

**Summary:**

# **The prevalence and relative risk of drink and drug driving in Norway**

In recent years, the number of drivers who drive while under the influence of drugs has been increasing. Previous studies of the presence of drugs in the samples obtained from road traffic accident fatalities have shown that a significant proportion of fatally injured drivers have drugs in their body. This present study of the prevalence of drugs in the driving population forms part of a larger, Europe-wide investigation of the impact of drugs, medications and medical conditions have on road safety. This research programme, known as the IMMORTAL project (Impaired Motorists, Methods of Roadside Testing and Assessment for Licensing) investigates the accident risk associated with different types of driver impairment and examines the implication for licensing assessment and roadside impairment testing (including drug screening).

The Norwegian study presented in this report, is also published as part of a three-country study called "*The prevalence of drug driving and relative risk estimations. A study conducted in the Netherlands, Norway and United Kingdom*". The intention of the three-country study was to examine whether drivers using one or more of eight defined drug groups have a higher accident risk than drivers not using these drugs; and as far as possible to quantify this risk.

## **The Norwegian study**

The seven drug groups included in the Norwegian part of the study were alcohol, amphetamine, benzodiazepines, cannabis, cocaine, ecstasy, and opiates. The methodology used in Norway included a case-control study, where the prevalence of the selected substances among injured and killed drivers (hospital and forensic institute samples) was compared with the prevalence in the general driving population (a random roadside sample), and risk ratios were calculated.

The study met with severe practical problems in collecting data from the general driving population and especially from injured drivers. The Medical Ethical Committee demanded a written positive approval for the use of blood samples from injured drivers. Although no injured driver refused to participate, obtaining the written approval turned out to be so demanding for the hospital staff, that one co-operating hospital refused to continue after the pilot study, and the other hospital obtained approvals from only 19 admitted drivers of a total of 77 who met the criteria of the project. For this reason, data on fatally injured drivers selected for autopsy by the police were included to compensate for the small number of injured drivers included.

Data on substance use by seriously injured drivers (in-patients) were collected in the Ullevål University Hospital in Oslo and the University Hospital in Bergen. Data on substance use by fatally injured drivers were obtained from the forensic medicine institutes in the two cities.

Data on substance use by the general driving population were collected in the above hospitals' catchment areas by means of oral fluid specimens by officers of the national mobile police and the Hordaland police district. The results are weighted by traffic flow.

Of 410 tested general drivers 1 was positive for benzodiazepines, 2 for cannabis and 1 for opiates. In total four general drivers tested positive for drugs above the analytical cut-off limit set by Altrix healthcare. However, providing an oral fluid specimen to the police was voluntary, and there may be reason to believe that drivers having recently used illegal substances or high doses of medical drugs may have refused to provide a specimen. Of 438 drivers stopped by the police for the survey, oral fluid specimens are missing for 28. All stopped drivers had to take a breath test for alcohol, but no driver stopped was positive for alcohol above the legal limit in Norway, BAC 0.2 g/l.

Of the total of 87 killed or injured drivers in the cases sample, 59 were negative for all seven drugs tested. 13 drivers were positive for alcohol, 8 positive for amphetamine, 10 for benzodiazepines, 2 for cannabis, 1 for ecstasy and 7 for opiates. No case driver was positive for cocaine. 18 drivers were positive for one drug. Seven drivers were positive for two drugs and three were positive for three drugs.

Relative risk is calculated by two methods, using percentages and odds ratios. As the total number of cases and controls is small and the cases are a selected sample, it is difficult to compute case/control and odds ratios for all seven drugs. The relative risk of drivers, who have used one or more substances of the seven included in the study, is 32.1 and the odds ratio for the same drivers is 33.7. Even though samples are small, there is no doubt that the risk of a severe accident increases considerably for drivers using one or more of these substances, with the exception of drivers who have taken cannabis only. Their risk is not significantly different from drivers who have taken no drug. However, the relative risk or odds ratio of drivers who have taken amphetamine, ecstasy, cocaine or alcohol alone, cannot be computed, because there is no driver positive of these substances alone among the control drivers. Table S1 below shows the main results from the Norwegian study.

Table S1. Injured or killed drivers and general drivers by impairment of alcohol and psychoactive substances. Odds ratio (relative risk). Norway

Psychoactive substances*	Injured/ killed drivers	General drivers (weighted)	Odds ratio (Relative risk)
Negative (for seven substances)	84.5**	406.5**	1
Positive for one or more substances	28	4	33.7
One substance (any of seven)	18	4	21.6
Two or three substances	10.5**	0.5**	101.0
Alcohol > 0.2 g/l + substance(s)	4.5**	0.5**	43.3
No alcohol, one or two other substances	15	4	18.0
Number of drivers (unweighted)	112***	410	

\* Alcohol, amphetamine, benzodiazepines (tranquilizers), cannabis, cocaine, ecstasy and opiates.

\*\*0.5 is added to the cases and the controls to make calculations possible for drugs which have no positive controls.

\*\*\* 25 negative case drivers added to correct a possible bias in the sample of killed drivers.

Source: TØI report 805/2005

The data sets were too small to calculate the injury risk of use of single psychoactive substances. Drivers who were positive for one or more of the drugs in question had a risk of injury or death about 30 times higher than drivers without these drugs, whereas drivers positive for only one of the seven drugs had a risk some 21 times higher than those negative for all seven drugs.

The European study will be followed up by a much larger European study called DRUID, about accident risk caused by drugs.

## Conclusion

There is no doubt that the use of one or more of the seven drugs studied increases the risk of a road accident. The samples obtained were unfortunately too small to produce relative risks for each of the seven drugs, not to speak about levels of concentration of each drug. More data is needed to produce such results. However, collecting samples from injured drivers is most difficult and time-consuming due to medical-ethical requirements.