

# Mortality among drugged drivers in Norway

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## ABSTRACT

The Norwegian Road Traffic Act prohibits driving under the influence of alcohol and other drugs. It has been found that a large proportion of the arrested drugged drivers are repeat offenders and probably drug abusers. The purpose of this investigation was to find the average mortality among drugged drivers over a period of 42 months subsequent to apprehension.

The National Institute of Forensic Toxicology in Oslo receives blood samples from all suspected drugged drivers in Norway. Drivers between 20 and 39 years old providing samples positive for drugs other than alcohol in 1992 (n= 930) were selected for this study. The mortality for the whole group was studied. 64 persons of the selected drugged drivers died during the follow-up period, 6 female and 58 male. The relative risk of death for the female drugged drives was 31 times higher than for the population in general, while it was about 21 times higher for male drugged drivers. The most prevalent causes of death were fatal poisoning/overdoses, accidents and suicides. The results support the assumption that a large proportion of apprehended drugged drivers are drug abusers, and rise the question for alternative strategies for treatment of this driver groups.

## INTRODUCTION

During recent years the problem of driving under influence of non-alcohol drugs has received considerable attention (Mørland 2000).

Norway has probably the highest detection rate of drugged drivers reported compared to other countries around the world (Christophersen et al. 1997). During the last 30 years, all blood samples from Norwegian drivers suspected of being influenced have been analysed at one institute, the National Institute of Forensic Toxicology (NIFT). The blood samples have been analysed by an analytical program, encompassing most drugs of abuse as well as some medicinal drugs, which can lead to misuse (Christophersen et al. 1997). The level of attention by the police towards the phenomenon of drugged driving has been high in Norway. During the last 10 years an increasing number of cases of impaired driving due to other drugs than alcohol has been registered. The most frequently detected drugs in blood samples from suspected drugged drivers have been benzodiazepines, tetrahydrocannabinol, amphetamine and opiates (Skurtveit et al. 1999a). Multi-drug detection has increased (Christophersen et al. 1997). In Norway, the number of samples tested positive for amphetamine and metabolites of heroin among drugged drivers have increased during the recent years (Skurtveit et al. 1999a).

A typical Norwegian drugged and drunken driver in Norway is a man (about 85 % who are 20–35 years old. It has been documented that a large proportion of arrested drugged and drunken drivers are rearrested later for the same offence (Skurtveit et al. 1999b). A majority of these drivers appear also to have alcohol and drug dependency problems. Use of illegal and prescribed psychoactive drugs in combination and findings of prescribed psychoactive drugs in blood samples at concentration above therapeutic levels are common (Skurtveit et al. 1995b). A previous study has indicated that drugged drivers have changed the abuse pattern from alcohol and “soft drugs” like tetrahydrocannabinol towards “harder drugs” like amphetamine (Skurtveit et al. 1999a).

Drunken drivers have been investigated in many countries (Pikkarainen et al. 1995) (Yu et al. 1995) and studies have shown that drunken drivers are characterised by high alcohol consume (Portman et al. 1997), alcohol related problems (Gjerde et al. 1986) and high frequency of later re-arrests later for the same offence. Studies have also shown high frequency of others types of criminality among drunken drivers (Mørland et al. 1999). Our knowledge, however, about drugged drivers is less comprehensive than for drunken drivers.

The aim of this study was to compare the mortality among drugged drivers with the mortality in the normal population. In this study we investigated the subsequent mortality rate among drugged drivers apprehended in the age group 20-39 years and followed them for the period of 42 months after apprehension.

#### MATERIALS.

Study cases were recruited from the year 1992 and consisted of drugged drivers. NIFT received totally 2 718 blood samples from suspected drugged drivers in 1992. All drivers with correct person identification, with age between 20-39 year and with blood samples positive for drugs other than alcohol were selected (n=930). Drivers who known to have emigrated from Norway to other countries between 1992 to 1995 were further excluded from the study (n=7). The selected material (n=923) consisted of 800 males and 123 females drugged driver. The female and male drivers were further divided in two groups: 1) drivers with multiple apprehensions for driving under influence during 1984-1995 and 2) drugged drivers apprehended only once. Drivers with multiple arrests were again further divided in three groups: a) drivers who had used prescribed drugs only at all occasions; b) drivers who had used illegal drugs and c) drivers who had used heroin. An illegal or heroin user was identified as a driver where illegal drugs or 6-monoacetylmorphine (metabolite of heroin) were detected in blood or urine samples at least once during all multiple occasions.

#### METHODS

The mortality in the groups of drugged drivers was studied by following groups from 1992 to 1995. Information regarding deaths was gained by linking of person identification between NIFT and Statistics Norway. Datainspectory approved linking.

NIFT receives information on all drugged drivers in Norway while Statistic Norway has information on all death in Norway. The causes of deaths were also been recorded. Mortality was expressed among categorised drugged female and male drivers by calculating the number of deaths per 1000 personyears. The number of person years was assessed as the number of years from 1992 to the end of the study 1995 (3.5 years) or half of the study period for persons who died during the observation period (1.75 years). Mortality for the normal population of age between 20-39 was calculated after the same principle.

Excess mortality, in terms of relative risk, was calculated as the mortality among the categorised drunken or drugged drivers, divided by the mortality for the normal population.

The expected number of deaths was estimated from death risks in the official statistics for the population of Norway for the end of follow-up (1995). The frequencies of causes of death were calculated for the normal population for 1995. The zero-hypothesis that RR=1 was tested by estimating 95 % confidence interval (Altman 1991).

## RESULTS

The average death rate for drugged female and male drivers and for the normal population is presented in table 1. The average death rate among 20-39 years old men in Norway, in 1995 was 1.02 per 1000 person years. Average death rate for women in the same age group was lower 0.46 per 1000 person years.

Our results showed that 64 drugged drivers died during the follow-up period, 58 males and 6 females (Table 1). The mortality was higher for drivers apprehended for driving under influence two or more times than drivers arrested only once. Totally, females displayed a lower mortality than males, 14 deaths per 1000 person years compared to 21 death per 1000 person years for males. The relative risks, however, for a typical female drugged driver was 31 times higher than for the female population in general. The corresponding number for the male group was about 21 times higher than normal male population.

The mortality was highest for heroin users, 59 deaths per 1000 person years for male drivers and 42 deaths per 1000 person year for females. The corresponding relative risks were 58 (male) and 92 (female).

**Table 1.** Mortality rate among male and female drugged drivers in age 20-39 years old compared to the normal population with the same age distribution.

|                                    | Number of drugged drivers | Number of deaths among drugged drivers | Deaths/1000 person year - drugged drivers | Deaths/1000 person year - normal population | Relative risk (CI 95%) |
|------------------------------------|---------------------------|--|---|---|------------------------|
| <b>Males</b>                       | 800                       | 58                                     | 21  | 1.02  | 21 (16-27)             |
| Drivers arrested two or more times | 673                       | 51                                     | 23  |   | 22 (17-29)             |
| 1. use of prescribed drugs         | 58                        | 4                                      | 20  |   | 20 (8-52)              |
| 2. use of illegal drugs            | 466                       | 19                                     | 12  |   | 12 (7-18)              |
| 3. use of heroin                   | 149                       | 28                                     | 59  |   | 58 (42-81)             |
| Drivers arrested only once         | 127                       | 7                                      | 16  |   | 16 (8-33)              |
| <b>Females</b>                     | 123                       | 6                                      | 14  | 0.46  | 31 (14-68)             |
| Drivers arrested two or more times | 75                        | 4                                      | 16  |   | 34 (13-88)             |
| 1. use of prescribed drugs only    | 9                         | 0                                      |   |   |                        |
| 2. use of illegal drugs            | 37                        | 0                                      |   |   |                        |
| 3. use of heroin                   | 29                        | 4                                      | 42  |   | 92 (37-229)            |
| Drivers arrested only once         | 48                        | 2                                      | 12  |   | 26 (7-103)             |

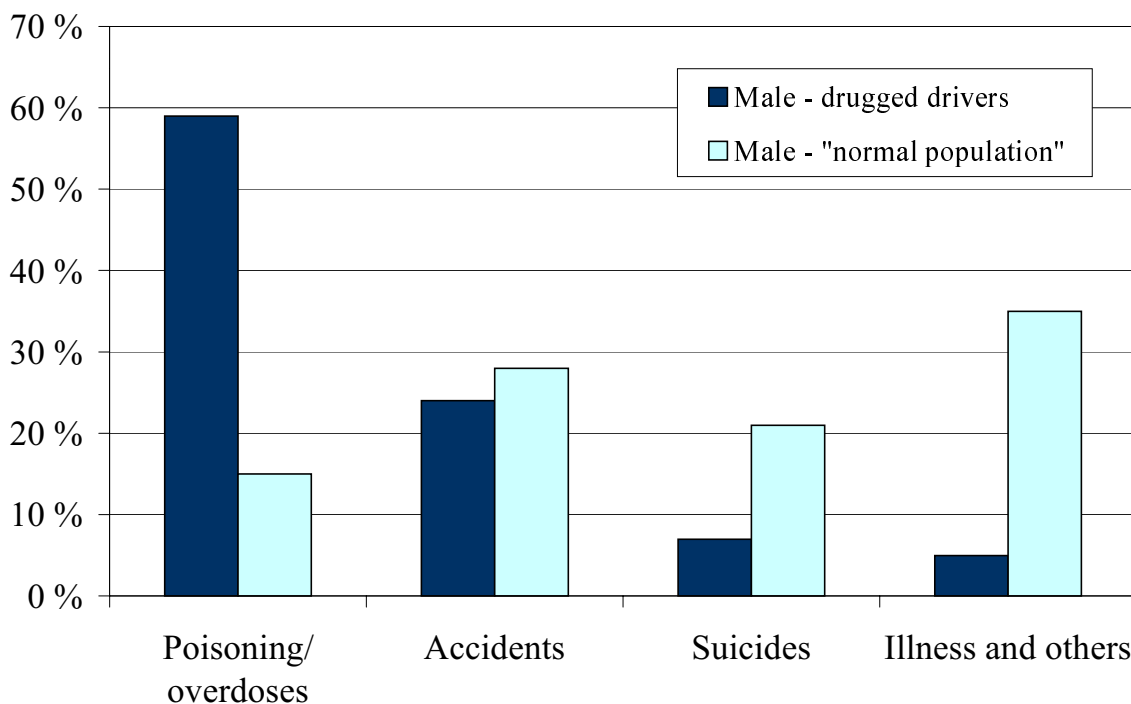
Table 2 shows the causes of deaths among drugged drivers. The most prevalent causes of deaths were fatal poisoning/overdoses (n=37, 58%) and accidents (n=16, 25%). In the groups of heroin users and users of illegal drugs, poisoning/overdoses were also the most prevalent causes of deaths, 26 and 9 cases respectively. In the group of drivers arrested for drugged driving only once the prevalent cause of death was accidents, 5 causes. Totally, accidents were the cause of death for 16 persons, seven of them died in traffic accidents.

**Table 2.** Cause of death among drugged drivers in 1992 who died during the observation

period (1992-1995) in Norway.

|  | Poisoning<br>/overdoses | Accidents       | Suicides      | Others        | Unknown       |
|--|-------------------------|-----------------|---------------|---------------|---------------|
| Drugged drivers arrested two or more times | 36                      | 11              | 3             | 2             | 3             |
| 1. use of prescribed drugs only            | 1                       | 3               | 0             | 0             |               |
| 2. use of illegal drugs                    | 9                       | 6               | 1             | 1             | 2             |
| 3. use of heroin                           | 26                      | 2               | 2             | 1             | 1             |
| Drugged drivers arrested only once         | 1                       | 5               | 2             | 1             |               |
| Drunken drivers                            | 2                       | 4               | 0             | 1             | 1             |
| <b>Total</b>                               | <b>37 (58%)</b>         | <b>16 (25%)</b> | <b>5 (8%)</b> | <b>3 (5%)</b> | <b>3 (5%)</b> |

The same causes of deaths pattern were observed for both female and male drugged drivers. Figure 1 shows the relative distribution of the causes of deaths for the male drugged drivers compared to the general male population of similar age. Thus the cause of death for 59 % (n= 34) of the male drugged drivers was overdose/poisoning compared to 15 % in the normal male population. Among the normal Norwegian male population between 20-39 years old, the most important causes of death in 1995 were diseases and accidents.



**Figure 1.** Cause of death among drugged drivers compared to the normal population (age 20 to 39 years).

## DISCUSSION

The main purpose of the present study was to analyse mortality and cases of deaths in groups of drugged drivers in Norway. The Norwegian road traffic act prohibits driving under the influence of alcohol and/or other psychoactive drugs. A strict policy against driving under influence of drugs other than alcohol, has been practised in Norway for many years (Christophersen et al. 1997). Samples from all Norwegian drugged drivers are analysed at one institute. In addition, the attention toward drugged driving is similar all over the country, giving data with good correlation between number of samples from car drivers suspected for

drugged driving and the number of inhabitants in each community. Thus, the material is, in this manner representative for Norway as a whole.

The results showed that drugged drivers had a very high mortality compared to the normal population, twenty-one times higher for men and thirty-one times higher for females.

To our knowledge no previous study on the mortality among drugged drivers has been conducted. The present study shows that it would be essential to take into account the higher mortality rate in this population.

One problem of the study is the low proportion of women in the study, which make calculation of relative risk with large confidences interval and the results will only be indicative of the situation. Classifying cause of death as poisoning/overdoses and suicides can also be difficult.

The study was performed on the drivers between 20-39 years. This group was selected since majority of drunken and drugged drivers in Norway the last 10 years are in this age (Skurtveit et al. 1995a).

It is well known that drug abusers have increased risk of dying in an early age compared to the normal population. Drug addicts are found to have a higher excess mortality than alcohol users (Rossow 1996). High numbers of deaths from suicide, accidents and overdoses are reported for drug users and seem to be repeated finding in many countries (Rossow 1996). The mortality rate among drug addicts, specially those using opiates is reported to be very high. For addicts with a mixed abuse, mortality frequencies of 1.3-2% per year have been reported from Norway, with a higher relative risk of death for females drug addicts than for males (Rossow et al. 1995). The mortality among intravenous drug users in Norway has been to be 31 higher than normal population (Eskelid et al. 1993). The same study reported mortality rate for HIV positive male and female drug users of age 25-35 years to be 58 and 60 higher than for the normal population respectively. A study from Sweden (Tunving 1988) reported that male opiate addicts and male amphetamine abusers died 5.4 and 2.5 times as often as expected, respectively. Totally in the study the males were exposed to greater risk than the female however opiate addict female had higher risk (8.0) of death compared to males. Twenty times higher risk of dying were observed between heroin addicts in United Kingdom (James 1967).

The findings in our study indicate that the mortality rate among drugged drivers in Norway is about 20-30 times higher than in a population of comparable age distribution. This corresponds to approximately 1.4-2.5 % of this population dying per year. Therefore, the death rate among drugged drivers is equally high as reported for drug abusers in general.

In our study of the population of drugged drivers violent and accidental deaths were more common than dying from the illnesses. This indicates a marked difference between the population of drugged drivers and normal population. Fatal poisoning /overdoses was registered as the most important causes of death among drugged drivers. The pattern of death among the drugged drivers population shows the same pattern as presented in different studies concerning the death of drug addicts (Steentoft et al. 1996).

In conclusion this study together with other studies of drugged drivers in Norway indicates that drivers apprehended for driving under influence have drug problems. The Norwegian system does not include any follow-up program or treatment connected to drug abuse for convicted drugged drivers. Based on the high mortality among drugged drivers and frequency of rearrest among these drivers, some sort of reaction or rehabilitation in addition to fines and imprisonment seems to be necessary.

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