Background
In comparison to alcohol, illicit drugs are not quantitatively a major traffic safety problem in Finland. However, this problem has been very rapidly increasing and alarming. Therefore more effective countermeasures were needed.

The number of fatal traffic accidents as well as number of traffic accidents involving alcohol has decreased very markedly. The trend of killed and injured people in road traffic accidents involving other intoxicant than alcohol has shown a sharp rise (Penttilä et al. 2002).

In February 2003, zero limit law for illicit drugs and driving was introduced in Finland. The law is applied to scheduled drugs in Finland. The scheduled drugs in Finland are about the same the drugs that are listed in UN convention on narcotics and psychotropic substances.

The zero tolerance is applied if the controlled drugs or their metabolites are found in blood. The zero tolerance law is not applied if the driver has a right to use the controlled substance, e.g. by prescription of a physician.

The impairment law stays still in the background in the legislation. The driver will be convicted for driving while intoxicated if the driving ability is impaired by the use of drugs. Driving ability is not allowed to be impaired by any substance. The impairment has to be shown in court. Symptoms of drug use can be shown by documentation of the policemen (Mini-DRE) and clinical sobriety test by physician. The impairment has to be shown also when the driver is prosecuted for severe drunken driving because of drugs.

The blood (and urine) samples are analysed in the Laboratory of Substance Abuse at National Public Health Institute, Finland. Both the illicit and legal drugs that can impair the driving ability are screened. Laboratory report is presented in the court. The report includes laboratory findings and a short explanation on the effects of the drugs. In impairment law case, the laboratory report includes also pharmacological evaluation.

Objectives
Police have had difficulties before implementing the zero tolerance law to show the impairment driving ability in the court. A reasonable part of the drugs and driving cases may previously remained unnoticed. This was the main reason for the government proposal for the drugs in traffic.

The purpose of this study is to show the effect of zero tolerance law to the number of those traffic cases, where police suspected drugs while driving and asked laboratory to perform drug testing in blood. The drug finding pattern will be presented.
Methodology
The police in Finland can ask medical personnel to take a blood sample, if a person is suspected of driving under the influence (Law on Coercive Means). For the illicit drugs and controlled medicinal substances zero tolerance law is applied. For other substances, the impairment of the driver has to be shown in court. This is based on 1) the documentation of policemen (Mini-DRE), 2) clinical sobriety test by physician and 3) the laboratory report including pharmacological evaluation.

In the laboratory, the substances hazardous or potentially hazardous to traffic safety are screened by analysing whole blood samples with immunological methods as well as by gas chromatography-mass spectrometry (GC-MS) and gas chromatography equipped with electron capture detector (GC-ECD), and further confirmed by separate GC-MS methods.

Immunological screening includes illicit drugs (cocaine, cannabis, amphetamine, metamphetamine, opioids) and benzodiazepines. By GC-MS, two large-scale semiquantitative/quantitative screenings are performed. The combined GC-MS and GC-ECD method (Gunnar et al. 2004) of 51 compounds includes, for example, benzodiazepines (12), cannabinoids (3), opioids (8), cocaine, antidepressants (13), antipsychotics (5) and antiepileptics (2) as well as zolpidem, zaleplon, zopiclone, meprobamate, carisoprodol, tizanidine and orphenadrine. The other GC-MS method includes amphetamine, methamphetamine and various designer drugs (e.g., MDMA, MDEA, MDA, MBDB, BDB) (Kankaanpää et al. 2004, in preparation).

Results and discussion
The increase of the number of samples sent to the laboratory increased about 60 % in one year after implementing the 'zero limit law' (Fig. 1 and 2). Police are satisfied with the zero tolerance law. In the case of illicit drug findings in blood police do not need to prove that the impairment in driving ability had occurred because of the drug.

![Number of samples](image_url)

**Fig. 1.** The cumulative monthly increase in the number of samples after introducing the zero tolerance law in February 2003.
The most common drug finding are benzodiazepines (Fig 3). Benzodiazepines are often taken together with illicit drugs. In about 60% of the benzodiazepine cases also simultaneous illicit drugs, mainly amphetamine and/or cannabis, are found.

Of the benzodiazepines, diazepam, oxazepam and alprazolam were found most often (Fig 4). Phenazepam in a new benzodiazepine derivative that was found on illegal drug markets in Finland. It is not scheduled in UN Convention on narcotics and psychotropical substances. Neither it is used as a medicinal drug. Therefore the use and the selling of phenazepam cannot be controlled. It is used as a benzodiazepine for anxiety and insomnia in Russia. It is comparable with lorazepam in respect of the strength of its action. In year 2003 there were 20 positive phenazepam cases. Flunitrazepam is not on the market in Finland.
The most common not medicinal illicit drug findings are amphetamine and cannabis. Methamphetamine was often found around the year 1999, since then it has almost disappeared. The marked increase can be seen in the number of amphetamine cases since introducing the zero tolerance law. Simultaneous use of alcohol, benzodiazepines and illicit drugs has been common in several years in Finland (Lillsunde et. al. 1996).
**Conclusions**

About 20,000 drivers are convicted annually for driving under the influence of alcohol. The zero tolerance law for drugs and driving has increased the prosecuted drugs and driving cases sharply. In this new legislation the medicinal use of drugs when the use is under control of a physician has been put into a different category than the illicit drug use. After introducing the zero tolerance law the authorities have better means to prosecute an intoxicated driver.

**References**


