the amount of data, i.e. 2200 samples from the general driver population and 750 samples from killed or injured drivers from the same times and places, will not be achieved due to practical data collection problems.

Possible Next Steps
The collection of samples from killed drivers will continue from March through June 2004 from the two forensic institutes, samples from injured drivers from one or two hospitals as well as from drivers on the road. At the time of writing it is impossible to say what amount of data will finally be available for statistical analysis.

It is possible that the data will be too limited for a proper case/control study, in which case the project must be considered a pilot study, showing the problems which have to be solved if a proper case/control study is to be carried out. However, if the prevalence of drugs is much higher among killed and injured drivers than in the driver population, there may be some evidence of relative risk for some of the drugs studied.

References