Road traffic and psychoactive substances

Seminar organised by the Pompidou Group

Strasbourg, 18-20 June 2003

Proceedings

Pompidou Group

Co-operation Group to Combat Drug Abuse
and Illicit Trafficking in Drugs

April 2004

Table of Contents

Pompidou Group

The Co-operation Group to Combat Drug Abuse and Illicit Trafficking in Drugs (Pompidou Group) is an inter-governmental body formed in 1971. Since 1980 it has carried out its activities within the framework of the Council of Europe. It provides a multidisciplinary forum at the wider European level where policy-makers, professionals and experts can exchange information and ideas on the whole range of drug misuse and trafficking problems. Whilst seeking to promote dialogue and interaction between policy, practice and science, it has turned its focus particularly to examining the practical implementation of drug policies and programmes in the field.

Foreword

Not a day goes past any more without news of some motorist who has caused an accident while under the influence of substances that impaired his or her ability to drive. While alcohol is still the number one culprit, for years now we have seen a growing number of accidents involving other substances, chief among them cannabis, of course, but also other illegal drugs and medicinal and therefore technically "legal" substances, taken either on their own or in combination with other psychoactive substances.

Gradually, a number of countries have introduced legislation to combat driving under the influence. Approaches vary from country to country but would appear to fall into two broad categories: the "zero tolerance" approach, where motorists who have taken specific substances, in particular "illegal" ones, are not permitted to drive at all, and a second approach based on the idea of "impairment" of the ability to drive, with some countries opting for a combination of the two. Whereas with alcohol, detection is not a major problem and penalties are based on a firm scientific and political consensus, the same cannot be said for driving under the influence of other substances. First and foremost of the problems encountered in this increasingly complex area is multiple drug abuse, the simultaneous or consecutive use of various substances, the effects of which can vary widely from one individual to another and are in some cases incalculable. The situation becomes especially complicated if the driver has taken medicines, technically "legal" substances which are normally obtained on prescription. The number of people who drive while taking, say, benzodiazepines for all manner of conditions is extremely high, but the challenge is to come up with a set of suitable, scientifically sound rules. How, in particular, can a prevention policy, or rather prevention policies, be devised that take account of the wide range of substances concerned (alcohol, medicines, illegal drugs) and target groups (young people with or without a history of "drug" use, sick people, patients who are more or less well informed and used to monitoring their consumption, etc)? Is current practice on warning against the effects of medicines appropriate and what alternatives might there be?

The Pompidou Group, the Council of Europe body in charge of issues related to drug addiction, held an initial seminar in April 1999 to assess the situation (cf. the publication "Road traffic and drugs", Council of Europe Publishing, 2000, ISBN 92-871-4145-2). Scientists, police officers, lawyers, physicians and other practitioners from twenty-seven countries came together to pool information and experience in a variety of areas: legal issues and practical law enforcement, prevalence, epidemiology and risk assessment and, finally, prevention and rehabilitation.

This initial seminar showed the complexity of the problems involved and the wide range of national situations and highlighted the need to step up research in the various areas significantly with a view to adopting suitable legislative and practical measures. Among the many grey areas identified, participants gave particular attention to the issue of prevention policies and the problems associated with the consumption of medicines, including those used in substitution treatment.

On examining the seminar conclusions and recommendations, the Permanent Correspondents of the Pompidou Group felt that further action was called for in this matter and included it in the Group's work programme for 2000-2003. A working group comprising the key experts from the 1999 seminar met for the first time in April 2000 to examine the seminar findings and prepare the ground for a second seminar in 2003. Consultants were drafted in to carry out various studies designed to update some of the information gathered for the 1999 seminar and focusing on the main issues to emerge from the seminar discussions and conclusions.

The preparatory group met again in January 2003 to decide on various organisational aspects of the seminar and identify those areas which the presentations and discussions could most usefully focus on. The group felt it was important to choose a topic that avoided the term "drugs" because it had different connotations in French and English. Likewise, no distinction was to be made between "legal" and "illegal" substances, a point that had already been pressed home in the conclusions of the 1999 seminar. What mattered, in fact, was not the legal classification of substances according to criteria which were inclined to vary from country to country, but rather the potential risks associated with substance use by motorists, whether it involved "illegal" or other substances, notably medicines. On this last point, the group held that only "psychoactive" medicines should be considered and not other medicines, even though some of these could also affect driving in certain circumstances. They accordingly agreed that the theme of the seminar should be "Road traffic and psychoactive substances".

The preparatory group also felt that the second seminar should have broadly the same structure and thematic working groups as those used in the first seminar, with an additional focus, however, on pharmaco-epidemiological aspects and issues related to the driving of persons undergoing substitution treatment. The seminar programme accordingly comprised the following working groups:

- Legal and legislative aspects (group A)
- Prevalence, risk assessment, pharmaco-epidemiology (group B)
- Practical aspects (detection, law enforcement) (group C)
- Prevention, rehabilitation, regranting of driving licence (group D 1)
- Substitution treatment and driving (group D 2)

The seminar was held in Strasbourg from 18 to 20 June 2003. With Mr Claude Gillard (Belgium) in the chair, 66 officials, researchers, physicians, practitioners and police officers from 23 member states, Canada and the United States exchanged information and views at plenary sessions and in the five working groups mentioned above. The background reports, most of the presentations made at the seminar and the conclusions and recommendations produced by the working group rapporteurs, preceded by general conclusions, can be found in this publication. We would like to express our sincere gratitude to all the speakers and rapporteurs for their invaluable contributions.

As in the case of the previous seminar, the Pompidou Group was able to rely, throughout the run-up to and during the seminar itself, on the cordial and efficient co-operation of senior officials and experts working on road safety problems and substance use for European Union bodies. The programme was thus expanded to include reports on major European Commission projects ("ROSITA", "CERTIFIED" and "IMMORTAL") and two reports prepared by the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) on legal issues, in particular non-criminal penalties for drug offenders. At the same time, a representative of DG TREN briefed participants on the various activities under way at the Commission. We would like to thank the representatives of these institutions most sincerely for their co-operation.

Once again, the focus was not solely on Europe, with experts from the United States and Canada presenting some extremely interesting papers on recent developments and research in those countries.

The seminar conclusions and recommendations show the highly complex nature of the problems involved and the wide range of national approaches. Despite definite progress in the various areas, the fact is that many issues require greater political commitment if the road safety risks associated with psychoactive substance use are to be reduced. At the same time, intensive, ongoing research and systematic assessment of any action taken will be essential in order to give policies a sound scientific underpinning. The approach which was adopted in the planning and organisation of the seminar, and has always been a feature of the Pompidou Group, is eminently appropriate here, namely a multidisciplinary exchange between government policy-makers, scientific experts from the various fields and those working on the ground to promote road safety.

The general verdict among participants was that, despite the progress made, much remained to be done, in every area from law enforcement to prevention. The need for a third activity to review the situation in due course was recognised by the Ministers in the Pompidou Group, who, at their conference in Dublin in October 2003, decided to include this objective again in the Group's work programme for 2004-2006.

Problems raised by the use/abuse of psychoactive drugs by drivers - report on the situation in 24 European countries

by Johan J. De Gier (The Netherlands)

NB: This report was prepared in 2001

Summary

This report serves the purpose of a follow-up survey addressing the recommendations that have been derived from the "Road Traffic and Drugs" seminar, organised by the Pompidou Group in 1999. It is the aim of this survey to disclose both barriers and opportunities to improving counter measures for controlling the use and abuse of psychoactive drugs in road traffic. The results are derived after data gathering by applying a questionnaire and analysing the responses from 24 countries (response rate: 73%). These results constitute the basis for future discussion on these barriers and opportunities.

Legislation and statistics
In one third of the countries responding to the questionnaire, discussion has started that addresses the gaps in research on the prevalence of illicit and medicinal drug involvement in accidents. The major barrier to improving this situation is legislation that provides for collection of blood samples only when a driver is suspected of driving under the influence of drugs.

Roadside surveys are not possible in 54% of the countries, but an obvious trend is developing in that 33% of countries have plans to start roadside surveys in the coming year (2002). Furthermore, it is obvious that collaborative actions (such as the ROSITA-project for use of screening devices) are needed, since 57% would like to support a possible pan-European cross-border approach to investigating the prevalence of drug use in different driver populations. It is, however, discouraging that standardised protocols for police procedures and analysis of blood samples only exist in 46% of the countries.

One possible barrier that has been identified for developing legislation is the lack of consensus amongst policy makers that some medicinal drugs are as impairing as illicit drugs and that both classes need appropriate attention in the process of changing legislation.

The conclusion is that lack of legal provision to conduct appropriate research is still the most important barrier to changing knowledge on drug related accidents. Furthermore, in developing future programmes priority should be given to harmonisation and standardization of research protocols and police procedures for improving relevant statistics.

Risk assessment
A majority of countries (62%) responded that risk assessment studies are more important than experimental studies and studies among DUI-arrested drivers for providing a basis for development of new legislation for medicinal and illicit drug use in road traffic. So far only three countries have planned or conducted small-scale studies.

The most important barrier to conducting risk assessment studies is the lack of records of medicinal drug use and accident involvement. It is difficult to expect that these problems will be resolved in many countries in the coming years, therefore the conclusion is that research efforts in countries where necessary records are available should be encouraged. Their outcomes will further stimulate countries to introduce provisions allowing them to participate in risk assessment studies based on standardised methodologies.

Policy issues related to risk assessment of patients on methadone use differ extensively between the various countries. More attention should be given to the outcomes obtained in programmes that have been implemented and evaluated for allowing patients to drive whilst undergoing methadone treatment.

Detection and police enforcement
It is obvious that very different training programmes are provided for police officers in various countries. The drug recognition and evaluation procedures are of particular interest, since only four countries reported the application of DRE-like procedures. In countries where these training programmes have not yet been provided, several reasons are presented ranging from lack of legal provisions for performing DRE-like procedures to lack of consensus on the type of (clinical) assessments that the police officer (and the public) will accept in daily practice. However, different training programmes have been implemented and experiences are available for further evaluation and development of a 'European approach'. The only thing that seems to be missing is an actual exchange of available knowledge.

The conclusion is reached that detection of drug impaired driving by the police is broadening its scope and importance, but the diversity of activities is so extensive that it is hard to understand how implementation of a 'standard procedure' in most European countries will be achieved. There are so far a few visible signs of exchange programmes between countries that support another opinion. The interest among countries to proceed with developing more extensive training programmes is rapidly growing and more interaction with 'more experienced countries' is badly needed.

Medical examination and toxicology
The vast majority of respondents (83.3%) indicated that there is a need for developing standardised procedures to clarify the role of examiners, but very little has been achieved so far. Only five countries reported the development of such protocols and these deserve to be examined in more detail.

A minority (12.5%) of the respondents agreed on the role of general practitioners as examiners, because they rated the education and training of physicians in the detection of drug-specific impairment as adequate and comprehensive. Most respondents, however, favour a situation in which police officers and medical examiners provide complementary information that, taken together, produces an overall picture. However, one third believed that a specially trained forensic physician should do the job. One interesting finding is the 'transformation' of general practitioners into forensic physicians after special education, which deserves closer inspection.

Only the Nordic countries responded that they were aware of any initiatives in their national laboratory for implementing a co-ordinated standardised testing programme for drug analyses in blood. The conclusion is reached that such a co-ordinated testing programme is feasible based on these experiences.

Prosecution

Unfortunately, the results in this report show that only a few (Nordic) countries were able to present the desired statistics. But even in a Nordic country it seems possible to decrease the value of statistics, where the responsible governmental agency has decided to change the presentation of national statistics. As a result there will no longer be a distinction between drivers under the influence of drugs and drivers under the influence of alcohol (and drugs in combination). The conclusion is that priority should be given to developing reliable statistics on arrested, prosecuted and convicted drivers in all countries of the Council of Europe.

In the 1999 seminar it was felt that basic knowledge among prosecution authorities and judges about the problem with drugged driving should be improved. Only one country has introduced some kind of training programme, whereas fourteen countries (54.2%) indicated that there would be a need for such training programmes. The conclusion is that basic knowledge about drugs and driving among prosecutors needs to be improved in order to prevent misunderstanding during the prosecution process and to support the provision of reliable statistics.

Regranting procedures and rehabilitation programmes

The responses of this survey show that enormous variation exists in regranting procedures, especially the period for licence suspension and the measures implemented in case of drug abuse or drug dependency. Furthermore, about half of the respondents declared that there are no assessments of patients in drug rehabilitation programmes to clarify whether or not patients are able to drive. The conclusion is that more exchange programmes are needed to define the effectiveness of different regranting schemes in treating offenders who are found drug-positive in road traffic.

Legislation

The results show that a majority of respondents (66.6%) favour the development of so called 'impairment' legislation for both illicit and medicinal drugs, whereas 33.3% would favour this for medicinal drugs only. The opinion about 'zero-tolerance' legislation indicated that 58.8% would favour this for illicit drugs only and 47.1% for both illicit and medicinal drugs. These results clearly indicate that consensus of opinion amongst members States is lacking.

Interestingly, responses given to the introduction of 'zero-tolerance' legislation in a few countries indicate that similar developments are followed by policy makers in 21% of the remaining countries with a slight preference to exclude medicinal drugs from the proposed legislation. However, some interesting developments have been observed, leading to the conclusion that the pros and cons of zero-tolerance and impairment laws need to be discussed and clarified in order to guide those countries that follow the 'lead countries'.

Prevention
The results of this survey indicate that a majority of respondents (66.6%) are not aware of any regular information campaigns during the last three years to inform the public about the dangers of drug impaired driving. However, some interesting examples of information campaigns have been identified. Only a few countries have started activities to improve patient drug information by proposing a categorisation system making it possible to select the least impairing drug within each therapeutic class. The same holds true for implementing prescribing and dispensing guidelines to promote the use of relatively safe medicines in treating patients who drive.

The conclusion is that countries who have developed initiatives to discuss proposals for changing legislation have not discussed supporting information campaigns aimed at the general public and health care professionals and need to be informed about the existing possibilities in more detail.

Recommendations
The recommendations that follow the conclusions of this survey allow the presentation of specific actions that the Council of Europe member States could consider as important for their policy development in the area of use/abuse of psychoactive substances by drivers. It is, however, unrealistic to expect that recommendations that present statements on what member States should do or need to develop will lead automatically to the initiation and implementation of changes in legislation, law enforcement procedures and data-gathering to present better statistics. It is therefore recommended to invite member States to discuss the so called *'best practices'* that could serve as an example to others. In this approach specific member States that have reported important achievements or significant change in the respective areas of interest as raised in this survey, are invited to communicate their information and discuss the problems and possible solutions in more detail during the next seminar of the Pompidou Group.

1. Preamble

This survey is a follow-up to the recommendations in "Road Traffic and Drugs", a report from a seminar organised by the Pompidou Group in Strasbourg on 19-21 April 1999. Although the focus of this seminar was primarily on the problems caused by illicit drugs, a substantial part of the discussion was dedicated to problems related to the impact of psychoactive medicinal drugs in road traffic. Therefore, this follow-up survey addresses all psychoactive drugs, including medicinal drugs in the context of the seminar's recommendations and how those recommendations have been implemented in various European countries since 1999.

2. Framework of the report

2.1 Aim and structure

The aim of the survey is to uncover both barriers and opportunities to the improvement of counter measures for controlling the use and abuse of psychoactive drugs in road traffic. The data gathering has been based on a questionnaire survey among the Permanent Correspondents of the Pompidou Group. The structure of the questionnaire was designed to follow the order of the recommendations in the report “Road Traffic and Drugs” (page 319), as mentioned earlier. In the questionnaire (see appendix 7.1) several questions were raised relating to both illicit and medicinal drugs. The respondents were requested to take this expanded scope into account.

This report includes the following sections that relate to the seminar recommendations of 1999. The intention is to find out how those recommendations have been implemented in various European countries since then.

The sections included are:

- Prevalence
- Risk assessment
- Detection and police enforcement
- Medical examination and toxicology
- Prosecution
- Regranting procedures and rehabilitation programmes
- Legislation
- Prevention

The present document will describe the basis for proposals and approaches that will contribute to the ongoing discussions in national and international bodies, both governmental and non-governmental, and at the level of researchers, professionals and practitioners.

2.2 Contributions from member States

The Permanent Correspondents were invited to present as far as possible the opinions of current policy makers in their respective countries. They were asked to answer the questions based on experience, current knowledge and opinions within their respective governments. If their responses were based on research already conducted and available for dissemination to the target groups (governments, researchers, police, medical and pharmaceutical profession, patient groups), this will be mentioned. The submission of additional materials (reports, position papers, journal articles, etc.) was requested where they contribute to a broader understanding of the issue.

The proposed first draft of this report, with conclusions from the survey, was planned to be available for further discussion by the end of 2001. Therefore, the deadline for returning the completed questionnaire was set as 1 October 2001. The questionnaire was sent out to 33 member States in August 2001.

2.3 Presentation of results

The responses of the various Permanent Correspondents will be presented in Chapter 3. The discussion and conclusions (Chapter 4) following the presentation of the results yield a set of recommendations (Chapter 5) for future activities to enhance the awareness of the need to improve road safety as it relates to the consumption of illicit or medicinal drugs which affect the ability to drive.

3. Results

3.1 Response rate

In total 24 questionnaires were received, most of them completed by more than one person representing the different areas of expertise (e.g. police and law enforcement, medical field). The response rate was 73%. The following member States responded to the questionnaire:

- Austria
- Belgium
- Croatia
- Cyprus
- Czech Republic
- Denmark
- Estonia
- Finland
- France
- Germany
- Greece
- Iceland
- Ireland
- Italy
- Netherlands
- Norway
- Poland
- Portugal
- Slovenia
- Spain
- Sweden
- Switzerland
- Turkey
- United Kingdom

3.2 Prevalence

Legislation for improved data-gathering

In the seminar of 1999 the participants expressed the view at a general level that considerable efforts must be made to close the gaps in research on prevalence. Such research should be conducted bearing in mind the particular ethical principles of each country and the rules laid down by national legislation on data protection. The collection of data for scientific purposes on the analyses of body fluids should become an issue for developing new legislation. The following question was raised in the questionnaire:

Q 3.2.1 Has legislation been initiated (or has discussion started) towards changes for improved gathering of scientifically useful data on illicit and medicinal drug involvement in accidents (analysis of body fluids, etc.)?

In seven countries (29%) discussion has started that addresses the gaps in research on the prevalence of illicit and medicinal drug involvement in accidents (**Austria, Czech Republic, Germany, Ireland, Norway, Poland, Turkey).** In one country (**Germany**) the discussion has focused on a specific group of medicinal drugs, the benzodiazepines. In most countries legislation provides for collection of blood or other body fluid samples only when a driver is suspected of driving under the influence of illicit or medicinal drugs. With the exception of the **Netherlands**, a random selection of the driver population cannot be stopped and asked to provide a blood or urine sample to determine the prevalence of drugs other than alcohol. In some countries legislation provides for collection of blood samples from *all* drivers involved in traffic accidents, causing injuries or death (**Estonia**), whereas in **France** recently introduced legislation provides for the analysis of blood samples of all drivers involved in accidents where at least one person is fatally injured.

Interestingly, several countries (**Belgium, Germany, Portugal, Slovenia, Sweden**) have changed their Traffic Laws during the last years in order to address, more specifically, drugs other than alcohol, whereas others are discussing this change (**Netherlands, Switzerland**).

Status of roadside surveys

Roadside surveys should be conducted regularly on a pan-European basis to investigate the prevalence of illicit and licit drug use in the general driving population and to keep abreast of the trends of drug use patterns among drivers. The following question was asked to find out more about the present situation:

Q 3.2.2 What is the status of roadside surveys conducted to obtain data on illicit and medicinal drug use in the general driving population?

In thirteen countries (54%) roadside surveys are not possible for several reasons, primarily lack of legislation and suitable screening equipment. In the **Netherlands** legislation only allows roadside surveys for scientific research. Roadside surveys are currently being conducted or are intended to start very soon in eight countries (33%):

Greece and **Turkey** (being conducted but no further information provided), **France** and **Portugal** (October 2001), **Iceland** (2002), **Spain** and **Norway** (in the near future).

Roadside surveys have been conducted and completed in five countries (20.8%): **Belgium, Denmark, Germany**, the **Netherlands** (only a small sub-sample of the driver population, motorists), **Switzerland** and **United Kingdom**. Available results indicate that medicinal drug prevalence contributes to the incidence of accidents and, together with alcohol, occurs in the majority of cases (**Norway**). Two respondents, however, indicated that medicinal drug prevalence together with alcohol occurs in a minority of cases (**Germany, United Kingdom**).

Most prevalent medicinal drugs

The opinion of countries with available results concerning which medicinal drugs are most prevalent (named as the top three) shows consensus on the most frequently used therapeutic class, the benzodiazepines:

1) Diazepam, the most frequently found benzodiazepine (**Norway**)
   Benzodiazepines (**Germany, Greece, Sweden, Switzerland**)

2) Amphetamine (**Norway**)
   Barbiturates (**Germany**)
   Methadone (**Switzerland**)

3) Combinations (**Norway**)
   Methaqualone (**Switzerland**)

Other research strategies

Nine countries (38%) indicated that research strategies other than roadside surveys have been planned or conducted (**Denmark, Finland, Germany, Ireland, Norway, Portugal, Switzerland, United Kingdom**). In some cases the focus has been on road accident fatalities (**Portugal, Norway, United Kingdom**), whereas epidemiological studies on selected groups of drivers, such as drivers suspected of driving under the influence of drugs are conducted continuously since 1990 (**Norway**).

In **Denmark** hospital interviews with injured drivers from traffic accidents have been conducted to gather more information on drug use. Reanalysing blood samples of different driver groups (suspected of driving under the influence of alcohol or drugs) has been extensively used as a research method in **Germany** and **Norway**.

Ireland is conducting a drugs and driving survey at the moment. In **Finland** research has been conducted as part of the EU-ROSITA-project, with emphasis on roadside screening devices.

Pan-European approach

A majority of the twenty four countries (58%) would like to support a possible pan-European cross-border approach to investigating the prevalence of illicit and medicinal drug use in different driver populations (general, collision involved, drunken, etc.). Three countries have responded 'neutral', primarily because of a lack of resources. One of the respondents indicated that drunk driving is a more acute problem as there is low incidence at the moment of drug use (**Estonia**). Six countries did not have an opinion about a pan-European cross-border approach.

Standardised research protocols

In about half of the countries there is no standardised research protocol in the national forensic laboratory to analyse body fluids of a representative sample of (fatally) injured drivers for a specified number of illicit and medicinal drugs. The reasons are different: budgetary constraints (**Czech Republic, Denmark**), the law prohibits this procedure (**Germany**), protocols are currently in preparation (**Poland**). Three other countries also indicated that different laboratories are involved in investigating road traffic accidents (**Germany, Switzerland**) or road traffic fatalities (**Ireland**).

In eleven countries (46%) a standardised research protocol has been implemented. In most countries the definition of the drivers sampled are those who are fatally injured (**Finland, France, Norway, Portugal, Spain**). In some countries all persons involved in traffic accidents causing injuries or death are sampled (**Belgium, Estonia, Greece, Turkey**). In **Norway,** where there is any doubt, analysis for drugs and alcohol is carried out on all injured drivers using a standardised protocol. In the **United Kingdom** a study on road accident fatalities was carried out over three years which is likely to be repeated in the future. The definition of the driver sample was all users (aged >16yrs) who died within 12 hours of the road traffic accident.

The body fluid(s) samples indicated in the standardised protocol are given in Table 1. Blood is always taken. In **Spain** urine is not taken and in the **United Kingdom** urine is taken only if blood is not available or sampling is not possible.

Table 1 Body fluids used in standardised protocols to analyse for a specific number of illicit and medicinal drugs.

Body fluid	Percentage of countries (n=11)
Blood	100%
Urine	82%
Saliva	0%
Other Vitrous humour and various tissues Bile/liver	 9% (**Norway**) 9% (**Greece**)

The drugs other than alcohol detected according to the standardised protocol are given in Table 2. The drug lists are similar in all countries. In **Norway,** GHB is screened for at the request of the police. In the **United Kingdom** screening for the presence of LSD has been conducted in the project mentioned above, although the substance is very rarely seen nowadays. In the case of medicinal drugs some differences exist. In **France** all medicinal drugs with psychoactive properties that impair driving are mentioned in the law: in daily practice this means all medicines with relevant warnings on the package inserts. In **Portugal,** there is no routine screening for medicinal drugs. In **Norway,** a selected number of antihistamines and muscle relaxants are taken into account, whereas, in **Spain,** anti-epileptics are included in the list. Data on the drug lists used in **Estonia** was not available. In **Turkey**, antihistamines and methadone are not included in the list. For medicinal drugs only seven countries (**Croatia, Finland, Greece, Norway, Spain, Turkey, United Kingdom**) are included in Table 2.

Table 2 Drugs other than alcohol screened for according to the standardised protocol.

Drug name	**Percentage of countries (n=10)**
Illicit drugs	
- Cannabinoids	100%
- Amphetamines	100%
- Opiates	100%
- Designer amphetamines	70%
- Cocaine	100%
- Other, - LSD - GHB (at request)	 10% 10%
Medicinal drugs	**Percentage of countries (n=8)**
- Hypnotics	86%
- Anxiolytics	86%
- Antihistamines	86%
- Antidepressants	100%
- Narcotic analgesics	86%
- Methadone	86%
- Antipsychotics	100%
- Amphetamines	100%
- Other, - Antiepileptics - Muscle relaxants	 14% 14%

One of the problems in detecting benzodiazepines is the recognition that these drugs are used illicitly. Among the countries where standardised protocols for screening of body fluids are implemented, only one country (**Norway**) has a procedure to learn how the substances found in drivers were obtained. By requesting the patient's medical record (with permission of the patient) police officers who interview the driver can investigate how the drug was obtained and research further during the medical examination which is mandatory. Furthermore, validation based on blood concentrations may conclude on the abuse of the drug, if the concentrations are above therapeutic level.

Standardised data collection

In twelve countries (50%), police report forms or protocols do not collect data in a standardised way concerning circumstances leading to suspicion of drug use and culpability ratings (whether or not the driver was judged responsible for the accident). Eleven countries (46%) claimed that such data are collected in a standardised way, but looking at the detailed information in their answers it was in most cases for documenting the circumstances leading to the accident. Culpability ratings are not routinely performed in those countries. Police protocols in some countries do, however, contain data obtained by rating the physical signs of impairment and drug recognition schemes (**Belgium, Germany, Sweden, United Kingdom**); (**Slovenia**) will start to apply these protocols from 2002.

Drug use prevalence according to policy makers

Finally, in order to know how policy makers would address their attention in developing new legislation and prevention programmes, such as public campaigns, were requested to answer the following question on the prevalence of drug use among drivers:

Q 2.3.3 Are policy makers generally of the opinion that the proportion of drivers in the general driving population taking psychoactive medicinal drugs is correctly estimated to be at least several times higher than the proportion of drivers using illicit drugs?

About one third responded (**Czech Republic, Finland, Portugal, Sweden, Switzerland**) that policy makers are not of the opinion that in the general driving population more drivers taking psychotropic medications are to be detected compared to the proportion taking illicit drugs. One third (**Austria, Greece, Netherlands, Norway, United Kingdom**) responded that the opinion was known that there are more drivers taking impairing medicines than taking illicit drugs, although some doubts were expressed about how widely known this is amongst policy makers. About one third did not give an opinion about this statement (**Croatia, Cyprus, Denmark, Germany, Iceland, Ireland, Poland, Spain, Turkey)**.

In **Estonia** both problems are rather new and have not been presented in public discussions or political statements. There is still no widespread use of psychoactive medicinal drugs; therefore policymakers only start to understand that some drivers can use these substances. The respondent from **France** made the comment that significant differences exist in subgroups of drivers (young males use more cannabis, elderly females more tranquillizers), therefore it was hard to answer the question.

3.3 Risk assessment

Risk assessment studies generally provide data either on

- increased accident risk, if drivers who are exposed to medicinal drugs in so called pharmacoepidemiological studies are being compared with drug-free control groups, or on

- increased risk of being responsible for causing the accident, if drug-positive fatally injured drivers are compared with control groups of drug-free fatally injured drivers.

Impact of risk assessment studies

The following question was presented to know the impact of risk assessment studies for developing new legislation:

Q3.3.1 If these studies provide a basis for developing new legislation, how would you say the impact of those studies is being rated? (Please check all answers that apply)

This question was not applicable to the situation in **Cyprus, Italy** and **Slovenia**. The answers of the remaining countries are given in Table 3. The majority of countries feel that risk assessment studies are more important than experimental studies and studies among DUI-arrested drivers for providing a basis in developing new legislation.

Table 3 Impact of risk assessment studies for developing new legislation

Rating	Percentage of countries (n=21)
Not more important than experimental studies (based on laboratory testing, driving simulator, on-road driving	14.3%
More important than experimental studies	33.3%
Not more important than studies among DUI-arrested drivers	23.8%
More important than studies among DUI-arrested drivers	28.6%
Other, The different studies mentioned above are all needed	14.3%
No opinion	19%

Risk assessment studies planned or conducted

Risk assessment studies like those noted above have been planned or conducted only in three countries (12.5%). In **France** and the **Netherlands,** risk assessment studies are planned to start in 2002. A pilot study focusing on new antihistamines has been started in **Finland** in 1999 and will continue till 2002.

Sixteen countries (66.6%) indicated that risk assessment studies have not been planned for several reasons (see Table 4). Overall the lack of records of medicinal drug use and of accident involvement has been given as the main reason for not planning a risk assessment study. More basically, in one country (**Czech Republic**), the lack of equipment and specialist training in toxicology has been given as the reason for not being able to provide data initially. In one other country (**Ireland**) the medico-legal investigations are divided between 48 coroners' districts, which has possible negative effects on data gathering. One respondent did not believe that risk assessment studies were feasible in the first stage (**Switzerland**).

Table 4 Reasons for not planning risk assessment studies

Reason mentioned (all relevant reasons checked)	**Percentage of countries (n=17)**
Records of medicinal drug use for individual patients are lacking	29.8%
Records of accident involvement of individual persons are lacking	23.5%
Data on drug use of fatally injured drivers are not routinely obtained	58.8%
Other, Lack of equipment and specialist training in toxicology, hospitals and medical faculties Medico-legal investigations are divided between 48 coroners' districts No one is carrying out this immense research effort	 5.9% 5.9% 5.9%

Risk assessment and methadone use

In the 1999 seminar it was concluded that for those drugs that can be used either illicitly or licitly, it is of paramount importance to determine which doses and/or blood or saliva concentrations are associated with acceptable and unacceptable driving capability. Of special interest are controlled substances such as methadone used in heroin replacement therapy. It was of interest to discover the opinions of the respondents by presenting the following question:

Q3.3.2. What is your country's policy, based on risk assessment, for patients using methadone or similar substances?

In four countries, this question was not applicable (**Croatia, Cyprus, Slovenia, Italy**). In two countries, (**Austria, Switzerland**) experimental studies have been conducted and show safe driving behaviour of patients if only methadone is present. Seven countries (29.2%) responded that driving is controlled by law to minimise the risk to the patients involved and to the general driving population by

- prohibiting driving entirely after each treatment (**Greece**),
- prohibiting driving for a specified period after each treatment (**Norway, Estonia**), or
- prohibiting driving if patients do not comply with specific procedures or do not comply with specific criteria (**Austria, Belgium, Germany, Norway, Spain**)

In **Norway,** patients on methadone treatment are prohibited to drive for 6 months after starting treatment and after changing doses. In addition, instructions are given not to drive for the first 3-4 hours after methadone intake. In **Germany,** patients are allowed to drive if they comply with the following set of criteria:

- period of substitution of more than one year;
- stable psycho-social integration;
- no evidence of consumption of additional psychotropic substances for more than one year;
- therapy compliance
- no evidence of serious defects of personality as a whole.

In **Austria,** patients are not allowed to drive if they do not comply with the prescribed dose or application of methadone, and/or use other psychotropic substances concomitantly.

In twelve other countries (50%), other procedures are followed in the case of methadone prescribed to drivers. Prohibiting of driving after methadone treatment is controlled by medical opinion and advice given to patients in several countries (**Czech Republic, France, Netherlands, Portugal, Sweden, Switzerland, United Kingdom**). If patients on methadone treatment are apprehended for drugged driving, the case will be evaluated according to the standard routine for all suspected drugged drivers in **Norway** and **Ireland**. Methadone is prescribed to 10% of heroin addicts in **Iceland**, 90% receive buprenorphine. In **Turkey** there is no methadone treatment (legally), whereas no special limitations for methadone use by drivers are known in **Poland**.

Medication for safe driving

It is necessary to obtain knowledge about how road safety would be affected if certain patients drive, un-medicated, in traffic. For example, schizophrenics who are not on medication are likely to create a greater risk than if they are on medication. This was one of the conclusions of the 1999 seminar. The following question was addressed to the different countries:

Q 3.3.3 Are you aware of any studies about the necessity for a medication with respect to the requirements of safe driving?

There are a very small number of studies known documenting a positive effect of medication on driving in patients, especially with opioids in controlled medical treatment settings, antihypertensives and nootropic substances. This was reported by three countries (**Germany, Norway, United Kingdom**).

3.4 Detection and police enforcement

Procedures used to detect impairment

Exchange of methods and experiences in detection and police enforcement between countries should be encouraged, according to the conclusions published in the report of the seminar in 1999. One area of interest in this respect are the procedures used by the police to reliably detect the impairment of drivers. The different countries were requested to state the procedures used by the police.

The vast majority of answers were roughly structured in four steps:

Step 1:Observation of erratic driving
Observation of erratic driving behaviour (**Croatia, Cyprus, Finland, Greece, Iceland, Ireland, Netherlands, Norway, Poland, Slovenia, Spain, Sweden**) was given as an answer in most cases. In addition to this first and obvious answer some countries have added specific information to indicate that roadside surveys (in most cases for detecting alcohol impaired driving) did provide opportunities to detect drug impaired driving (**Austria, Estonia, Norway, Portugal, United Kingdom**). Six countries indicated that when there is an accident, police officers normally use systematic procedures for investigating suspicion of drugged driving (**Belgium, Czech Republic, Estonia, France, Italy, Norway**, **Switzerland**). Random control in addition to observation of erratic driving was mentioned by the respondent from one country (**Turkey**). In **Germany** reasonable suspicion of impairment is needed (e.g. erratic driving) in order to proceed further.

Step 2: Alcohol breath testing
Alcohol breath testing is used in all countries as the second step. Some countries specifically indicated that the alcohol breath test is meant to be a selective screening device and that an evidential breath test is needed at the police station (**United Kingdom, Netherlands**), followed by assessment by a police surgeon or physician who may request blood tests, for example, if the breathalyser cannot be applied. In **France,** alcohol breath testing is systematically conducted at the request of the prosecutor.

Step 3: Drug recognition and evaluation
In only five countries (20.8%), a DRE-like evaluation with different steps will be conducted if there is suspicion of drugged driving (**Belgium, Finland, Germany, Norway, United Kingdom**). In the **United Kingdom.** This is currently conducted as a voluntary procedure if alcohol breath testing is negative. Horizontal Gaze Nystagmus and eye pupil size examination are conducted in two other countries (**Slovenia, Sweden**).

Step 4 : Medical examination
In almost all countries, blood (and urine) samples are collected at the police station or hospital and a physician performs a medical examination. Urine testing is a standard procedure in **Iceland**. In fatal accidents blood, eye fluid and urine are obtained for analysis in **Cyprus**. If a traffic accident has occurred, the driver is taken to a forensic laboratory in **Turkey** (not all over the country).

Step 5: Analysis of blood and urine samples
If a medical examination is performed and body fluid samples are required, samples are collected and analysed in a forensic laboratory according to procedures as required in the respective countries.

In some countries results from an expert witness statement are also requested, based on all documentation from the case (e.g. **Norway**).

Use of drug testing devices

One major conclusion from the seminar in 1999 was clear: the authorities responsible for roadside screening should be able to have accurate, reliable and robust roadside screening devices allowing, if necessary, screening of body fluids (urine, saliva, sweat). Respondents were requested to answer the following question:

Q 3.4.1 Please identify the drug testing device, if any, used by police in roadside screening of drivers suspected of driving under the influence of illicit or medicinal drugs

The answers to this question are summarised in Table 5. In seventeen countries (70.8%), the selection of drug testing devices is still under discussion. Only a few countries (**Finland, Norway, United Kingdom**) have had field-test experiences with screening devices, but they were not yet found sufficiently reliable, although most of the time acceptable by the public. In three countries (**Belgium, Finland, Switzerland**), police officers currently use screening devices.

Table 5 The use of drug testing devices by the police

Identified use by the police	Percentage of countries (n=21)
Selection of drug testing devices is still under discussion	8%
Drug testing devices are neither used now nor are planned to be used in the future	4.8%
Our police officers currently use Dipro (Belgium) Cogart (Finland) Urine rapid test (Switzerland)	 4.8% 4.8% 4.8%
We have field-tested drug screening devices and found them not to be useful (e.g. Rapiscan, Drugwipe in the ROSITA-project)	14.3%

Training programmes for police officers

There is a need for an effective training programme for police officers regarding drug recognition, drug impairment, and drugs and driving. In order to discover the present situation the following question was presented in the questionnaire:

Q 3.4.2 Are there any specific training programmes for police officers regarding drug recognition, drug impairment, or drugs and driving?

In eleven countries (45.8%), no specific training programmes have been provided for police officers. Several reasons have been given for not providing these programmes. In **Poland,** a general programme on drugs has been developed, not related to traffic safety. While in **France,** the reason for not providing such a programme is that it has not been determined which elements of a clinical examination the police will accept as part of their task. In **Ireland** and **Cyprus**, legislation does not demand roadside drug testing by the police. In **Spain** and the **Netherlands,** implementation of a DRE-like programme depends upon the outcome of the present political discussion on how to change the traffic law. There are plans to start a training programme in **Portugal**. Lack of human and financial resources will prevent the development of such programmes in the **Croatia, Czech Republic** and **Greece**.

In the countries where there is an interest in beginning such a training programme for police officers, the following answers were given when it was asked what is most needed in order to start developing it:

- Identify an institute to develop the programme and employ specialists for training
  (**Croatia, Czech Republic**).

- Legal provision that drug recognition is valid as evidence in court (**Cyprus**).

- New legislation on drugged driving in which impairment by medicinal drugs will be detected in the same way as impairment caused by the use of illicit drugs (**Netherlands**).

- Firstly legal provision, then reliable testing devices (**Poland**).

- Firstly illicit drugs, secondly medicinal drugs (**Spain**).

In thirteen countries (54.2%), specific training programmes are provided. A well described programme is known as the BASt training programme 'Drug Recognition in Road Traffic' (**Germany**). For this purpose a panel of experts was established (traffic physicians, forensic physicians, toxicologists, jurists, police officials and doctors), thus guaranteeing that the subject would be developed in a comprehensive, comprehensible, well-balanced and practical manner. The programme has been used since 1997. The following areas are covered: legal issues, drug effects, legal and illegal drugs (alcohol, cannabis, cocaine, amphetamines, designer drugs, opiates, hallucinogenic drugs, inhalant medications affecting CNS and the combined effects of psychotropic substances), how to recognise suspicious circumstances and how to preserve evidence. The programme also includes a workshop. A two-stage system of training serves to convey knowledge on a broad basis in 'multiplier seminars'. Participants receive approximately 32 hours of training. They then impart the knowledge to colleagues in 'practical seminars' that cover approximately 8-12 hours. A similar but less extensive programme has been developed in **Belgium**.

In **Austria, Finland, Norway** and the **United Kingdom,** members of the traffic police force are trained in a DRE-like training course, sometimes described as the 'modified German model'. In the **United Kingdom,** this programme is not as detailed, because some of the DRE programme is administered by police surgeons (e.g. Horizontal Gaze Nystagmus).

In **Estonia,** a special training programme on drug related problems (legislation, detection of drug use, etc) was carried out in 2000 for 625 police officers. This programme did not include questions on impairing effects of medicinal drugs.

In the basic training in **Sweden**, police officers have to pass a test based on two days training on signs and symptoms of drugs.

In **Switzerland**, there is a programme known as "Medtralex for Police Officers", but in practice it is rarely used.

In **Italy**, a six months training programme is normally provided for police officers who want to become traffic control officers. During this training some time has been dedicated to recognise the signs of the use of drugs other than alcohol.

In **Iceland**, training is done in the Police Academy regarding drug recognition and drug impairment.

In **Slovenia**, a special programme was started in October 2001, in which trainees' inclusion criteria are a few years traffic police experience, which covers in particular alcohol and drug impaired driving.

In **Turkey**, the Institute of Forensic Sciences is in the process of implementing a Drug Evaluation and Classification programme for the Traffic Police. A first group will be trained in February 2002.

Medicinal drugs covered in training programmes

In the questionnaire a specific question was related to how impairment by *medicinal* drugs is covered in the training programme. In **Norway**, focus is on the most frequently detected medicinal drugs e.g. benzodiazepines. In **Germany**, extensive reference is given to documentation which explains how medicinal drugs that affect the CNS might influence drivers' behaviour. The most important substances are listed; there are indications as to the extent to which those substances are known to be misused. A reference similar to the German BASt programme was provided by the respondent from **Switzerland**.
In the **United Kingdom**, awareness of the potential impairment arising from specific medicines is taught. Impairment, whether due to drugs or medicines is treated in the same manner.

Reviewing effectiveness of police activities and law enforcement

The last issue raised under the heading 'Detection and Police Enforcement' in the questionnaire was to discover whether any initiatives were being undertaken for systematically reviewing studies of the effectiveness of police activities and law enforcement counter measures in combating and reducing drugs and driving.

In fourteen countries (58.3%), no such initiatives could be found. Nine countries (37.5%), have planned or conducted various activities as listed below:

- Pilot project to investigate the effectiveness of police interventions with drivers suspected of consumption of drugs before and while driving (**Czech Republic**).

- The evaluation of the traffic law of 1999 (**France**).

- BASt will conduct an evaluation of the drug recognition programme very soon. Aspects within this evaluation will be, for example: how many Federal Laender implemented the programme, how many police officers took part in multiplier and practical seminars, and how do they use what they have learned in daily practice (**Germany**).

- During 2000 a more holistic project aimed at reducing road accidents has been undertaken by all relevant Ministries (Interior, Transport, Public Order, Health Environment and Public Works) in co-operation with the University of Athens, including also measures for drugged and drunk driving. The project will be completed in 2015: Phase A: 2000-2005 and Phase B: 2005-2015 (no relevant documents available) (**Greece**).

- Police participate in co-operation with the Medical Bureau of Road Safety in the current drugs and driving survey (**Ireland**).

- Exchange of experiences concerning DRE programmes by the police obtained in Australia, USA and Canada (**Netherlands**).

- Police perform reviews for improving enforcement efficiency and present results in seminars about traffic safety (**Slovenia**).

- The Institute of Forensic Sciences of Istanbul University is reviewing studies regarding the issue and is trying to establish a clearinghouse (**Turkey**).

- Currently monitoring the effectiveness of the Field Impairment Tests DRT/FIT (**United Kingdom**).

3.5 Medical examination and toxicology

Standard procedures and protocols

The role of examiners (police, medical examiners, forensic physicians) in determining drug- specific impairment could be clarified across Europe if valid, standardised procedures and protocols existed. The following question was asked in order to reveal what has been achieved so far:

Q 3.5.1 Would you say that there is a need for developing these procedures and protocols?

For three countries this question was not applicable (**Cyprus, Italy, Slovenia**). The vast majority of respondents - twenty countries (83.3%), indicated that there is a need for developing standardised procedures and protocols; one respondent disagreed without giving a specific reason.

The respondents were also asked to specify what developments, if any, could be indicated in their country. In five countries (**Germany, France, Portugal, Norway, Sweden**), protocols have been developed and are in use in daily practice by police officers and forensic physicians or applied in a study to detect drug abuse in impaired drivers (**Portugal**). In two countries, proposals have been made to the relevant government ministers (**Ireland, Turkey**).

One country made a comment (**Netherlands**) that harmonisation will be difficult across Europe, since every country will, based on their own legal system, have to develop a dedicated procedure to detect drugged drivers.

General Practitioners' role

In the seminar of 1999 it was made clear that education and training of physicians in the determination of drug-specific impairment should be improved. Their training must be co-ordinated with the drug recognition programme of the police. But to achieve this, it must be clear how different countries feel about the role of the examiners (police, medical examiners, forensic physicians) and whether general practitioners are the best authority for providing the medical examination in drugged drivers.

Q 3.5.2 Are general practitioners (physicians) the best authority for providing appropriate medical examinations of drivers who are arrested for drug-impaired driving?

Table 6 explains how the respective countries felt about this role. One country made a comment that some improvement in involving more physicians has been observed by 'transforming' general practitioners into forensic physicians after special education (**Norway**).

Table 6 Agreement on general practitioner's role as examiner

Reasons for agreement or disagreement	Percentage of countries (n=24)
Yes, because education and training of physicians in the determination of drug-specific impairment are adequate and comprehensive	12.5%
No, because police officers trained as drug recognition experts have had adequate training to provide similar information	8.3%
No, because police officers and medical examiners generally provide complementary information that, taken together, produces an accurate overall picture	50%
No, because specially trained forensic physicians should do the job	29.2%

Standardised assaying and reporting of drugs

Experts in 1999 agreed that procedures used by national forensic laboratories for assaying and reporting illicit and medicinal drugs should be standardised across European countries. Only three countries responded that they were aware of any initiatives in their national laboratory for implementing a co-ordinated standardised testing programme for drug analysis in blood. **Finland** and **Norway** have contributed to comparative studies in the Nordic countries applying one standardised testing programme. **Portugal** has supported initiatives to organise future meetings for adopting standardised procedures across European countries. National initiatives to improve standardization have been reported in **Poland, Portugal** and **Turkey**.

3.6 Prosecution

Statistics

There is a need for distinguishing between drug and alcohol-related offences in statistics. This holds true for police reports on drugged driving, dismissals on prosecutions' decisions and charges or indictments before courts. The following question was presented to the representatives of the participating twenty one countries:

Q 3.6.1 How many cases of drivers under the influence of drugs come before courts each year in your country? Please provide statistics for the last two years

The results are presented in Table 7. Only eight countries (**Croatia, Czech Republic**, **Estonia, Finland, Iceland, Ireland, Norway, Sweden**) were able to present some statistics on cases pertaining to drugs other than alcohol. In **Finland**, the presentation of national statistics was changed on 1 October 1999; after that date it was no longer possible to distinguish between drivers under the influence of drugs or alcohol.

A new payment system for analysing DUI cases introduced in 2000 in **Norway** decreased the number of arrests by the police in that particular year. In **Sweden**, the introduction of new legislation in 1999 resulted in an increase of the number of DUI arrests for drugs other than alcohol in 2000.

In the remaining countries, all statistics cover drugs and alcohol-drug cases, not separating drug cases from the alcohol cases.

Table 7 Number of drivers, arrested, prosecuted and convicted for driving under the influence of drugs other than alcohol in 1999 and 2000.

Description of cases	Number of drivers in 1999	Number of drivers in 2000
Arrested for DUI other than alcohol	1,351 (to 1-10-99 - Finland) 20 (Iceland) 50 (Ireland) 4,800 (Norway) 1,700 (Sweden)	 15 (Iceland) 78 (Ireland) 3,900 (Norway) 3,800 (Sweden)
Prosecuted for DUI other than alcohol	6 (Croatia) 1 (Estonia) 370 (to 1-10-99 - Finland) 10 (Iceland) 3,300 (Norway)	13 (Croatia) 7 (Estonia) 13 (Iceland) 2,800 (Norway)
Convicted for DUI other than alcohol	2 (Czech Republic) 359 (to 1-10-99 - Finland) 7 (Iceland) 2,200 (Norway)	0 (Czech Republic) 13 (Iceland) 2,350 (Norway)

Training programmes for prosecutors and judges

In the 1999 seminar it was felt that basic knowledge about the problem of drugged driving should be improved for prosecution authorities and judges. Only one country (**Norway**) has installed a kind of training programme where physicians give lectures from the National Institute of Forensic Toxicology, but not on a regular basis. However, fourteen countries (54.2%), indicated that there would be a need for these training programmes, one country (**Sweden**) did not see the need for a training programme and two countries (**Germany, Italy**) did not have an opinion.

The opinions of countries who felt that there is a need for training programmes and on how such an initiative would be most effectively developed in their country, was given as follows:

- Need to disseminate more information on different aspects: the toxicological/medical problems, problems with necessary against unnecessary medication and misuse, psychosocial problems. Interdisciplinary working groups would be very helpful and should consist of prosecution authorities, judges, police officers, medical doctors, psychiatrists, social workers, probation officers (**Austria**).

- Should be initiated by the Ministry of Justice. Because of insufficient knowledge in this field now, judges have to invite experts to explain even relatively simple questions (**Estonia**).

- To be integrated in standard training programmes, related to traffic safety or drug use in the Ecole National de la Magistrature de Bordeaux (**France**).

- In co-operation with the relevant drug prevention authorities (**Greece**).

- Through the Department of Forensic Medicine attached to a medical school (**Ireland**).

- Courses organised for prosecutors and judges should be developed by collaboration between police, prosecutors, courts' defence lawyers and the National Institute of Forensic Toxicology (**Norway**).

- Seminars involving international experts (**Poland**).

- By specialists of the Institute of Forensic Medicine (**Switzerland**).

- Joint certification programme, seminars by universities and authorities (**Turkey**).

- There would be an advantage to such training in helping judges/magistrates to understand procedures used in DRT/FIT (**United Kingdom**).

3.7 Regranting procedures and rehabilitation programmes

Procedures for treating drug-positive offenders

There is a need for describing the procedure as to how offenders are treated after drug consumption in road traffic, with or without impairment. Representatives from the different countries were requested to clarify the procedures in their respective countries by responding to the following question:

Q 3.7.1 What is the procedure for treating offenders who are found to be drug-positive in road traffic (with or without impairment)?

The question did not apply to one country (**Cyprus**), while no standard procedures could be reported by one other (**Czech Republic**). In eighteen countries (75%), licence suspension was carried out as the procedure for treating offenders who are found to be drug-positive in road traffic.

Regranting of the licence is possible after a period of time that varied from a minimum of 15 days in **Italy** to a maximum of 36 months in **Poland** and **Estonia.** The various possibilities are given below:

- In principal 3 months, but 4 weeks if it was a first time abuse and not a driver with a licence for heavy goods vehicles (**Austria**).
- Up to three years, depending upon repeated offence during the last 12 months, or causing serious violations of traffic rules (**Estonia**).
- Usually 3-6 months (**Finland**).
- One month, no medical and/or psychological assessments are required in cases without impairment (Road Traffic Act) while in cases with impairment (Penal Code) six months and medical and/or pscyhological assessments are required (**Germany**).
- Usually 15 days-6 months, if recidivism occurs within one year, the duration of suspension will be doubled (**Italy**).
- 12 months (**Netherlands**).
- 24 months, depending on degree of impairment, or earlier number of sentences (**Norway**).
- 6-36 months (**Poland**).
- 1-24 months, depending on seriousness of situation/offence (**Portugal**).

In three countries (**Austria, Finland, Netherlands**), regranting is possible if offenders undergo psychological and medical assessment (driver's mental fitness) or (psychological) treatment to learn how and when to restrict drug use in conjunction with driving. This will, however, depend on the severity of the offence and whether or not it concerns a repeat offence (**Finland**)**.** In **Portugal,** regranting is always possible without any treatment. In **Germany** regranting is possible without any treatment in the cases giving rise to administrative fines on the basis of the Road Traffic Act, whereas in cases of penal sanctions on the basis of Penal Code, medical and/or psychological assessments is needed.

In cases of *drug abuse* or *drug dependence*, special measures are implemented in a minority (33.3%) of countries, ranging from no tests performed (**Norway**) to licence revoked (**Portugal**). In **Austria**, extra fines will be charged, whereas in **Greece**, offenders will be treated according to the Drug Law. In **Germany** medical and/or psychological assessments combined with rehabilitation programmes will be needed. In **Sweden**, the sentence might include treatment similar to that in the **Netherlands,** where medical examination is required to prove that dependence is no longer present.

In the **United Kingdom**, measures are dependent upon the type of substance and the type of licence to be able to drive (non)commercial vehicles. For example, for cannabis and amphetamines, the persistent use or dependency on one of these substances, confirmed by medical enquiry, will lead to licence revocation until a six month period (commercial vehicles) or one year period (heavy goods vehicles) free of such use has been attained. Independent medical assessment and urine screening arranged by the Driving Licensing Authority may be (commercial) or will normally be (heavy goods vehicles) required.

Similar requirements with different periods and treatment programmes are described for misuse of or dependency on opiates, cocaine and benzodiazepines.

Assessment for patients in drug rehabilitation programmes

Half of the respondents (50%) declared that there are no assessments for patients in drug rehabilitation programmes (such as methadone substitution) to clarify whether patients are able to drive non-commercial or commercial, or heavy goods vehicles. Seven of those respondents furthermore declared that there are currently no discussions about establishing such assessments. Only four countries (**Finland**, **Germany, Norway, United Kingdom**) declared establishment of those assessments. In **Germany** patients are allowed to drive if they comply with the following set of criteria:

- period of substitution more than one year
- stable psychosocial integration
- no evidence of consumption of additional psychotropic substances for more than one year
- therapy compliance
- no evidence of serious defects of personality as a whole.

In **Norway**, patients on methadone treatment are prohibited from driving for 6 months after commencement of the treatment and after changing doses. Permission to receive a driver's licence is granted by the Chief Medical officer. In the **United Kingdom**, drivers on a consultant-supervised oral methadone withdrawal programme may be licensed, subject to annual medical review and favourable assessment.

Three countries (**Cyprus, Italy, Slovenia**) did not consider assessments for patients in drug rehabilitation programmes applicable to their national situation, whereas in **Turkey** methadone therapy does not exist (legally).

Advice given by health care professionals

Health care professionals should advise drug dependent patients about their illnesses and treatment regimes, as well as about their fitness to drive – or not to drive. Thirteen countries (54.2%) could not report the type of advice that is given by health care professionals in their country. Those who did respond to the question as to what advice was given, only provided very general statements such as that it is recommended not to drive, or patients should comply with the treatment and not drive after changing the dose, or that it was handled in a case by case manner.

3.8 Legislation

Approaches for new legislation

In discussing what doses and/or blood concentrations of drugs (either illicit or medicinal) are associated with acceptable or unacceptable driving capacity, experts often report that establishing defensible limits is almost impossible. Respondents were requested to give their opinion about how this view might affect the development of new legislation. In Table 8 their responses are summarised dividing the 'zero-tolerance' and 'impairment' approaches.

Table 8 Opinion on the development of new legislation, if defensible blood limits are impossible.

Focus on zero tolerance/impairment legislation	Percentage of countries
'Zero tolerance' legislation for	
- illicit drugs only	58.8%
- medicinal drugs only	0%
- both illicit and medicinal drugs	47.1%
'Impairment' legislation for	
- illicit drugs only	6.7%
- medicinal drugs only	33.3%
- both illicit and medicinal drugs	66.6%

Responses to new legislation

In Germany, Belgium, and Sweden, 'zero-tolerance' laws have been introduced for illicit drugs during the last few years. The following question was presented to the respondents of the other countries:

Q3.8.1. How did policy makers in your country respond to the 'zero-tolerance' laws introduced in Germany, Belgium and Sweden?

Their responses are given in Table 9. Three countries explained the change of their traffic law to 'zero-tolerance' as follows. In **Portugal** zero-tolerance for illicit drugs was introduced in 1999, whereas in **Slovenia** this was already the case before zero-tolerance was introduced in the three countries mentioned above. In **Switzerland,** a zero-tolerance law has been considered for a certain number of illicit drugs or drugs to be determined.

Table 9 Responses given to the introduction of 'zero-tolerance' laws

Type of response	Percentage of countries (n=19)
By conducting a general review of drugged driving law	36.8%
By following the lead of those countries	21.1%
By changing the traffic law to 'zero-tolerance'	10.5%
No specific response has been given so far	31.6%

No specific responses have been given in **France**, where the results of the new law since 1999 (drug screening in fatally injured drivers only) will be evaluated first. **Norway** responded differently by declaring that the number of apprehended drugged drivers is higher in Norway than in other countries. The need to introduce a zero-tolerance law is therefore not considered to be imminent. If zero-tolerance should be introduced, the impairment law still has to be in force, to secure a system for drugged drivers similar to that of drunk drivers.

Consequences of new legislation

Germany is the only country where studies are being undertaken after the introduction of a zero-tolerance law as well as other legal changes. The ongoing study is conducted by BASt (Project FE 82.173) in which the consequences will be investigated.

Changes regarding medicinal drugs

In discussing new legislation the focus is most often put on illicit drugs. Therefore it was decided to include the following question about the focus that has been given to medicinal drugs:

Q3.8.2 If changes in traffic law have been discussed or proposed, what has been the nature of the changes regarding medicinal drugs?

In total fourteen countries responded to this question. The results are presented in Table 10.

Table 10 Opinion on changes regarding medicinal drugs in proposed legislation

Opinion on medicinal drugs	Percentage of countries (n=14)
Excluded in the proposed changes	57%
Included in the proposed changes	43%

A few respondents stated their opinions as follows:

For *excluding* medicinal drugs:

- Including medicines would limit people's freedom to move (**Finland**)
- Many people say that medicines if taken correctly yield a better quality of life and social integration (**France**)
- No scientific proof of general endangerment of traffic safety, through use of medication

- Can be necessary to restore driving fitness of the patient, patient is under control of physician (**Germany**)
- Problem not indicated, needs to be considered in wider perspective (**Poland**)
- Very difficult to determine which medicinal drugs and which concentrations need to be foreseen in the law (**Portugal**)
- Preventive measures, such as written information for health care providers and patients have been developed and are well accepted (**Belgium**).

For *including* medicinal drugs:

- Current traffic law includes provision concerning medicinal drugs. Further measures will be adopted for the implementation of these provisions (**Cyprus**)
- Discussions are still ongoing (**Netherlands**)
- Included in the discussion so far (see comments above) (**Norway**)
- Generally included (**Switzerland**)
- No changes in present position – i.e. that impairment from any drug remains an offence (**United Kingdom**)

Changes in the Traffic Law are discussed in the **Netherlands**. A proposal has been developed to forbid the use of illicit drugs in traffic as well as some medicinal drugs, such as barbiturates and some benzodiazepines. The latter group has been divided into two sub-groups: long- and short-acting benzodiazepines. The use of long-acting benzodiazepines (half-life >24 hours) by drivers is totally forbidden according to the proposal, whereas the use of short-acting ones is forbidden only when taken in high dosages. In order to set this criteria the blood levels derived from taking more than 75% of the Defined Daily Dose (a WHO-standard dose for the main indication of the drug taken by an adult person) for more than 2 weeks are calculated based on a pharmacokinetic model. The 75% DDD-limit has also been proposed for tricyclic antidepressants. The discussion within the Council of Ministers is expected to take place in March 2002. If approval of the proposal is the outcome of this discussion, a new law will come into effect by the end of 2004.

Lower BAC-limits for drug-positive drivers

In the 1999 seminar's conclusions it was stated that national bodies should consider the possibility of establishing lower per se blood alcohol limits for drivers depending on the presence of illicit and licit psychotropic drugs in the same samples. In three countries, this movement has been identified, but discussions started only recently (**Finland, Ireland, Slovenia**). In one country (**Cyprus**), proposals have in fact already been made. Fifteen of the remaining nineteen respondents who responded that no movements are identified, stated that there will be no change in the foreseeable future.

3.9 Prevention

Information campaigns

Legislation is a most important factor of prevention. To highlight this function, new legislation should be accompanied by information campaigns and has to be discussed in public. The intention of the new regulation, the efficiency of the legislation and the corresponding information campaign should be evaluated. This was one of the conclusions of the 1999 seminar. There is a need to know where well-designed, carefully implemented and critically evaluated drugs-and-driving prevention programmes exist. The following questions were therefore addressed to the representatives of the different countries.

*Q 3.9.1 Are you aware of any regular information campaign during the last three years, to inform the public of the dangers of driving when taking certain **illicit drugs**?*

The vast majority of the respondents (66.6%) were not aware of any campaigns for illicit drugs. In three countries (the **Netherlands, Norway, Turkey**), some activities could be described, whereas in one (the **United Kingdom**), plans for future campaigns have been prepared. In **Norway**, newspapers and medical journals regularly pay attention to the problem of drugged driving and information brochures have been distributed to make the public more aware. In the **Netherlands**, one campaign aimed at high school students has been organised. In **Belgium**, various written materials have been developed, while there was extensive media coverage when the new Traffic Law was introduced. In **Turkey**, leaflets on the effects of alcohol and narcotic drugs have been printed and distributed during a Traffic Week in 2001. Furthermore, seminars organised within the framework of the education of drivers contain issues relating to the effects of narcotic drugs. Evaluation of the effectiveness of the campaigns mentioned above could not be provided.

A similar question was presented pertaining to medicinal drugs:

*Q 3.9.2 Are you aware of any regular information campaign during the last three years, to inform the public of the dangers of driving when taking certain **medications**?*

A majority (63%) did not present any information to illustrate awareness of a campaign to inform the public on medicinal drugs that impair driving. In **Norway** and **Turkey,** medicinal drugs were also included in the campaigns as reported above for illicit drugs.

In **Denmark**, in 2001, the Danish Council of Road Safety developed information on the risk of driving under the influence of benzodiazepines. In **Germany**, a free brochure was produced in 1997 under the auspices of the Federal Ministry of Transport, Building and Housing concerning medicinal drugs, distributed through community pharmacies, explaining a three-tier categorisation system. In **Belgium**, an extensive scientific background document was published and distributed among health care providers in order to make them aware of a drug categorisation system allowing them to prescribe the least impairing medication within each therapeutic class of psychotropic medicinal drugs. Furthermore, brochures to make the public aware of this have been developed as part of an extensive media campaign. In **Spain** several campaigns have been developed to draw attention to fatigue, medication, alcohol, mobile phones and driving. In addition the Ministry of Transport provided a brochure with the three tier categorisation system and respective drug lists (similar to that used in **Germany** and **Belgium**) to all physicians to promote safe prescribing for patients who drive while taking medication.

In the **United Kingdom**, discussions are in progress with driver licensing and drug regulatory authorities (DVLA, MCA) and others (advertising agency) regarding improving labelling, information provision and the possibility of a campaign to publicise the dangers of driving under the influence of drugs/medicines.

Improvements of patient drug information

The information in the package insert of medicinal drugs should be more informative, operational and less vague, according to the experts' conclusions in the 1999 seminar. The following question was asked to find out more about initiatives in that direction since then:

Q 3.9.3 Are you aware of any improvements in package information inserts for medicinal drugs (e.g., more informative, more operational, and/or less vague)?

Ten out of twenty two respondents (45.5%) could not describe any improvements at all to package information. The remaining half responded that package inserts have warning sections pertaining to driving in layman's language that have been declared mandatory by drug regulatory authorities. Only one country (**France**) has introduced a pictogram in package inserts to draw attention to a drug's driving impairment properties; a system that has been discussed in **Austria** as well and will probably be implemented in the near future. Such a warning system has also been considered in **Belgium**. The **United Kingdom** responded that new EU requirements would be awaited before any improvements, such as pictograms, are implemented.

Requirements to add a pictogram (for example, a warning triangle or other traffic sign) on medicines that have the potential to impair driving are documented for the Nordic countries since 1983. Therefore, **Denmark, Iceland, Finland, Norway** and **Sweden** responded that the red triangle warning system has been implemented in their respective countries.

Except for **Austria, Poland, Spain** and the **United Kingdom** no other country has discussed the possibility to introduce such a warning symbol in the foreseeable future and to follow the Nordic countries and France. Some countries (**Estonia, Switzerland**) responded that no such change is to be expected.

Categorisation system for medicinal drugs

Three countries (**France,** the **Netherlands, Spain**) responded that there has been an official discussion about developing a categorisation system (undertaken on a European level) requiring physicians to prescribe the least impairing medicinal drug in each therapeutic class. A European Commission working group within DG TREN (Transport and Energy) on illicit and medicinal drugs has made recommendations, but these are not yet published.

Prescribing and dispensing guidelines

Only one respondent (**Norway**) was aware of any improvements in prescribing and dispensing practices among physicians and pharmacists respectively, regarding medicinal drugs affecting driving performance. Educational programmes for physicians and pharmacists have been adopted to fulfil those needs. One other comment was made by the respondent from **Estonia,** who explained that doctors in this country prefer to prescribe the newer drugs that have a lesser impact on driving. Since 1991 there has been a major change in these prescribing practices as there were previously only a limited number of medications available.

4. Discussion and conclusions

This report encompasses a follow-up survey addressing the recommendations that were drawn up at the “Road Traffic and Drugs” seminar, organised by the Pompidou Group in 1999. It is the aim of this survey to identify both barriers and opportunities for improving counter measures controlling the use and abuse of psychoactive drugs in road traffic. The results presented in Chapter 3 are the basis for future discussions on these barriers and opportunities.

Legislation and statistics

In the seminar of 1999 the participants expressed the view at a general level that major efforts must be made to close the gaps in research on prevalence. Such research should be conducted bearing in mind the particular ethical principles of each country and the rules set by national legislation on data protection. The collection of data on the analysis of body fluids for scientific purposes should become an issue for developing new legislation.

In one third of the countries responding to the questionnaire, discussion has started that addresses the gaps in research on prevalence of illicit and medicinal drug involvement in accidents. The major barrier to improve this situation is legislation that provides for collection of blood samples only when a driver is suspected of driving under the influence of drugs.

Roadside surveys are not possible in 54% of the countries, but there is a clear trend in that 33% of countries have plans to start roadside surveys in the coming year (2002). Furthermore, it is obvious that collaborative actions (such as the ROSITA-project for use of screening devices) are needed, since 58% would support a possible pan-European cross-border approach to investigating the prevalence of drug use in different driver populations. It is, however, discouraging that standardised protocols for police procedures and analysing blood samples only exist in 46% of the countries.

One possible barrier that has been identified for developing legislation is the lack of consensus amongst policy makers that some medicinal drugs are as impairing as illicit drugs and that both classes need appropriate attention in the process of changing legislation.

In conclusion, lack of legal provision to conduct appropriate research is still the most important barrier to changing knowledge on drug related accidents. Furthermore, in developing future programmes, priority should be given to harmonisation and standardisation of research protocols and police procedures in order to improve relevant statistics.

Risk assessment

A majority of countries (62%) responded that risk assessment studies are more important than experimental studies and studies among DUI-arrested drivers for providing a basis for developing new legislation for medicinal and illicit drug use in road traffic. Only three countries have planned or conducted small-scale studies so far. The most important barriers to conducting risk assessment studies are the lack of records of medicinal drug use and accident involvement. It is difficult to expect that these problems will be resolved in many countries in the coming years, therefore the conclusion is that research efforts in countries where necessary records are available should be encouraged. Their outcomes will further stimulate countries to introduce provisions allowing them to participate in risk assessment studies based on standardised methodologies.

Policy issues related to risk assessment of patients on methadone differ extensively between the various countries. More attention should be given to the outcomes obtained in programmes that have been implemented and evaluated to allow patients to drive on methadone treatment.

Detection and police enforcement

Exchange of methods and experiences in detection and police enforcement between countries should be encouraged, according to the conclusions published in the report of the seminar in 1999. One area of interest in this respect are the procedures used by the police to reliably detect the impairment of drivers. After observing the descriptions reported by the respondents, it is obvious that very different training programmes are provided to police officers in different countries. The drug recognition and evaluation procedures are of particular interest, since only four countries reported the application of different DRE-like procedures. In countries where these training programmes have not yet been provided, several reasons are presented ranging from lack of legal provisions for performing DRE-like procedures to lack of consensus on the type of (clinical) assessments that the police officer (and the public) will accept in daily practice. However, different training programmes have been implemented and experiences are available for further evaluation and development of a 'European approach'. The only thing that seems to be missing is an actual exchange of available knowledge.

A European approach has been observed for testing drug screening devices (ROSITA-project). The responses provided by different countries indicate that the use of such drug testing devices is still under discussion, and that only very limited field-testing experiences have been evaluated so far. In addition, it has been reported by nine of the countries (37.5%) that several initiatives have been undertaken for systematically reviewing the implementation and evaluation of police activities and law enforcement counter measures in combating and reducing drugged driving.

The conclusion is that detection of drug-impaired driving by the police is broadening its scope and importance, but the diversity of activities is so extensive that it is difficult to understand how implementation of a 'standard procedure' in most European countries could be achieved.

There are a few visible signs of exchange programmes between countries that support another opinion. The interest among countries to proceed with developing more extensive training programmes is growing rapidly and more interaction with 'more experienced countries' is badly needed.

Medical examination and toxicology

The role of examiners (police, medical examiners, forensic physicians) in determining drug-specific impairment could be clarified across Europe if valid, standardised procedures and protocols existed. The vast majority of respondents (83.3%) indicated that there is a need for developing standardised procedures to clarify the role of examiners, but very little has been achieved so far. Only five countries reported the development of such protocols and these deserve to be examined in more detail. In the seminar of 1999 it was made clear that education and training of physicians in the determination of drug-specific impairment should be improved. Their training must be co-ordinated with the drug recognition programme of the police. But to achieve this, it must be clear how different countries feel about the role of the examiners (police,

medical examiners, forensic physicians), and whether general practitioners are the best authority for providing the medical examination of drugged drivers.

A minority (12.5%) of the respondents agreed on the role of general practitioners as examiners because they rated the education and training of physicians in the detection of drug-specific impairment as adequate and comprehensive. Most respondents, however, favour a situation in which police officers and medical examiners provide complementary information that, taken together, produce an overall picture. However, one third believed that a specially trained forensic physician should do the job. One interesting finding, which deserves closer examination, is the 'transformation' of general practitioners into forensic physicians after special education.

Experts in 1999 agreed that procedures used by national forensic laboratories for assaying and reporting illicit and medicinal drugs should be standardised across the European countries. Only the Nordic countries responded that they were aware of any initiatives in their national laboratory for implementing a co-ordinated standardised testing programme for drug analyses in blood. The conclusion is that such a co-ordinated testing programme is feasible based on these experiences.

Prosecution

There is a need to distinguish between drug- and alcohol-related offences in statistics. This holds true for police reports on drugged driving, dismissals on prosecutions' decisions and charges or indictments before courts. Unfortunately, the results in this report show that only a few (Nordic) countries were able to present the desired statistics. But even in a Nordic country it seems possible to decrease the value of statistics, where the responsible government agency has decided to change the presentation of national statistics. As a result there will no longer be a distinction between drivers under the influence of drugs and drivers under the influence of alcohol (and drugs in combinations). It is concluded that priority should be given to developing reliable statistics on arrested, prosecuted and convicted drivers in all countries of the Council of Europe.

In the 1999 seminar it was felt that basic knowledge about the problem with drugged driving should be improved for prosecution authorities and judges. Only one country has initiated a kind of training programme, whereas fourteen countries (61%) indicated that there would be a need for such training programmes. In conclusion, basic knowledge about drugs and driving among prosecutors needs to be improved in order to prevent misunderstandings within the prosecution process and to support the provision of reliable statistics.

Regranting procedures and rehabilitation programmes

There is a need for describing a procedure as to how offenders are treated after drug consumption in road traffic with or without impairment, according to the experts reporting in the seminar of 1999. The responses in this survey show that there is enormous variation in regranting procedures, especially the period for licence suspension and the measures implemented in case of drug abuse or drug dependence. Furthermore, about half of the respondents declared that there are no assessments for patients in drug rehabilitation programmes to clarify whether or not patients are able to drive. The conclusion reached is that more exchange programmes

are needed to define the effectiveness of different regranting schemes in treating offenders who are found drug-positive in road traffic.

Legislation

In discussing what doses and/or blood concentrations of drugs (either illicit or medicinal) are associated with acceptable or unacceptable driving quality, experts often report that establishing defensible limits is almost impossible. Respondents were requested to give their opinion about how this view might affect the development of new legislation. The results show that a majority of respondents (66.6%) favour the development of so called 'impairment' legislation for both illicit and medicinal drugs, whereas 33.3% would favour this for medicinal drugs only. The opinion about 'zero-tolerance' legislation indicated that 58.8% would favour this for illicit drugs only and 47.1% for both illicit and medicinal drugs. These results clearly indicate that consensus in opinion amongst members States is lacking.

Interestingly, responses given to the introduction of 'zero-tolerance' legislation in a few countries indicate that similar developments are followed by policy makers in 21% of the remaining countries with a slight preference to exclude medicinal drugs from the proposed legislation. However, some interesting developments have been observed, leading to the conclusion that the pros and cons of zero-tolerance and impairment laws need to be discussed and clarified in order to guide those countries that follow the 'leading countries'.

In the 1999 seminar's conclusions it was stated that national bodies should consider the possibility of establishing lower per se blood alcohol limits for drivers where there is the presence of illicit and licit psychotropic drugs in the same samples. In three countries this movement has been identified, but discussions started only recently, whereas in one country proposals have in fact already been made. Because thirteen of the remaining seventeen countries stated that there would be no change in the foreseeable future, it is of importance to know the reasons for the differences in opinion.

Prevention

Legislation is a most important factor of prevention. To point out this function, new legislation should be accompanied by information campaigns and should be discussed in public. The intention of the new regulation, the efficiency of the legislation and the corresponding information campaign should be evaluated. This was one of the conclusions of the 1999 seminar. There is a need to know where well-designed, carefully implemented and critically evaluated drugs and driving prevention programmes exist. The results of this survey indicate that a majority of respondents (66.6%) is not aware of any regular information campaigns during the last three years to inform the public about the dangers of drug impaired driving. Some interesting examples of information campaigns have, however, been identified. Only a few countries have started activities to improve patient drug information by proposing a categorisation system allowing the selection of the least impairing drug within each therapeutic class. The same holds true for implementing prescribing and dispensing guidelines to promote the use of relatively safe medicines in treating patients who drive.

It is concluded that countries that have developed initiatives to discuss proposals for changing legislation have not discussed supporting information campaigns aimed at the general public and health care professionals and need to be informed about the existing possibilities in more detail.

5. Recommendations

The recommendations that follow the conclusions (see Chapter 4) of this survey allow the presentation of specific actions that the Council of Europe member States could consider as important for their policy development in the use/abuse of psychoactive drugs in driving. It is, however, unrealistic to expect that recommendations that present statements on what member States should do or need to develop will lead automatically to support the initiation and implementation of changes in legislation, law enforcement procedures and data-gathering to present better statistics. It is therefore recommended to invite member States to discuss the so called *'best practices'* that could serve as an example to others. In this approach specific member States that have reported important achievements or significant change in the respective areas of interest as raised in this survey, are invited to communicate their information and discuss the problems and possible solutions in more detail during the next seminar of the Pompidou Group.

In particular, one could imagine that a seminar with sessions that allow optimal interaction between participants is the desired way to exchange knowledge and experiences. Therefore the possibility of organising workshops with discussions of case studies dedicated to specific themes is suggested as the way forward.

The presentation of *'best practices'* focused on the following subjects will allow the member States to learn from those countries that have (recently) been involved in changing the legislation, law enforcement, data-gathering on cases pertaining to drugs and driving and prevention activities. The suggestions for topics and countries which have *'best practices'* to report are presented in Table 11.

Table 11 Suggested topics for discussing the 'best practices' presented by various countries

Topic	Countries with 'best practices'
Provisions in legislation	
- to improve standardised data-gathering in accidents	Norway, France, United Kingdom
- to introduce 'zero-tolerance' for illicit drugs	Germany, Belgium, Sweden
- to conduct roadside surveys	Germany, Netherlands
Standardised protocols for analysing body fluids	Norway
Risk assessment and methadone use	Austria, Germany, Switzerland
Field experiences with roadside screening devices	Norway, Finland, United Kingdom
Training programmes for police officers	Norway, Germany, Belgium, Slovenia
Distinguishing between drug and alcohol-related offences in statistics (arrested, prosecuted and convicted)	Norway, Sweden
Improvement of patient drug information	
- Warning systems	Norway, Finland, Sweden, France
- Leaflets	Belgium, Germany
Improvement of prescribing and dispensing practices	Belgium, Germany, Netherlands, Spain
- Categorisation system	Norway, Netherlands, Spain
- Guidelines	

The organisation of the workshops should create the right atmosphere to provide optimal exchange of knowledge and experiences allowing member States to promote activities and action plans that are more realistic in their respective political and social environments. By offering practical background information and motivation meeting participants' needs it is expected that professionals will support a movement to change practices and policy making. It is a challenge to provide a networking activity and stimulating environment that allows participants to continue communications with representatives from countries that present *'best* practices' after the next seminar and thereby contribute more to its objectives.

6. Acknowledgements

The author gratefully acknowledges the co-operation and support of the following representatives of the various Council of Europe member States:

Austria:
Josef Baumgartner - Federal Ministry of Social Security and Generations
Univ.-Prof. Dr. Alfred Springer
Dr. Michael Braun
Mag. Katharina Hnatek-Petrak

Belgium:
Charles De Winter - Federal Police
Prof. Alain Verstraete – University of Gent

Cyprus:
Androulla Boularan - Ministry of Justice and Public Order

Czech Republic:
Josef Radimecky - National Drug Commission
Ass. Prof Marie Balikova – Medical Faculty
Judr. Hanlova – Public Prosecution

Denmark:
Lars Petersen - Ministry of the Interior and Health
Michael Højer - Ministry of Justice
Louise Heilberg – Ministry of Transport
Per Helboe – The Danish Medicines Agency
Eva Bidstrup – National Board of Health

Estonia:
Andri Ahven - Ministry of Internal Affairs

Finland:
Dr Tapani Sarvanti - Ministry of Social Affairs and Health
Dr Pirjo Lillsunde
Mrs Leene Leikas
Mr Terhi Hermanson

Germany:
Dr Susanne Becker - Federal Highway Research Institute
Dr Albrecht – Bundesanstalt für Strassenwesen- BASt

Greece:
Dr Anna Kokkevi - Greek Organisation Against Drugs (OKANA)

Iceland:
Sandra Baldvindottir – Ministry of Justice

Ireland:
Cornelius F.O'Donoghue - Garda National Traffic Bureau
Catherine P. Leavy - Medical Bureau of Road Safety

Italy:
-

Netherlands:
Mrs Wil de Zwart - Ministry of Health, Welfare and Sports

Norway:
Ketil Bentzen - Ministry of Health and Social Affairs
Lilly Sofie Ottesen - Ministry of Health and Social Affairs
Prof Asbjørg S. Christophersen and
Prof Jørg Mørland – National Institute of Forensic Toxicology

Poland:
Tomasz Polec - Department of Road Traffic Policy

Portugal:
Joaquim Rodrigues - Ministry of Health
Pedro Manuel Neto Gouveia
Dra. Adelaide Nuncio

Slovenia:
Robert Susanj - General Police Directorate

Spain:
Ana Andres Ballesteros - National Plan on Drugs, Ministry of the Interior

Sweden:
Ralf Löfstedt - Ministry of Health and Social Affairs
Eva Brannmark - Swedish National Police Board

Switzerland:
Diane Steber Buchli - Swiss Federal Office of Public Health
Dr Peter Xiten - University of Zurich
Dr Werner Bernhard - University of Berne

Turkey:
Osman Paksut - Ministry of Foreign Affairs

United Kingdom:
Dr Paul Jackson
Robert Davies
Jeremy Moore
Dr John S. Oliver
Dr Jane Durston

Problems raised by the use of psychoactive drugs by drivers - update to review the progress since 2001

by Johan J. De Gier (The Netherlands)

Summary

This update serves the purpose of a follow-up survey addressing the progress that member States can disclose to show how policies in the use/abuse of psychoactive drugs have been developed since the first survey conducted in 2001. The results are derived after data gathering by applying a questionnaire sent out to 24 member States and analysing the responses from 11 countries (response rate: 46%). This response rate is probably moderate because not many new or planned developments could be indicated in the past one and a half year. But a significant number of countries could report significant changes.

Legislation and prevalence of drug use among drivers
No major progress has been reported, neither with respect to changes in legislation nor the planning of future road side surveys, except for the Swiss intensions to plan several road side surveys in a few Cantons. In France a new Traffic Law (enforced in February 2003) allows police enforcement officers to conduct roadside testing if there is suspicion of illicit drug use.

Impact of risk assessment studies
The new information provided by the Swiss respondents that a retrospective study will be completed in 2004, did not indicate whether the prevalence data of injured drivers will be compared with a control group in order to estimate risk potentials. The Finnish respondent reported an antihistamine study presently conducted.

Detection and police enforcement
In this update only four other countries reported progress compared to the previous responses. In Slovenia and Poland the establishment of a drug recognition and evaluation programme for police officers could be reported, whereas in Spain a project to revise the police procedures for detecting drug us in road traffic controls will start within a few months. Finland reported the inclusion of a modified DRE-training in the basic education programme
of police officers. In France urine screening tests for illicit drugs are used to decide whether or not blood tests should follow in prosecution. A new European approach has been observed for testing drug screening devices (ROSITA -Roadside Testing Assessment – II project, including 8 European countries). The responses provided by two countries indicated the involvement in saliva screening under field-testing conditions (only Norway reported involvement in the ROSITA II- project to be started in 2003). In Switzerland a similar interest in saliva screening has been reported, which indicate the importance of an acceptable, non-invasive drug screening device to be applied by police enforcement officers.

Medical examination and toxicology
In this update only one country, Poland, reported a new project to develop guidelines for examiners supported by the Ministry of Health. Although a minor change compared to the previous questionnaire this development is significant for Poland, where several activities have started to train police officers and physicians (see above).

Prosecution
It is a positive sign that in this update Slovenia could provide some statistics, in addition to Finland, Norway and Sweden, with respect to the prosecution of DUI cases, but progress seems to be slow in other countries. However, priority should be given to developing reliable statistics on arrested, prosecuted and convicted drivers in all countries of the Council of Europe.

Regranting procedures and rehabilitation programmes
In this update new procedures have been introduced in France, Luxembourg and Poland, whereas Switzerland has prepared changes in the traffic law to be enforced in 2005. The responses in the previous survey showed that there is enormous variation in regranting procedures, especially the period for licence suspension and the measures implemented in case of drug abuse or drug dependence. The conclusion reached in 2001 is still valid today that more exchange programmes are needed to define the effectiveness of different regranting schemes in treating offenders who are found drug-positive in road traffic.

Legislation
In this update Finland and France both reported the introduction of a zero-tolerance legislation in February 2003, whereas Switzerland has indicated that a new Road Traffic Act will be enforced in 2005, in which zero blood concentrations for the most frequently used illicit drugs will be stated. Interestingly, responses given in this update to the introduction of 'zero-tolerance' legislation by six countries indicate that policy makers in these countries have reported different opinions. A 'zero-tolerance' legislation for both illicit and impairing medicinal drugs was indicated as opinion for discussing future development of legislation in Slovenia. The respondent from Switzerland indicated that a 'zero-tolerance' law will be introduced for a certain number of illicit drugs or drugs to be enforced in 2005, but 'impairment' legislation was indicated for medicinal drugs with impairing effects on driving only and for illicit drugs which are not included in the illicit drug list of the zero-tolerance law. A similar approach is indicated by the respondent from Finland. In France zero-tolerance legislation is introduced for illicit drugs only. In Spain 'impairment' legislation has been reported as the opinion for most frequently illicit drugs only. In Norway the government has recently discussed the Road Traffic Act (presently an 'impairment' legislation) and decided not to change the law into a 'zero-tolerance' law. These results clearly indicated that consensus in opinion amongst member States is still lacking, and calls upon further discussion to know the reasons for the differences in opinion.

Prevention

The examples presented by two respondents in this update show that campaigns which are different in scope. One example from Slovenia shows an information campaign regarding drugs and driving as part of a drug abuse prevention programme that was launched a few years ago among workers by the Institute of Public Health of Slovenia together with the Ministry of Labour, Family and Social Affairs. The programme identified in Spain shows an annual campaign aimed at health professionals, through specific medical media, in order to inform them about drugs and driving problems. In this country the application of pictograms on medicines has been announced to warn the patient about medicines that have a potential to impair driving.

In Slovenia discussions have started to improve patient drug information by proposing a categorisation system allowing the selection of the least impairing drug within each therapeutic class. The same holds true for implementing prescribing and dispensing guidelines to promote the use of relatively safe medicines in treating patients who drive.

It is further identified that policy makers in these two countries were indeed of the opinion that the proportion of drivers under the influence of impairing medicinal drugs is greater than the proportion of drivers under the influence of illicit drugs. This awareness might be reflected by their activities to improve prescribing and dispensing practices for the application of impairing medicinal drugs.

Conclusions

It is concluded in this update that a few countries have developed initiatives since 2001 to discuss proposals for changing legislation. The need to discuss the various opinions about whether the 'zero-tolerance' approach or the 'impairment' approach will be the best option for their respective societies is still present and should be addressed in future activities of the Pompidou Group. Especially since one country, Norway, has done some evaluations concerning their present ('impairment') law in comparison with the outcomes of European developments with respect to 'zero-tolerance' legislation that lead to the conclusion not to change their law in the foreseeable future.

One other conclusion is that changing the perception in society about the need to address the drugs and driving problems seems to work if various activities can be developed that are interrelated and thereby can support each other. For example the Slovenian approach makes clear that a change in traffic law, can be best discussed when police officers are simultaneously trained to be better prepared for drug screening in traffic control conditions and health care professionals are made more aware of improving their prescribing and dispensing practices with respect to impairing medicinal drugs. This integrated approach might be another item for in-depth discussion of a 'best practice' situation to inspire other member States in their policy development in the use/abuse of psychoactive drugs in driving.

1. Preamble

In April 2002 the Pompidou Group was able to publish a report *Problems raised by the use / abuse of psychoactive drugs by drivers* prepared by Dr Johan J. De GIER[1]. This report was based on the input provided by the Permanent Correspondents to Dr De GIER by completing a questionnaire sent by the Pompidou Group in 2001.

In preparing the Pompidou Group's next Seminar on Road Traffic and Drugs in June 2003, the preparatory committee has suggested to update the content of the report mentioned above. This will allow the organizers of the Seminar to use the most recent information for developing its programme.

The same subjects as presented in the questionnaire in 2001 were covered in this update, including a short list of questions, allowing Permanent Correspondents to indicate any new developments in their respective countries **since October 2001.**

2. Framework of the progress report

2.1 Aim of the update

The aim of this progress report is to update the previous survey (published in April 2002) by disclosing new developments in the various countries since October 2001, the date that the first questionnaire was completed for analyses. The same subjects as presented in the previous questionnaire were provided again in this update:

- Prevalence
- Risk assessment
- Detection and police enforcement
- Medical examination and toxicology
- Prosecution
- Regranting procedures and rehabilitation programmes
- Legislation
- Prevention

The present document will describe the updated basis for proposals and approaches that will contribute to the ongoing discussions in national and international bodies, both governmental and non-governmental, and at the level of researchers, professionals and practitioners.

2.2 Contributions from member States

The Permanent Correspondents were asked to answer the questions based on experience, current knowledge and opinions within their respective governments that could reflect any progress since October 2001. In case no responses were received, it was felt that the situation as described in the report of April 2002 was still valid for further discussion.

1 Cf. Pages 13 & seq.

The proposed update was planned to be available for further discussion by the beginning of June 2003. Therefore, the deadline for returning the completed questionnaire was set as end of March 2003. The questionnaire was sent out in February 2003 to 24 member States, who responded previously to the first questionnaire,.

2.3 Presentation of results

The responses of the various Permanent Correspondents will be presented in Chapter 3. The discussion and conclusions following the evaluation of these responses are presented in Chapter 4, and meant to decide how the set of recommendations of the previous report (Chapter 5) is still valid for future activities to enhance the awareness of the need to improve road safety as it relates to the consumption of illicit or medicinal drugs which affect the ability to drive.

3. Results

3.1 Response rate

In total 11 questionnaires were received, most of them completed by more than one person representing the different areas of expertise (e.g. police and law enforcement, medical field). The response rate was 46%. The following member States responded to the questionnaire:

- Cyprus
- Finland
- France
- Norway
- Poland
- Slovenia
- Spain
- Sweden
- Switzerland
- Turkey

One member State, **Luxembourg**, responded to the questionnaire in the present survey, whereas no responses were received in the previous survey.

3.2 Prevalence

Legislation for improved data-gathering
The following question was raised in the questionnaire:

Q 3.2.1 Has legislation recently been initiated (or has discussion started) that allow gathering of data on prevalence of drug use by drivers?

In **Finland** and **France** a new Traffic Law allows police enforcement officers to conduct roadside testing, if there is suspicion of illicit drug use. In none of the other responding countries new legislation has been introduced since 2001 that allow gathering of data on prevalence of drug use by drivers.

Status of roadside surveys
The following question was asked to find out more about any recent developments:

Q 3.2.2 Are there any roadside surveys presently being conducted or planned to obtain data on illicit and medicinal drug use in the general driving population?

In two countries (**Switzerland , Poland**) new developments could be reported. In **Switzerland** road side surveys are planned on Cantonal (State) level, not on a Federal level, although no further details could be presented. In **Poland** a survey among the general population conducted in 2002 on “Psychoactive Substances Attitudes and Behaviours” included some questions related to drugs use in traffic. Results could not be reported yet.

3.3 Risk assessment

Risk assessment studies generally provide data either on

- increased accident risk, if drivers who are exposed to medicinal drugs in so called pharmacoepidemiological studies are being compared with drug-free control groups, or on

- increased risk of being responsible for causing the accident, if drug-positive fatally injured drivers are compared with control groups of drug-free fatally injured drivers.

Impact of risk assessment studies
The following question was presented to know the impact of risk assessment studies for developing new legislation:

Q3.3.1 Are there any risk assessment studies [with drug positive (fatally) injured drivers compared with control groups, or other epidemiological studies] recently being conducted?

One country, **Finland**, reported that an antihistamine study was carried out by the University Forensic Institute, but results could not yet be presented. One other country (**Switzerland**) reported a retrospective study on drug prevalence in the last 15 years, which will be finished by the University of Zürich in 2004. However, it is unclear whether the drug positive drivers will be compared with a control group in order to estimate risk potential.

3.4 Detection and police enforcement

Procedures used to detect impairment
Exchange of methods and experiences in detection and police enforcement between countries should be encouraged, according to the conclusions published in the report of the seminar in 1999. One area of interest in this respect are the procedures used by the police to reliably detect the impairment of drivers.

The different countries were requested to state any recent change in procedures used by the police by answering the following question:

Q 3.4.1 Are there any recent changes concerning procedures used by the police to detect the impairment of drivers reliably?

Only two countries (**Slovenia, Spain**) reported recent developments. In **Slovenia** the establishment of a drug recognition system for police officers could be reported, although no details could be presented on the exact nature of the procedures. In **Spain** a project to revise the procedures for the police in detecting drug use in road traffic controls will be starting within three months (before the summer of 2003).

The use of screening devices by the police was investigated by presenting the following question:

Q 3.4.2 Are there any drug testing devices for field-testing being used since 2001, or planned to be used?

In **Luxembourg** discussions have started to establish a better screening for drugs other than alcohol. In **Finland** the police has received about 50 Cozart-urine testing devices, donated by Lions Clubs. In **France** urine screening has been introduced to decide whether or not a blood test should follow in case a driver is suspected of driving under the influence of a drug other than alcohol. In **Norway** participation in the ROSITA-II-project (European project for evaluation of road side testing devices) will start in autumn 2003. Devices for saliva testing will be evaluated. Results from blood sample analyses will be compared with results from saliva sample analyses, where both samples are collected from the same drivers. In **Switzerland** a similar range of projects is running to evaluate different saliva screening devices in Zürich in Geneva. These projects will soon be finished and results will be available in due time. In **Spain** the outcomes of the project for revising the police procedures might indicate the need for new screening devices (see above).

Training programmes for police officers
There is a need for an effective training programme for police officers regarding drug recognition, drug impairment, and drugs and driving. In order to discover the most recent developments the following question was presented in the questionnaire:

Q 3.4.3 Are there any specific training programmes for police officers regarding drug recognition, drug impairment, or drugs and driving, recently being developed, introduced or planned?

Five countries reported recent developments. **Finland** reported the inclusion of a modified DRE-training in the basic education of police officers. In **Luxembourg** annual courses on drugs and driving are organized to educate traffic police enforcement officers. However any recent change in these courses could not be indicated. In **Poland** several activities started. Last year (2002) the Polish police organized a training for traffic police officers in cooperation with the Ministry of Health to educate skills for recognizing symptoms of recent drug use among drivers. During this summer (2003) a training programme in collaboration with German experts (scientists and police officers) will be organized.

In **Slovenia** drug recognition training courses have also been developed recently for traffic police officers. In **Spain** any need to train police enforcement officers will depend on the outcomes of the project for revising the police procedures that might indicate the need for new screening devices (see above).

3.5 Medical examination and toxicology

Standard procedures and protocols
The role of examiners (police, medical examiners, forensic physicians) in determining drug- specific impairment is varies from country to country. The following question was asked in order to reveal what has recently been achieved:

Q 3.5.1 Are you aware of any changes in examinations of drivers arrested for drug-impaired driving by medical examiners, forensic physicians, or general practitioners?

Only one country (**Poland**) reported a project by the Ministry of Health to develop guidelines for examiners concerning the detection of signs and symptoms of drug impaired drivers.

Q 3.5.2 Are you aware of any recent initiatives in your laboratory for implementing a new and standardized testing programme for drug analyses in blood?

Since the last two years all blood samples from apprehended drivers suspected to driving under the influence of drugs in **Norway** are analysed for 25 drugs (including alcohol, illegal drugs, psychoactive medicines, commonly used in Norway). Other drugs are looked for on special requests by the police or by the physician responsible for the medical examination performed at the time of the blood sampling. No recent developments could be disclosed by the other respondents.

3.6 Prosecution

Statistics
There is a need for distinguishing between drug and alcohol-related offences in statistics. This holds true for police reports on drugged driving, dismissals on prosecutions' decisions and charges or indictments before courts. The following question was presented to the representatives of the 24 participating countries:

Q 3.6.1 How many cases of drivers under the influence of drugs come before courts in the years 2001 and 2002 in your country?

The results are presented in Table 1. Only three countries (**Norway, Slovenia, Sweden**) were able to present some statistics on cases pertaining to drugs other than alcohol.

Table 1 Number of drivers, arrested, prosecuted and convicted for driving under the influence of drugs other than alcohol in 2001 and 2002.

Description of cases	Number of drivers in 2001	Number of drivers in 2002
Arrested for DUI other than alcohol	1,844 (Finland) 4,353 (Norway) 3.684 (Sweden)	1,850 (Finland) 5.165 (Norway) 4,258 (Sweden)
Prosecuted for DUI other than alcohol	Appr. 3,500 (Norway) 2,932 (Slovenia) 1,896 (Sweden)	Appr. 4,150 (Norway) 3,059 (Slovenia) 2,694 (Sweden)
Convicted for DUI other than alcohol	Appr. 2,350 (Norway)	Appr. 2,750 (Norway)

In comparing these years the increase of cases by 18% in 2002 in Norway and 42% in Sweden (for cases prosecuted for DUI) clearly indicates a trend that the police is still very active in arresting drivers for DUI. Surprisingly in Finland the number of cases arrested for DUI of drugs other than alcohol has stabilized over the last two years, as was the case with the number of DUI-cases prosecuted in Slovenia.

3.7 Regranting procedures and rehabilitation programmes

Procedures for treating drug-positive offenders
Representatives from the 24 countries were requested to clarify recent changes, if any, pertaining to the regranting procedures and rehabilitation programmes in their respective countries by responding to the following question:

Q 3.7.1 Are there any recent changes in procedures for treating offenders who are found to be drug-positive in road traffic (with or without impairment), specifically in licence suspension, regranting of licences, and drug rehabilitation programmes?

The change in the French Traffic Law (enforced in February 2003) allows convictions up to three years of imprisonment and fines of € 9,000. In addition driving licences can be withdrawn. In **Luxembourg** a change in the Traffic Law was introduced in August 2002. A 12 point-system for all driving licence holders was introduced. By committing traffic violations, a driving licence holder will loose points. A conviction of driving under the influence of drugs will result in the loss of one point. After suspension of a driving licence the regranting of a licence is possible after the completion of an examination (theoretical and practical) allowing to regain the 12 points with the licence after successful completion.

In **Poland** some rules in the Road Traffic Act (art 122 and 124) were changed in 2001. Offenders who are found drug-positive are now obliged to psychological and medical examination. In **Switzerland** offenders who are found to be drug positive can be convicted to imprisonment of minimum 6 months and a suspension of driving licence of minimum 3 months under a new Traffic Law that will be enforced in 2005.

3.8 Legislation

Approaches for new legislation
In discussing new legislation for drugs other than alcohol the question always will be raised about what doses and/or blood concentrations of drugs (either illicit or medicinal) are associated with acceptable or unacceptable driving capacity. Respondents were requested to give their opinion about recent developments in their respective countries pertaining to this issue by answering the following question:

Q.3.8.1. Are you aware of any development of new legislation where doses and/or blood concentrations of drugs (either illicit of medical) are associated with acceptable or unacceptable driving quality?

Both **Finland** and **France** reported the introduction of a zero-tolerance legislation for illicit drugs in February 2003. One other country, **Switzerland**, reported a new Road Traffic Act that will be enforced in 2005, in which zero blood concentrations for the most frequently used illicit drugs will be stated.

Responses to new legislation
In Germany, Belgium, and Sweden, 'zero-tolerance' laws (no measurable amounts of drugs detectable in the body) have been introduced for illicit drugs during the last few years. The following question was presented to the respondents of the other countries:

Q3.8.2. If you review the recent discussions in your country about legislations in Germany, Belgium and Sweden (all 'zero-tolerance laws'), please indicate how most of the opinions presented would favour a future development of the following options:

Three respondents reported an opinion that were different in nature. In **Slovenia** a 'zero-tolerance' legislation for both illicit and impairing medicinal drugs was indicated as opinion for discussing future development of legislation. In **Spain** 'impairment' legislation has been reported as the opinion for most frequently illicit drugs only.

In **Switzerland,** a zero-tolerance law will be introduced for a certain number of illicit drugs or drugs to be determined in 2005, but 'impairment' legislation was indicated for medicinal drugs with impairing effects on driving only (assessment by the police together with a physician to exclude illness/injury) and for illicit drugs which are not included in the illicit drug list of the zero-tolerance law.

In **Norway** the government has recently discussed the Road Traffic Act (presently an 'impairment' legislation) and decided not to change the law into a 'zero-tolerance' law. The main reason for this decision is the opinion that the present law seems to work well, given the large numbers of drugged drivers arrested each year (almost 4,000 DUI cases in a population of 4.5 million inhabitants).

3.9 Prevention

Information campaigns
Legislation is a most important factor of prevention. To highlight this function, new legislation should be accompanied by information campaigns. In order to disclose any recent plan to start an information campaign the following question was presented:

Q 3.9.1 Are you aware of any recent development to start an information campaign to inform the public of the dangers of driving when taking certain illicit or medicinal drugs?

Only two countries have reported recent activities. In **Slovenia** a drug abuse prevention programme was launched a few years ago among workers by the Institute of Public Health of Slovenia together with the Ministry of Labour, Family and Social Affairs as part of an ILO (International Labour Organization) - project. The programme included an information campaign regarding drugs and driving. In **Spain** an annual campaign has been started about the use of medicine in transportation. This campaign is aimed at health professionals, through specific medical media.

Improvements of patient drug information
The information in the package insert of medicinal drugs should be more informative, operational and less vague, according to experts' opinion. One way to improve these type of warnings is the use of pictograms. The following question was asked to find out more about initiatives in that direction since 2001:

Q 3.9.2 Are you aware of any (recent or intended) improvements in warning systems (for example pictograms on medicines that have a potential to impair driving?

Only one member State, **Spain**, stated the application of pictograms on medicines.

Categorisation system for medicinal drugs
One way to improve the use of relatively safer medication by drivers is to prescribe and dispense the least impairing medicinal drug in each therapeutic class. The guidelines to support such practices have been introduced in a few European countries during the last few years. The following question was presented to respondents from other countries:

Q 3.9.3. Has there been a recent discussion about developing a categorisation system (as introduced in for example Belgium and Spain) allowing physicians to prescribe the least impairing medicinal drug in each therapeutic class?

In **Slovenia** discussions have started at a national level to develop such a categorisation system. The information received during participation in international working groups and at international meetings has been used to feed these discussions.

Opinion about proportion of drivers taking psychoactive drugs
In the development of new prevention programmes it is important to know how policy makers feel about the magnitude of a problem, such as the proportion of drivers in the general driving population taking impairing psychoactive drugs. The following question was presented to know this opinion:

Q 3.9.4. Are policy makers generally of the opinion that the proportion of drivers in the general driving population taking psychoactive drugs with the potential to impair driving is estimated to be higher than the proportion of drivers using illicit drugs?

Four member States (**Cyprus, Finland, Slovenia, Spain**) responded that policy makers were indeed of the opinion that driving using medicinal drugs that impair driving is more frequently expected to happen in the general driving population than driving while using illicit drugs.

4. Discussion and conclusions

It is the aim of this survey to present an update of the report published in April 2002, especially to disclose whether new developments could be described that have not been reported in the previous questionnaire which was sent to the member States in 2001. The new information has been provided by about half (11) of respondents from the 24 countries who provided the answers to the questions in the previous questionnaire. This rather low response rate could be decided as a limitation of this update, preventing any firm conclusions about the progress in the 24 member States.

It could also be considered as a realistic view on the developments in many countries, where changes in opinions by policy makers are not frequently observed within a period of just one or two years. However, it is not certain whether this was the case, since responses from the 15 remaining countries were not received.

The responses of this update could indicate a trend of new developments at least in those countries from which the completed questionnaires were received. Therefore these trends will be discussed, comparing the result with the responses given previously in the more extensive survey among 24 member States.

Legislation and prevalence of drug use among drivers
In one third of the countries responding to the previous questionnaire in 2001, discussion has started that addresses the gaps in research on prevalence of illicit and medicinal drug involvement in accidents. The major barrier to improve this situation is legislation that provides for collection of blood samples only when a driver is suspected of driving under the influence of drugs. New legislation that allow gathering of data on

the prevalence of drug use by drivers has not been introduced since 2001 in any of the responding countries involved in this update. It is concluded that no significant changes have been reported, neither with respect to changes in legislation nor the planning of future road side surveys, except from the Swiss intensions to plan several road side surveys in a few Cantons.

Impact of risk assessment studies
In the previous questionnaire only one countries not responding in this update (Netherlands) disclosed its intension to conduct risk assessment studies in 2002. Since no information could be obtained from these countries in this update earlier this year, it is unclear whether this country has succeeded to complete a study. The new information provided by the Swiss respondents that a retrospective study will be completed in 2004, did not indicate whether the prevalence data of injured drivers will be compared with a control group in order to estimate a risk potential.

Detection and police enforcement
The drug recognition and evaluation procedures are of particular interest, since only four countries (Austria, Finland, Norway, United Kingdom) reported the application of different DRE-like procedures in the previous survey. In the update only two other countries reported progress compared to the previous responses. In Slovenia and Poland the establishment of a drug recognition and evaluation programme for police officers could be reported, whereas in Spain a project to revise the police procedures for detecting drug us in road traffic controls will start within a few months.

A European approach has been observed for testing drug screening devices (ROSITA -Roadside Testing Assessment – II project including 8 European countries). The responses provided by two countries indicated the involvement in saliva screening under field-testing conditions (only Norway reported involvement in the ROSITA II-project to be started in 2003). However, since the ROSITA II- project will be conducted with contributions of experts from 8 European countries, at least seven other countries would have been able to report this progress. In Switzerland a similar interest in saliva screening has been reported, which indicate the importance of a acceptable, non-invasive drug screening device to be applied by police enforcement officers.

Medical examination and toxicology
In the previous questionnaire only five countries (Germany, France, Portugal, Norway and Sweden) reported the development of protocols for medical examination by (forensic) physicians and assessments by police officers to detect signs and symptoms of drug use in impaired drivers. In this update only one country, Poland, reported a new project to develop such guidelines for examiners supported by the Ministry of Health. Although a minor change compared to the previous questionnaire this development is significant for Poland, where several activities have started to train police officers and physicians (see above).

Prosecution

There is a need to distinguish between drug- and alcohol-related offences in statistics. This holds true for police reports on drugged driving, dismissals on prosecutions' decisions and charges or indictments before courts. Unfortunately, the results presented in the previous survey show that only a few (Nordic) countries were able to present the desired statistics. It is a positive sign that in this update Slovenia could provide some statistics with respect to the prosecution of DUI cases, but progress is slow in other countries. More priority should be given to developing reliable statistics on arrested, prosecuted and convicted drivers in all countries of the Council of Europe.

Regranting procedures and rehabilitation programmes

The responses in the previous survey showed that there is enormous variation in regranting procedures, especially the period for licence suspension and the measures implemented in case of drug abuse or drug dependence. In this update new procedures have been introduced in Luxembourg and Poland, whereas Switzerland has prepared changes in the traffic law to be enforced in 2005. The conclusion reached in 2001 is still valid today that more exchange programmes are needed to define the effectiveness of different regranting schemes in treating offenders who are found drug-positive in road traffic.

Legislation

Respondents in the previous survey in 2001 were requested to give their opinion about how the development of new legislation will proceed if there is virtually no information on what doses and/or blood concentrations of drugs (either illicit or medicinal) are associated with acceptable or unacceptable driving quality. The results in this previous survey showed that a majority of respondents (66.6%) favour the development of so called 'impairment' legislation for both illicit and medicinal drugs, whereas 33.3% would favour this for medicinal drugs only. The opinion about 'zero-tolerance' legislation indicated that 58.8% would favour this for illicit drugs only and 47.1% for both illicit and medicinal drugs. In this update one country, Finland, reported the introduction of a zero-tolerance legislation as of February 2003. Switzerland has indicated that a new Road Traffic Act will be enforced in 2005, in which zero blood concentrations for the most frequently used illicit drugs will be stated.

Interestingly, responses given in this update to the introduction of 'zero-tolerance' legislation in five countries indicate that policy makers in these countries have reported different opinions. A 'zero-tolerance' legislation for both illicit and impairing medicinal drugs was indicated as opinion for discussing future development of legislation In Slovenia. The respondent from Switzerland indicated that a 'zero-tolerance' law will be introduced for a certain number of illicit drugs or drugs to be enforced in 2005, but 'impairment' legislation was indicated for medicinal drugs with impairing effects on driving only and for illicit drugs which are not included in the illicit drug list of the zero-tolerance law. A similar approach was indicated by the Finnish respondent. In Spain 'impairment' legislation has been reported as the opinion for most frequently illicit drugs only. In Norway the government has recently discussed the Road Traffic Act (presently an 'impairment' legislation) and decided not to change the law into a 'zero-tolerance' law. The main reason for this decision is the opinion that the present law seems to work well, given the large numbers of drugged drivers arrested each year (almost 4,000 DUI cases in a population of 4.5 million inhabitants).

These results clearly indicated that consensus in opinion amongst member States is still lacking, and calls upon further discussion to know the reasons for the differences in opinion.

Prevention

Legislation is a most important factor of prevention. There is a need to know where well-designed, carefully implemented and critically evaluated drugs and driving prevention programmes exist. The examples presented by two respondents in this update clearly show that campaigns are different in scope. One example from Slovenia shows included an information campaign regarding drugs and driving as part of a drug abuse prevention programme that was launched a few years ago among workers by the Institute of Public Health of Slovenia together with the Ministry of Labour, Family and Social Affairs. The programme identified in Spain shows an annual campaign aimed at health professionals, through specific medical media, in order to inform them about drugs and driving problems. In this country the application of pictograms on medicines has been announced to warn the patient about medicines that have a potential to impair driving.

In Slovenia discussions have started to improve patient drug information by proposing a categorisation system allowing the selection of the least impairing drug within each therapeutic class. The same holds true for implementing prescribing and dispensing guidelines to promote the use of relatively safe medicines in treating patients who drive.

It is further identified that policy makers in these two countries were indeed of the opinion that the proportion of drivers under the influence of impairing medicinal drugs is greater than the proportion of drivers under the influence of illicit drugs. This concern might be reflected by their activities to improve prescribing and dispensing practices for the application of impairing medicinal drugs.

Conclusions

It is concluded in this update that a few countries have developed initiatives since 2001 to discuss proposals for changing legislation. The need to discuss the various opinions about whether the 'zero-tolerance' approach or the 'impairment' approach will be the best option for their societies is still present and should be addressed in future activities of the Pompidou Group. Especially since one country, Norway, has done some evaluations concerning their present ('impairment') law in comparison with the outcomes of European developments with respect to 'zero-tolerance' legislation, that lead to the conclusion not to change their 'impairment' law in the foreseeable future.

One other conclusion is that changing the perception in society about the need to address the drugs and driving problems seems to work if various activities can be developed that are interrelated and thereby can support each other. For example the Slovenian approach makes clear that a change in traffic law, can be best discussed when police officers are simultaneously trained to be better prepared for drug screening in traffic control conditions and health care professionals are made more aware of improving their prescribing and dispensing practices with respect to impairing medicinal drugs. This integrated approach might be another item for in-depth discussion of a 'best practice' situation to inspire other member States in their policy development in the use/abuse of psychoactive drugs in driving.

Finally, it is probably not surprising that only those countries have responded to the questionnaire in this update that can show progress since 2001. It is stimulating that different opinions have been presented by just a few countries concerning the various topics, but it would be more rewarding if future discussions with all member States will result in a better exchange of knowledge and experience to follow up on what has been started by the Pompidou Group in recent years.

5. Recommendations

The recommendations that follow from this update are in agreement with those presented in the previous survey published in 2002. It is still unrealistic to expect that recommendations on what member States should do or need to develop will lead automatically to support the initiation and implementation of changes in legislation, law enforcement procedures and data-gathering to present better statistics. It is therefore recommended to invite member States to discuss the so called *'best practices'* that could serve as an example to others. In this approach specific member States that have reported important achievements or significant change in the respective areas of interest as raised in this survey, are invited to communicate their information and discuss the problems and possible solutions in more detail during the next seminar of the Pompidou Group.

In particular, one could imagine that a seminar with sessions that allow optimal interaction between participants is the desired way to exchange knowledge and experiences. Therefore the possibility of organising workshops with discussions of case studies dedicated to specific themes is suggested as the way forward.

The presentation of *'best practices'* focused on the following subjects will allow the member States to learn from those countries that have (recently) been involved in changing the legislation, law enforcement, data-gathering on cases pertaining to drugs and driving and prevention activities. The suggestions for topics and countries which have *'best practices'* to report are presented in Table 2. This table is partly derived from Table 11 in the previous report and completed based on the update in this progress report.

Table 2 Suggested topics for discussing the 'best practices' presented by various countries

Topic	Countries with 'best practices'
Provisions in legislation	
- to improve standardised data-gathering in accidents	Norway, France, United Kingdom
- to introduce 'zero-tolerance' for illicit drugs	Finland, Germany, Belgium, Sweden
- to conduct roadside surveys	Germany, Netherlands
Standardised protocols for analysing body fluids	Norway
Field experiences with roadside screening devices	Norway, Finland, United Kingdom, Switzerland
Training programmes for police officers	Norway, Germany, Belgium, Poland, Slovenia, Spain
Distinguishing between drug and alcohol-related offences in statistics (arrested, prosecuted and convicted)	Norway, Slovenia, Sweden
Improvement of patient drug information	
- Warning systems	Norway, Finland, Sweden, France, Spain
- Leaflets	Belgium, Germany
Improvement of prescribing and dispensing practices	
- Categorisation system	Belgium, Germany, Netherlands, Spain
- Guidelines	Norway, Netherlands, Spain

The organisation of the next seminar should create the right atmosphere to provide optimal exchange of knowledge and experiences allowing member States to promote activities and action plans that are more realistic in their respective political and social environments. By offering practical background information and motivation meeting participants' needs it is expected that professionals will support a movement to change practices and policy making. It is a challenge to provide a networking activity and stimulating environment that allows participants to continue communications with representatives from countries that present *'best* practices' after the next seminar and thereby contribute more to its objectives.

6. Acknowledgements

The author gratefully acknowledges the co-operation and support of the following representatives of the various Council of Europe member States:

Cyprus:
Mr Andreas Tryfonides - Ministry of Health
Police Headquarters, Traffic Department – Ministry of Justice and Public Order

Finland:
Veli-Matti Risku – Ministry of Social Affairs and Health Department
Dr Pirjo Lillsunde – National Public Health Institute
Mr Terhi Hermanson
Mrs Leena Leikas

France:
Mrs Evelyne Jimenez – MILDT

Luxembourg
Mrs Simone Schram – Direction de la Santé, Service AST

Norway:
Prof Asbjørg S. Christophersen – Norwegian Institute of Public Health, Div. of Forensic Toxicology and Drug Abuse
Prof Jørg Mørland – Norwegian Institute of Public Health, Div. of Forensic Toxicology and Drug Abuse

Poland:
Piotr Jabłoński – National Bureau for drug Prevention

Slovenia:
Dusan Nolimal – Institute of Public Health
Robert Sušanj - General Police Directorate
Dr Madja Zorec Karlovšek - Institute of Public Health

Spain:
Juan Carlos Gonzales Luque - General Directorate of Traffic. Ministry of Interior
Mrs Yolanda Nuñez - Government Delegation for the National Plan on Drugs

Sweden:
Ralf Löfstedt - Ministry of Health and Social Affairs
Mrs Eva Brännmark - Swedish National Police Board

Switzerland:
Dr Peter X. Iten - University of Zurich
Dr Werner Bernhard - University of Berne

Turkey:
Ismail Aramaz – Ministry of Foreign Affairs
Kadir Duman – Ministry of Interior
A. Erkan Coca - Ministry of Interior

Methadone and driving - problems related to driving under the influence of methadone or other substances

by Johan J. De Gier (The Netherlands)

Summary

The aim of this report is to support the various discussions on the relationship between methadone use, impaired driving and accident risks within the Pompidou Group by reviewing the literature and evaluating the present knowledge. In addition, by evaluating some 'best practices' in the application of procedures for rehabilitation of drug-driving offenders, some recommendations will be presented to support further discussion on problems related to driving under the influence of methadone and other substances.

In Chapter 1 the introduction describes the reasons for focusing on problems related to driving under the influence of methadone and other substances. In the seminar *Road traffic and drugs*, organised by the Co-operation Group to Combat Drug Abuse and Illicit Trafficking in Drugs (Pompidou Group), held in Strasbourg, 19-21 April 1999, it was made clear by the discussants that different opinions exist with respect to traffic safety issues if drivers are methadone substitution patients.

In Chapter 2 the various substances (methadone, buprenorphine, levo-alpha-acetylmethodol, LAAM) used in maintenance programmes for opiate addicted persons are discussed in more detail, focusing on the differences that exist between the drugs that have an impact on their use in treatment programmes.

In Chapter 3 the different approaches to study the effects of methadone on driving performance and accident risk are discussed by reviewing more than 20 experimental studies and a limited number of epidemiological studies. There is substantial evidence that methadone intake might impair functions of importance to safe driving. Considerable variation observed among subjects included in these studies prevents the generalization of these studies' outcomes.

In Chapter 4 emphasis is given to the existing procedures for assessing patients' driving fitness in methadone maintenance treatment programmes, particular in those countries where extensive experiences exist and where society has recognized the need to support the position of the patient under methadone maintenance treatment. By discussing these examples it might stimulate countries where present legislation does not provide patients in rehabilitation programmes to drive their cars, to act in concordance with what a best practice could be. The examples in this report refer to three countries (Germany, Austria and Norway) who provided adequate information concerning these issues in the previous reviews by the Pompidou Group, although evaluation of those activities could not always be presented.

Final discussion and conclusions are presented in Chapter 5. According to statistics provided in these countries it is obvious that that methadone use among drivers arrested for driving under the influence of a drug other than alcohol is rather low (1-5%). The police in Norway is the most effective in detecting drivers suspected for driving under the influence of drugs other than alcohol: about ten times more cases per million population in comparison with for example Austria. It is of interest to know how more intensive police enforcement activities, combined with less severe criteria for regranting a driving licence under methadone treatment in Norway relate to the low number of methadone substitution patients in treatment in this country. Additionally, the longer period for driving licence withdrawal in Norway (24 months) if drivers are convicted for DUI of drugs other than alcohol, might have some impact on people's behaviour in drug use and driving. On the other hand, the high percentage of additional psychotropic drug intake in methadone positive DUI cases in Norway (97%) shows that there probably exists a subgroup of hard core multiple drug users. These finding might be interpreted in various ways. One possibility is that most of the patients in methadone maintenance treatment who follow the treatment guidelines of not combining other drugs with methadone, could drive in a way not attracting the attention of the police. Those who did combine psychoactive drugs, however, will demonstrate the potential deteriorating effects of their drug intake in road traffic.

In reviewing the assessment procedures for patients in rehabilitation programmes substantial differences can be observed. In Austria a driver rehabilitation course has recently been introduced (in 2002) for drug impaired driving offenders. Successful completion of the course is a prerequisite for regranting the driving licence. But the criteria for assessing the performance of patients in substitution treatment programmes are not yet completely developed. Remarkable differences exist in the percentages of drivers who can comply with the criteria for regranting their driving licence (50% in Norway versus 5% In Germany). It is unknown whether differences in the length of the period in which stable methadone use should be proven (6 months in Norway versus 12 months in Germany) will in itself have an impact on the proportion of drivers who are able to comply with the criteria, or that other factors have an impact on this outcome.

Finally some recommendations to stimulate further discussion are presented in Chapter 6. The first recommendation is based on the Norwegian experiences and the differences in applying criteria for methadone users in regranting procedures for driving licences, if compared with criteria applied in both other countries (Germany and Austria). All other recommendations are based on the discussion of issues that need more attention in applying present procedures as indicated by the experts in this survey and relate to three different areas. Firstly, multidisciplinary programmes where abstinence will not only be achieved by methadone substitution, but also by behavioural treatment options and approaches to improve social circumstances. Secondly, quality assurance measurements for improving transparency and standardization of medical treatment, psychological methods and law enforcement practices. Thirdly, secondary prevention, especially to understand how the methadone patients can comply with the criteria for regranting a driving licence and how to separate drivers on methadone who drive without causing problems and comply with the criteria from those who continue to use other psychoactive drugs, and thereby constitute a major traffic safety problem, in applying legislation.

1. Introduction

In the seminar *Road traffic and drugs*, organised by the Co-operation Group to Combat Drug Abuse and Illicit Trafficking in Drugs (Pompidou Group), held in Strasbourg, 19-21 April 1999, it was made clear by the discussants that different opinions exist with respect to traffic safety issues if drivers are methadone substitution patients. Active participation of drug addicts as drivers in road traffic is in general rejected on the basis of the assumption that the use of illicit drugs is severely impairing driving ability and thereby constitutes an unacceptable risk. The question when and how drug addicts can meet the requirements for driving fitness while in substitution therapy was an issue causing much debate among physicians, psychologists, forensic, legal and traffic safety experts.

In a situation of treating patients with methadone maintenance, this treatment is aimed at resocialisation and a return to mental and physical health, if abstinence from drugs or substitution without additional use of illicit drugs is ascertained. The possession of a driving licence will be seen as a precondition for resocialisation (1).

In a situation of applying legislation concerning driving under the influence of drugs other than alcohol and regranting of driving licences after suspension, it is obvious that there are legal constraints that will prevent patients in substitution treatment to legally drive a car (2). In every European country there exists legislation with sanctions against drivers who are under the influence of substances and have an impaired ability to drive a vehicle. The different EU members States apply national regulations on driving licences following Council Directive 91/439/EEC, in which it is declared that “driving licences shall not be issued to or renewed for applicants or drivers who are dependent on psychotropic substances or who are not dependent on such substances but regularly abuse them”.

It is a enormous dilemma if methadone substitution patients who are treated according to existing medical guidelines and regain the social support to live a normal live, will be prevented from obtaining or regranting a driving licence. It is even more complicated if these patients suffer from associated psychiatric disorders (psychosis, depression, anxiety, delirium) and are treated with medication occasionally prescribed, such as antipsychotics, antidepressants and benzodiazepines.

In addition to these issues specifically relating methadone substitution to driving impairment, other more general issues have an impact on the views of policy makers and health care providers. In a recent study by Bell et al. (3) the history of substitution treatment in five countries (Canada, the United Kingdom, Australia, Israel, and France) has been reviewed. In all these countries the critical issues around substitution treatment are similar. The first key issue concerns the balance between making treatment accessible and attractive, and at the same time minimizing diversion of the substances to the black market. The role of primary health care in delivering methadone maintenance treatment is the second issue for debate. Although, there has been increasing involvement of primary health care, with training and support for practitioners, there still remains uncertainty and official ambivalence over whether treatment should be restricted to specialist clinics and practitioners, or made available through primary care.

Most importantly, underlying the various critical issues is the problem of stigma being associated with both addiction, and with substitution treatment. One should be aware of the enormous strains on substitution treatment if community values and support to treatment programmes are discussed and the changes in policy that follow from those discussions. These critical issues are part of the broader discussion on methadone substitution treatment and traffic safety, and should not be overlooked in discussing this topic.

There is a need for reviewing the various aspects of these problems and for analysing the present knowledge and experiences pertaining to accident risk of patients treated with methadone as well as to effectiveness of rehabilitation programmes. The outcomes of these evaluations might support a discussion on how to develop strategies for rehabilitating drug-driving offenders and patients in methadone maintenance programs which are clear and transparent with respect to issues of concern in traffic safety. The relationship between the healthcare professional and the patient should be respected in order to achieve a positive treatment outcome as well as the need to determine how this treatment in itself constitutes a major danger to road safety.

The aim of this report is to support the various discussions within the Pompidou Group by evaluating the present knowledge on the relationship between methadone use, impaired driving and accident risks. In addition, by evaluating some 'best practices' in the application of procedures for rehabilitation of drug-driving offenders, some recommendations will be presented to support further discussion on problems related to driving under the influence of methadone and other substances.

2. Substances for opioid dependence

Substitution treatment for heroin addiction, defined as maintenance prescribing of opioid agonist drugs to opioid dependent subjects, has increased in the last decade. Opiates in the form of pain relievers, such as codeine and morphine, or drugs of abuse, such as heroin, act on a variety of receptors in the brain (4). The three most important subtypes are the mu, delta and kappa opiate receptor. The brain makes its "own morphine" (peptides derived from precursor proteins to form endorphins or enkephalins) to mediate opiate–like actions. However, the precise function of these endogenous opiates in the central nervous system remain largely unknown.

Exogenous opiates act as agonists at all three types, but in particular the mu receptor. At and above pain relieving doses the opiates induce euphoria, which is their main reinforcing property. A brief an intense euphoria is called a "rush", followed by a strong sense of tranquillity and drowsiness, mood swings, apathy and slowed motor movements. In overdose these agents act as depressants of respiration and can induce coma.

Opiates readily cause tolerance and dependence when given chronically. The first sign of adaptation of opiate receptors after chronic administration of opiates is the need to take a higher dose in order to relieve pain or to induce the desired euphoria. The withdrawal syndrome that shows once the chronically administered opiate is stopped is another sign that dependence has occurred. Craving for another dose of opiate, a feeling of dysphoria, irritability and sign of autonomic hyperactivity (such as tachycardia, tremor and sweating) are characteristic for the withdrawal syndrome. To relieve symptoms of withdrawal the opiate abuser will do everything to obtain the next dose.

Opiate receptor can readapt to normal in the abstinence of additional opiate doses. However, this is in most cases too difficult for the drug abuser and therefore oral substitution substances are given to assist the detoxification.

2.1 Methadone

Methadone (a prescription drug available since 1950) is currently the primary pharmacotherapy used in the treatment of heroin dependence in many countries, in order to reduce criminal behaviour, infectious disease transmission and overdose death. The drug is an opiate receptor agonist which has relief of moderate to severe pain as principle indication (10 to 20 mg/day, maximum 90 to150 mg/day). The drug is a central nervous system depressant that can cause drowsiness, dizziness, weakness, disorientation, lightheadedness and visual disturbances. The manufacturer cautions that methadone may impair the mental and/or physical abilities required for the performance of potentially hazardous tasks, and that the sedative effects of the drug may be enhanced by the concurrent use of other central nervous system depressants, including alcohol (5).

For substitution treatment with (R,S)-methadone (racemic methadone) a daily dose of 30 to 180 mg is used, whereas the (R)-methadone (levomethadone) is given in a daily dose of 10 to 75 mg. Withdrawal symptoms are similar to those of other opiates, is slower in onset and lasts longer, but is less severe.

To investigate the relationship between the increase in the number of methadone maintenance treatments, criminal activity of addicts and overdose-related deaths a study was undertaken in the Canton of Geneva, from 1983 to 1999 (6). Only a slight decrease is observed in the number of imprisoned opiate addicts since 1994, and a marked decrease is seen in overdose deaths from 1997 on.
In a French study a linear correlation was found between the increasing number of patients on maintenance treatment and the decrease in fatal heroin overdoses between 1994 and 1998 (7). In parallel with the expansion of these treatments the number of lethal overdoses has fallen off regularly from 564 in 1994, to 393 in 1996 and to 143 in 1998 (a reduction of 75.6% in 4 years). However, the investigators stated that other factors, such as political, social, healthcare related etc. could have modulated this decrease as well.

2.2 Buprenorphine

Buprenorphine (available since 1985) is a partial mu opiate agonist to substitute for stronger opiates. The drug is available in the form of sublingual tablets (0.2 or 0.4 mg) or as an injectable 0.3 mg/ml solution. Single doses of 0.3 to 0.6 mg may be repeated at 6 hours intervals. The drug is a central nervous system depressant that can cause drowsiness, dizziness, confusion, fatigue, blurred vision and slurred speech. The manufacturer cautions that buprenorphine may impair the mental and/or physical abilities required for the performance of potentially hazardous tasks, and that the sedative effects of the drug may be enhanced by the concurrent use of other central nervous system depressants, including alcohol (4).

Since February 1996, French general practitioners (GPs) are allowed to prescribe high dosages of buprenorphine for maintenance treatment of major opioid drug addiction. A prospective cohort of major opiate addicts was initiated in order to assess patient outcomes, such as follow-up two years after inclusion, retention rate in treatment, drug use, intravenous injection (8). Each GP, known to be involved in drug user management, had to include the first 10 opiate drug addict patients to whom he prescribed high dosage buprenorphine, with a maximum inclusion period of 3 months. Between May and July 1996, 919 patients (664 men and 225 women, mean age: 30 years) with a long and serious history of drug addiction were included by 101 GPs. Concurrent drug use (cocaine, codeine and other illicit drugs) was observed for most patients, while a majority suffered from psychiatric disorders (28% definite, 45% probable) and a smaller proportion from hepatic infections (hepatitis B: 23%; hepatitis C: 21%). Two years later, 55% of all patients were still followed-up by the same GP and a additional 12% were followed–up by another GP or in a health care institution (hospitalised or receiving methadone in a specialized centre). 13% were not followed, but GPs were able to describe their situation, 8% had been included by GPs who had dropped the study. Altogether 12% of patients were lost to follow-up. The substitution rate was 84% among the 508 patients still followed-up by the GP after two years. The mean daily dosage at inclusion and after two years was the same (7.8 mg), although the dosage range was larger after two years (0.4 to max 28 mg). Heroin intake in the previous month at intake and after two years fell from 40% to 11% and the additional drug intake from 53% to 20%. Social conditions had improved to average (housing and work). 14% of patients declared intravenous injection of high dosage buprenorphine in the previous month.

Another French study by De Ducla et al. (9) showed that care given by GPs prescribing high-dose buprenorphine is effective with respect to its impact on medical and social status of drug-dependent outpatients. A retrospective study was undertaken by 71 GPs, randomly selected from physicians in four health care networks. For the period between June and December 1997 data concerning the initial prescription, the first stabilization prescription and the most recent prescription was collected retrospectively. Among the outpatients included in this study, high-dose buprenorphine treatment resulted in a clear reduction in the use of heroin (69.9%) and benzodiazepines (57.1%).

It also reduced associated risks of infection and social vulnerability. The majority of opiate-dependent outpatients were compliant with treatment and successfully reintegrated into society. The study shows that the physicians within the framework of a primary health care network, with specialized training are able to provide effective treatment to opioid addicted outpatients.
Buprenorphine is also effective for short-term ambulatory heroin withdrawal, with greater retention, less heroin use and less withdrawal discomfort; and increased postwithdrawal treatment retention than clonidine and other symptomatic medications (10). Premedication with buprenorphine in newer methods of ultra-rapid opiate detoxification under intravenous sedation was proved to be safe and markedly decreasing post-procedure morbidity (11).

2.3 Levo-alpha-acetyl-methodol (LAAM)

L-Alpha-acetylmethodol acetate (LAAM) is a long-acting orally active opiate with pharmacologic properties similar to those of methadone (4). LAAM is however a much longer acting opiate with a longer half-life than methadone. Consequently clients receiving LAAM have a dose every 2 or 3 days whereas clients on methadone maintenance treatment must pick up a dose daily. The availability of LAAM has potential important implications for patients, clinics, and the community at large. Its high safety profile and low physical dependence liability make it a suitable drug for a subset of addicts as well as an initial treatment of choice in many opioid substitution treatment programmes (12).

Most information on the effectiveness of LAAM for treatment of opioid dependence has been given in studies comparing this drug with methadone and buprenorphine (see 2.4).

2.4 Comparison of different treatments

Johnson et al. conducted a 17-week randomised study of 220 patients, comparing LAAM (75 to 115 mg), buprenorphine (16 to 32 mg), and high-dose (60 to 100 mg) and low-dose (20 mg) methadone as treatments for opioid dependence (13). LAAM and buprenorphine were administered three times a week, whereas methadone was administered daily. Doses were individualized except in the group assigned to low-dose methadone. Patients with poor responses to treatment were switched to methadone. There were 55 patients in each group; 51% completed the trial. The mean number of days that a patient remained in the study was significantly higher for those receiving LAAM (89 ±6), buprenorphine (96±4), and high-dose methadone (105±4) than for those receiving low-dose methadone (70±4, $P<0.001$). Continued participation was also significantly more frequent among patients receiving high-dose methadone than among those receiving LAAM ($P=0.02$). The percentage of patients with 12 or more consecutive opioid-negative urine specimens was 36% in the LAAM group, 26% in the buprenorphine group, 28% in the hig-dose methadone group, and 8% in the low-dose methadone group. At the time of their last report, patients reported on a scale of 0 to 100 that their drug problem had a mean severity of 35 with LAAM, 34 with buprenorphine, 38 with high-dose methadone, and 53 with low-dose methadone ($P=0.002$). It was concluded that LAAM, buprenorphine and high-dose of methadone substantially reduced the use of illicit opioids compared with low-dose methadone.

In a double-blind randomised 6-week trial of buprenorphine and methadone, Petitjean et al. compared the safety and efficacy of sublingual buprenorphine tablets with oral methadone in a population of opioid-dependent individuals, using a flexible dosing procedure (14). Fifty-eight patients seeking treatment for opioid dependence were recruited in three outpatient facilities and randomly assigned to substitution with methadone or buprenorphine. The retention rate was significantly better in the methadone maintained group (90 vs 56%; P<0.001). Opioid positive urine samples were observed in similar proportions in both treatment groups (buprenorphine 62%; methadone 59%) completing the study. Positive urine specimens and mean heroin craving scores decreased significantly over time (P=0.035 and P<0.001). The proportion of cocaine-positive toxicology did not differ between groups.

At week 6 mean stabilization doses were 10.5 mg per day for the sublingual buprenorphine tablet, and 69.8 mg per day for methadone, respectively. The lower retention rate for buprenorphine was explained as a result of less adequate dosages during treatment induction.

In a meta-analysis conducted by Barnett et al. (15) the effectiveness of buprenorphine relative to methadone was considered. A systematic literature search identified five randomized clinical trials comparing the two drugs. Subjects who received 8-12 mg/day buprenorphine had 1.26 times the relative risk of discontinuing treatment (95% confidence interval 1.01-1.57) and 8.3% more positive urinalyses (95% confidence interval 2.7-14%) than subjects receiving 50-80 mg/day methadone. Buprenorphine was more effective than 20-35 mg/day methadone. The substantial variation in outcomes in the different trials may be due to differences in dose levels, patient exclusion criteria and provision of psychosocial treatment.

In conclusion, the differences in the effectiveness of buprenorphine and methadone may be statistically significant, but these differences are small compared to the wide variance in outcomes achieved in different methadone treatment programmes. Further research is needed to determine if buprenorphine treatment is more effective than methadone in particular settings or in particular subgroups of patients. LAAM is probably as effective as high-dose methadone and buprenorphine, but is quiet different in dosing schedule (every 2-3 days compared to daily doses of the other two drugs). Its high safety profile and low physical dependence liability make it a suitable drug for a subset of addicts as well as an initial treatment of choice in many opioid substitution treatment programmes.

3. Maintenance treatment and driving

(Chapter 3 is primarily based on a book chapter published by Prof Jørg Mørland, Norwegian Institute of Public Health, Division of Forensic Toxicology and Drug Abuse, in the book "Maintenance Treatment of Heroin Addiction – Evidence at the Crossroads", Edited by Helge Waal and Egil Haga, J.W. Cappelens Forlag AS, Oslo, Norway, 2003. Parts of this chapter have been used with courtesy of the original author).

A complete understanding of the problem of drugs and driving (both its magnitude and the contributory role drugs play in road crashes) will only be achieved in the presence of findings from two complementary research approaches: experimentation and epidemiology (16). Experimental studies seek to determine the precise nature of the impairment produced by specific drugs, for example, to ascertain what psychomotor skills are affected in what ways, by what particular dosages (blood levels) of a substance. Although the particular behavioural effects of specific drugs are defined by such research, it will be difficult to translate these effects into road crashes. But how the extent and the magnitude of the problem is remains unknown. The purpose of epidemiological research is to answer these questions by examining the incidence of drugs in various subpopulations of road users. The primary goal of epidemiological research is:

- to provide an indication of the extent or magnitude of the problem (descriptive epidemiology);
- to determine which drugs are risk factors for collision involvement (analytic epidemiology).

Even with substantial evidence from experimental and epidemiological studies it remains difficult to assess risk connected with the use of a particular substance by drivers. This is partly because traffic accidents are events with a magnitude of more or less coinciding causative elements and also because certain aspects of driving in real life are very difficult to test. Furthermore, it is important to realize that in epidemiology only association, but not causation can be assessed.

Experimental studies are controlled experiments (laboratory performance tests, simulated driving and real driving, either on closed circuits or in real traffic), and probably the most suitable way to reveal drug effects on performance. These studies should, however, be well-designed and using objective measures of performance that are valid, reliable and sensitive. However, methodologies used to assess drug effects on driving performance can vary widely, making it difficult to compare results from different studies. Guidelines for experimental studies in this field are available but not always followed completely by experimental scientists (17).

Analytical epidemiological studies are meant to assess which drugs are risk factors for collision involvement, by determining which substances are over-represented in persons involved in road crashes. The two most commonly used models are case-control and cohort studies. In case-control studies the case is the subject under study, i.e. a driver who causes (or is involved in) a road accident. The control is a driver not causing (or involved in) a accident, but has similar characteristics and exposure to the driving variables as compared to the cases. In a cohort study drivers on certain medication are followed over time while road accidents are determined, and compared to a control group not on medication, but otherwise as similar as possible to the cohort under study. The calculation of relative risks with respect to accidents is a strength of epidemiological studies and allows comparisons with risks of other drugs and alcohol.

The main drawback is the composition of the control group. It should be as similar to the cases as possible with respect to age, gender, sociodemographic variables, education, disease and mental conditions (e.g. fatigue), and previous drug use. In methadone studies the controls should ideally be former heroin addicts not using drugs, which is hardly possible. Finally, the controls should have similar driving experience as the cases, and drive under the same traffic conditions. It is obvious that perfectly matched control groups will never be found.

It is important to understand the advantages and disadvantages of both research approaches for determining risk potential in road traffic of substances such as methadone.

3.1. Experimental studies

A literature search back to 1975 demonstrated that only for methadone there existed enough publications to constitute a knowledge base for further evaluation. In addition, several literature surveys published in recent years were used for evaluating methadone's effects on driving performance and the drug's accident risk potential (18,19).

Single dose methadone given to naive subjects
Rothenberg et al. (20) found dose-related increases of reaction time and decrements of vigilance for methadone up to 10 mg. Later studies by the same group of investigators (21,22) showed that similar doses of methadone decreases pursuit performance and depressed the gain of horizontal tracking movements. Jasinski and Preston (23) found dose-related subjective effects (possibly impairing performance) after methadone doses up to 20 mg. These studies demonstrate the impairing effects of low doses of methadone on driving related skills and performance.

Single dose methadone given to chronic opiate users
Rothenberg et al. (20) also found performance differences between addicts and non-addicts. Signs of development of tolerance in chronic opiate users was detected as the effects of methadone (up to 10 mg) found in naive subjects were not present in patients who had been treated with methadone (20-70 mg per day) for at least one month prior to the test. Curan et al (24) studied 20 opiate addicts who were stabilized on 10-50 mg methadone daily for 5 days. They found memory impairment after the intake of methadone if the daily dose was given as a single dose, but not if the dose was divided and given twice daily. These observations show that at least some tolerance to acute methadone doses can be observed in opiate users.

Effects of daily maintenance dose in patients during methadone maintenance
Kelly et al. (25) studied the effect of the daily maintenance dose (20 to 120 mg) in 30 patients on methadone for a period of 240 days, at least 14 days after stabilizing the daily dose. Small, but statistically significant differences were found between methadone and placebo groups with respect to distance perception only. Moskowitz and Robinson (26) tested tracking performance before and after a daily dose of 60-100 mg methadone, and found no detrimental effects on tests (information processing and visual functioning) performed 2 hours after methadone intake.

In a driving simulator study Lenné et al. (27) found no significant effects in 10 subjects during a 4 hour period after dosing on standard deviation of lateral position (SDLP) and reaction times.

Performance of patients on methadone maintenance compared to control groups
Gritz et al. (28) found that 10 patients on methadone (35-85 mg daily) performed significantly poorer on several tests of learning and immediate recall compared to abstinent subjects, while other tests showed no differences between both groups. Appel and Gordon (29) found no marked differences between 24 patients on methadone (80-120 mg daily) fro about a year or more and former heroin addicts or a control group with no history of drug dependence in a digit symbol substitution task (DSST). Grevert et al. (30) found no differences between 30 subjects on methadone for 3 months (20-80 mg daily) and a similar sized group of matched non-opiate users in memory tests. Appel (31) examined sustained attention in methadone patients (70-120 mg daily), drug-free ex-addicts and opiate-naive comparison groups. Groups did not differ overall in accuracy or response latencies. Moskowitz and Robinson (26) found no effect on tracking performance in 27 methadone-maintained patients (60-100 mg daily) compared to 27 ex-heroin users who were drug free. The same investigators demonstrated slower rates of information processing, while no differences were found for visual acuity, rate of accommodation, peripheral vision or visual search performance in comparing patients receiving daily doses of 60-80 mg methadone with a control group of former heroin addicts who were drug free. Kubitzki (32) found some differences on real driving performance between 22 patients on 14-120 mg methadone daily and a matched control group of non-addicts, but the majority of performances tested were similar for both groups. Staak et al. (33) subjected the most fit 13 out of 34 patients on 17.5-80 mg daily methadone to a broad battery of tests and compared the results to those fro 13 matched controls. The patients yielded significant poorer results compared to the control group leading the authors to conclude that in general patients on methadone maintenance treatment are unfit to drive. Dittert et al. (34) compared 28 patients on low doses of methadone with 28 matched control performing in several psychomotor tests. For the tests relevant to driving patients on methadone showed significantly reduced performance. Six patients, however, passed the tests in a way which, according to the authors, indicated sufficient driving skills. Specka et al (35) studied 54 patients (on 10-240 mg methadone daily) and 54 matched healthy controls in a battery of six cognitive psychomotor performance tests. The patients performed worse compared to controls in some tests, especially in an attention task. However, large variance was observed for several tests. Darke et al (36) compared a group of 30 methadone maintenance patients (15-200 mg daily) with a matched non-heroin using control group. The patients performed significantly poorer than controls on all of the neuropsychological domains measured: information processing, attention, short-term visual memory, short-term verbal memory, long-term verbal memory and problem solving.

In a study by Mintzer and Stitzer (37) 18 methadone patients (mean daily dose 67.2 mg) were evaluated relative to 21 controls without substance abuse histories. Methadone patients showed impairment relative to controls in psychomotor speed, working memory, decision making and metamemory, while no impairment was registered in time estimation, conceptual flexibility or long-term memory.

Hauri-Bionda et al. (38) studied 34 maintenance patients of whom 29 were on low methadone dose (up to 60 mg per day) in a psychophysical test battery consisting of 10 individual performance tests in comparison with an unmatched control group of workers from the investigating institution. The methadone group achieved lower results in almost all variables and particularly in sustained attention, sensorimotor coordination and reaction time. Approximately two thirds of the methadone group screened urine positive for other psychoactive substances, most frequently for cannabis metabolites. This fraction of the methadone group performed markedly worse than the remaining third of the group, which showed results only somewhat lower than the control group.

It should be concluded that some studies revealed a significant impairment of performance of patients during methadone maintenance in comparison to healthy controls, in some studies patients showed a performance as good as controls. Observations of impaired performance by methadone patients could have several causes, such as acute effects versus effect of chronic methadone use, previous use of other drugs, differences in personality and psychopathological disorders, and pre-drug use differences between patients and controls.

Comparison of performance before and after long-term methadone intake
Grevert et al (30) tested memory in 30 patients before, following one month and three months of continuous methadone treatment with 20-80 mg daily. No differences in memory-score was recorded between the three test sessions. For subjects acting as their own controls it can be concluded that low to medium daily doses of long-term methadone intake will not necessarily reduce memory, but that other aspects of psychological functioning might be inhibited by long-term high dose methadone intake.

Comparison of impairment in drug-dependent patients on buprenorphine and methadone
Soyka et al (39) reported preliminary data of an experimental study on buprenorphine's effect on driving ability under steady-state conditions in drug-dependent patients, using a standardized test battery measuring peripheral vision, split attention, sensorimotor function, reaction time, stress resistance, and the capacity to integrate information. The 13 buprenorphine patients (mean dose 6.5 mg) were compared with 28 patients under methadone maintenance (mean dose 68 mg). Both groups did show negative drug screenings. The results showed an overall better psychomotor performance in patients under buprenorphine, especially in tests with stress components. Owing to the small number of subjects tested the clinical conclusions from this study are considered preliminary, but a better psychomotor performance after buprenorphine use is an interesting finding that needs
further attention.

3.2 Epidemiological studies

Three cohort studies have been published. Babst et al (40) compared the accident and conviction rates for approximately 448 methadone maintenance patients with driving records with a matched sample of New York City regular male drivers.

It was found that the accident and conviction rates were about the same for both groups within the same period of time. In a study by Blomberg and Preusser (41) New York State driver records for 718 methadone maintenance patients and 579 controls (non-addicted friends of the patients) were analysed. There were no marked differences between both groups. Maddux et al (42) compared the motor vehicle driving records of 104 former heroin users during 1 year of heroin use before admission to methadone maintenance with their records during 1 year after admission while they were maintained on methadone. The investigators found a statistically significant increase in convictions for speeding from the year on heroin to the year on methadone, but no significant change in convictions for negligent collision, other moving violations, driving without a license, and in accidents. The frequency with which the subjects were involved in accidents did not differ significantly from that of all Texas licensed drivers. On the basis of this study the authors recommend no restriction of the driving privilege of persons maintained on methadone.

3.3 Prevalence in driving under the influence of drug (DUID) suspected drivers

Patients in methadone maintenance programmes in some countries are sometimes allowed to drive a car, if their treatment is controlled and regular screening of urine samples confirm the absence of other drug use. However, prevalence studies with methadone detection among suspected impaired drivers show that quiet often the continued use of other drugs together with methadone can be observed.
In Canton de Vaud in Switzerland Augsburger and Rivier (43) examined laboratory records concerning living drivers suspected of driving under the influence of drug (DUID) during the 13 years period ranging from 1982 to 1994. This study included 641 records (551 men and 90 women; average age 27 ± 7 years) showing the overrepresentation of the younger age groups (18-30 years interval in 80% of the cases). According to the records a traffic accident had occurred in 254 (40%), 273 (43%) drivers were suspected of DUID during police controls and 95 (15%) drivers were suspected of DUID because of their erratic driving. One or more psychoactive drugs were found in 92.8% of the samples. In these records, cannabinoids were found in 57%, opiates in 36%, ethanol in 36%, benzodiazepines in 15%, cocaine in 11%, methadone in 10% and amphetamines in 4%. The majority (58%) of cases presented two or more drugs in biological samples, thus indicating a high incidence of potential interactions between psychoactive drugs. This observation was especially relevant for methadone and methaqualone.

In Germany, in the region of the city of Bonn, Musshoff et al. (44) examined the blood samples of 98 drivers who were tested positive for methadone (83% males, aged between 20 and 49 with an average of 30.8 years) during the years 1997 to 2000. In only four cases methadone was the sole intoxicating agent. In most cases one additional substance (26 cases), two additional substances (31), three (29), four (7) or even five (1) additional intoxicating agent could be found. Most commonly found were benzodiazepines (in 58% of the cases), followed by morphine (42%), alcohol (37%), cannabinoids (32%), cocaine (27%), antidepressants (4%) and amphetamines (1%). In more than 70% of the cases substitution methadone treatment was performed under the supervision of a doctor. In five cases the drivers did not have a valid driving licence.

Mørland et al. (45) examined all methadone positive cases using the nationwide database of the National Institute of Forensic Toxicology in Norway on blood concentrations measured in suspected drugged drivers during 1997-2001.The number of suspected drugged driving cases was approximately 3,000 to 4,000 per year for the study period, while methadone positive cases increased steadily from 3 in 1997 to 69 in 2001. In 97% of the cases additional drugs were detected. Flunitrazepam was present in 72% of the samples, often in high concentrations, as were cannabinoids and amphetamine. Recent heroin use could be detected in 17%, and was suspected in additional 18% of the cases. As a mean between 2 and 3 additional psychotropic substances were found in methadone positive samples. A similar trend was observed from 200 and onwards, during which period routinely analyses were performed fro approximately 25 drugs other than alcohol, including all major illicit drugs and medicinal drugs of particular importance to traffic safety. From 2000 to march 2002 104 blood samples were collected that contained methadone. In only three of these cases methadone was found as the only drug.

These studies illustrate that many drivers receiving methadone maintenance treatment do not follow the guidelines stressing to avoid the use of other psychotropic drugs together with methadone. It is obvious that mixing these drugs is not compatible with driving. Similar trends have been observed in Germany and Norway, where 3-4% of the methadone positive drivers only used this drug.

3.4 Conclusions

Methadone's effects upon driving performance and related skills have been evaluated in more than 20 experimental studies. There is substantial evidence that methadone intake might impair functions of importance to safe driving. Considerable variation observed among subjects included in these studies prevents the generalization of these studies' outcomes.
It should be concluded that some studies revealed a significant impairment of performance of patients during methadone maintenance in comparison to healthy controls, in some studies patients showed a performance as good as controls. Observations of impaired performance by methadone patients could have several causes, such as acute effects versus effect of chronic methadone use, previous use of other drugs, differences in personality and psychopathological disorders, and pre-drug use differences between patients and controls.

From the very limited number of epidemiological studies it can be concluded that major increases in the frequency of traffic accidents will not be expected with patients in controlled methadone maintenance treatment. However, in evaluating the few prevalence studies it shows that many drivers receiving methadone maintenance treatment do not follow the guidelines stressing to avoid the use of other psychotropic drugs together with methadone. It is obvious that mixing these drugs is not compatible with driving. In Germany and Norway, only 3-4% of the methadone positive drivers in DUID cases only used this drug. Mørland et al (45) emphasized that this finding might be interpreted in various ways. One possibility is that most of the patients in methadone maintenance treatment who follow the treatment guidelines of not combining other drugs with methadone, could drive in a way not attracting the attention of the police.

Those who did combine psychoactive drugs, however, will demonstrate the potential deteriorating effects of their drug intake in road traffic.

In particular the simultaneous use of other psychoactive drugs increases impairment of performance to an extent that methadone patients should completely avoid driving. The present data do not allow us to conclude that patients who use methadone as recommended as their only drug would be safe drivers. On the other hand most experts would state that these patients do not appear to represent a major traffic risk. Mørland et al. concluded that the risk would probably be lowest among those who are using a small daily methadone dose and who have been using this dose for a long period of time (for example 6 months). These patient should be advised not to drive during the first 3 to 4 hours after the last dose. However, large inter-individual differences will remain and need to be investigated. More valid risk assessment is needed to conclude on the risk potential of methadone (and other substitution treatments). Finally, because of the individual variation in sensitivity to methadone effects, the development of simple, sensitive screening tests for impaired driving related performance is needed to support methadone maintenance treatment programmes.

4. Evaluation of some 'Best Practices'

In the 2002 report of the Pompidou Group on problems raised by the use/abuse of psychoactive drugs among 24 countries (46), it was made clear that only 30% of these countries responded that driving under methadone treatment is controlled by law to minimize the risk to the patients involved and to the general population. In the 1999 seminar of the Pompidou Group it was made clear that the rehabilitation of drug-driving offenders should be understood in a broad sense to cover any course of treatment aimed at changing the behaviour of the offender so that he or she does not persist in combining drug-taking with driving. It was emphasized that use may be made of educational methods, psychological techniques, medical treatment, or a convenient mix of these approaches. It was mentioned with reference to the field of alcohol, that rehabilitation of drink-driving offenders has been shown to be effective, with a wide variety of programmes and approaches depending on the country (50). As regards rehabilitation of drug-driving offenders, there is, to the best of our knowledge, very limited experience available within European countries.

The opinion in many countries, but not all, is that patients diagnosed as drug-dependent will constitute an acceptable risk in road traffic, if adequate medical treatment and psychological monitoring are provided and patients are compliant with the existing guidelines. The re-socialization process is aimed at encouraging patients to integrate in society, by taking a job or participate in social activities. It will be difficult to use the regranting of a driving licence as a reward for compliant behaviour in treatment, if this constitutes an unacceptable risk to society. Therefore it is important to evaluate the existing procedures for assessing patients' driving fitness in methadone maintenance treatment programmes, particular in those countries where experiences exist and where society has recognized the need to support the position of the patient under methadone maintenance treatment. By discussing these examples it might stimulate countries where present legislation does not provide patients in rehabilitation programmes to drive their cars, to act in concordance with what a best practice could

be. It is emphasize that the term 'best practice' does not implicate the meaning as in medical sciences where evidence based treatment outcomes are needed to define a practice as the best possible option to achieve definite outcomes according to standards and guidelines. In the context of this report on problems related to driving under methadone treatment, the term 'best practice' is used for those countries where definite provisions are made in the field of legislation, police enforcement, prevention, and rehabilitation. The examples in this report refer to three countries (Germany, Austria and Norway) who provided adequate information concerning these issues in the previous report (46), although evaluation of those activities could not always be presented. Although it is well accepted that methadone maintenance treatment is offered to opiate addicts in order to reduce criminal behaviour, infectious disease transmission and overdose-death, these aspects will not be taken into account in evaluating the best practices. The examples will be described based on a questionnaire (see Appendix) that was discussed during three site visits (end 2002 beginning of 2003) and will be presented below. The descriptions and conclusions constitute a basis for further discussion in the next Pompidou Group seminar (18-20 June 2003).

4.1 Procedures for offenders who are found drug positive in road traffic

Germany

- It is estimated that in Germany 250,000-300,000 persons are addictive to opiates (Jahrbuch Sucht 2002, Data of DHS: Deutsche Hauptstelle gegen die Suchtgefahren). This number is increasing because more drug addicts are reported due to the influx of people from Eastern European countries. There exists a small group of people using methadone as a legal drug: 40,000-45,000 persons, which means 16-20% of all addicts. The percentage of illegal consumption of drugs other than methadone among the methadone substituted people is estimated to be up to 70% (Bayerische Akademie für Suchtfragen, 2001). The prevalence of illegal consumption of methadone is difficult to estimate. About 50-70% of the opiate addicts have experience with methadone (taken as drug or in self- controlled substitution).
- The percentage of methadone users taking part in driving is unknown. It is estimated that only 4% of methadone positive drivers use methadone as the sole intoxicating agent, in most cases additional agents are present (44).
- A larger group of people use THC and/or amphetamines (and mixtures of illicit drugs) regularly (2 million) and cause substantial problems in traffic. Those who are detected as driving under the influence of the drug or cause traffic accidents will have their driving licence withdrawn. In this group (n= 150,000) a majority of the cases are alcohol related, whereas 1% is estimated to be related to illicit drugs only. There exists an underreporting of drugs because the police will not investigate the presence of drugs other than alcohol in most cases, if alcohol has been found present. No systematic analyses over time exist to show a trend in drug use among drivers.
- In Germany (total population of about 82 million inhabitants) it is estimated that 50 million people possess a driving licence, whereas 40 million are active in driving.

- Two years ago there was a change in the law (substitution of drugs) that allowed people who were treated with dihydrocodeine to use methadone as substitution treatment.

Procedures for offenders in Germany
Driving under impairing influence of alcohol or other intoxicating substances is punished by a penal code (Strafgesetzbuch, StGB) according to Art 316 or Art 315c (endangering others under influence). The judge will withdraw the licence and state a period wherein the administrative authority can not regrant the licence. Depending on the severity of the offence this period is between 9 and 15 months for first-time-offenders. The decision about the regranting of the licence is the responsibility of the administrative body, that also decides whether it needs an expert's opinion or not.

For cases without impairment but with a detection of illicit drug consumption (irrespective of the detection of a driving problem) there are rules in the (Strassenverkehrsgestz, StVG) in the same Art 24a as driving with detected but not impairing blood-alcohol-concentrations (fines are given from .05% BAC and up). For most illicit drugs driving with a detectable amount of an active agent is punished with a fine of € 250 (first-time-offence) up to € 750 (repeated offence) and a suspension of the driving licence for 4 weeks (first time) up to 3 months (repeated offence). Further there will be an investigation to assess the nature of drug use (occasionally, regularly or because of dependency). The medical assessment (costs € 500 to be paid by the subject) is to define the nature of drug use in roughly three categories:

1. Occasional cannabis use: if the person can separate drug use from driving it is allowed to keep the driving licence.
2. Regular cannabis use or use of other illicit drugs: one has to prove to be abstinent before regranting of the driving licence
3. Methadone use: one has to show successful methadone substitution treatment for at least one year, furthermore exclusion of additional intake of intoxicating agents, proof of readiness to feel responsible for him/herself, therapy compliance and absence of personality disorders. It is estimated that only 5% of methadone users can comply with these criteria. Annually subjects have to apply for a new assessment. If they show to be additive they will need to undergo life long assessments till the moment that they stop taking drugs.

Although there are no studies to confirm that drivers treated with methadone comply to all criteria, it is roughly estimated that 20% of methadone users still drive their cars with the possession of a driving licence without complying to the criteria. At the same time drivers are considered not to be involved in conflicting situations under the attention of the police.

Austria

- Regarding experience of illicit drug use in Austria results of a recent regional population survey carried out in Upper Austria show that in this Federal state of Austria 21% of the population over 15, indicate that they have tried cannabis at least once, lifetime experience of ecstasy and cocaine is 4% for either substance, whereas for morphine the figure is 1% (Pilot project Rapid Situation Assessment, Report on the Drug Situation 2001, Österreichisches

Bundesinstitut für Gesundheitswesen). The relevant percentages are markedly lower for experience of use in the past year or month, results of more than 1% are found in the case of cannabis only. More detailed analyses can not be made for drugs other than cannabis, since the percentages of other drugs tend to be too low. The number of persons currently registered for substitution treatment is about 5,000.

- In Austria (total population of about 8 million inhabitants) it is estimated that about 4 million persons possess a driving licence.
- The percentage of methadone users taking part in driving is unknown.
- Statistics of the Federal Ministry of Interior show that 551 DUI cases for drugs other than alcohol have been registered for conviction in 2001. These cases are based on police observations, without use of a screening test and have been assessed by doctors opinions. Of these cases 131 were opiate positive and 31 methadone positive.
- Until December 2002 drug suspicious drivers were obliged to undergo a clinical impairment examination only and could not be forced to undergo a blood and/or urine examination. Therefore, only refusal of the clinical impairment check had legal consequences (at least four months of licence suspension). According to a new law blood tests can be applied since 1st of January 2003 to confirm DUI suspected cases.

Procedures for offenders in Austria

Driving under impairing influence of alcohol or other intoxicating substances is punished by a penal code (Road Traffic Act) according to article 99 in conjunction with article 5 DUI suspected drivers will be screened for breath alcohol first, and after positive results no further examination will follow for drugs other than alcohol, unless there is a clear suspicion. In that case clinical examination will follow by a physician's judgement using an extensive checklist (Drogen-check-formular). A blood test is compulsory if clinical examination confirms the impairment due to drug consumption. If the blood test is positive various legal consequences will follow depending upon the circumstances of the violation. Refusal of both clinical and blood tests has legal consequences (see Table 4.1 for misuse).

If the physician's diagnosis is impairment by drugs other than alcohol it will be decided whether the impairment could be the result of medicines (e.g. benzodiazepines) of physical condition (e.g. tiredness). In that situation no DUI of illegal drugs can be assessed and a lower fine will be applied by the licencing authorities.

Table 4.1 Legal consequences for DUI cases

Legal consequences	**DUI**	**Consequences of refusal (clinical and blood test)**
Fine	€ 581-3,633	€ 1,162- 5,813
Licence withdrawal	1 or minimum 3 months*	Minimum 4 months
Driver rehabilitation course	From second infraction within 2 years from the first offence	Yes
Psychological and medical assessment	Yes	Yes
Other	Notifying Administration**	--

* In case of an accident or driver with a class C driving licence (heavy goods vehicle)

** Since 1-1-2003: Health authorities will be notified, not the court, unless persons were killed in the accident

Persons addicted to drugs do not have to undergo an obligatory driver rehabilitation course or a psychological and medical assessment, since they will have their driving licence regranted during the period of addiction. In case of doubts the licencing authority can ask for a psychological and medical assessment.
Persons taking drugs for medical reasons (eg. methadone) will not have their driving licence regranted without a positive medical assessment. For this group a driver rehabilitation course or psychological assessment is not obligatory. Nevertheless, the licencing authority can ask for a psychological assessment in case of doubts.

Norway

- It is estimated that in Norway 10,000-15,000 addicts are using heroin, of whom about 2,000 are on methadone assisted treatment (estimated for 2002, figures increased from 100 in 1998 to 1,074 in 2000 and to 1,503 in 2001).
- In 1998 methadone assisted treatment was introduced. There are strict rules for starting a treatment. A medical committee (based in one of the five centres in the country) decides and refers a heroin addicted person to a doctor who is trained by these centres and qualified to provide the treatment. Criteria for receiving methadone assisted treatment are: age over 25 years and the delivery of a urine sample for screening of opiates drugs of abuse twice a week. It is estimated that 60% of methadone treated patients use other drugs, often benzodiazepines, in addition to methadone.
- In Norway (total population of about 4,5 million inhabitants), about 2,8 million persons possess a driving licence.
- The percentage of methadone users taking part in driving is unknown. Norwegian patients in methadone assisted treatment programs are allowed to drive after at least 6 months of treatment on an unchanged daily dose and persistent delivery of cleaned urine samples.
- Official statistics in the years 1997-2001 show that about 3,500 DUI positive cases for drugs other than alcohol have been reported each year, whereas methadone positive cases increased steadily from 3 in 1997 to 69 in 2001 and 100 in 2002.
- In 97% of these cases additional drugs were detected. Flunitrazepam was present in 72% of the samples, whereas recent heroin use could be stated in 17% , and was suspected in additional 18% of the cases. As a mean between 2 to 3 additional drugs were found in methadone positive drivers.

Procedures for offenders in Norway
Driving under impairing influence of alcohol or other intoxicating substances is punished by a penal code (Road Traffic Act) according to article 22.1. The law for driving under the influence of drugs and/or alcohol is an impairment based law.

Drivers are stopped by the police in case of an accident, dangerous or reckless driving, or at road side checks. If the primary judgement by the police officer results in a suspicion for alcohol only, evidential breath testing or, since evidential breath testing instruments are scarcely dispersed in Norway, blood sample (in about 50% of the cases), will follow to bring the cases to court. The blood samples are sent to the

Norwegian Institute of Public Health, Division of Forensic Toxicology and Drugs Abuse, for analyses of alcohol. No further examination will follow for drugs other than alcohol, unless there is a suspicion.
In cases where the primary judgement of the police officer results in a clear suspicion for drugs other than alcohol, blood (and urine) samples are taken and a clinical examination by a police physician will follow. Analyses (screening and confirmatory GC/MS, LC/MS) at the Norwegian Institute of Public Health will be based on a list of 25 compounds. Primary evaluation is based on analytical results and clinical examination and reported to the police as guidance for further handling of the case. For the majority of the cases, a written expert witness statement is needed to declare the impairing effects of the drug concentrations found. In some cases, the expert witness has to testify in court.
In 2002, approximately 80% of the 5,150 DUI cases were positive for drugs other than alcohol, with a mean of 2,5 different drugs per case.

First time-offenders will be convicted to a withdrawal of driving license for a period of 2 years in addition to a fine or prison sentences If expert witness statement declares a drug positive case with low blood concentration, not considered to cause significant impairment, no penalty or withdrawal of driving licence according to the Road Traffic Act will follow. However, illegal drug use may cause a penalty in those cases, according to the Penal code § 162.

4.2 Assessment procedures for patients in rehabilitation programmes

Germany
The Guidelines for Expertises on Driver Aptitude, issued by the Joint Advisory Council for Traffic Medicine at the Federal Ministry of Transport, Building and Housing and the Federal Ministry of Health state the following recommendation:
Heroin addicts treated with methadone are generally not fit to drive. However, a positive evaluation for obtaining a driving can following after fulfilling the following criteria:

- a period of methadone substitution for more than one year
- stable psychosocial integration
- exclusion of additional drug consumption (to be checked by regular random urine and alcohol tests)
- proof of personal responsibility (the subject's readiness to feel responsible for himself/herself)
- therapy compliance
- absence of personality disorders

At this moment there are no differences in assessments procedures depending upon the type of vehicle. Germany is fulfilling the needs of the EU directives and has no need or knowledge to differentiate any further in type of vehicle.
In the future one could imagine that depending upon the political discussion on drug use in general (and liberalization of cannabis use in particular) that rehabilitation programmes for cannabis users can be different from those to be applied in users of other illicit drugs.

Austria
Assessment procedures to decide whether patients are able to drive are defined (Driving Licence Health Act FSG-GV, in force since 11-1997). Additionally some guidelines (regarding expertises and training) have been introduced in order to standardise psychological assessment. For the specific medical assessment analogous guidelines are not yet available. At present it is a case by case assessment.
A study on traffic specific performance of opiate dependent persons in substitution treatment is presently carried out to design a test model which can show the influence of relevant factors for functional driving fitness in assessing performance.

Obligatory rehabilitation courses for persons driving under the influence of drugs and medicines have been introduced in addition to the already existing courses for DUI offenders or for offenders without DUI, e.g. speeding (Driving Licence driver Improvement Act, FSG-NV, in force since 1-10-2002). This course is for persons having driven impaired due to addictive drugs or medicines, regardless whether they have a licence, on probation or not. For first-time offenders the duration of the course is 15 course units of 50 minutes each; in minimum 4 sessions, within minimum 22 to maximum 40 calendar days and in group settings (6-11 persons). For repeated offenders the duration of the course is 18 units. Alcohol testing takes place during the course, but no drug screening. Fixed prices are € 35.00 for a 50 minutes course unit in group setting, and € 109.00 in a single setting.
Successful completion of the course is a prerequisite for regranting the driving licence. Authorized institutions (at present in total 8 course sites in Austria) have to report to licensing authorities on each successful course participation, on each rejection as well as the number of courses. The number of participants country-wide is growing from 32 in 2000, 27 in 2001 to 40 in 2002. . In general, persons in methadone substitution treatment are no course participants. M methadone use by course participants is not routinely determined. If strong dependency exists, drivers will be referred to additional treatment.

Norway
Patients in methadone assisted treatment programs who are stable in using methadone (no other drugs) with no change in methadone dose for 6 months can have their driving licence granted again. If for any reason their methadone maintenance dose needs to be increased, a period of 14 days to refrain from driving has to be respected. If their methadone use is not stable (for example in combination with other drugs) the procedure will start again with withdrawal of the driving licence and a waiting period for 6 months before licensed driving can start again. It is estimated that about 50% show positive urine screening during methadone treatment for other drugs and will not have their driving licences regranted.

4.3 Effectiveness of present policies

Germany
There are no national statistics based on the annual decrease or increase in the number of methadone positive offenders, or methadone users killed or injured in traffic accidents.

More statistics are to be expected in the near future since the introduction of a quality system (three years ago) to use specific protocols for substitution treatment, urine screenings, etc. There are official audits that will stimulate this development.

Austria
There are no national statistics based on the annual decrease or increase in the number of methadone positive offenders, or methadone users killed or injured in traffic accidents.
Providers of rehabilitation programmes have their own statistics. The number and type of different courses have to be reported to the Ministry.

Norway
There are national statistics based on the annual decrease or increase in the number of methadone only positive offenders as recorded at the National Institute of Public Health (NIPH), showing that only 3% of methadone positive drivers in the DUI suspected sample analysed have used methadone as the only drug. There is, however, a steady increase each year in methadone positive drivers in samples of suspected drugged drivers (from 3 in 1997 to 100 in 2002, whereas during the same period the number of detected drugged drivers was rather constant; 3,500-4,100/year). This increase in methadone positive drivers can be explained to some extend by the larger number of methadone users that have controlled use of their driving licence, since the increase in numbers of patients enrolled in the methadone assisted treatment program show a steady growth as well (ten fold in the period 1998-2002).

The fact that 97% of the DUI cases with methadone in their blood, had additional drugs present that might themselves impair driving and also potentiate the impairing effects of methadone on driving is cause of concern. It might be interpreted as indicating a subgroup of methadone maintenance patients who continue to use other drugs, and thereby constitute a major traffic safety problem. The results might further be interpreted to indicate that patients who use methadone as recommended usually drive in a way not attracting the attention of the police.

There is no reporting system by the existing centres for providing the methadone assisted programs on the effectiveness of their programs.

4.4 Issues that need more attention in applying present policies

Germany
There will be a need for one programme to achieve abstinence based on the experiences of successful alcohol dependence treatment programmes. This new approach will be a multidisciplinary programme where abstinence will not only be achieved by methadone substitution, but also by behavioural treatment options and approaches to improve social circumstances. If one only focus on one aspect (the methadone substitution), other reasons for drug dependence will strike back after the pharmacological intervention has been completed. Long term psycho-social therapy will benefit those who suffer withdrawal symptoms by offering a therapeutic setting for controlling withdrawal effects. Some experts fear that widespread use of methadone will prevent people to join psychotherapy, allowing substitution therapy to become a substitute therapy.

Austria
Two practical problems exist. Firstly the availability of a physician at night in the rural areas for clinical assessments of impairment. Secondly, the training of the police force in detecting impairment needs much more attention in order to improve the effectiveness of present legislation. But also psychologists and medical doctors should be more transparent in applying the procedures allowing independent quality assurance measurements for improving standardization of their practices.

There is a need to know more about the impact of licit drugs on driving fitness and traffic safety in Austria. In addition the use of marihuana in Austria is growing and consequences for traffic safety need to be clarified.

Norway
There have been discussions to change the present impairment law into a zero tolerance law. The reason for changing the present law is primarily based on European movements into that direction. However, the Norwegian Government recently decided not to change the present legislation since the present law works well and allows many DUI suspected cases to be sentenced to court (about 4,000 DUI cases annually in a population of only 4,5 million inhabitants!).

More focus on rehabilitation and secondary prevention is important for future policies. Repeat offenders are a cause of concern. By reducing these to half will gain a lot in terms of traffic safety. The same focus is needed on young drivers, especially the first-timers in DUI, and the hard core multiple drug users, usually in their late twenties, early thirties, who are not addicted.

4.5 Conclusions

By reviewing some of the background information given for the three countries it is clear that differences are shown for the prevalence of methadone use (Table 4.2). As far as official statistics are available it is also clear that methadone use among DUI positive cases is rather low, ranging from less than 1% (roughly estimated) in Germany to 2% in Norway and 5% in Austria. It is important to note that among methadone positive DUI cases a vast majority (>96% in Germany and Norway) is taking additional psychotropic drugs.

Table 4.2 Methadone use in substitution treatment and prevalence in DUI cases

Subject description	Austria	Germany	Norway
Population (in million)	8.1	82.2	4.5
Number of opiate addicts (estimated)	Not available	250,000 - 300,000	10,000 – 15,000
Patients in substitution treatment (estimations) -Per million population	5,000 620	42,500 520	2,000 440
DUI cases for drugs other than alcohol (2001) -Per million population	551 68	16,000 (*) 200	3,500 777
Methadone positives among DUI cases for drugs other than alcohol (2001)	31 (5%)	Estimated <1%	69 (2%)
Additional psychotropic drug intake among methadone positive cases (%)	Not available	96% (**)	97%

(*) Based on statistics concerning driving licence withdrawal for DUI (in 2001: n= 108,600) and the assumption that 10-20% of DUI cases are positive for drugs other than alcohol.
(**) Based on blood analyses in the Institute für Rechtsmedizin, University of Bonn (44)

The procedures for offenders who are found to be drug positive in road traffic in the three countries vary substantially (Table 4.3). A major change in the Austrian Road Traffic Act since 2003 allows the application of blood samples to confirm DUI suspected cases. This change will have impact on future statistics. As a legal consequence of DUI convicted cases licence withdrawal for first-time offenders will follow ranging from 1-3 months in Austria, 9-15 months in Germany (depending on the severity of the offence), and to 24 months in Norway.
In cases where illicit drug consumption rather than impairment can be detected, different procedures will follow. In Austria and Norway illegal drug use may cause to a penalty according to a Penal code, whereas in Germany an investigation will be mandatory for assessing the nature of drug use (occasionally, regularly, dependency related).

Table 4.3 Procedures for DUI offenders who are found drug positive in road traffic

Subject description	Austria	Germany	Norway
Licence withdrawal (first-time offenders) -With impairment -Without impairment	 1-3 months(*) No offence according to Traffic Law	 9-15 months 1 month (first-timer) 3 months (repeat-offender)	 24 months No offence according to Traffic Law
Fines - With impairment - Without impairment	 € 581 – € 3,633 No fines according to Traffic Law	 Depending upon severity decided by the judge € 250 (first-timer) to € 750 (repeat-offender)	 Depending upon drivers income (appr. one month's wages) No fines according to Traffic Law

(*) In principle 3 months, but 4 weeks if it was a first-time abuse and not a driver with a licence for heavy goods vehicles.

In reviewing the assessment procedures for patients in rehabilitation programmes substantial differences can be observed. In Austria a driver rehabilitation course has been introduced for drug impaired driving offenders very recently in 2002. Successful completion of the course is a prerequisite for regranting the driving licence. But the criteria for assessing the performance of patients in substitution treatment programmes are not yet completely developed. In Germany a set of criteria has been established for assessing whether patients in substitution treatment are able to drive. The patient has to show that he or she is stable for one year showing compliance in methadone treatment and abstinence for taking other psychotropic substances. In Norway this period is 6 months.

All three countries could not show a national reporting system based on the performance of the existing centres for providing methadone substitution treatment pertaining to the effectiveness of their programmes. Similarly no national statistics could be provided based on the annual decrease or increase in the number of methadone positive offenders, except for Norway. In this country a steady increase in the number of methadone positive drivers in the DUI suspected drugged drivers could be detected each year since 1997, whereas the annual number of detected drugged drivers was rather constant. In Germany the introduction of a quality assurance programme for the application of specific protocols in substitution treatment and procedures for urine screening, etc. three years ago will contribute to more statistical evaluations of existing procedures in the near future.

In summary, issues that need more attention in applying present procedures relate to three different areas:

- multidisciplinary programmes where abstinence will not only be achieved by methadone substitution, but also by behavioural treatment options and approaches to improve social circumstances.

- quality assurance measurements for improving transparency and standardization of medical, psychological and law enforcement practices;
- secondary prevention, especially to understand how the methadone patients can comply with the criteria for regranting a driving licence and how to separate drivers on methadone who drive without causing problems and comply with the criteria from those who continue to use other psychoactive drugs, and thereby constitute a major traffic safety problem, in applying legislation.

5. Discussion and conclusions

It is a enormous dilemma if methadone substitution patients who are treated according to existing medical guidelines and regain the social support to live a normal live, will be prevented from obtaining or regranting a driving licence. It is obvious that assessing these patients as safe drivers is only possible with complete knowledge of the effects of the drug on driving performance and of other relevant issues that affect their behaviour as patient and driver. The outcomes of these evaluations might support a discussion on how to develop strategies for rehabilitating drug-driving offenders and patients in methadone maintenance programs which are clear and transparent with respect to issues of concern in traffic safety. The relationship between the healthcare professional and the patient should be respected in order to achieve a positive treatment outcome as well as the need to determine how this treatment in itself constitutes a major danger to road safety.

The aim of this report is to support the various discussions within the Pompidou Group by evaluating the present knowledge on the relation between methadone use, impaired driving and accident risks. In addition, by evaluating some 'best practices' in the application of procedures for rehabilitation of drug-driving offenders, some recommendations will be presented to support further discussion on problems related to driving under the influence of methadone and other substances.

Methadone's effects upon driving performance and related skills have been evaluated in experimental studies, conducted under laboratory conditions. There is substantial evidence that methadone intake might impair functions of importance to safe driving. Considerable variation observed among subjects included in these studies prevents the generalization of these studies' outcomes. Other substances such as buprenorphine and LAAM have not been studied to an extent that impairment of driving performance related skills can be determined compared to methadone's effects upon driving.

It should be concluded that some studies revealed a significant impairment of patients' performance during methadone maintenance in comparison to healthy controls, in some studies patients showed a performance as good as controls. Observations of impaired performance by methadone patients could have several causes, such as acute effects versus effect of chronic methadone use, previous use of other drugs, differences in personality and psychopathological disorders, and pre-drug use differences between patients and controls. The conclusion from experimental laboratory studies is that narcotic-tolerant subjects stabilized on methadone substitution treatment will show a few subjective and objective effects on performance.

But no experiments have been conducted with actual driving tests, and the possible interaction of methadone with other psychotropic substances is also unstudied. From the very limited number of epidemiological studies it can be concluded that major increases in the frequency of traffic accidents will not be expected with patients in controlled methadone maintenance treatment.

However, in evaluating the few prevalence studies based on drivers suspected of driving under the influence of a drug other than alcohol, it shows that many drivers receiving methadone maintenance treatment do not follow the guidelines stressing to avoid the use of other psychotropic drugs together with methadone. In particular the simultaneous use of other psychoactive drugs increases impairment of performance to an extent that methadone patients should completely avoid driving. The present data do not allow us to conclude that patients who use methadone as recommended as their only drug would be safe drivers. On the other hand most experts would state that these patients do not appear to represent a major traffic risk. More valid risk assessment is needed to conclude on the risk potential of methadone (and other substitution treatments).

The opinion in many countries, but not all, is that patients diagnosed as drug-dependent will constitute an acceptable risk in road traffic, if adequate medical treatment and psychological monitoring are provided and patients are compliant with the existing guidelines. The re-socialization process is aimed at encouraging patients to integrate in society, by taking a job or participate in social activities. It will be difficult to use the regranting of a driving licence as a reward for compliant behaviour in treatment, if this constitutes an unacceptable risk to society. Therefore it is important to evaluate the existing procedures for assessing patients' driving fitness in methadone maintenance treatment programmes, particular in those countries where experiences exist and where society has recognized the need to protect the position of the patient under methadone maintenance treatment. By discussing these examples it might stimulate countries where present legislation does not provide patients in rehabilitation programmes to drive their cars, to act in concordance with what a feasible practice could be. The examples in this report refer to three countries (Germany, Austria and Norway) who presented in the previous report (46) adequate information concerning these issues, although evaluation of those activities could not always be presented.

In these three countries the number of patients in methadone substitution programmes is estimated to be ranging from 440 per million population in Norway, to 520 in Germany and 620 in Austria. According to statistics provided in these countries it is obvious that methadone use among drivers arrested for driving under the influence of a drug other than alcohol is rather low (1-5%). The police in Norway is the most effective in detecting drivers suspected for driving under the influence of drugs other than alcohol: about ten times more cases per million population in comparison with Austria.

It would be interesting to know how more intensive police enforcement activities, combined with less severe criteria for regranting a driving licence under methadone treatment in Norway relate to the low number of methadone substitution patients in treatment in this country. Additionally, the longer period for driving licence withdrawal in Norway (24 months) if drivers are convicted for DUI of drugs other than alcohol, might have some impact on people's behaviour in drug use and driving. On the other hand, the high percentage of additional psychotropic drug intake in methadone positive DUI cases in Norway (97%) shows that there probably exists a subgroup of hard core multiple drug users. It is obvious that mixing these drugs is not compatible with driving. Mørland et al (45) emphasized that this finding might be interpreted in various ways. One possibility is that most of the patients in methadone maintenance treatment who follow the treatment guidelines of not combining other drugs with methadone, could drive in a way not attracting the attention of the police. Those who did combine psychoactive drugs, however, will demonstrate the potential deteriorating effects of their drug intake in road traffic.

In reviewing the assessment procedures for patients in rehabilitation programmes substantial differences can be observed. In Austria a driver rehabilitation course has recently been introduced (in 2002) for drug impaired driving offenders. Successful completion of the course is a prerequisite for regranting the driving licence. But the criteria for assessing the performance of patients in substitution treatment programmes are not yet completely developed. In Germany a set of criteria has been established for assessing whether patients in substitution treatment are able to drive. The patient has to show that he or she is stable for one year showing compliance in methadone treatment and abstinence for taking other psychotropic substances. It is estimated that in Germany only 5% of methadone users can comply with the criteria, whereas in Norway where this period of stable methadone use is 6 months, it is estimated that 50% of methadone users show positive urine screening for other drugs preventing them from having their driving licences regranted. In depth comparison of both systems was not possible based on the information obtained in this review, but it would be interesting to know how many methadone patients whose driving licence was regranted remain safe drivers in both systems. Remarkable differences exist in the percentages of drivers who can comply with the criteria for regranting their driving licence (50% in Norway versus 5% In Germany). It is unknown whether differences in the length of the period in which stable methadone use should be proven (6 months in Norway versus 12 months in Germany) will in itself have an impact on the proportion of drivers who are able to comply with the criteria, or that other factors have an impact on this outcome.

All three countries could not show a national reporting system based on the performance of the existing centres for providing methadone substitution treatment pertaining to the effectiveness of their programmes. Similarly no national statistics could be provided based on the annual decrease or increase in the number of methadone positive offenders, except for Norway. In this country a steady increase in the number of methadone positive drivers in the DUI suspected drugged drivers could be detected each year since 1997 (from 3 in 1997 to 100 in 2002), whereas the annual number of detected drugged drivers was rather constant (3,500 – 4,100/year).

This increase in methadone positive drivers can be explained to some extent by the by the larger number of methadone users that have controlled use of their driving licence, since the numbers of patients enrolled in the methadone assisted treatment program show a steady growth as well (ten fold in the period 1998-2002).

In Germany the introduction of a quality assurance programme for the application of specific protocols in substitution treatment and procedures for urine screening three years ago will contribute to more statistical evaluations of existing procedures in the near future.

In discussing issues that need more attention in applying present procedures in the three countries it was obvious that political changes and attitudes towards the methadone and driving problems were leading in suggesting future targets. In general it can be argued that two propositions towards methadone and driving are valid, depending upon the ”political climate” in a given country. One proposition, more progressive and change oriented, is focussed on methadone as a good standard of practice to support the rehabilitation and re-socializing processes. There is no objective to stop the treatment because of a risk that the person using the drug as a medicine is falling back into the criminal scene. The second proposition is risk oriented, where assessment of patient’s ability to drive is focussed on complying to the criteria for driving fitness under methadone treatment, which are hard to comply to for most drug users. However, most doctors who treat their patients with methadone want to reward them for being compliant to the treatment by keeping them on the road as drivers with a driving licence.

Methadone as substitution treatment is considered to be a relatively easy way to keep drug users out of the criminal scenery. Many doctors and policy makers support this opinion. Re-socializing aspects are considered more important than medical aspects of methadone treatment (no emphasis on the pharmacological or impairing side effects). The result is a “stable position” of a problem with addictive people. However, many questions remained unanswered, such as:

- How successful are methadone programmes (e.g. compared to alcohol dependence treatment programmes)?
- What are the reasons for failures (what lessons could be learned)?
- How transparent are methods used by medical, psychological and law enforcement professionals (are there any quality assurance programmes)?
- How to achieve the most from rehabilitation programmes (focussing on repeat-offenders, young drivers who are first-time DUI offenders, hard core multiple drugs users)?

Although these questions could not be answered, it is obvious that existing practices in the three countries are developing along lines that provide opportunities to give the answers in due time. It would be interesting to know more about the reasons for changing political opinions and professional standards and guidelines. Especially future plans for official audits to assess practices in rehabilitation will stimulate the development of any course of treatment aimed at changing the behaviour of the methadone patient so that he or she does persist in combining abstinence in drug use and driving. Most experts indicate that a multidisciplinary approach is needed in applying medical treatment, psychological techniques and education programmes, but

this should be evidence based. Countries with opportunities to change their systems should know about experiences and learn from the evidence provided in other countries. This exchange of knowledge and expertise is a major challenge for the Pompidou Group in contributing to solution for problems related to driving under the influence of methadone and other substances.

6. Recommendations

The following recommendations are derived after reviewing the best practices in three different countries. Although it is well known that methadone maintenance treatment is offered to opiate addicts in order to reduce criminal behaviour, infectious disease transmission and overdose-death, these aspects will not be taken into account in presenting the recommendations. The first recommendation is based on the Norwegian experiences and the differences in applying criteria for methadone users in regranting procedures for driving licences, if compared with criteria applied in both other countries Germany and Austria. All other recommendations are based on the discussion of issue that need more attention in applying present procedures as indicated by the experts in this survey and relate to three different areas:

- multidisciplinary programmes where abstinence will not only be achieved by methadone substitution, but also by behavioural treatment options and approaches to improve social circumstances.
- quality assurance measurements for improving transparency and standardization of medical treatment, psychological methods and law enforcement practices;
- secondary prevention, especially to understand how the methadone patients can comply with the criteria for regranting a driving licence and how to separate drivers on methadone who drive without causing problems and comply with the criteria from those who continue to use other psychoactive drugs, and thereby constitute a major traffic safety problem, in applying legislation.

The recommendations are meant to facilitate discussion in a seminar with experts from various countries where more extensive experiences exist in approaching problems related to methadone and driving. Each country has to decide whether a given recommendation can be implemented as a change in their respective political and legislative systems. But it is unrealistic to expect that recommendations that present statements on what countries should do or need to develop will lead automatically to implementation of those changes. It is therefore recommended to invite member states to discuss examples that could serve as a ‘best practice’ to others. The examples given should motivate them to discuss new options and opportunities that have been developed by other countries and show effectiveness in solving these problems.

Recommendation 1:
Discussion on the Norwegian experience in applying systems for regranting driving licences for patients in methadone substitution programmes should be focussed on the following key questions:

- How does the 'impairment law' (Norwegian road traffic legislation is based on an impairment law for driving under the influence of drugs other than alcohol) influence the attitudes towards methadone impaired driving compared to impaired driving due to illicit and/or medicinal drug use compared to countries with 'zero-tolerance'-legislation?
- What impact have the differences in criteria for regranting a driving licence for patients in methadone substitution programmes in comparing Norway with Germany (in Norway 50% of people who want their driving licence regranted can comply with the criteria, whereas in Germany this is only 5%).
- What is the impact of longer periods of driving licence withdrawal (24 months in Norway) for treating offenders who are found to be drug-positive in road traffic, on treatment and rehabilitation programmes provided to opiate addicts compared to shorter periods such as exist in most countries?
- What information is needed to define whether or not methadone patients who use only methadone as treatment are safer drivers?

Recommendation 2:
Discussion on the rehabilitation of drink-driving offenders that has been shown to be effective with a variety of programme approaches (medical treatment, psychological techniques, educational methods) and its implication in developing multidisciplinary programmes where abstinence will not only be achieved by methadone substitution, but also by behavioural treatment options and approaches to improve social circumstances.

Recommendation 3:
Discussion on quality assurance programmes that exist or are under development for improving transparency and standardization of medical treatment, psychological methods and law enforcement practices in order to improve rehabilitation programmes.

Recommendation 4:
Discussion on present knowledge that exist or needs for research to understand how the methadone patients can comply with the criteria for regranting a driving licence and to know how criteria are accepted by professionals who work in this field for clinical and psychological assessments.

Recommendation 5:
Discussion on various options how to separate drivers on methadone who drive without causing problems and comply with the criteria from those who continue to use other psychoactive drugs, and thereby constitute a major traffic safety problem, in applying legislation.

Recommendation 6:
Discussion on opportunities to define targets in traffic safety and public health policies in which subgroups of DUI prone drivers are identified and treated differently in order to achieve a reduction in repeat-offenders, young drivers who are first-time DUI offenders, and multiple drug users who are not addicted and how these policies might effect the number of opiate users and the methadone substitution programmes.

Recommendation 7:
Discussion on research findings on driving specific performance of opiate dependent persons included in substitution treatment in order to design a test model for screening functional driving fitness in assessing performance.

7. References

1. Battista H-J (1999). Substitution programme (methadone) and driving ability. Road traffic and driving. Proceedings seminar organized by the Co-operation Group to Combat Drug Abuse and Illicit Trafficking in Drugs (Pompidou Group). Council of Europe Publishing, Strasbourg, France, 287-292.

2. Alvarez FJ (1999). Drug dependence and road safety: the treatment and rehabilitation of drug addicts and their relevance for road safety. Road traffic and driving. Proceedings seminar organized by the Co-operation Group to Combat Drug Abuse and Illicit Trafficking in Drugs (Pompidou Group). Council of Europe Publishing, Strasbourg, France, 272-279.

3. Bell J, Dru A, Fischer B, Levit S, Sarfraz MA (2002). Substitution therapy for heroin addiction. Subst Use Misuse;37:1149-1178.

4. Stahl SM (2000). Essential Psychopharmacology. Neuroscientific Basis and Practical Applications. 2nd Edition, Cambridge University Press, Cambridge, 521-522.

5. Physicians' Reference Desk (1999). Medical Economics Company, Montvale, NJ.

6. Niveau G, Rougemont AL, La Harpe R (2002). Methadone maintenance treatment, criminality and overdose-related deaths. An ecological study, 1983-1999. Eur J Public Health,12:224-227.

7. Lepere B, Gourarier L, Sanchez M, Adda C, Peyret E, Nordmann F, Ben Soussen P, Gisselbrecht M, Lowenstein W (2001). Reduction in the number of lethal heroin overdoses in France since 1994. Focus on substitution treatments. Ann Med Interne, 152:IS5-IS12.

8. Duburq A, Charpak Y, Blin P, Madec L (2000). Two years follow-up of a heroin users cohort treated vwith high dosage buprenorphine. Results of the SPESUB study (pharmacoepidemiologic follow-up of general practice Subutex). Rev Epidemiol Sante Publique,48:363-373.

9. De Ducla M. Gagnon A, Muchielli A, Robinet S, Vellay A (2000). Follow-up of opioid addicts treated with high-dose buprenorphine in a health care network. National retrospective study. Experience of French general physician. Ann Med Interne, 151:A27-A32.

10. Lintzeris N, Bell J, Bammer G, Jolley DJ, Rushworth L (2002). A randomised controlled trial of buprenorphine in the management of short-term ambulatory heroin withdrawal. Addiction,97:1395-1404.

11. Bochud Tornay C, Favrat B, Monnat M, Daeppen JB, Schnyder C, Bertschy G, Besson J (2003). Ultra-rapid opiate detoxification using deep sedation and prior oral buprenorphine preparation: long-term results. Drug Alcohol Depend,69:283-288.

12. Ling W, Rawson RA, Compton MA (1994). Substitution pharmacotherapies for opioid addiction: from methadone to LAAM and buprenorphine. J Psychoactive Drugs, 26:119-128.

13. Johnson RE, Chutuape MA, Strain EC, Walsh SL, Stitzer ML, Bigelow GE (2000). A comparison of levomethadyl acetate, buprenorphine, and methadone for opioid dependence. N Eng J Med, 243:1290-1297.

14. Petitjean S, Stohler R, Deglon JJ, Livoti S, Waldvogel D, Uehlinger C, Ladewig D (2001). Double-blind randomized trial of buprenorphine and methadone in opiate dependence. Drug Alcohol Depend,62:97-104.

15. Barnett PG, Rodgers JH, Bloch DA (2001). A meta-analysis comparing buprenorphine to methadone for treatment of opiate dependence. Addiction,96:683-690.

16. Simpson HM , Vingilis E (1992). Epidemiology and special population surveys. In: Methodology in man-machine interaction and epidemiology on drugs and traffic safety, Editors: Ferrara SD and Giorgetti R. Addiction Research Foundation of Italy, Padova, Italy, 51-94.

17. Vermeeren A, de Gier JJ (1995). Methodological guidelines for experimental research in drugs and driving: accomplishments and future needs. In: Medikamente im Strassenverkehr: Auftreten, Risiken, Konsequenzen. Editors: Krüger H-P, Kohnen R, Schoch H. Gustav Fischer Verlag, Stuttgart, 49-59.

18. European Monitoring Centre for Drugs and Drug Addiction (1999). Literature review on the relation between drug use, impaired driving and traffic accidents (CT.97.EP.14), EMCDDA publishing, Lisbon.

19. Berghaus G (2002). Methadon-Substitution und Fahrsicherheit/Fahreignung – Überblick über die experimentellen Forschungsergebnisse. Suchtmed 4,169-174.

20. Rothenberg S, Schottenfeld S, Meyer RE, Kraus (1997). Performance differences between addicts and non-addicts. Psychopharmaclogy, 52:299-306.

21. Rothenberg S, Schottenfeld S, Gross K, Selkoe D (1980). Specific oculomotor deficit after acute methadone I. Saccadic eye movements. Psychopharmacology, 67:221-227.

22. Rothenberg S, Schottenfeld S, Selkoe D, Gross K (1980). Specific oculomotor deficit after acute methadone II. Smooth pursuit eye movements. Psychopharmacology, 67:229-234.

23. Jasinski DR, Preston KL (1986). Comparison of intraveneously administered methadone , morphine and heroin. Drug Acohol Depend, 17:301-310.

24. Curran HV, Kleckman J, Bearn J, Strang J, Wanigaratne S (2001). Effects of methadone on cognition, mood and craving in detoxifying opiate addicts: a dose-response study. Psychopharmacology, 154:153-160.

25. Kelley D (1978). Methadone maintenance: an assessment of potential fluctuations in behavior between doses. Int J Addictions, 13:1061-1068.

26. Moskowitz H, Robinson CD (1985). Methadone maintenance and tracking performance. Alcohol, Drugs and Traffic Safety, US Dept of Transportation, Washington DC, 995-1004.

27. Lenne MG, Dietze PM, Rumbold GR, Cvetkovski S, Redman JR, Triggs T (2000). Proceedings of the 15th Int Conference on Alcohol, Drugs and Traffic Safety, 3:974-979.

28. Gritz ER, Shiffmann SM, Jarvik ME, Habers JH, Dymonds AM , Coger R. Charuvastra V, Schleisinger J (1975). Physiological and psychological effects of methadone in man. Arch Gen Psychiatry, 32:237-242.

29. Appel PW, Gordon NB (1976). Digit-symbol performance in methadone-treated ex-heroin addicts. Am J Psychiatry, 133:1337-1339.

30. Grevert P, Masover B, Goldstein A (1977). Failure of methadone and levomethadyl acetate (levo-alpha-acetylmethadol, LAAM) maintenance to effect memory. Arch Gen Psychiatry, 34:849-853.

31. Appel PW (1982). Sustained attention in methadone patients. Int J Addictions, 17:1313-1327.

32. Kubitzki JH (1997). Driving behavior and personality in methadone patients. Proceedings of the 14th Int Conference on Alcohol, Drugs and Traffic Safety, 1:391-299.

33. Staak M, Berghaus G, Glazinski R, Höher K, Joó S. Friedel B (1993). Empirische Untersuchungen zur Fahreignung von Methadon-Substitutionspatienten. Blutalkohol, 30:321-333.

34. Dittert S, Naber D, Soyka M (1999). Methadonsubstitution und Fahrtauglichkeit. Nervenarzt, 70:457-462.

35. Specka M, Finkbeier T, Lodemann E, Leifert K, Kluwig J, Gastpar M (2000). Cognitive-motor performance of methadone-maintained patients. Eur Addiction Res, 6:8-19.

36. Darke S, Sims J, McDonald S, Wicks W (2000). Cognitive impairment among methadone maintenace patients. Addiction, 95:687-695.

37. Mintzer MZ, Stitzer ML (2002). Cognitive impairment in methadone maintenance patients. Drug Alcohol Depend, 67:41-51.

38. Hauri-Bionda R, Bär W, Friedrich-Koch A (1998). Beitragyzur Frageyder Fahrfähigkeit/Fahreignung Methadonsubstituierter. Schweiz. Med. Wochenschrift, 128:1538-1547.

39. Soyka M, Horak M, Dittert S, Kagerer S (2001). Less driving impairment on buprenorphine than methadone in derg-dependent patients. J Neuropsychiatry Clin Neurosc 13:527-528.

40. Babst DV, Newman S, Gordon N, Warner A (1973). Driving records of methadone maintenance patients in New York State. J Drugs Issues, 3:285-292.

41. Blomberg RD, Preusser DF (1974). Narcotic use and driving behaviour. Accid Anal & Prev, 6:23-32.

42. Maddux JF, Williams TR, Ziegler JA (1977). Driving records before and during methadone maintenance. Am J Drug Alcohol Abuse, 4:91-100.

43. Augsburger M, Rivier L (1997). Drugs and alcohol among suspected impaired drivers in Canton de Vaud (Switzerland). Forensic Sci Int, 85:95-104.

44. Musshoff F, Banaschak S, Madea B (2001). Verkehrsteilnehmer unter dem Einfluss von Methadone – Ein aktueller Zustandsbericht. Blutalkohol, 38:325-335.

45. Mørland J, Ripel Å, Øgaard T (2002). Methadone detections in blood samples from apprehended drugged drivers. Proceedings 16th Int Conference on Alcohol, Drugs and Traffic Safety, 2:565-569.

46. De Gier JJ (2002). Problems raised by the use/abuse of psychoactive drugs by drivers. Report on the situation in 24 European countries. Pompidou Group, Council of Europe, Strasbourg, France.

47. Wells-Parker E, Bangert-Drowns R, McMillen R, Williams M (1995). Final results from a meta-analysis of remedial interventions with drink/drive offenders. Addiction,90:907-926.

8. Acknowledgements

The author gratefully acknowledges the co-operation and support of the following:

Germany
Drs Wolf-Ruediger Nickel, Sabine Loehr-Schwaab, and Juergen Brenner-Hartmann - Medical-Psychological Institute TUV, Munich

Austria
Dr. Birgit Bukasa, and Martin Vergeiner - Kuratorium für Verkehrssicherheit , Vienna

Norway:
Prof Asbjørg S. Christophersen and Prof Jørg Mørland - Norwegian Institute of Public Health, Div. of Forensic Toxicology and Drug Abuse, Oslo

Approaches in preventing driving under the influence of drugs

by Hans Peter Krüger, Charlotte Meindorfner, Yvonne Körner, Anke Siebers (Germany)

Introduction

In our report for the last seminar of the Pompidou Group on "Illicit Drugs in Road Traffic" in 1999 we could summarise our experience from the investigations in 17 European countries into: "All of the participating countries perceive prevention programme to be necessary and important, in conjunction with controlling drug dealing and providing therapeutic programmes for drug addicts. There is a need for well-designed, carefully implemented, and critically evaluated drugs-and-driving prevention programmes." But we also mentioned that "the strategy of silently tolerating a drug in general and outside of the road traffic domain, but officially penalising its use prior to or during driving, hinders the implementation of traffic-specific prevention programmes with clear-cut recommendations for young people on how to handle drugs-and-driving situations." During the seminar, an important change in direction took place: the problem of illegal drugs was extended to the problem of psychoactive substances including medicaments. A series of contributions at the seminar pointed out that the prevalence of psychoactive medicaments in traffic and their accident risk make it necessary to come to a comprehensive discussion. As a consequence, the demand for "regular campaigns to inform the public of the dangers of driving when taking certain medications" was formulated in the recommendations of the seminar.

From the point of view of traffic safety, the crucial variable is accident risk. If it comes from driver impairment, it makes no difference whether this impairment is caused by alcohol, illegal drugs or medicaments. Insofar, there is no need to differentiate between these substances. The situation changes when looking at prevention. Prevention of consumption clearly is an issue for illegal drugs, it could be one for alcohol, but is surely not adequate for medicaments used by patients. Thus, the subsumption into "psychoactive substances" simplifies the discussion with respect to traffic safety but complicates it with respect to prevention messages.

Considering these problems, a survey was conducted to get information about the solutions which the member states of the Council of Europe found for these problems. The first aim of the survey was a stock taking of prevention efforts in the different countries, separated into alcohol, illegal drugs and medicaments, and differentiated into general prevention and into prevention in traffic. From the beginning, we were aware of the fact that the outcome would not be too abundant because those programmes are very expensive. Therefore, the questionnaire included a series of questions asking for the experts' opinions on the adequacy and efficiency of different prevention measures.

We hoped to get at least a summary of the experiences all over Europe of how to design prevention programmes for the different kinds of psychoactive drugs. These questions were derived from a review on the literature about prevention and the different issues described there. Therefore, the following report gives an overview about different strategies in prevention and develops a framework of issues first. In the second part, the results of the survey are presented.

1. Different classifications of prevention

Revising the literature on prevention, the difference between general prevention and prevention in traffic immediately leaps to one's eye. As Table 1 shows the respective databases MEDLINE and PSYCINFO yield an overwhelming number of studies on either drug, alcohol or medication prevention. Restricting the search for prevention in traffic (or driving), the numbers decrease enormously. These numbers already reflect the problem: prevention in traffic is a relatively small area of research and is mostly concerned with alcohol, but nearly blind to medicaments.

Table 1: Exemplary results of a literature search in the databases Medline and Psycinfo

Keywords			***Results***
prevention	drug or alcohol or medication		158,552
prevention	drug or alcohol or medication	traffic	1074

Therefore, our search for a classification scheme of prevention issues must be based on conceptions developed in general prevention.

Basic principles of the prevention classification

The most common classification of different prevention types stems from Caplan (1964). Following the medical terminology, he differentiated between primary, secondary and tertiary prevention/intervention. Caplan used these terms in psychiatry to name measures that were implemented to avoid not yet existing disorders (primary prevention), to combat disorders when appearing for the first time (secondary prevention), and to avoid aggravation or consequences of disorders when they had already appeared (tertiary prevention, later referred to as harm reduction). The term secondary prevention was also modified later and further subdivided into

- measures aimed at specific high-risk groups or
- measures to detect disorders or critical behaviour as early as possible.

Perrez (1991) further differentiated specific vs. non-specific, population- vs. high-risk-group-oriented, and person- vs. system-oriented prevention programmes. He specified the following aspects as main prevention aims in the area of addiction including psychoactive substances in traffic:

- to create sensitivity for the problem,
- to impart knowledge,
- to enhance motivation,

- to impart social skills,
- to maintain desired behavioural changes, and
- to prevent relapses.

These aims should be achieved via enlightenment, consultation, training, as well as environment- and system-based interventions.

However, prevention turns out to be a problem if preventive measures are carried out despite insufficient etiological knowledge. On this account it seems particularly important to promote not only preventive measures themselves but also research activities and especially their practical application. According to Perrez (1991), a main problem of efficient prevention often is the insufficient social and economic promotion. Moreover, it often is difficult to evaluate and to prove the effects of the implemented measures.

2. Further approaches to the classification of preventive strategies

Starting from the scheme of Caplan (1964), many further classifications of prevention measures were developed. In the following, we try to describe their main characteristics giving special emphasis to those issues which are directed – at least in an indirect way – to traffic safety. Concerning the problem "alcohol at the wheel", Huguenin & Winkler (1993) ask for general as well as special prevention measures. General prevention approaches subsume (1) educative measures, (2) information measures, as well as (3) legal measures.

Educative measures should start to create a driver image in which being sober and rejecting alcohol is not seen as boring but as being "cool". *Information measures* should reduce the social significance of alcohol and sensitise drinking drivers. The increased accident risk should especially be explicated. As drinking behaviour is difficult to influence, prevention should concentrate more on driving than on drinking strategies, i.e. the development of alternatives to driving themselves. As a third very important part of successful prevention of alcohol at the wheel, Huguenin & Winkler (1993) specified *legal measures* which have to build up a sufficient counterpart against inappropriate behaviour.

The Swiss department for alcohol and other drug problems (SFA, 2003) decided for another differentiation and subdivided the programmes in accordance with two basic concepts:

- measures aimed at persons at risk and
- measures aimed at social circumstances (focused on the social environmental conditions)

Measures aimed at persons (at risk) were further subdivided into five different types of programmes:

- programmes to impart knowledge
- programmes based on principles of affective education
- programmes to impart resistance techniques (inoculation method)
- programmes to teach personal and social skills (life mastering skills)
- programmes to develop alternative behaviour to drug use

The effectiveness of *programmes to impart knowledge* resp. to transfer information has been widely demonstrated: even short prevention measures are able to enhance knowledge of drugs significantly. But still, effects on attitudes are ambiguous and effects on behaviour changes could not be found. Occasionally, boomerang effects can be ascertained, too. Moreover, it is common knowledge that information about drugs is a necessary but not sufficient condition for a rational decision. As adolescents are often exposed to informal and dubious sources of information, adequate information is even more important. Results indicate that the symbolic meaning of drugs has changed: today, drug consumption is increasingly associated with sorrow and illness, whereas it used to be related to rebellion.

Thus, the credibility of adults (parents, teachers, doctors) should have increased, too. Furthermore, the effects of affective information, especially fear appeals in prevention programmes are controversially discussed by many educationalists. Scientific literature approves the use of affective information, particularly if it aims at maintaining a legitimate fear. For teenagers, the fear of the physical consequences is the main motive to refrain from illegal drug consumption. Prosperities in smoking or AIDS prevention can be attributed to this motive, too. But of course, drug prevention should not exclusively be restricted to the presentation of deterring information. However, adolescents not yet consuming illegal drugs are much more interested in objective information about drugs than adolescents who are already experienced in drug consumption.

In contrast, *affective education* aims at promoting a responsible behaviour by making conscious the individual values and needs as well as their role in the decision-making process. To reach this goal, specific techniques are used: clarification of values, analysis of decision consequences, identification of alternative behaviour that is congruent with the individual's values and needs. Because of the lack of reliable evaluation data, statements of the effectiveness of the prevention of illegal drugs are not possible.

The *inoculation method* represents perhaps the most important attainment of drug prevention. The respective programmes try to teach adolescents the causes of smoking and excessive alcohol or drug abuse, to explain the role of peers, models or advertisement in creating the significance of these substances, and to demonstrate and practice a successful resistance to social manipulations. Present evaluation data reveal a positive image of the measures´ efficiency. Especially in the prevention of smoking cigarettes and marihuana, teaching of resistance techniques seems to have promise. Furthermore, these programmes often use *peer leaders* as mediating persons who will be carefully trained before employed.

The term *assertiveness training* comprises general education techniques to teach adolescents to express their needs and preferences by training skills like expressing disagreement, refusing requests, asking for favours and initiating communication. Indeed, such programmes are able to improve social skills of adolescents and can potentially avoid drug use. Further approaches in this area revealed programmes to teach problem solving techniques or to help in decision making processes in order to efficiently cope with manipulations of peers. Prevention programmes which do not focus on individuals but on their social background can be classified on the basis of the institutional aspects they address: parents/family and school, community, and/or the entire society.

Informational measures proved to be effective for parents and teachers on the knowledge dimension but showed no effects on their behaviour. Training of skills, however, partly proved to be successful with regard to parents and teachers; but the effects on children were controversial. The results concerning this topic are not consistent. In the parental training it turned out to be the most difficult problem to reach the parents. Furthermore, there are convincing results in the area of cardiovascular diseases that a municipality near prevention can be effective (smoking prevention), but the reliability of the obtained effects is still not known with certainty. There are only a few evaluations of municipality-related approaches with the aim of preventing the substance use.

An very important literature review is presented by DeJong & Hingson (1998) in order to update research on the prevention of alcohol-related traffic deaths since the 1988 Surgeon General's Workshop on Drunk Driving.[2] Four primary areas of research concerning strategies to reduce driving under the influence of alcohol were reviewed: (1) general deterrence policies, (2) alcohol control policies, (3) mass communication campaigns including advertising restriction, and (4) community approaches to prevention / community traffic safety programmes.

Modern efforts against drunk driving in the United States began with *specific* deterrence strategies to punish convicted drunk drivers. Specific deterrence laws aim to reduce the recidivism of persons convicted of alcohol-impaired driving by treatment, mandatory license suspensions, actions against vehicles and vehicle tags, lower legal BAC limits, jail sentences, probation, or a combination of those. A successful strategy, however, also requires a *general deterrence* that aims at dissuading the entire population from driving after drinking. Thereby, the following key strategies should be included: administrative license revocation, sobriety checkpoints, lower per se limits and zero tolerance laws. In addition to general deterrence policies, a population-based *alcohol control policy* should be included which is based on the idea that reducing the availability of alcohol discourages underage drinking and excessive consumption. *Mass communication campaigns* are typically designed for a broad undifferentiated audience and, thus, not necessarily for those at greatest risk. In addition, there is little evidence of the effectiveness of such campaigns in reducing drunk driving, due to the expense and the difficulty of their evaluation. Mass communication campaigns can basically promote general awareness, individual behaviour change, and public action.

According to recent evaluations a comprehensive approach to alcohol control and drunk driving prevention like *community approaches to prevention resp. community traffic safety programmes* seems to work best. Community-based prevention programmes can help to establish or reinforce community social norms against underage drinking and drunk driving, and provide youth with awareness education and direct training on peer resistance skills. Furthermore, they should offer structured mentoring, interpersonal counselling, and recreational opportunities for youth to enhance their basic personal skills while also minimising their exposure to social and environmental risk factors and create changes in the environment through regulations and other policies.

[2] All references quoted in the following sections are again quoted in the literature review of DeJong & Hingson, but in order to arrange the text more clearly, the add-on “quoted by DeJong & Hingson, 1998” will be left out.

All in all, for the future of alcohol control the authors recommend a comprehensive, community-based approach including

- formation and support of local coalitions that work for change in the physical, social, economic and legal environment that shapes alcohol consumption,
- rigorous and well-publicised enforcement of existing laws and regulations,
- mass media campaigns to communicate moderate drinking social norms and expectations,
- education programmes to support individual change and to gain widespread support for new alcohol-control policies and
- installation of systems for early identification, referral and treatment of people with alcohol-related problems.

Finally DeJong & Hingson (1998) emphasise the need to integrate other traffic safety initiatives into drunk driving prevention.

For another important classification scheme, Bühringer (2000) focused on prevention of abuse of psychoactive substances in general as well as on prevention of psychoactive substances in traffic. Concerning the first one, the following ten conditions are the most important protective and risk factors of substance related disorders and damages: predisposition, abuse in family, education style, early deviant and delinquent behaviour, peer group influence, availability of psychoactive substances, behavioural tendencies concerning psychoactive substances, communication abilities, self-confidence, and coping with stress. Two types of preventive measures can be derived directly from these (respectively two types of) factors:

- factors/measures concerning the individual behaviour (communicative or behavioural prevention) and
- factors/measures concerning social structures and circumstances (structural prevention).

According to Bühringer (2000) *communicative/behavioural prevention* aims at the single persons who should be supported by information and education in order to cope with the risks of their environment. Especially, concepts promoting life competencies are currently emphasised. These groups of programmes can be characterised as theoretically based on the concept of risk factors and protective factors with differences concerning how the single factors are weighted. They are to present specific information about psychoactive substances and their effects and they emphasise exercising parts (role-playing, etc.) to promote general life competencies as well as the way how is dealt with psychoactive substances (e.g. “say no”).

S*tructural prevention* aims at the way how substances are dealt with in the family, in the close social environment as well as in the entire society, including the availability of substances and the corresponding norms and values. Thereby, (concerning alcohol) structural prevention has been shown to be more effective than communicative prevention (Edwards et al., 1994/1997, quoted by Bühringer, 2000). Furthermore, one can differentiate preventive measures according to how strongly they relate to specific substances. Thus, there are (1) substance unrelated prevention (they do not refer to the way how is dealt with the substances at all), (2) substance related prevention (they aim to influence the way how is dealt with the substance), and (3) prevention related to specific substances.

Regarding the prevention of psychoactive substances in traffic, Bühringer (2000) emphasises that the objectives of prevention differ according to the consumption pattern of the target persons. Thereby, consumption is considered problematic if a person is not able to control it anymore so that he can not participate in traffic without risk. Thus, the major aim (no participation in traffic under the influence psychoactive substances) can rather be realised by distinguishing different sub-goals for an unproblematic vs. a problematic pattern (even though transitions are fluent). For an unproblematic consumption pattern the main sub-goals are reduction/renouncement of consumption before participation in traffic and renouncement of participation in traffic under the influence of psychoactive substances. This requires a high grade of self-management, self-control and temporal advance planning, as well as a differentiated knowledge of the correlation of the consumed amount of the substance and the duration and intensity of the impairment of driving ability. Measures referring to those aspects belong to primary and secondary prevention. In contrast, the sub-goals for a problematic consumption pattern are more general. Thus, they are total the renouncement of consumption in case of a present diagnosis of abuse/addiction and total renounce of participation in traffic in case of a present diagnosis and acute problems since in the case of such a diagnosis there is a very high risk for a loss of control (e.g. for an impaired self-management). For those persons, a separation of general and traffic specific measures is obviously unrealistic. Thus, secondary prevention, therapy as well as tertiary prevention are indicated.

An additional attempt to classify prevention measures stems from the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA 1998). At the “First European Conference on the Evaluation of Drug Prevention”, the following issues were discussed: (1) Mass-media campaigns, (2) Work in the community, (3) Youth subcultures, and (4) Peer group approaches.

Concerning *mass media campaigns*, a model with four stages was developed: The recipient is (1) physically contacted and exposed to the communication, becomes (2) aware of the message, (3) understands the message, and (4) accepts and absorbs it.

Furthermore, it was pointed out on two essential features of mass media campaigns: they are characterised by the involvement of a one-way communication from a "sender" to an anonymous "recipient" and, thereby, many senders vie for the attention of the target audience. In the planning stage of such campaigns, important aspects are how the recipient is exposed to the message (this involves the selection of appropriate media and channels of communication and the assessment of the frequency and intensity of exposure to the message) and how the recipient's attention is held at the second stage e.g. how is the message made attractive and appealing (this refers to aspects as linguistic style and mode of expression, scope of the message, as well as quantity and depth of the information), as well as the logic and clarity of the argument, its credibility and any educational elements.

The workshop tackling *"youth culture"* revealed that cultural influences seem to be ignored too often when planning prevention activities and that, therefore, more research is needed to incorporate "youth culture" into basic prevention and to realise more subtly differentiated prevention measures. It was felt that an important, hitherto neglected strategy was to ask young people what they needed in order to cope with the risks, what might be a basis for prevention.

Concerning *school based prevention,* it was felt that schools were appropriate settings for educational prevention strategies and that prevention activity should be seen as an integral part of the school curriculum, progressing from non-specific primary prevention to more targeted secondary prevention. Thereby, straightforward information should be provided and psychosocial skills should be developed with teachers as mediating people of trust between children and parents. Teachers, in turn, could be trained and supervised by professional experts.

Since prevention must be credible in the eyes of young people, *peer-based programmes* may be the best way of ensuring this. These initiatives should be viewed as partly primary prevention, partly harm reduction. Thereby, peers rather are used as supporters of intervention leaders than as leaders themselves, particularly during the planning stage, and peers should not be defined in terms of use or abstinence, but in terms of attitude, dress code and age, and whether a peer leader was for or against drug use, of course.

Well-known classifications of prevention issues came from OSAP (Office for Substance Abuse Prevention) in the USA in 1989, from Kumpfer (1989), and from Gerstein & Green (1993). They are described in more detail in the excellent publication "Handbook Prevention: Alcohol, Drugs and Tobacco" from Jaap van der Stel, assisted by Deborah Voordewind, published by the Pompidou Group - Council of Europe & Jellinek Consultancy. The listing in Table 2 together with the classification schemes described above makes obvious how concurrent the different approaches are.

Table 2: Three classification schemes for strategies in prevention

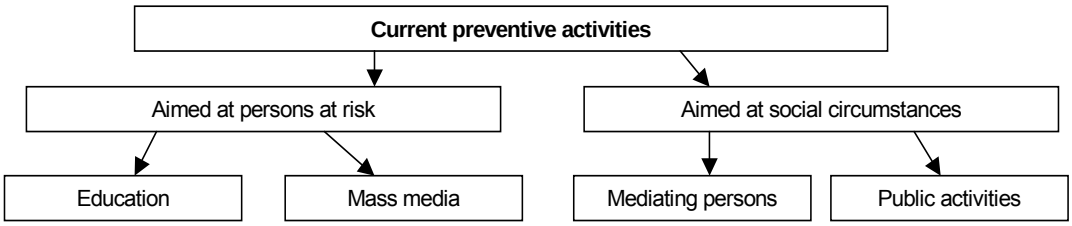
OSAP (1989)	***Kumpfer (1989)***	***Gerstein & Green (1993)***
Strategies targeted at individuals (Scare tactics, affective and interpersonal approach, alternative activities, informative approach, "it could happen to me", dealing with emotions, improving social skills, detecting antisocial behaviour)		The risk factor approach The development approach
Strategies targeting at peers		
Educational approaches targeted at parents	Prevention schemes targeted at families	The social influence approach
Strategies targeted at schools	Prevention schemes in schools	Programmes targeted at schools
System of pupil guidance		
Approaching teachers		
Mass media approaches		Mass media campaign
Preventing by means of legislative and other controls		
	Prevention schemes targeted at or based on the local community	The community-specific approach

3. Structure of the presented questionnaire

Based on the literature reviewed above, our questionnaire was developed as follows: In order to integrate all relevant aspects and to capture all current approaches in preventing alcohol, illegal drugs and medicines in traffic, the questionnaire will be structured into three sections:

1. National prevention management
2. Current preventive activities
3. Special programmes

The **first section** is to give a review of the general management concerning the prevention of psychoactive substances in traffic in the respective countries (regarding e.g. importance, financial aspects and research). Whereas the **third section** aims to describe special prevention programmes in detail, the **second section** contains some questions of the countries' current measures against driving under the influence of psychoactive substances. In order to receive a structured pattern of these current preventive measures, a classification was developed based on current literature (see below).



Generally, it may be differentiated between

- activities aimed at **persons at risk** themselves and
- activities aimed at **social circumstances**.

Persons who take psychoactive substances and (are likely to) participate in traffic as drivers are characterised as **persons at risk**, that might concern different subgroups of persons. As factors of interest, age (illegal drugs are rather the problem of younger persons vs. alcohol and medicines is a problem of all age groups), therapeutic indication and compliance (use vs. abuse) must be taken into account. **Social circumstances** contain measures aimed at the environment of persons at risk, including private and job-related persons and preventive activities in the environment of the concerned subject.

3.1. Persons at risk

Measures aimed at persons at risk could be further subdivided into

- **educative measures** and
- **mass media campaigns**.

Courses or workshops addressing a defined group of persons at risks are subsumed under the term "**education**" or "**educative measures**". Such arrangements can give *objective information* on psychoactive substances (general effects, effects on driving fitness, etc.), or it allows the persons to *experience the substance's effects* (e.g. controlled application of alcohol in a driving simulation). Furthermore, educative measures can *train skills* or strategies to resist driving when impaired by psychoactive substances (e.g. "say no"), deter by giving *affective information* (fatalities, accidents, punishments), and involve the *assignment of peers* as leaders or as supporters of leaders.

In addition, it is demanded in literature that prevention should be adapted to characteristics of the target persons (differential prevention). This might concern linguistic style, mode of expression, quantity and depth of information, etc. The relevant characteristics (e.g. age, sex, education and consumption patterns (beginners, moderate, heavy users, addicts)) are used for differentiation of the preventive measures, too.

On the other hand, **mass media campaigns** concern messages that are delivered to a rather anonymous population at risk by mass media (e.g. newspapers, television). These messages can contain objective and effective information or can advise alternative behaviour (e.g. the designated driver approach). Besides, activities can be reinforced by announcing incentives like for instance prizes at contests (e.g. “Draw the best comic to discourage people from driving under alcohol, and win a journey!”).

3.2. Social circumstances

Activities concerning **social circumstances** contain

- measures aimed at **mediating persons,** as well as
- promotion of **public activities**.

Mediating persons are persons who do not take psychoactive substances and drive themselves but are in close contact to persons at risk and could influence them positively. This might concern family and friends, caregivers, teachers, driving teachers, co-workers and superiors as well as policemen or physicians. Activities aimed at mediating persons can clarify by giving *information* on psychoactive substances and persons at risk via workshops, courses or mass media campaigns. Moreover, they can *train skills* to e.g. teach courses about psychoactive substances in traffic for persons at risk or train the use of psychological techniques concerning communication, problem solving, mediation etc.

Furthermore, all **public**, governmental, and communal **activities** regarding the prevention of psychoactive substances in traffic are subsumed including the configuration of social backgrounds, places of domicile, employment or leisure (e.g. free shuttle service, breathalysers in night clubs).

4. results of the questionnaire survey

4.1. Responders

In January 2003, this questionnaire was sent to all the permanent correspondents of the Pompidou Group of the member states of the Council of Europe requesting them to answer until 31 March 2003. All in all, 17 of 45 member states returned a completed questionnaire which resulted in a responder rate of 37.8%. These states were: (in chronological order of responding date): Belgium, Cyprus, Czech Republic, Estonia, Finland, France, Germany, Luxembourg, The Netherlands, Norway, Poland, Lithuania, Slovakia, Slovenia, Spain, Sweden and Switzerland. The data of all these states were included in the analyses presented in the following sections – except for the data of Germany concerning section 4.3 which could not be included anymore.

4.2. National prevention management

4.2.1. Prevention management by official vs. private institutions

According to the first question in this section, *prevention of psychoactive substances in general* seems to be rather a matter of official institutions: 10 of the responding countries ticked this response option, only in Lithuania it is exclusively a matter of official institutions, whereas 4 countries indicated a ratio of 1:1. In contrast to that, Poland and Belgium reported that the prevention of psychoactive substances in general is rather a matter of private institutions.

The percentage to which prevention in general is handled by official institutions (and appropriate descriptive statistics) is depicted separately for alcohol, drugs and medication in Table 3. Thus, especially in case of medication, official institutions are responsible for prevention in general, however, at this item the largest amount of missing values (59%) was found. In addition, it is very interesting that the minimum value is 50% for alcohol and medication, but 40% for illegal drugs, thus only in this field a higher portion of private than of official institutions was reported.

Table 3: Prevention as a matter of official institutions in percent

	alcohol	illegal drugs	medication
N (valid)	12	14	7
mean	76,67	67,64	80,00
standard deviation	17,75	19,71	20,00

Approximately 57 % of the responders (8 out of 17 including 3 missing values) indicated that a similar relation applied for the prevention of psychoactive substances in traffic. However, Slovakia, Finland, Slovenia, and Switzerland quoted different ratios for traffic.

At large, *prevention of psychoactive substances in traffic* also seems to be rather a matter of official institutions: 7 of the responding states ticked this response option, Slovakia, Lithuania, and Slovenia even indicated that it was exclusively a matter of public institutions, whereas 3 countries reported a ratio of 1:1. Only Switzerland considered prevention in traffic to be rather a matter of private institutions.

The percentage to which prevention in traffic is handled by official institutions (and appropriate descriptive statistics) is presented separately for alcohol, drugs and medication in Table 4. It is obvious that prevention in traffic is even more a matter of official institutions than prevention in general for alcohol and drugs, whereas there is no difference regarding medicines. However, the minimum value for all substances is 30%, reported by Switzerland, approving that in Switzerland, traffic related prevention is handled more privately than officially.

Table 4: Prevention in traffic as a matter of official institutions in percent

	alcohol	illegal drugs	medication
N (valid)	11	11	7
mean	75,00	74,09	81,43
standard deviation	23,77	24,58	24,62

4.2.2. Money spent on prevention

The questions regarding the money spent on prevention were left out by most of the countries resp. they indicated that it was not known. Thus, in Table 5 the amounts are presented for the individual countries who responded. When it was differentiated between the amounts spent by official and private institutions, the latter was usually lower than the former.

The largest amount for preventive measures against psychoactive substances in general is spent by official institutions in Luxembourg, whereas regarding prevention in traffic Switzerland is in the fore of the responding states with an total amount of € 7,700,000. Furthermore, it can be demonstrated that in all countries the amount of money spent on preventive measures against illegal drugs or medication is dramatically lower than regarding alcohol.

Table 5: Money spent on prevention in general and in traffic per year in Euro

	alcohol		**illegal drugs**		**medication**		**total**	
	general	**traffic**	**general**	**traffic**	**general**	**traffic**	**general**	**traffic**
Netherlands								
official:	2,000,000		2,000,000				4,000,000	
private:	500,000						500,000	
Total	2,500,000		2,000,000				4,500,000	
Luxembourg (official)			13,826,000				13,826,000	
Finland								
official:							2,000,000	
private:							10,000,000	
Total							12,000,000	
Estonia (official)	30,000	25,000	15,000				45,000	25,000
Cyprus (official)		118,000					118,000	
Switzerland								
official:		5,000,000		1,000,000		500,000		6,500,000
private:		1,000,000		200,000		0		1,200,000
Total		6,000,000		1,200,000		500,000		7,700,000
Sweden								
official:		1,500,000		1,000		10,000		1,511,000
private:		100,000		500		1,000		101,500
Total		1,600,000		1,500		11,000		1,612,500

4.2.3. Organisations/Institutions

All in all, only a few countries reported about the number of organisations or institutions concerned with the prevention of psychoactive substances, as it can be seen in Table 6. Especially the number of institutions concerned with medication is extremely low.

Table 6: Number of organisations/institutions concerned with the prevention of psychoactive substances

	alcohol		illegal drugs		medication	
	official	private	official	private	official	private
Responder	7	6	9	8	5	3
mean	73,71	13,50	72,78	35,50	98,60	18,00
standard deviation	179,28	18,57	155,21	42,77	213,24	27,73

7 countries (Cyprus, Estonia, Luxembourg, Netherlands, Slovenia, Sweden, and Switzerland) responded that they had a special official institution focusing on the prevention of alcohol in traffic as a main topic, Luxembourg, Switzerland and Germany reported that they had a private one and Sweden reported to have both. The remaining countries told about other official institutions: 4 states have such a special institution for drugs. Estonia, Germany and Slovenia reported to have an official institution, Luxembourg has a private institution, Sweden again reported to have both. However, regarding medication, only Luxembourg (private), Germany (official) and Sweden (again official and private) seem to have institutions especially focusing on the prevention in traffic as a main topic.

There is a unifying institution that conceives, co-ordinates and supervises prevention activities concerning alcohol in 12 countries (12 for prevention in general, 8 of them also for prevention in traffic), Slovenia indicated that such an organisation is in preparation for general prevention. In the Czech Republic, the same holds true for prevention in traffic, and Finland is preparing such an institution for both prevention in general and in traffic. Regarding general prevention against illegal drugs, 13 states reported to carry on such an institution, for prevention in traffic 6 countries did so, and, in addition, the Czech Republic reported to prepare one for traffic prevention. In contrast to that, only 10 member states have such an institution for general prevention regarding medicines, but anyway, Luxembourg, Spain, Sweden, Germany and Switzerland mentioned also an institution dealing with traffic relevant aspects. The institution prepared by Czech Republic should also deal with medication in traffic. (see Table 7)

Table 7: Unifying institutions conceiving, coordinating, and supervising prevention activities

	alcohol		illegal drugs		medication	
	general	traffic	general	traffic	general	traffic
Yes	12	8	13	6	10	5
in preparation	2	2		1		1

4.2.4. Statistics concerning psychoactive substances

There is a wide range of statistics and data available concerning the use/abuse of, the prevalence of, accidents due to, and further aspects of alcohol, illegal drugs and medication, as depicted in Table 8. Its obvious that most data are available concerning alcohol. In contrast, medication data are less extensive and rather concerned with the use/abuse than with traffic related aspects. The use/abuse of illegal drugs is the most analysed topic (with 94%) of the states which have data about it.

Table 8: Statistics concerning alcohol, drugs, and medication

	alcohol		illegal drugs		medication	
	fj	%	fj	%	fj	%
use/abuse	13	76.5	16	94.1	10	58.8
prevalence in traffic	13	76.5	7	41.2	3	17.6
accidents	13	76.5	8	47.1	5	29.4
further aspects	4	23.5	3	17.6	2	11.8

4.2.5. Public discussion

Psychoactive substances in general are widely discussed in public, as in legislation, science, media and politics. However, medication is the substance which is paid the least attention to (s. Table 9). This becomes especially obvious when regarding psychoactive substances in general because illegal drugs are nearly in all fields of public interest discussed, whereas only 3 states reported a political commitment with medication in general. In traffic, the public discussion is generally more rare, medication in traffic is also discussed least.

Table 9: Psychoactive substances in general resp. in traffic as a matter of public discussion

in general:

	alcohol		illegal drugs		medication	
	fj	%	fj	%	fj	%
politics	11	64.7	14	82.4	3	17.6
- in election campaigns	4	23.5	12	70.6	1	5.9
- in party platforms	4	23.5	11	64.7	2	11.8
legislation	14	82.4	16	94.1	10	58.8
media	15	88.2	16	94.1	9	52.9
science	12	70.6	17	100.0	10	58.8

in traffic:

	alcohol		illegal drugs		medication	
	fj	%	fj	%	fj	%
politics	11	64.7	12	70.6	2	11.8
- in election campaigns	3	17.6	4	23.5	0	0.0
- in party platforms	3	17.6	4	23.5	1	5.9
legislation	12	70.6	12	70.6	7	41.2
media	14	82.4	12	70.6	9	52.9
science	9	52.9	7	41.2	4	23.5

4.2.6. Four subjects of drug policy

This item aims at the concept of the four subjects/columns of drug policy: (1) primary prevention, (2) repression, (3) therapy, and (4) harm reduction. All in all, the portion of harm reduction in drug policy seems to be very low. However, the greatest contingent can be found for medication (Table 10). In the policy regarding alcohol, primary prevention, repression and therapy are nearly balanced (md=30%), only harm reduction is weighted less (md=10%) than the other three subjects. Concerning illegal drugs, repression seems to be the most important goal of drug policy, certainly because of the culpability of consumption. On the other hand, the handling of medication is mainly conditioned by therapy, and it is the sole field in which harm reduction is not the least important subject of drug policy but on the second position. In this area, of course, repression is rather impossible to realise because medicines are at first used to a therapeutical end. But unfortunately, also primary prevention is extremely neglected in this field.

Table 10: Relevance of the 4 subjects of drug policy

alcohol:

	(primary) prevention	repression	therapy	harm reduction
N (valid)	10	10	10	10
mean	32.5	36	25	6.5
standard deviation	17.36	21.06	13.54	4.74

illegal drugs:

	(primary) prevention	repression	therapy	harm reduction
N (valid)	10	10	10	10
mean	27.8	38.3	23.8	10.1
standard deviation	14.85	18.01	12.25	5.07

medication:

	(primary) prevention	repression	therapy	harm reduction
N (valid)	7	7	7	7
mean	27.86	16.43	35.00	20.71
standard deviation	28.85	15.47	25.66	10.97

4.2.7. Research activities

As far as alcohol is concerned, there seem to be quite a lot of research activities about the substance effects in general and in traffic. Furthermore, many studies about the efficiency of various preventive strategies, as well as some evaluation studies of definite preventive programmes were reported. However, traffic related research regarding illegal drugs and medication seems to be very rare. Especially as far as prevention and evaluation are concerned, no research was reported for medication no matter if it aims at general prevention or prevention in traffic. For illegal drugs, at least some states indicated research about prevention in general. (Table 11)

Table 11: Research activities

Substance effects:

	alcohol		illegal drugs		medication	
	fj	**%**	**fj**	**%**	**fj**	**%**
effects in general	4	23,53	5	29,41	2	11,76
effects on driving fitness	1	5,88	0	0.0	0	0.0
both	4	23,53	4	23,53	3	17,65
total valid	9	52,94	9	52,94	5	29,41
missing responses	8	47,06	8	47,06	12	70,59
Total	17	100,00	17	100,00	17	100,00

Efficiency:

	alcohol		illegal drugs		medication	
	fj	**%**	**fj**	**%**	**fj**	**%**
prevention in general	3	17,65	8	47,06	0	0.0
prevention in traffic	2	11,76	0	0.0	0	0.0
both	3	17,65	0	0.0	0	0.0
total valid	8	47,06	8	47,06	0	0.0
missing responses	9	52,94	9	52,94	17	100.0
Total	17	100,00	17	100,00	17	100.0

Evaluation of prevention programmes:

	alcohol		illegal drugs		medication	
	fj	%	fj	%	fj	%
general programmes	3	17,65	9	52,94	0	0.0
traffic related programmes	2	11,76	0	0.0	0	0.0
both	4	23,53	0	0.0	0	0.0
total valid	9	52,94	9	52,94	0	0.0
missing responses	8	47,06	8	47,06	17	100.0
Total	17	100,00	17	100,00	17	100.0

Only Cyprus (the draft of National drug strategy for Cyprus illegal drugs), Slovakia (theoretical foundation, validity, reliability, in some cases also comparability), and Belgium established obligatory criteria to assess prevention programmes. 9 of 17 countries reported that results of research are usually adopted in practice, Cyprus and Slovenia answered in the negative.

4.3. Current preventive activities

Based on our literature review, prevention was differentiated into eleven different strategies in our questionnaire. Table 12 shows that all these preventive measures listed are widely applied in the responder countries. All countries reported to know about objective information transfer in educative measures and in mass media campaigns, as well as about affective information transfer in mass media. The least known strategies were peer involvement, skill training of mediating persons, as well as activities and incentives.

Table 12: Application of different preventive strategies regarding psychoactive substances in traffic

Strategy			frequency	%
Aimed at persons at risk	**Educative measures**	**objective information transfer**	16	100.0
		experience transfer	10	62.5
		skill training	13	81.3
		affective information transfer	14	87.5
		peer involvement	10	62.5
	Mass media campaigns	**objective information transfer**	16	100.0
		affective information transfer	16	100.0
		activities and incentives	7	43.8
Aimed at social circumstances	**Mediating persons**	**information transfer**	15	93.8
		skill training	10	62.5
	Public activities		12	75.0

The following sections will further investigate the different preventive strategies regarding detailed information about special preventive measures and degree of use in the particular states. Furthermore, the responding persons were asked to estimate the effectiveness, the cost-value-ratio of the strategies, and the necessity to adapt the respective strategy to characteristics of the concerned persons. All these continuative questions are only asked for ten of the eleven preventive strategies presented above, thus, “activities and incentives” cannot be compared to the other prevention measures.

4.3.1. Detailed applications of the current preventive strategies

4.3.1.1. Educative measures aimed at persons at risk

At most 87.5% of the correspondents knew one of the different measures containing objective information transfer (Table 13), whereas all of them reported to know about such measures in general in their own country (see Table 12). Anyway, half of the responding states inform their citizens about availability of other means of travel in order to prevent driving under the influence of drugs.

Concerning the strategy “training of skills”, the analysis revealed a discrepancy: although 86% of the responding correspondents knew about skill training in educative measures in their country, however, the various types of skills offered in our questionnaire are less prevalent (Table 13). Not even half of the states seemed to know one of the detailed possibilities to apply such skill training in prevention of psychoactive substances in traffic. The (rather well-known) designated driver concept is mentioned most often, but only by 44% of the responders.

Compared to objective one, affective information transfer is very less used in educative measures, but more than 60% of the responding countries especially inform about fatalities, statistics of accidents, and legal punishment (Table 13).

On the other hand, peer involvement seems to be quite seldom in prevention of psychoactive substances in traffic. Thereby, as to be expected and in literature recommended, peers are somewhat more often deployed as supporters than as leaders (Table 13)

Table 13: Detailed applications of strategies in educative measures – objective information about

	frequency	%
objective information about		
substances' effects in general	14	87.5
substances' effects on driving fitness	12	75.0
availability of other means of travel like public transport	8	50.0
others (information in medicine packings)	1	6.3
skills: training of		
reliable assessment of one´s state	3	18.8
"answering no"	6	37.5
compliance in medical therapy	3	18.8
applying a designated driver	7	43.8
use of other means of travel	5	31.3
others (in rehabilitation programs)	2	12.5
affective information about		
fatalities	10	62.5
statistics of accidents	10	62.5
single case reports	9	56.3
legal punishments	10	62.5
others (documents, films, etc.)	1	6.3
peers		
as leaders	4	25.0
as supporters	6	37.5

4.3.1.2. Mass media campaigns aimed at persons at risk

In contrast to the rather personal strategies of educative measures, mass media campaigns want to get through to as much persons as possible. Table 14 shows the detailed measures of objective and affective information transfer in mass media campaigns. It is obvious that detailed objective information is more often used than affective one in mass media campaigns. But there are only less differences between information transferred in educative measures and transferred in mass media campaigns.

Table 14: Detailed applications in mass media campaigns

	frequency	%
objective information about		
substances' effects in general	14	87.5
substances' effects on driving fitness	12	75.0
availability of other means of travel like public transport	8	50.0
affective information about		
fatalities	10	62.5
statistics of accidents	12	75.0
single case reports	10	62.5
legal punishments	9	56.3
others	1	6.3

4.3.1.3. Social circumstances: Mediating persons

Concerning measures aimed at mediating persons, affective as well as objective information transfer was asked for at the same item, but only objective information was differentiated more detailed in the subsequent questions. The upper part of Table 15 demonstrates the frequencies of applications in informing mediating persons objectively. Only a little less detailed measures are applied in this field than in education or in mass media campaigns.

Table 15: Detailed applications of strategies aimed at mediating persons

	frequency	%
information about		
substances´effects in general	11	68.8
substances´effects on driving fitness	9	56.3
availability of other means of travel like public transport	5	31.3
skills: training of		
teaching courses	6	37.5
psychological techniques	4	25.0

The lower part of Table 15 shows in comparison to the upper one that information transfer is much more prevalent than training of skills when addressed to mediating persons. Only 38% of the responding states offer training in teaching courses to mediating persons, psychological techniques are transferred only in a quarter of the countries.

4.3.1.4. Social circumstances: Public activities

Half of the responder countries apply public activities to improve public transport for adolescents or self-management of them. For patients, the possibilities to choose other means of travel are by far worse, merely 28% of the countries commit themselves in improvement of their mobility (Table 16).

Table 16: Detailed applications of public activities

	frequency	%
improvement of public transport for adolescents	7	50.00
improvement of mobility for patients	4	28.57
improvement of self-management	7	50.00
others	0	0.00

4.3.2. Degree of use, effectiveness and cost-value-ratio of prevention strategies

In order to analyse the frequency of applying the particular prevention strategies in the different countries by a standardised instrument, the correspondents were asked to estimate their degree of use at a seven point scale (bipolar). The same scale was used to gather the estimated effectiveness of the preventive measures and their cost-value-ratio.

In order to compare the weighting of the particular strategies in the different countries, respectively three sequences were built for alcohol, illegal drugs and medicines concerning degree of use. Table 17 and Table 18 demonstrate these sequences on the one hand for each strategy, on the other hand aggregated in the 4 groups of preventive measures.

First, Figure 1 illustrates that all preventive measures are used to a higher degree in alcohol related strategies than to prevent driving under the influence of illegal drugs or medication because the red graph is always higher than the other ones. That becomes especially clear when comparing alcohol and medicines: the highest average degree of use in medication corresponds to the lowest one in alcohol prevention. In general, information transfer seems to be the most important prevention measure for all three substance group. Involvement of peers, experience transfer, and public activities are least used in all substance categories.

Table 17: Comparison between preventive strategies for alcohol, illegal drugs, and medication regarding the sequence in average degree of use

Average degree of use of different strategies:

strategy	alcohol	illegal drugs	medication
information (mediating persons)	4.08	3.38	2.54
training skills (mediating persons)	3.64	2.64	2.73
objective information (education)	3.42	2.50	2.11
peer involvement (education)	3.21	2.45	2.00
training skills (education)	3.00	2.43	1.88
affective information (education)	2.70	2.36	1.67
objective information (mass media)	2.67	2.00	1.64
public activities	2.60	1.89	1.29
affective information (mass media)	2.55	1.50	1.25
experience (education)	2.50	1.50	1.00

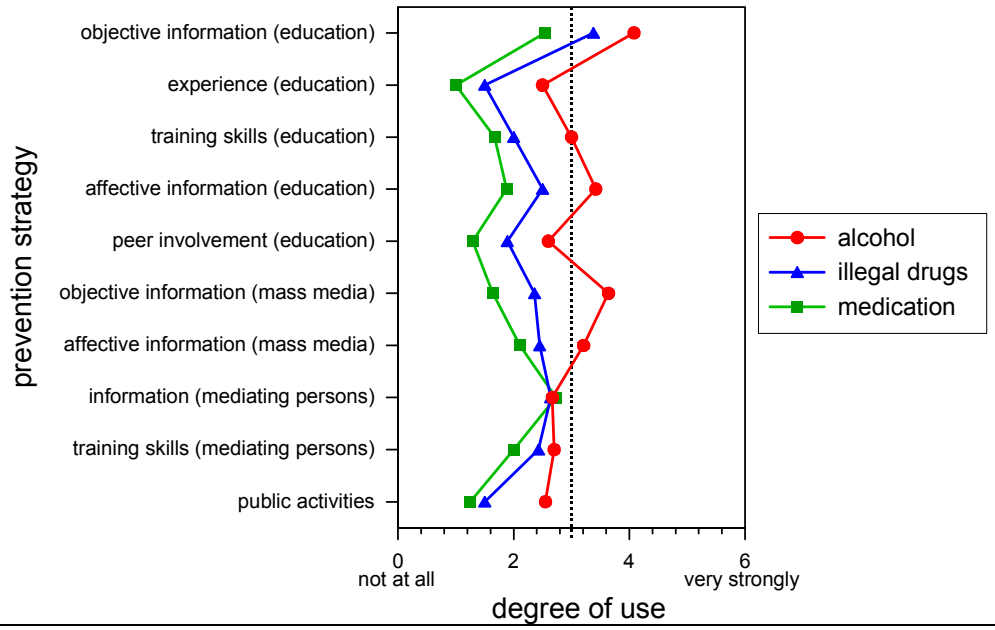


Figure 1: Mean degree of use of the particular preventive strategies depending on the target substance

According the different substances, however, there are little differences in handling the information. Objective information in educative measures is preferred in all prevention conceptions, but programmes against illegal drugs or medicines apply increasingly often strategies aimed at mediating persons. This result becomes more apparent when considering the aggregated sequences (Table 18, Figure 4 left part): in alcohol related prevention programmes, mass media is the most applied instrument, followed by educative measures, and mediating persons only rank third. However, the involvement of mediating persons becomes the most important preventive strategy combating illegal drugs and medicines.

Table 18: Comparison between different groups of preventive strategies for alcohol, illegal drugs, and medication regarding the sequence in average degree of use

strategy	alcohol	illegal drugs	medication
mass media	3.43	2.55	2.55
education	3.28	2.48	2.01
mediating persons	2.85	2.41	1.77
public activities	2.55	1.5	1.25

In contrast to that, the estimations of effectiveness (Table 19, Figure 2) do not differ very much in their absolute values or sequences. The two measures aimed at mediating persons, information transfer as well as training of skills, rank first according to the opinion of the responding prevention specialists. However, information transfer via mass media or educative measures is rated rather less effective, therefore the question is posed why these appraisals are not adopted in practice. The similar feature holds true for Table 20 (resp. Figure 4 central part), mass media campaigns in general are estimated least effective, but according Table 18 they are used to the highest degree in alcohol related prevention programmes.

Table 19: Comparison between preventive strategies for alcohol, illegal drugs, and medication regarding the sequence in average estimated effectiveness

Estimated effectiveness of different strategies

strategy	alcohol	illegal drugs	medication
information (mediating persons)	3.54	3.33	3.55
training skills (mediating persons)	3.45	3.27	3.00
objective information (education)	3.38	3.13	2.83
peer involvement (education)	3.33	2.75	2.83
training skills (education)	3.27	2.70	2.75
affective information (education)	3.25	2.60	2.29
objective information (mass media)	3.21	2.58	2.20
public activities	3.20	2.50	2.11
affective information (mass media)	2.86	2.30	2.10
experience (education)	2.75	2.17	2.00

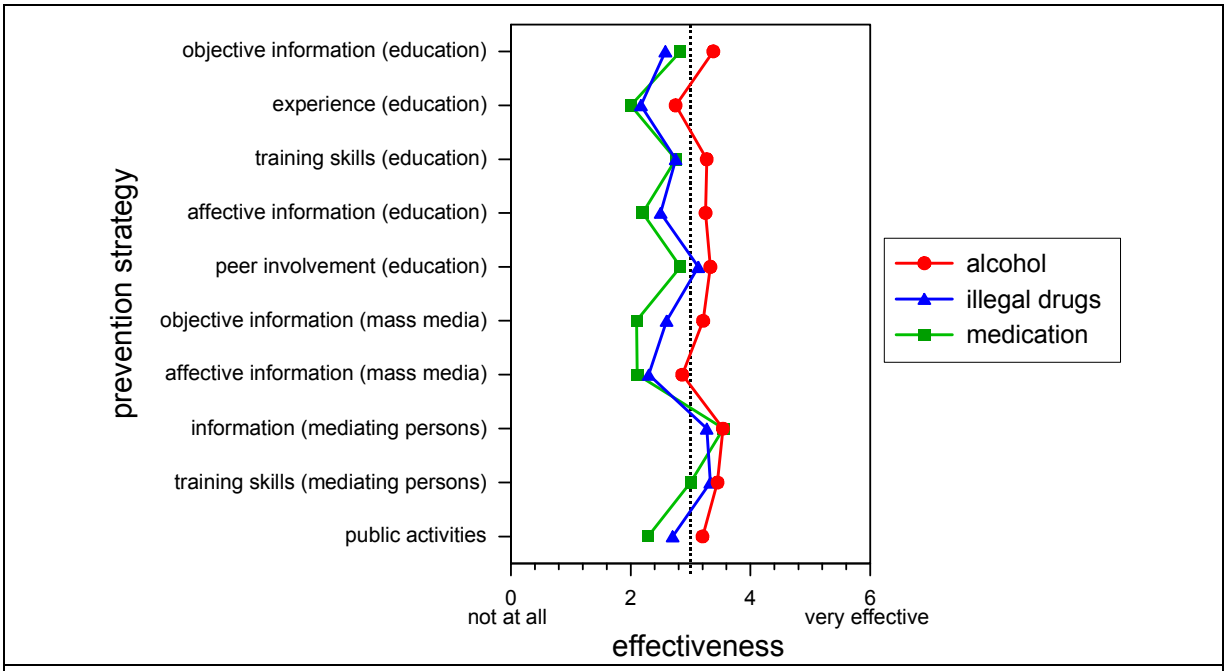


Figure 2: Mean estimated effectiveness of the particular preventive strategies in dependence on the target substance

Table 20: Comparison between different groups of preventive strategies for alcohol, illegal drugs, and medication regarding the sequence in average estimated effectiveness

strategy	alcohol	illegal drugs	medication
mass media	3.54	3.27	3.32
education	3.29	2.72	2.63
mediating persons	3.20	2.70	2.29
public activities	3.04	2.41	2.09

In general, these patterns could be confirmed by the estimated cost-value-ratios of the different strategies, both at the detailed sequences as well as at the aggregated ones (Table 21/Figure 3 and Table 22/Figure 4 right part). For all three substance groups, measures involving mediating persons are approved as most profiting, followed by mass media campaigns. Educative measures are rated less profiting, maybe because it is much more expensive to reach the persons of interest singularly or in small groups personally than to create a great campaign and thereby nearly completely reaching a population subgroup.

Table 21: Comparison between preventive strategies for alcohol, illegal drugs, and medication regarding the sequence in average estimated cost-value-ratio

Mean estimated cost-value-ratio of different strategies

strategy	alcohol	illegal drugs	medication
information (mediating persons)	3.54	3.40	3.50
training skills (mediating persons)	3.44	3.33	3.17
objective information (education)	3.43	3.29	3.00
peer involvement (education)	3.30	3.00	2.89
training skills (education)	3.29	2.71	2.83
affective information (education)	3.27	2.67	2.43
objective information (mass media)	3.21	2.67	2.38
public activities	3.09	2.44	2.33
affective information (mass media)	3.09	2.44	2.29
experience (education)	3.00	2.43	2.00

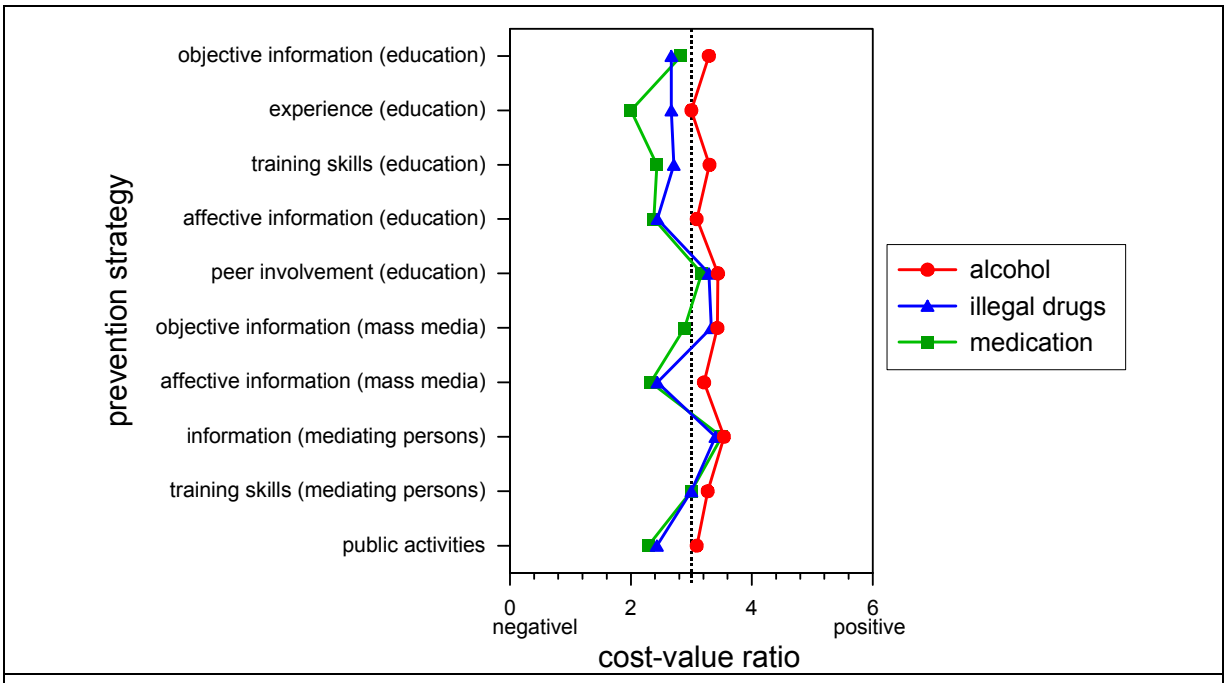


Figure 3: Mean estimated cost-value ratio of the particular preventive strategies in dependence on the target substance

Table 22: Comparison between different groups of preventive strategies for alcohol, illegal drugs, and medication regarding the sequence in average estimated cost-value-ratio

strategy	alcohol	illegal drugs	medication
mass media	3.50	3.35	3.40
education	3.32	2.95	2.7
mediating persons	3.25	2.75	2.58
public activities	3.09	2.43	2.29

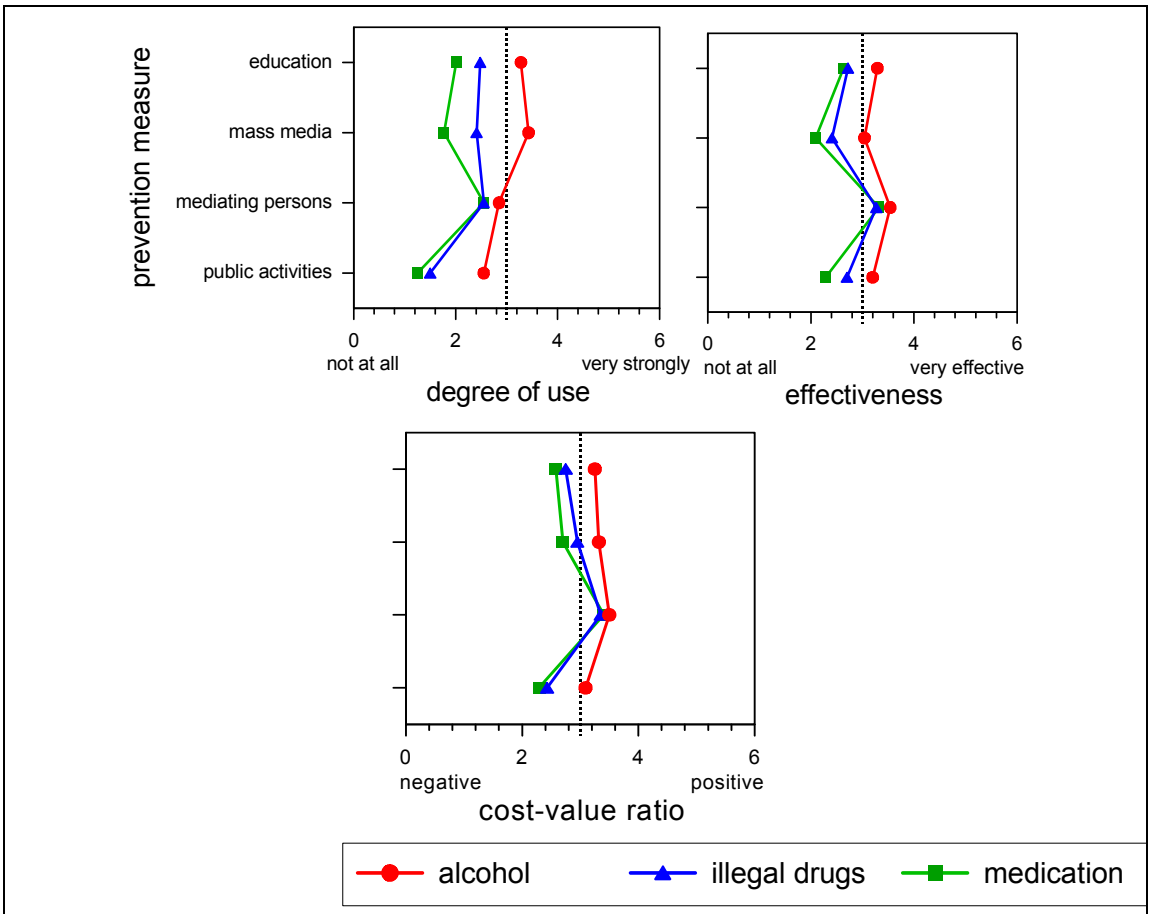


Figure 4: Estimated degree of use, effectiveness and cost-value ratio of the different prevention measures in dependence of target substance

4.3.3. Differences between substances

4.3.3.1. Educative measures aimed at persons at risk

Concerning the degree of use of objective information transfer (i.e. information on psychoactive substances, such as general effects, effects on driving fitness, etc.) in educative measures, analyses revealed a significant difference between alcohol, illegal drugs and medication. Objective information is used to the highest degree for alcohol, significantly more seldom for medication than for both alcohol and illegal drugs. The same holds true for the estimated effectiveness of objective information. Transferring objective information by educative measures is supposed to be significantly more effective for alcohol than for illegal drugs. In contrast to that, the differences between alcohol, illegal drugs and medication regarding the cost-value-ratio of objective information did not reach level of significance.

As to be expected, there is a significant difference in the degree of use of experience transfer (i.e. measures which allow the persons to experience the substance's effects, e.g. controlled application of alcohol in a driving simulation) between the three psychoactive substances. The responding countries use this strategy significantly more often for alcohol than for illegal drugs and medication, but there was no distinction between illegal drugs and medication. However, it also seems to be very interesting that two countries (Estonia and France) apply experience transfer in the field of illegal drugs, too. Furthermore, experience transfer was estimated to be in the same way effective for all substance classes. The estimated cost-value-ratios of experience transfer do not differ significantly between alcohol, illegal drugs and medication. The estimated cost-value-ratio of experience transfer for medication is lower than for alcohol and illegal drugs. And again, only the cost-value-ratio of alcohol related prevention is estimated positive, measures regarding illegal drugs and medicines again seem to cost a little more than they reveal.

In the same way, the degree to which skill training (i.e. training of skills or strategies to resist driving when impaired by psychoactive substances, e.g. "say no") are used in educative measures differed significantly between alcohol, illegal drugs and medication: these strategies are significantly more often applied in alcohol prevention. Concerning effectiveness, the same pattern resulted as described for objective information transfer and experience transfer: skill training were also estimated to be more effective for alcohol than for illegal drugs and medication. Regarding the cost-value-ratio of skill training, no significant differences could be found between the three types of substances and only the ratio of alcohol related measures could reach the positive level.

The degree to which affective information transfer (i.e. deterrent information about fatalities, accidents, punishments, etc.) is used in educative measures differs significantly between alcohol, illegal drugs and medication. It is significantly more often applied and considered to be more effective for alcohol than for illegal drugs and for medication.

Peer involvement (as leaders or as supporters of leaders in preventive measures) is mostly used in alcohol prevention. The cost-value-ratio does not differ between the three types of substances, but in contrast to all other education strategies, involvement of peers is estimated to have a general positive cost-value-ratio in prevention. This result points to an important discrepancy: despite the conviction that peer involvement is very efficient in prevention, this strategy is less used than objective and affective information transfer and training of skills. The most probable reason is that peer involvement is the most expensive strategy.

4.3.3.2. Mass media campaigns aimed at persons at risk

As for the use of objective information in educative measures, objective information in mass media campaigns is mostly used for alcohol. No significant differences between illegal drugs and medication could be found. The degree to which affective information transfer is used in mass media differs significantly between alcohol, illegal drugs and medication. Affective information is significantly more often transferred in alcohol related measures than in the prevention of driving under the influence of illegal drugs or medication. There was no significant difference between illegal drugs and medication.

According to the effects in educative measures, affective information is considered to be more effective for alcohol than for medication and in a tendency than for illegal drugs.

4.3.3.3. Social circumstances: Mediating persons

Regarding the information transfer to mediating persons, the analyses revealed significant differences between alcohol neither for the degree of use, nor for the effectiveness or the cost-value-ratio, illegal drugs, and medication. But it has to be considered that the cost-value-ratio is obviously higher than 3 for all three groups of substances and ,therefore, this strategy seems to be very useful and efficient.

The same (as for the information transfer to mediating persons) holds true for the training of skills for mediating persons (i.e. training of e.g. teaching courses about psychoactive substances in traffic for persons at risk or training of the use of psychological techniques concerning communication, problem solving, mediation etc.). Neither the degree of use, nor the effectiveness or the cost-value-ratio differed significantly in dependence of type of substance.

4.3.3.4. Social circumstances: Public activities

In contrast to that, there was a significant difference in the degree of use of public activities (i.e. all public, governmental, and communal activities regarding the prevention of psychoactive substances in traffic including the configuration of social backgrounds, places of domicile, employment or leisure, e.g. free shuttle service, breathalysers in night clubs, etc.) aimed at alcohol, illegal drugs and medication in traffic. Such activities are used significantly more often for alcohol than for both illegal drugs and medication, the difference between illegal drugs and medication was not significant. Regarding the effectiveness of public activities, significant differences between the three types of substances could also be shown. The effectiveness of public activities was considered higher for alcohol than for medication. The estimations of the cost-value-ratio of public activities did not differ significantly in dependence of the type of the three substances.

4.3.4. Adaptation to characteristics of persons at risk in educative measures

One part of the questionnaire dealt with the question whether preventive measures have to be adapted to characteristics of the persons at interest. As important personal variables age, sex, education, and consumption pattern were chosen because these are also named as the most important ones in the appropriate literature.

At large, consumption pattern and age of the target persons are considered to be important characteristics to which educative measures should be adapted, whereas education and especially sex are considered less important. Furthermore, the average necessity to adapt the preventive measures is always estimated higher than 3 which represents the centre of the item-scale, so all responding countries basically agree on the fact that educative measures in prevention have to be adapted in general (see Table 23).

Table 23: Mean estimated necessity to adapt educative measures to characteristics of the target person

	age	sex	education	consumption pattern
Objective information	4.21	3.15	3.92	4.60
Experience transfer	4.08	3.36	3.67	4.17
Skill training	4.46	3.08	3.69	4.00
Affective information	4.25	3.17	3.67	3.75

4.3.5. Medication and instruction leaflets

Subsequent to the questions on objective information transfer in educative measures, responding persons were asked for legal requirements to inform patients about the risks of medication use for driving fitness. Table 24 demonstrates that almost half of the responding states (Belgium, Estonia, France, Luxembourg, Poland, Slovakia, and Spain) prescribe such information for all drugs. In the Czech Republic, Lithuania, the Netherlands, Norway, and Switzerland pharmaceutical producers only have to suggest on these hazards in case of psychoactive drugs. However, Finland, Slovenia, and Sweden do not have an obligatory requirement, thus patients must not be informed about the adverse effects in traffic of medication.

Table 24: Offering objective information in instruction leaflets of medication

	fj	%	val. %
Prescribed by law for *all* drugs	7	43.75	46.67
Prescribed by law only for *psychoactive* drugs	5	31.25	33.33
Optional	3	18.75	20.00

4.3.6. Most and least commonly media in mass media campaigns

Furthermore, the correspondents should state which media is most respectively least commonly used for mass media campaigns in their country. Thus, objective information is mainly transferred by radio, television, and newspapers, whereas flyers, handouts, or leaflets have an underpart as well as the measures distributed via world wide web (Table 25). A similar pattern is found for affective information, again radio, television are the most commonly applied media, the world wide web is rather neglected (Table 26).

Table 25: Most and least commonly used media for objective information

	most		least	
	fj	%	fj	%
posters	1	18.8	0	0.0
flyers/handouts	3	18.8	3	18.8
radio	6	37.5	3	18.8
TV	9	56.3	2	12.5
Newspapers	5	31.3	3	18.8
WWW	1	6.3	5	31.3

Table 26: Most and least commonly used media for affective information

	most		least	
	fj	%	fj	%
posters	2	12.5	1	6.3
flyers/handouts	2	12.5	2	12.5
radio	5	31.3	3	18.8
TV	10	62.5	3	18.8
Newspapers	3	18.8	1	6.3
WWW	0	0.0	4	25.0

4.3.7. Mediating persons

Mediating persons (should) play an very important role in preventing driving under the influence of psychoactive substances. Therefore, it was asked to further differentiate which persons are suitable for prevention concerning the different substance groups. Concerning alcohol, teachers, driving instructors, and policemen are approved to be most qualified to transfer the relevant messages, whereas policemen resp. physicians and pharmacists rank first while preventing illegal drugs or medication in traffic (Table 27).

Table 27: Mediating persons

	alcohol		illegal drugs		medication	
	frequency	%	frequency	%	frequency	%
teachers	10	62.5	8	50.0	2	12.5
driving instructors	11	68.8	7	43.8	5	31.3
physicians/pharmacists	9	56.3	8	50.0	9	56.3
caregivers	5	31.3	3	18.8	4	25.0
policemen	10	62.5	9	56.3	6	37.5
relatives	8	50.0	6	37.5	5	31.3
competent co-workers	4	25.0	4	25.0	2	12.5
peers	7	43.8	6	37.5	4	25.0

4.4. Special programmes

The last section of the questionnaire was addressed at special prevention programmes. The countries were asked to describe one to three prevention programmes, especially those aimed at medication in traffic. 6 of the responder countries (Cyprus, Finland, France, Lithuania, Poland, and Slovakia) did not describe special preventive programmes at all.

In total, 15 programmes were portrayed in detail. Most of them aim at alcohol in traffic: 3 countries implemented prevention programmes applying the designated driver concept (Luxembourg: C*hauffeur pour une nuit*, the Netherlands and Belgium: *The BOB campaign for designated drivers)*. Five further countries reported about programmes against alcohol, using many different preventive strategies (Spain: *Driving and Alcohol*, Norway: *DWA-programme*, Switzerland: *Safety Tool* and *Handle with care*, Sweden: *Operation Civil Courage*, and Estonia: *Drive hard-headed*). Germany conducts a peer-education prevention programme against alcohol and illegal drugs (*Peer-project at driving schools*).

Three of the prevention programmes portrayed in detail focus on teaching policemen to recognise illegal drug consumption in traffic: the correspondent of the Czech Republic described two of them (*Drugs in Road Traffic* and *Drugs in Road Traffic: Drugs in Organism and validated toxicological methods*), the third one (*The Police Drug recognition System in Traffic*) also aims at medication and was conducted in Slovenia.

Only two countries reported to apply (primary) preventive programmes against medication, whereas one of them only contains a section focusing on this problem (Spain: *Training and Advising Programme at Primary Attention Centres*). The third programme described by the prevention expert from Switzerland is the only one that targets alcohol, drugs and medication in traffic in equal parts. This programme named *No drinks, No drugs, No problems* will be presented in another article of this issue.

5. Summary and Conclusions

The presented survey was aimed at assessing the current state of prevention of psychoactive substances in traffic in the member states of the Council of Europe and at finding out if there is a differentiation between alcohol, illegal drugs, and medication. For this purpose, we sent a very detailed questionnaire to the permanent correspondents of the 45 member states of the Council of Europe. Taking into account that the questionnaire was very detailed and required some time to fill out, we achieved an acceptable response rate of 37.8%.

5.1. National prevention management

Overall, prevention of the abuse of psychoactive substances in general is mainly a matter of official institutions. This holds even more true for the prevention of alcohol and illegal drugs in traffic. It is difficult to give a clear statement for medication since only less than the half of the countries responded the respective questions. However, both the prevention of the abuse of medication and the prevention of medication in traffic also seem to be rather a matter of official institutions.

Especially the data concerning money spent on prevention can not be considered representative since the respective questions were left out by most of the countries. Only Estonia, Cyprus, Switzerland, and Sweden indicated the amounts of money they spend on the prevention of psychoactive substances in traffic per year. Thereby, the amounts ranged between 25,000 and 6,000,000 Euro for alcohol, between 1,500 and 1,200,000 Euro for illegal drugs, and between 11,000 and 500,000 Euro for medication. Thus, as to be expected, the amount of money spent on preventive measures against alcohol is significantly higher than that one spent against illegal drugs and medication. For the prospective, prevention management one should take a leaf out of Switzerland's book which indicated the largest amounts for all three substances. Regarding a special institution focusing on the prevention of psychoactive substances in traffic, 7 countries reported to have such institutions for alcohol, 4 for illegal drugs, and only 2 (Switzerland and Luxembourg) for medication.

The previous results apart already suggest that there is a lack of prevention concerned with medication in traffic. This goes with the result that medication is the substance that is paid the least attention in public discussion. However, a somewhat better picture was found concerning statistics and data about psychoactive substances. There is a wide range of such data available about the use/abuse of, the prevalence of, and accidents due to alcohol, illegal drugs and even for medication, albeit again most data are available for alcohol and the data for medication are rather concerned with its use/abuse than with traffic relevant aspects. This fits to the result that there are quite a lot of research activities concerned with alcohol, whereas traffic related studies regarding illegal drugs and particularly regarding medication are very rare. Especially, as far as prevention and evaluation are concerned, no research at all was reported for medication. With regard to the four columns/subjects of drug policy (primary) prevention, repression, therapy, and harm reduction, data revealed that the latter – to which traffic related prevention appertains – looms low compared to the other three columns. However, the greatest contingent was found for medication.

5.2. Current preventive activities

All eleven preventive strategies against psychoactive substances in traffic included in our classification were widely known and applied in the responder states, especially objective and affective information transfer in mass media as well as objective information in educative measures aimed at persons at risk. However, peer involvement, skill training of mediating persons, and activities and incentives seem to be applied least. This result might be due to the fact that peer involvement and particularly skill training are very sumptuously referring to the number of persons who can be reached at the same time. The reason why activities and incentives are less reported might be a similar one: measures like these are often applied only for a short time and regionally, so that they are also only able to reach a small target group and thus are not very widely known.

The objective information most often transferred are those about the substances' effects in general and those about the substances' effects on driving fitness. The availability of other means of transport is less often used. However, after all, 50% of the responders reported that it is topic of the information they transfer in educative measures for persons at risk, and all the same about a third confirmed this for mass media campaigns and measures for mediating of persons. Although also skill training in educative measures seems to be widely used in the responder countries, they had difficulties to specify the types of skills trained in these measures since the various skills offered in our questionnaire were rarely named.

The designated driver concept was the one which was most prevalent, although not even the half of the countries ticked this response option. As affective, deterrent information fatalities, statistics of accidents, and legal punishments were used in equal portions (all by almost two thirds of the responder countries) in educative measures, whereas in mass media campaigns statistics of accidents was the information most often transferred, namely by 75% of the countries. Single case reports were slightly less frequent, they were indicated by slightly more than half of the countries. Peers were slightly more often deployed as supporters of leaders than as leaders themselves, in accordance with the recommendations in literature.

Within the rarely used measures of training skills of mediating persons, the training of teaching courses was yet a little more frequent than the training of psychological techniques, with the former being only used by a third of the states.

As public activities, improvement of public transport for adolescents and improvement of self-management were more often named (both by half of the countries) than the improvement of mobility of patients (only by a quarter of the countries). Since patients are a main target group of preventive activities concerning medication in traffic, this result also reflects a lack of those measures.

When considering the degree of use of the eleven classified strategies in dependence on the type of substance (alcohol vs. illegal drugs vs. medication), our data revealed that all of them are applied to the highest degree for alcohol. Thereby, the degree of their application differed hardly between illegal drugs and medication. In general, for all three substances, involvement of peers, experience transfer, and public activities were the least used measures, whereas information transfer was the one applied most.

However, there are some differences in dependence of the substances' types in *how* these information are communicated: whereas for alcohol information is preferentially transferred by mass media, for illegal drugs and medication mediating persons are favoured. Despite the differences in the degree of use, the estimations of effectiveness and the cost-value-ratio of the strategies did hardly differ for the three types of substances: all measures were considered as effective and profiting for illegal drugs and medication as for alcohol. Generally, measures aimed at mediating persons ranked highest, mass media campaigns ranked lowest. Thus, this pattern contradicts the pattern of the degree of use: for example regarding alcohol, mass media ranked highest in the degree of use but lowest in the estimated effectiveness and the cost-value ratio. This discrepancy might be traced back to the fact that via mass media campaigns it is relatively easy to reach a large population with a short message by radio and television (the most frequently used media according to our data). This is in contrast to measures for mediating persons which are more sumptuous and difficult to realise. In addition, the choice of the mediating persons depends on the type of substance: for alcohol teachers and driving instructors are preferred, whereas for illegal drugs and medication, physicians and pharmacists are favoured in addition to policemen who are considered appropriate as mediating persons for all three types of substances.

Overall, the responder countries basically agreed that educative measures have to be adapted to the characteristics of the target persons at risk to participate in traffic under the influence of psychoactive substances. Thereby, consumption pattern and age were considered to be the most important characteristics - independently of the type of the measure being applied (objective information, experience transfer, skill training or affective information).

Despite of the lack of actual preventive activities regarding medication in traffic, all the same half of the responder countries prescribe information about the effects on driving fitness in the instruction leaflets for all drugs, a further third of the countries at least for psychoactive drugs. Only about a fifth of the countries reported that offering such information in the instruction leaflets is optional. However, it is assumed that even if such an information is offered, it will be insufficient and not detailed enough.

5.3. Conclusions

At large, preventive activities against medication (and illegal drugs) in traffic are extremely rarely applied in the responder countries, even if the discussed measures are rated as effective and as profiting (reflected in the estimated cost-value ratios) for medication as for alcohol (for which they are applied relatively often). Taking the high risk for traffic safety into account which is associated with psychoactive drugs, an urgent need for action has become obvious by our survey. Therefore, an important aim for future preventive activity regarding traffic safety must be to prompt the European countries to engage in and carry out programmes and measures that are specially concerned with medication in addition to merely offering some insufficient information in the instruction leaflets.

6. References

Bühringer, G. (2000). Prävention substanzbezogener Störungen: Was hilft? In H-P Krüger (Hrsg.) Drogen im Straßenverkehr. Freiburg: Lambertus-Verlag, 295-307.

Caplan, G.(1964). *Principles of Preventive Psychiatry*. New York: Basic Books.

Drummer, O. H. (1994) *Drugs in drivers killed in Australian road accidents: the use of responsibility analysis to investigate the contribution of drugs to fatal accidents.* Victorian Institute of Forensic Pathology, Department of Forensic Medicine, Monash University, Victoria.

EMCDDA (1998): *Evaluating drug prevention in the European Union*. Report No. 2, Scientific Monographs.

Gerstein, D.R. & Green, L.W. (1993). *Preventing drug abuse, what do we know?* Washington, DC: National Academy Press.

Hausmann, E., Möller, M. R. & Otte, D. (1988). *Medikamente, Drogen und Alkohol bei verkehrsunfallverletzten Fahrern.* Bergisch Gladbach: Bericht der Bundesanstalt für Straßenwesen.

Huguenin, R.D. & Winkler, W. (1993). Prävention alkoholbedingter Unfälle im Straßenverkehr. *Drogalkohol 17*(1): 13-23.

DeJong, W. & Hingson, R. (1998). Strategies to reduce driving under the influence of alcohol. *Annual Review of Public Health 19*, 359-378.

Kumpfer, K.L. (1989). Prevention of alcohol and drug abuse: A critical review of risk factors and prevention strategies. In OSAP: *Prevention of mental disorders, alcohol and other drug use in children and adolescents*. *Prevention Monograph-2* (pp. 309-371), Rockville: U.S. Department of Health and Human Services).

Kraus, L. & Augustin, R. (2001). Repräsentativerhebung zum Gebrauch psychoaktiver Substanzen bei Erwachsenen in Deutschland 2000. *Sucht, 47* (Sonderheft 1).

Longo, M. C., Hunter, C. E., Lokan, R. J., White, J. M. & White, M. A. (2000). The prevalence of alcohol, cannabinoids, benzodiazepines and stimulants amongst injured drivers and their role in driver culpability. *Accident Analysis and Prevention, 32*(5), 613-622.

Office for Substance Abuse, Prevention Plus II (1989). *Tools for creating and sustaining drug-free communities* (pp. 17-91), Rockville: National Clearinghouse for Alcohol and Drug Information.

Schweizerische Fachstelle für Alkohol- und andere Drogenprobleme (SFA, n.d.) *Die verschiedenen Strategien der Prävention*. Retrieved April 16, 2003, from http://www.sfa-ispa.ch/Prevention/allemand/ WasIstPravention/Strategies.htm.

Perrez, M. (1991). Prävention, Gesundheit- und Entfaltungsförderung: Systematik und allgemeine Aspekte. In M. Perrez & U. Baumann (Hrsg.). *Klinische Psychologie Band 2: Intervention* (pp. 80-98), Bern: Huber.

Poppelreuter, S., DeVol, D.M. & Salk, J. (1991). Pilotprojekt Alkoholprävention bei Fahrschülern und Fahranfängern (PAFF). Blutalkohol 38, 407-425.

Terhune, K. W., Ippolitio, C. A., Hendricks, D. L., Michalovic, J. G., Bogema, S. C., Santinga, P., Blomber, R. & Preusser, D. F. (1992). *The incidence and role of drugs in fatally injured drivers.* Washington.

Williams, A. F., Peat, M. A.; Crouch, D. J., Wells, J. K. & Finkle, B. S. (1985). Drugs in fatally injured young male drivers. *Public Health Reports (Washington, DC: 1974), 100*(1), January - February, 19-25.

Zehnpfennig, A., Rosarius, H. & Bourauel, R. (2002). Angetörnt Autofahren - Fahren unter Ecstasy, Haschisch oder Kokain. mobil und sicher – Das Verkehrswachtmagazin, 5. Retrieved March 17, 2003, from http://www.mobilundsicher.de/seiten/index2.html.

Drugs and driving in Norway, an example of ”best practice”

by Jørg Mørland (Norway)

Introduction

The notion “best practice” in the title of this presentation has not been suggested by the present author, but is the choice of a working group preparing this seminar. It is of course a challenge to present a system which might be considered to represent a successful way to approach the problem of drugged driving. The central role of the Norwegian Police in this respect should already at this stage be highly acknowledged.

In this paper “drugs” is used synonymously with all non-alcohol psychoactive drugs, i.e. both licit (medicinal drugs) and illicit substances affecting the central nervous system. In the following I will present (1) legal issues connected to the use of such drugs in roadside traffic, (2) the operation of the system for detection and handling of suspected drugged driving cases, (3) the performance of the system as well as (4) some final comments.

Legal issues

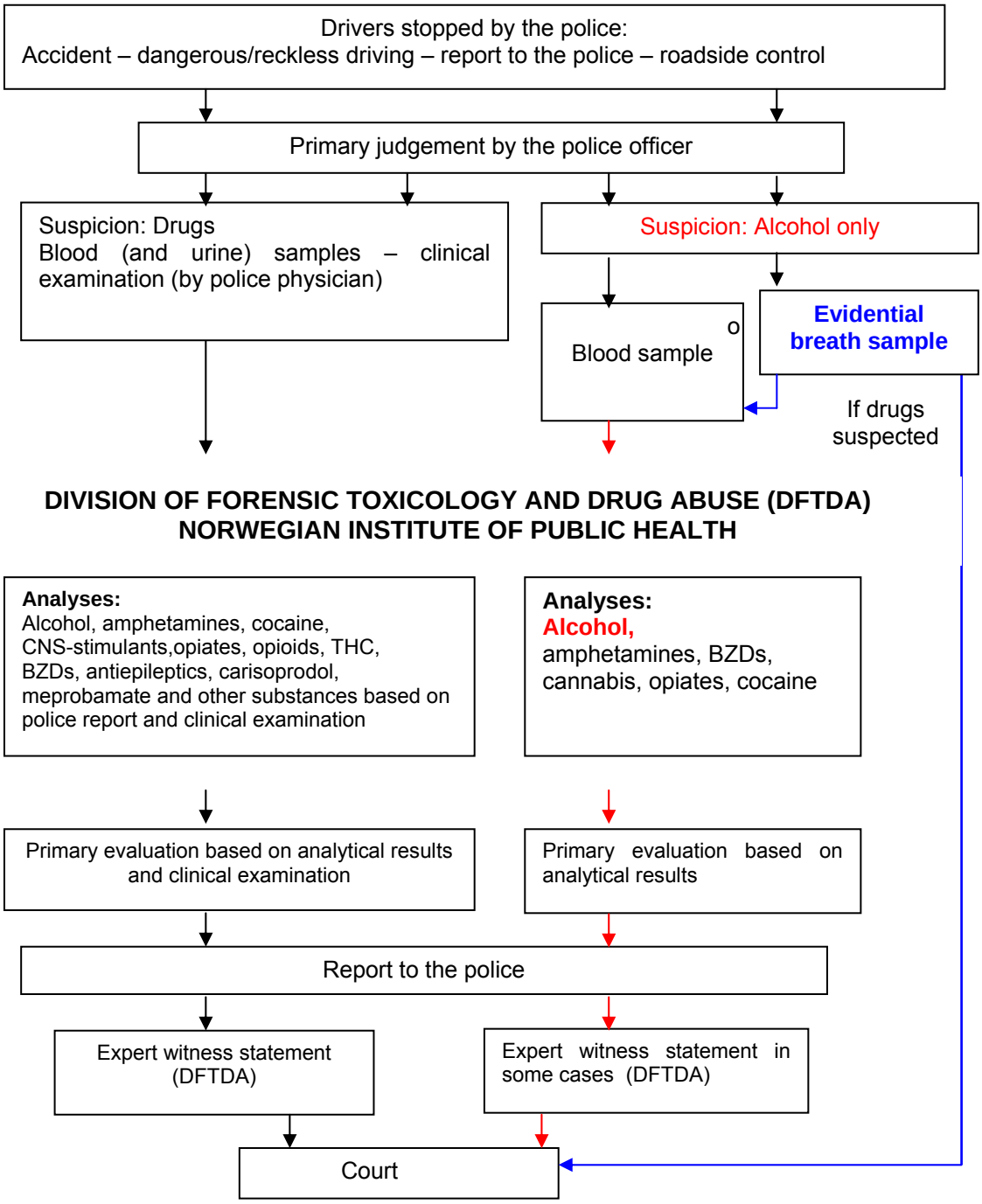
The Norwegian Road Traffic Act was extended in 1959, to include driving under the influence of drugs other than alcohol. Norway had already at that time a long tradition in law regulation for driving under the influence of alcohol. As the first country in the world, a fixed blood alcohol concentration (BAC) legal limit (0,05%) was introduced in 1936. Since 1959, the police has been allowed, if drug influence is suspected, to request blood analysis for illegal and prescribed drugs affecting driving performance. The extension of the Traffic act represented the establishment of an impairment based law for non-alcohol drugs. There is no legal limit for drugs other than alcohol and impairment has to be proven for the court in each individual case. The court decision is based on the outcome of a clinical examination performed at the time of blood sampling, results from blood drug concentration measurements with interpretation, and in most cases an expert witness statement (see below). The sentences for driving under the influence of alcohol or drugs are fines, conditional or unconditional imprisonment, depending in alcohol cases on BAC, or in non-alcohol drug cases on the degree of drug impairment. In addition, the driving licence is withdrawn usually for at least two years.

Furthermore, according to the Norwegian Act on Medicinal Products etc, the use of drugs can be penalised. Drugs in this regard are those detailed in the list of narcotics which contains all the psychotropic substances (cf. Convention on Psychotropic Substances) and narcotic drugs (cf. Single Convention on Narcotic Drugs) under international control and in addition a few substances/plants, which are only under national control. This means that Norwegian law prohibits e.g. the use of amphetamines, cocaine, cannabis, heroin as well as morphine and other opioids, or benzodiazepines, when not prescribed by a physician. The detection of such drugs (or metabolites) in blood (or other biological samples) is regarded as proof of use. There is accordingly zero tolerance to drug use in general, and of course also zero tolerance to drug use by a driver. Drug use detected this way is usually sentenced by a fine for first time violators. In practice this means that a suspected drugged driver with certain drugs found in his blood sample, can either be punished because of impairment, or if not considered impaired, he can be penalised for drug use according to the general zero tolerance principle.

Operation of the system for detection and handling of drugged driving cases

The Norwegian system can be best described by tracing the procedures of a suspected drugged driving case, as can be seen from fig. 1.

Fig. 1: Handling of drunken and drugged driving cases in Norway



The primary attention by the police of a case in often a consequence of calls from the public (there is a high density of cellular phones in the Norwegian society) reporting dangerous and reckless driving. Accidents and more seldom speed controls and sobriety roadblock controls will also bring the police in contact with a suspected driver. The police uses roadside breath alcohol testing at a low threshold in such situations. If no alcohol is indicated, the drivers are generally observed for some period by highly suspicious police officers often trained by some DRE-program and often with some local knowledge of the drivers. If the suspicion of drug impairment is not precluded at this stage, the suspect is taken to the closest police station for additional observation by another police officer. If impairment cannot be excluded a police physician is called or the suspect is brought to the physicians office. In the larger cities there will always be a police physician on duty, in more rural districts the physician on call is by law obliged to offer his assistance to the police in such cases. The physician performs a standardized clinical test of impairment consisting of 25 observations and subtests, gives his conclusion as to which degree the suspect appears to be impaired or not, and always collects a blood sample and usually an urine sample as well. This procedure is supervised by the police, which afterwards brings or sends the biological samples and the clinical test forms to the Division of Forensic Toxicology and Drug Abuse, at the Norwegian Institute of Public Health (DFTDA), which is the only national institute for further handling of samples/information of drugged driving cases.

At DFTDA the blood is screened for approximately 25 different drugs (and alcohol) regardless of any specific primary suspicion of a particular drug. The drugs always screened for are amphetamines, cocaine, various other CNS-stimulants, opiates, certain opioids, tetrahydrocannabinol, a series of benzodiazepines and benzodiazepine like drugs, certain antiepileptics, carisoprodol and meprobamate. In some cases additional drugs are looked for based on information from the police or the police physician. Immunological as well as LC/MS methods are used for screening, confirmation and quantification are always performed by means of GC/MS or LC/MS-methods.

Drug blood concentrations found are reported back to the police together with a provisional evaluation as to whether impairment is likely or not, based upon the analytical results and the findings from the clinical test of impairment. When receiving this report the police will decide whether they will proceed the case for the courts as an impaired drugged driving case, or if the will only consider the case as a violation of the zero tolerance Act on Medicinal Products etc. If they decide that the case should be tried as an impaired driving case, they will ask DFTDA to give an expert witness statement on the case after providing additional information on the suspect’s drug habits, drug use in relation to the actual driving, timing of drug intake in relation to the driving period, and possible drug intake after driving.

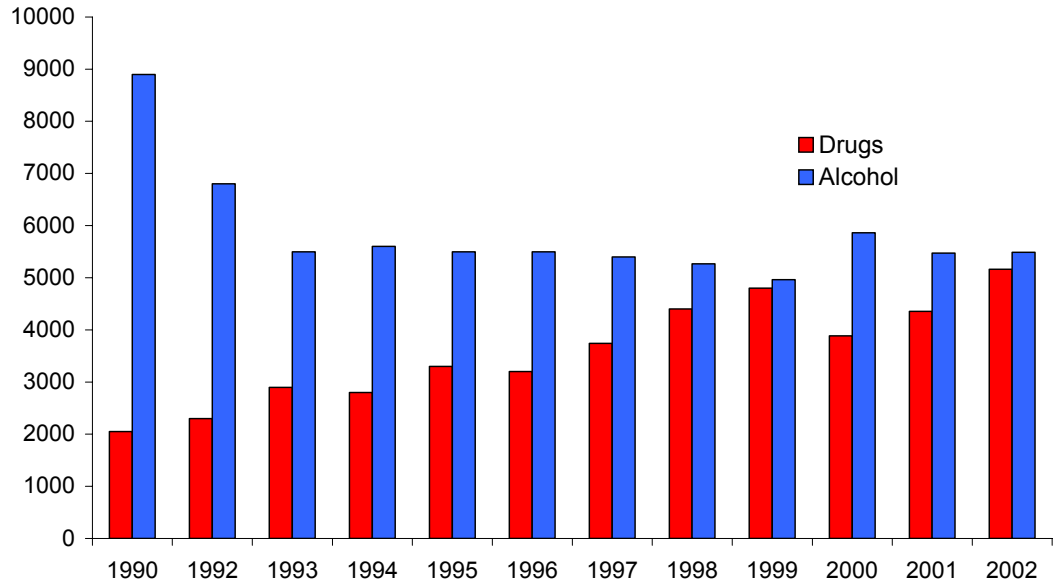
The case will now be handled by physicians at DFTDA, who are specialists in clinical pharmacology (or under training) and who have experience in traffic medicine and behavioural pharmacology. (DFTDA has 15 positions for this type of physicians). The expert witness statement elaborated is based on: pharmacokinetic estimation of drug concentrations during driving from the blood concentrations measured and information about drug intake, on a continuously updated database of international scientific literature relevant to drug impairment of driving, the results from the clinical test of impairment of the particular case, and knowledge about the suspect's drug habits. The essential fundaments of the expert witness statement are the blood drug concentrations and the scientifically based information about the impairing effects of such concentrations. For a certain drug level there will always be some individual variation with respect to drug influence. The expert witness tries to assess this based on information of the suspect's drug habits and the results from the clinical test of impairment, and then to incorporate all relevant elements into a final integrated opinion on the likehood of impairment during driving, ranging from "not impaired", through "impairment cannot be excluded", "possibly impaired", "likely impaired" to "by all probability impaired".

The expert witness statement is given as a written report which is subject to review by an independent panel of forensic experts, before it can be used in court by the police. The courts practise free evaluation of all evidence presented, but during the years it has become evident that the written expert statements have a marked impact on the decisions by the courts. In some rare occasions the expert witness is asked to be present in court, more often possible additional information from the expert is obtained by telephone testimonies.

Performance of the system

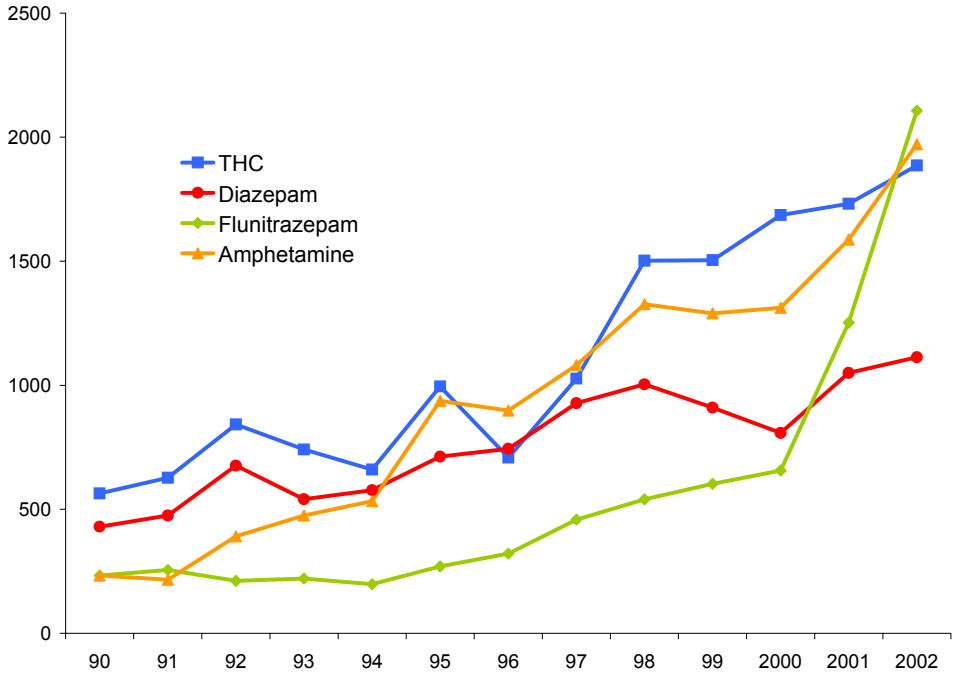
Drivers apprehended for impaired driving, main trends. Fig. 2 shows that the number of drivers apprehended by the police, suspected for drugged driving, has increased steadily from approximately 2000 per year in 1990 to approximately 5000 in 2002. In the same period the number of apprehended suspected drunken drivers was reduced from approximately 9000 per year, to approximately 5000 in 2002.

Fig. 2 Apprehended drivers suspected for drunken or drugged driving 1990-2002



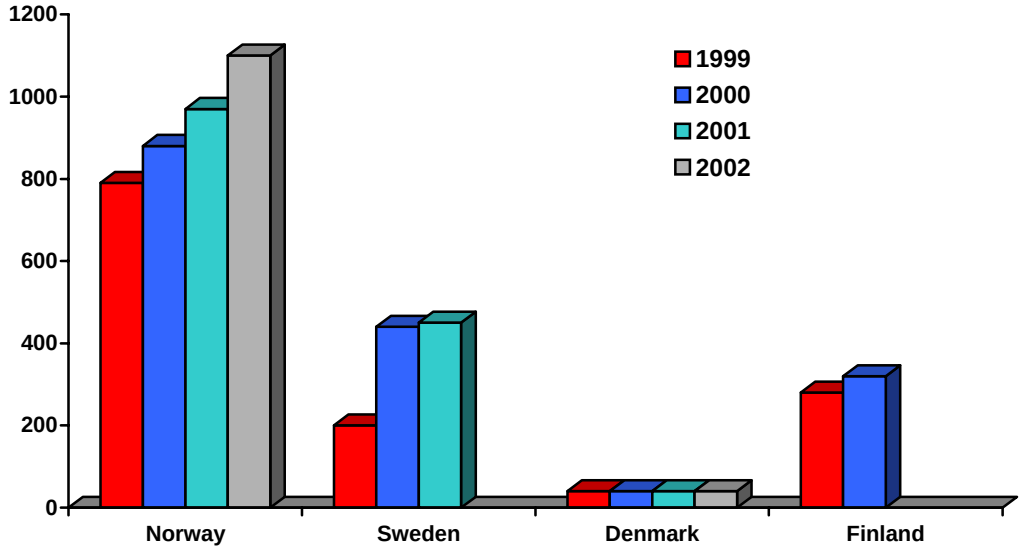
Drugs were found in more than 80 per cent of the samples from suspected drugged drivers, and in approximately 10 per cent of the samples from suspected drunken drivers. In samples containing drugs, the finding of two or three drugs was the general rule. The 4 drugs most abundantly detected over the last 13 years are shown in Fig. 3. Every year somewhere between 30 and 50 different drugs are detected when the results from all samples are combined.

Fig. 3 Most common substances in blood samples from apprehended drivers



Comparison with other countries. In comparison with the other Nordic countries the apprehension rate was markedly higher, shown in fig. 4.

Fig. 4 Norway compared to other Nordic countries – number of apprehended drivers per mill. inhabitants



As far as we are aware of, no other country has published higher prevalence rates for detected drugged driving than Norway.

With respect to court sentences for drug impaired driving an estimate was made for 1998, showing approximately 2000 sentences in Norway compared to numbers ranging from approximately 100 to 180 for the other three Nordic countries. These numbers do not include sentences related to violation of the zero tolerance principle.

Estimates of the prevalence of other problematic drug use show no significant difference between the four Nordic countries, indicating than the focus of the Norwegian police force on drugged driving is the main reason for the high detection rate of this type of crime in Norway.

Characteristics of the apprehended drugged driver. In many cases medicinal drugs were detected in the blood samples. E.g. benzodiazepines, morphine, methadone and buprenorphine were frequently found. Further analysis of such cases, however, revealed frequently combined use with illicit drugs, alcohol or medicinal drugs in high concentrations, in other cases the medicinal drug itself was found to be present at blood levels not compatible with therapeutic use. In only 1-2 per cent of the cases involving the four drug types mentioned above, therapeutic drug concentrations were measured.

In general medicinal drugs of all types were very seldomly found at therapeutic concentrations in samples obtained from apprehended drugged drivers. Accordingly the large majority of the cases comprised high dose drug use of licit and illicit drugs, often found in combination. Young males were overrepresented among the apprehended group, which can be assumed to contain a large proportion of drug abusers.

Additional studies have shown a high rate of drugged driving recidivism among apprehended drugged drivers (1). Thus approximately 60 percent were rearrested for the same offence during a seven year period subsequent to the first apprehension. Recently we found that future mortality of a drugged driver was approximately 20 times higher than in an
age matched group (2). These observations call for new policies and approaches besides sentencing, to handle the problems of this group in a way which would be more beneficial to both the subjects and the society, than to-days practice.

Final comments

There is no obvious single reason why the Norwegian system has such a high detection rate of drugged driving. Probably the interplay between police, police physicians, DFTDA and courts developed over years is important.

We do not know how the high detection rate has influenced the frequency of drug-related traffic accidents, as we have no satisfactory statistics for drug involvement in such accidents. This statistics is, however, highly needed, and improvements may be made in near future. So far, we have to believe only, that frequent detection of dangerous drugged driving, followed by apprehension, and sentencing have caused at least some reduction of accidents that could otherwise have happened.

The Norwegian system is a high cost system with expenses to police physicians, drug analyses and interpretation, elaboration of expert witness statements and conductance of court cases. It can, however, be calculated that except for the court costs, the sum of all the other mentioned would be less than those saved, if two fatal accidents are prevented per year.

References

(1) Christophersen AS, Skurtveit S, Grung M, Mørland J. Rearrest rates among Norwegian drugged drivers compared with drunken drivers. Drug and Alcohol Dependence
(2002) 66; 85-92.

(2) Skurtveit S, Christophersen AS, Grung M, Mørland J. Increased mortality among previously apprehended drunken and drugged drivers. Drug and Alcohol Dependence (2002) 68; 143-150.

Results of the CERTIFIED and ROSITA projects

by Alain Verstraete (Belgium)

1. Introduction

In 1999 and 2000, two Projects sponsored by the European Commission were carried out:

- Certified (Conception and Evaluation of Roadside Testing Instruments to Formalise Impairment Evidence in Drivers), which focused more on testing for impairment, and
- ROSITA (Roadside testing assessment) which focused on on-site tests for the detection of drugs.

Recently, a second ROSITA study was started and the aims of this study will also be explained.

2. CERTIFIED

The CERTIFIED consortium first made a selection of priority drugs, then reviewed existing testing methods and performed a pilot study with MDMA (ecstasy).

2.1. Selection of priority drugs

CERTIFIED prioritised those drugs and medicines which by the nature of their impairing effects and the frequency of their incidence in the driving population, represent the greatest risk to road traffic safety by considering (i) research evidence of impairment effects; (ii) estimates of exposure within the driving population; and (iii) association with accident causation. Using this metric, the estimated risk scores was used to provide a preliminary prioritisation of the drug groups in terms of relevance to traffic safety. This ranking was then adjusted where there was justification for rank assignments that were significantly discrepant from expectations.

They came to the following list:

- High Priority = alcohol, benzodiazepines
- Medium Priority = amphetamines, opiates, cocaine, cannabis
- Low Priority = methadone, antihistamines, anti-depressants

These estimates should not be considered as definitive indications of accident risk because of assumptions underling the reliability, validity and generality of the parameter. As such, this exercise may only be reasonable as a first approximation of (relative) accident risk for the purpose of approximating a rank ordering of drugs for the purpose of the project; namely to select candidate drugs on the basis of safety priority with which to pilot potential impairment testing methods (and target areas for future research).

2.2. Pilot studies

In the pilot study, the University of Maastricht performed psychometric and psychophysiological testing of alcohol and MDMA under double-blind laboratory conditions. In addition to standard psychometric testing of psychomotor performance (e.g., pursuit tracking), the Maastricht study incorporated a new test method devised by the University of Leeds (OMEDA). Based on a top-down theoretical account of intersection accidents, this test has been formulated to test effects of age and dementia on higher level cognitive functions including working memory, time-to-contact estimates, collision judgements and divided attention.

The performance measures showed dissociative effects of MDMA. There was simultaneous improvement and impairment of performance on different tasks. Improvement of performance relative to placebo was clearly seen on the psychomotor task measuring compensatory tracking performance. In addition, the divided attention version of this task, when it is combined with peripheral signal detection, showed improvement under the influence of MDMA, while alcohol's effects on errors in this task tended to be negative.

Impaired performance under the influence of MDMA was seen on the OMEDA task. The essence of this task was also divided attention, but its unique component was the perception of object movement and the subsequent estimation of object movement without vision, i.e. time perception. In particular, the performance on a Time-To-Contact Estimation subtask was impaired under the influence of MDMA. In depth analysis of the effects of MDMA on this task showed that MDMA's influence was especially pertinent when movement of the object was occluded. This is perhaps indicative of the subjects' impairment under MDMA to adequately make a mental representation of the events in time. MDMA improves psychomotor function, but impairs time perception.

3. ROSITA

3.1. Introduction

In their report for the first Pompidou Group meeting on drugs and driving in 1999, Krüger et al. pointed to the need for the development of a valid, rapid and affordable roadside test for the major drugs (1). In countries with impairment-type laws, roadside analysis can confirm the suspicion of the police officer and focus the attention on drugs. In countries with *per se* legislation, screening devices are essential for the detection of driving under the influence of drugs, before further measures (e.g. blood sampling, temporary driving prohibition …) can be taken. Only a few studies have evaluated roadside drug tests (2-8).

This work consisted mainly of the evaluation of the on-site devices for urine, oral fluid and/or sweat in 8 countries. Other parts, which will not be discussed here, were:

- an overview of drugs and medicines that are suspected to have a detrimental impact on road user performance
- an inventory of roadside drug screening devices in urine, saliva and sweat, and
- an overview of the operational, user and legal requirements across EU member states for roadside drug testing equipment.

The reports of these parts can be downloaded from www.rosita.org.

3.2. Materials and methods

Because of different legislation, the circumstances under which the tests were performed varied among the countries:

- Spain: The on-site tests were performed by the agents of the Traffic Police. Reading and interpretation of the results were done together by the members of the Institute of Legal Medicine present during the control and by traffic police officers trained in the use of the devices. With one exception, the tests were performed at the roadside.
- Belgium: the samples collected at the roadside were first screened by the Police with the Dipro Drugscreen 5 and then by lab technicians with the other devices.
- Norway: the on-site urine tests were performed by the police officers in the laboratory at National Institute for Forensic Toxicology, in collaboration with representatives from some manufacturers as assistants. The oral fluid tests (Cozart Rapiscan and Drugwipe) were performed at the police station.
- Italy: The on-site tests were performed at the roadside by police personnel or ambulance volunteers or in the lab by trained technicians. Roadside collection of blood, urine and oral fluid samples was made by medical personnel.
- Finland: Urine was collected under police supervision in the hospital and not at the roadside. Police and laboratory staff mainly performed the urine tests at the laboratory of drug abuse. The oral fluid tests were performed roadside by trained police officers.
- Germany: The test was performed by police officers during police controls. Oral fluid and sweat samples were collected and tested directly at the roadside, whereas urine samples were normally collected and tested at police stations or at public lavatories. The control actions were performed during the night, so the reading of the results occurred in more difficult circumstances than in a police station, hospital or laboratory.
- France: the on-site tests were evaluated in the lab.
- Scotland: The subjects were prisoners. The on-site tests were performed by at least two members of the research team, either within the prison or in the laboratory.

The reference methods were gas chromatography-mass spectrometry (GC-MS) or, in some cases, high pressure liquid chromatography with diode array detection (HPLC-DAD) or gas chromatography with electron capture detection (GC-ECD).

The data from the evaluations in the eight countries were obtained in Microsoft Excel format. For the evaluation of opiates, we have considered positive the specimens that contained morphine, 6-acetylmorphine, or codeine. It should be noted that other substances may give positive results with on-site tests, for example dihydrocodeine or pholcodine. We used the following analytical criteria for an acceptable test: accuracy > 95%, sensitivity > 90%, specificity > 90%, when compared with a reference method in urine. Statistical analysis of the data was performed using Microsoft Excel, Medcalc (MedCalc Software, Mariakerke, Belgium) and SPSS (SPSS Inc. Chicago, IL).

Several comparisons were made between the different methods (on-site tests or reference methods) and matrices (blood, urine, oral fluid or sweat). For each drug class, the following comparisons were made:

- A comparison between the reference method in blood and the other biological fluids, in order to assess if findings in each matrix correspond well to those in blood.

There is a general consensus that blood is the reference sample, as impairment (or recent exposure to drugs) corresponds best to presence of drugs in blood;
- A comparison of on-site results with the reference method for the same matrix;
- The validity of the roadside test for predicting blood positives by comparison with the blood reference method.

For the determination of the optimal cut-off in oral fluid, receiver operating characteristic curves (ROC curves) were used.

3.3. Results

The study was performed on 2968 subjects, 92 % of them male.

Analytical aspects

For amphetamines, with the reference methods, all fluids could be used to detect or exclude the presence of amphetamines in blood (see table 1). Both urine and oral fluid have good accuracy and predictive values. Eighteen different on-site tests for amphetamine or methamphetamine were evaluated. Only one test (Syva Rapid Cup, SRC) satisfied the analytical criteria, but it was tested only on a low number of samples. Three other tests came close to satisfying the analytical criteria (Mahsan, SYVA rapid test (SRT) amphetamine, and Triage). Most methamphetamine tests succeeded better in detecting samples that contained MDMA (ecstasy) or related compounds.

If the results of amphetamines and methamphetamine were considered jointly (i.e. if one considers the test to be positive if either the amphetamine or the methamphetamine test is positive), Rapid Drug Screen (RDS), Dipro and SRT satisfied the analytical criteria. This strategy seemed to be a good way of obtaining excellent sensitivity and specificity.

Tests for oral fluid had much lower accuracy (80 % or less in all cases). For sweat, the low number of samples (nearly all positive) did not permit definite conclusions, but use of sweat seemed promising. The optimal cut-off for amphetamines in oral fluid was in the range of 70-90 ng/mL.

Table 1: Comparison of the accuracy, sensitivity and specificity of the qualitative results by GC-MS in urine, oral fluid and sweat versus GC-MS in blood for the different drugs.

		Accuracy			**Sensitivity**			**Specificity**	
Analyte	*Urine*	*Oral fluid*	*Sweat*	*Urine*	*Oral fluid*	*Sweat*	*Urine*	*Oral fluid*	*Sweat*
Amphetamine	94%	95%	97%	97%	98%	100%	92%	91%	0%
Benzodiazepines	89%	29%	NA	89%	21%	NA	90%	67%	NA
Cannabinoids	86%	89%	78%	97%	86%	91%	81%	90%	17%
Cocaine	97%	99%	89%	95%	96%	100%	98%	99%	0%
Opiates	86%	91%	80%	97%	89%	88%	85%	91%	63%

For benzodiazepines, with the methods used, urine seemed to be a better fluid to detect benzodiazepines at the roadside (table 1). Out of the tested on-site urine tests, Triage and RDS were the only that met our analytical criteria. The sensitivity of the on-site test and of some confirmation methods seemed insufficient. This was explained by the extremely low concentrations of benzodiazepines in oral fluid (often less than 1 ng/mL). This was even more so for the low dose benzodiazepines like flunitrazepam.

For cannabinoids, the comparison of the performance of the different matrices showed a small advantage for oral fluid (table 1), which is not unexpected considering the much longer window of detection of cannabis metabolites in urine compared to the presence of THC in blood. Three out of 11 on-site tests for urine met the analytical criteria: Dipro, Cortez and SRT. In comparison to blood, the accuracy of the best on-site urine tests was close to 90 %. For the on-site oral fluid tests the sensitivity was too low (18 to 25 % compared to blood). The required sensitivity of on-site oral fluid tests was 2 ng/mL of THC. No on-site tests were available for sweat.

There were indications that tetrahydrocannabinol (THC) binds to the material of some sampling devices. Much higher concentrations of THC could be extracted from the cotton of the Salivette, in comparison to the THC-concentrations in oral fluid. A possible explanation could be that the cotton of the Salivette absorbs the THC which has been sequestered on to teeth and gum, but this needs further confirmation. This phenomenon could be useful in order to increase the sensitivity of oral fluid analysis for THC, if a suitable extraction method can be found to release the THC trapped on the fibers of the sampling device.

For cocaine and metabolites both oral fluid and urine gave good results for the prediction of positivity in blood with the reference methods (table 1). Eight of the 11 on-site tests met the analytical criteria: Dipro, RDS, TesTcup, SRC, SRT, SureScreen, Status DS and Triage. Even compared to blood, 4 tests had an accuracy > 95 % and sensitivity and specificity > 90 %: RDS, Roche TesTcup, SRT and Triage. In oral fluid, the evaluation was hampered by the low number of positive samples. For Drugwipe the sensitivity was too low. For sweat, the number of samples that could be evaluated was also small, and the evaluation was done with positive samples only. The accuracy of Drugwipe was 77 %.

For opiates, in the comparison of the different fluids with reference methods, oral fluid had slightly better results than urine (table 1). Six of the eleven on-site tests met the analytical criteria: RDS, Cortez, SRC, SRT, Status DS and Triage. In oral fluid, the on-site tests showed less accuracy than urine tests. The sensitivity, in particular, was too low. An ideal oral fluid test should have a detection limit of 2-5 ng/mL for opiates.

Practical and operational aspects:
When the necessary facilities were available (e.g. a sanitary van), urine could be obtained relatively easily at the roadside. When the facilities were not available, obtaining a urine sample was a problem and it could be time-consuming if the driver had to be brought to a suitable facility. In some cases, the volume of urine obtained was low, and tests should require a small sample volume. Some countries clearly stated that sampling urine at the roadside was unacceptable. A clear majority of countries preferred oral fluid as the matrix for roadside testing, while one country

favoured sweat and one favoured urine. The methods for obtaining saliva need further improvements. Wiping over the tongue seemed to be a well accepted technique, but in this case the analytical detection technique needs to be very sensitive. Sampling oral fluid with dedicated devices gave the following problems: it was sometimes messy; it was sometimes uncomfortable for the subject; in some cases it took a long time; the co-operation of the subject was needed (in some cases, intentionally or not, the subject swallowed the collection device); oral fluid was sometimes viscous, which gave problems with some devices.

Dry mouth was a frequently encountered problem in drug users. Sampling was then more difficult and time-consuming, but in the evaluation it was possible to obtain oral fluid in nearly all cases. In all, sweat and saliva sampling seemed very well accepted by the subjects, much better than urine or blood sampling.

3.4. Discussion

Due to the design of the study (mainly dictated by the different legal situation), some **limitations** must be pointed out:

- the analytical methods used in all the countries were not identical;
- the evaluation of the devices was done in different places, at the roadside, in the police station, or in the laboratory;
- the devices were evaluated by different persons, which makes the comments on the practical and operational aspects more difficult to compare;
- the prevalence of different drugs and the selection criteria of the subjects differed according to countries, which resulted in strongly different prevalence in the samples used to test with for different on-site devices, depending on the countries they were tested in.

In several countries, the Rosita evaluations were the first experience police officers had with roadside drug tests, and, despite some problems and disappointments, **police officers liked having the tools to detect drugged drivers**.

Users of on-site tests have shown great creativity in overcoming some of the encountered problems. The oral fluid devices available at the moment of the study all had some practical disadvantages, and the analytical evaluation was not satisfactory. But the need for such devices is so great that in one country, police officers prefer to use an oral fluid test that is imperfect, than no test at all (although we strongly advise against using any of the present oral fluid devices for benzodiazepines or cannabis detection). In other countries, police will rather use urine tests.

Police did not have major objections to collecting specimens.
There was a majority of countries that favoured **oral fluid** as a matrix.

Table 2: number of comparisons (n), sensitivity (Se, %), specificity (Sp, %) and accuracy (Ac, %) of rapid tests for five drug classes. The results were compared to the results obtained by GC-MS. For amphetamines, in some cases (A+M) the combination of an amphetamine and methamphetamine test was used (see text).

	Amphetamine + methamphetamine					Benzodiazepines				Cannabis				Cocaine				Opiates			
		n	Se	Sp	Ac	n	Se	Sp	Ac	n	Se	Sp	Ac	n	Se	Sp	Ac	N	Se	Sp	Ac
American Biomedica Rapid Drug screen	A+M	468	98	99	99	219	91	98	97	571	97	90	92	580	100	98	98	472	98	95	95
Cortez	A+M	186	87	93	90	189	81	84	82	369	95	95	95	393	85	98	97	387	98	95	95
Dipro Drugscreen 5 panel test	A+M	122	97	100	98					123	99	92	97	128	100	99	99	34	100	85	88
Frontline	A	68	100	56	68																
Mahsan	A	157	88	99	97					148	97	91	94	156	100	93	94	137	-	97	97
Rapitest Multidrug panel	A	95	86	96	92	92	95	82	91	95	70	98	85	96	75	100	99	97	78	99	97
Roche Testcup5	A	527	75	100	95					542	92	93	93	570	95	99	99	474	97	93	94
Status DS	A	92	85	96	91					92	80	100	91	92	100	99	99	94	100	97	97
Surescreen 6 Drug MultiTest	A+M	106	93	95	94	102	89	88	88	114	76	99	90	116	100	100	100	118	82	97	96
Syva RapidCup	A	52	100	100	100					88	97	92	94	90	100	98	98	85	100	96	96
Syva RapidTest	A+M	558	97	100	100	354	98	84	86	880	93	100	97	904	96	99	99	782	95	96	96
Triage	A	395	89	99	98	394	94	99	98	396	84	99	96	396	95	100	100	396	100	99	99

On site testing gave police confidence, saved time and money.

In general, the use of roadside tests offered the following advantages in the enforcement of drug-driving laws, both in countries with an impairment-type law and in countries with 'per se' laws:

- It gave confidence to the police officer. Without an on-site tool to confirm his impression, a police officer will be more reluctant to press charges. Thanks to the immediate feedback, he rapidly increases his skill at detecting drugged drivers.
- On-site tests saved time, because the subject did not need to be transported to the police station for testing.
- On-site tests saved money, because the more expensive confirmation tests were limited to cases that are much more likely to be positive. The use of on-site tests will be more targeted and economical if it is based on a suspicion by a trained police officer.
- Subjects were impressed by the result (even more so if the procedure was complex or if the result is read electronically) and often confessed when confronted with a positive result.
- The publicity that accompanied the use of roadside tests (e.g. in Finland) was considered (by the police officers) to have a preventive effect.

Most of the urine devices worked well and generally served as good predictors of blood concentrations.

Sampling urine was no problem if appropriate facilities were present. Urine on-site tests are relatively easy to use after some training, however, appropriate training in the use and reading of on-site tests is essential. There is no clear majority for dip or pipette-type devices, but cup-type devices should require less sample. A preference exists for blue lines and multi-analyte tests. In some countries, 'aggressive' tests (fewer false negatives than false positives) are preferred. For the different drugs (amphetamines, benzodiazepines, cannabinoids, cocaine and opiates), several on-site devices met our analytical criteria for the reliability of analytical results.

Oral fluid and sweat are promising specimens and in some cases are better than urine but more research and development will be needed.

Sampling of oral fluid and/or sweat was much better accepted by the drivers and the police officers. For some drugs, with reference methods, there was a better agreement between oral fluid and blood than between urine and blood. The oral fluid devices that were tested were not satisfactory for use at the roadside either in terms of ease of use, duration, sample volume needed, sensitivity and reliability (accuracy of 50-81 % for the different drugs in comparison to blood). On-site tests for oral fluid should be targeted to the parent molecule (e.g. THC, 6-acetylmorphine, cocaine) and not to the urinary metabolite. For sweat, only one device was available and relatively good results were seen for some drugs, but more studies are needed to determine if external contamination and the later appearance of drugs in sweat are an issue.

The technology is changing rapidly and more accurate, more sensitive, easier to use devices are expected in the near future.

Many development efforts are under way, and new devices and improved versions of the devices that we tested here, are expected.

Roadside tests are, and should always remain, preliminary tests, that allow the police officer to take immediate measures on-site. A legal sanction should only be based on the result of a reference method in a certified laboratory and/or on the signs of impairment of the subject (depending on the type of legislation in force).

3.5. Conclusion

Roadside drug tests were considered to be very useful. In the future, oral fluid seems the most promising, but the presently available tests are not satisfactory. Urine tests can be an acceptable alternative.

4. ROSITA-2

At the very end of 2002, the ROSITA-2 project started. The project has a duration of 3 years, and its main aim will be to evaluate the newer saliva drugs tests that have appeared on the market or will appear shortly. The project will be carried out in six European countries and four US states. During two nine-month periods, two devices will be evaluated in each participating centre. Between these periods, an interim evaluation will take place and the protocol will be altered if needed. Based on the experience with the first ROSITA project, the focus will be on a more uniform protocol with identical limits of detection for the reference methods. The results of our first evaluations of the newer (versions of the) saliva tests shows that there has been some progress, but not as much as was hoped in 2000. In particular, the detection of THC still seems problematic. While a limit of detection of 2 ng/mL is necessary, the best device can only detect 20 ng/mL 50% of the times (M. Walsh, personal communication).

5. References

1. Krüger HP, Bud Perrine MW, Mettke M, Huessy FB. Overview of the legal provisions, difficulties faced by police, and analysis of prevention attempts in selected European countries. In: Road Traffic and Drugs, Council of Europe publishing, Strasbourg 2000, ISBN 92-871-4145-2. pp. 63-85

2. Frank JF, Hersch RK, Crouch DJ, Cook RF. On-site drug detection device field test. Presented at the ICADTS meeting in Stockholm, May 2000.

3. Kauert GF. Drogennachweis in Speichel vs. Serum. Blutalkokol 2000; 37 Sup 1: 76-83

4. Buchan BJ, Walsh JM, Leaverton PE. Evaluation of the accuracy of on-site multi-analyte drug testing devices in the determination of the prevalence of illicit drugs in drivers. J Forensic Sci 1998; 43: 395 – 399

5. Matthijssen MPM. Drug-, medicijn- en alcoholgebruik van automobilisten in Nederland 1997/1998. Stichting wetenschappelijk onderzoek Verkeersveiligheid (SWOV) R-99-5, Leidschendam, pp. 1 – 49

6. Samyn N, van Haeren C, On-site testing of saliva and sweat with Drugwipe and determination of concentrations of drugs of abuse in saliva, plasma and urine of suspected users Int. J. Legal Med. 2000; 113: 150-154

7. Tunbridge R, Rowe DJ. Roadside drug screening, field impairment testing and DRE programme and experiences. In: Road Traffic and Drugs. Council of Europe, Pompidou Group 2000: Strasbourg, pp. 249-249.

8. Sachs H, von Meyer L. Sweat testing for drugs using Drugwipe. Abstract no. 44. Abstract book (CD-ROM) of the 34th TIAFT meeting, Interlaken, Switzerland.

Presentation of the research project IMMORTAL - Impaired motorists, methods of roadside testing and assessment for licensing

by Inger Marie Bernhoft (Denmark)

IMMORTAL specifies a research programme concerning the accident risk associated with different forms of driver impairment and the identification of criteria applied to licensing assessment and roadside impairment testing (including drug screening).
The scientific objectives of **IMMORTAL** are to:

- investigate the influence of chronic and acute impairment factors on driving performance and accident risk;
- recommend criteria for high risk categories of impairment;
- provide key information to support formulation of European policy on licensing assessment and roadside testing.

Thus, **IMMORTAL** is focused on two societal needs that both contribute to quality of life, namely mobility and safety. **IMMORTAL** will provide added community value in terms of the generalisation of conclusions relevant to EU policy and standardisation of driver testing and assessment methods with respect to EEC directives.

IMMORTAL started on 1 January 2002 and runs for three years. The work plan comprises both research and policy functions:

- One research work package focuses on chronic impairment from ageing, mental illness and medical diseases.
- The other research work package focuses on acute impairment from drugs and medicines, alone or in combination with alcohol.
- The policy function will provide workshops on various physical impairment factors (i.e., fatigue, visual and perceptual deficiencies) and consider relevant countermeasures, including licensing and impairment testing.

1. Research on chronic impairment: Ageing, mental illness and medical diseases

Literature review of impairment and accident risk associated with ageing, illness and disease

The task will provide an updated literature review and metaanalyses of health-related risk factors, partly based on research reports compiled for the Norwegian Traffic Safety Handbook.

Estimation of risk involvement of several medical disorders in road accidents

A questionnaire-based study of self-reported health problems among crash-involved drivers will aim at estimating the culpability in accident risk amongst drivers with ageing, illness and disease conditions using an "induced exposure" estimation of risk involvement of several disorders in road accidents.

Medical predictors at time of licensing for traffic violations and accidents

The task will provide a prospective analysis of the assessment of fitness to drive and accident risk. A medical-psychological assessment of drivers obtaining a driving license

or renewing their driving licence will be used to predict licensing assessment and subsequent traffic violations and accidents.

Effects of depression and antidepressant therapy on driving performance

The study will measure the effects of antidepressants and depression severity on cognition, psychomotor function and driving performance. Performance of drivers with clinical depression under various treatment regimes during a 6-week therapy will be studied by means of laboratory performance tests and standardized actual driving tests, respectively.

Effects of diabetes on driving performance

The study will describe the effects of diabetes on cognitive and driving performance using simulation experiment (driving simulator) and psychological examination of the effects on cognitive and driving performance. Furthermore, it will be described how these effects relate to other known effects such as fatigue and alcohol (a BAC of 0.05).

Protocol development for assessment of fitness-to-drive amongst categories of elderly driver

Whereas many countries do have licensing restrictions, the testing methods used to determine the form of restriction are seldom standardised or validated. The study will develop licensing assessment protocols for elderly drivers suffering from various types of impairment to be used specifically to categories of physical and cognitive impairment amongst elderly drivers

Assessment of fitness-to-drive amongst patients with learning difficulties

The study will assess methods used in fitness to drive evaluations of persons with learning difficulties. The study includes a detailed description of the developed assessment methods, experimental design, results and conclusions regarding the potential and feasibility of medical assessment, neuropsychological assessment, simulator assessment and on-road assessment.

2. Research on acute impairment: Alcohol, drugs and medicines

Review of driver impairment and accident risk for drivers impaired by drugs and medicines, alone or in combination with alcohol

The task will provide an introduction into the problem of impaired drivers and the impact of different substances on driving performance. The review includes recent results of scientific research on this topic concerning the possibilities of detecting impaired drivers and assessing the influence on driving performance and accident risk.

The prevalence of drivers impaired by drugs and medicines, alone or in combination with alcohol, and accident risk for these drivers

Roadside surveys will be carried out in three countries (Norway, Netherlands, UK). The results will give an indication of the prevalence of substances in drivers. Furthermore, a comparison of incidence rates from controls at the road side and hospital cases (injured drivers) will aim at suggesting risk factors for different substance categories. Where possible, tolerance levels will be specified from analyses of dose-equivalent effects.

A qualitative analysis of accident causation factors related to drugs and medicines, alone or in combination with alcohol.

The task will provide a qualitative analysis of accident causation factors related to impaired drivers. Anonymous in-depth interviews of the drivers in such accidents will be carried out in co-operation with physicians at selected hospitals.

Driver impairment, accident risk and tolerance levels from consumption of drugs
The task will assess the effects of MDMA on actual driving performance, cognition and psychomotor function of recreational MDMA users as a function of dose and time after dosing. The study will be designed to assess the effects of MDMA with and without a social dose of alcohol. The driving performance tests take place in a closed area.
Driver impairment, accident risk and tolerance levels from consumption of remedy medicines
The task will assess the effect of cold virus and cold virus medication on driving and cognitive performance. Subjects diagnosed with a common cold will be compared, with and without medication and to base line conditions. Impairment will be measured by psychometric tests and driving performance in a simulator.

3. Policy functions
This work package will identify relevant information to support policy by operating topic workshops to include researchers and policy makers from the European countries and representatives from related projects.
Four workshops will be carried out with the following topics:

- Vision and perceptual deficiencies as a risk factor in traffic safety (SINTEF, Trondheim, May 2003)
- Fatigue as a risk factor in traffic safety (TOI, Oslo, September 2003)
- The use and usability of Council Directive No. 91/439 on Driving License (University of Valladolid, Valladolid, May 2004)
- Cost benefit analyses of countermeasures to prevent driving while impaired and impairment-related accidents (TOI, Brussels, September 2004)

Thus, the results of **IMMORTAL** will:

- Provide comprehensive knowledge concerning the influence of acute and chronic impairing factors that may be used in policy decisions.
- Support recommendations on how to (a) examine chronically impaired people seeking (re)licensing, and (b) assess drivers for acute impairment (at roadside).

The **consortium** comprises 10 partners from a range of European institutions. The multi-disciplinary expertise and critical mass of the consortium will ensure that the objectives are feasible and applicable to the European context.
The partners are:

- School of Psychology, University of Leeds, UK – coordinator
- SWOV Institute for Road Safety Research, The Netherlands
- Board for Safety and Prevention (KuSS), Austria
- Danish Transport Research Institute (DTF), Denmark
- Institute of Transport Economics (TOI), Norway
- Foundation for Scientific and Industrial Research at the Norwegian Institute of Technology (SINTEF), Norway
- Department of Pharmacology and Therapeutics, University of Valladolid, Spain
- Transport Research Centre (CDV), Czech Republic

- Transport Research Laboratory (TRL), UK
- Brain Behaviour Institute, Maastricht University, The Netherlands

More information on IMMORTAL can be found on the web site www.immortal.or.at.

Presentation of Belgian legislation

by Claude Gillard (Belgium)

Section 35 of the Road Traffic Act already prohibited driving a vehicle in a state comparable to inebriation as a result of the use of drugs or medication.

However, this provision did not specify either the types of substance concerned or the dosages applicable, nor did it lay down the screening methods.

Owing to its geographical location, Belgium faces two specific types of problem with regard to the use of drugs, namely drug tourism from the Netherlands and people returning from the large dance establishments (so-called “mega-dances”), especially those close to border areas.

For example, some drivers, in order to avoid being checked for the possession of drugs, prefer to consume them on the spot and then drive on under the influence.

The first police checks based on the taking of a urine sample could only be carried out with the consent of the person concerned. In order to resolve these difficulties, a draft law was submitted to the Council of Ministers laying down a general framework in order to permit progress to be made with regard to the substances detected, the detection levels and the policing methods.

The “Legislation” section of the Council of State, whose opinion is compulsory before a bill is submitted to parliament, raised major objections. This being a criminal law, the Council of State pointed out that it must be subject to a strict interpretation. The law must accordingly explicitly specify the types of substance, the detection levels and the policing methods.

Before being able to draft such a precise law, it was necessary to resolve a number of difficulties, including:

- the use of prescribed drugs;
- the presence of codeine in certain cough syrups;
- passive consumption and the resulting false positives;
- variations in the levels of concentration over time and according to the type of testing equipment;
- patients treated with the aid of a morphine pump;
- etc…

In order to place the draft law on a recognised scientific basis, a scientific study was conducted beforehand. The conclusions were set out as a preamble to the parliamentary business and were incorporated in the explanatory memorandum to the draft law.

As a result of this prior scientific approach, Parliament unanimously passed the draft law without any amendments (which is rare in the case of drugs).

The features of the Law of 16 March 1999, which came into force on 9 April 1999, are as follows:

Banned substances:

- THC (the active substance of cannabis);
- Amphetamines including MDMA, MDEA, MBDB, morphine;
- cocaine.

The tests are subdivided into three phases. The next phase can be initiated only if the preceding test is positive.

These phases are:

- series of standardised tests: pupillary examination, walking along a line, etc.
- obligation to submit to an immunoassay of urine;
- blood analysis, which alone constitutes evidence in court.

The principle that applies is that of zero tolerance (detection threshold level) tempered by the fact that the series of standardised tests will only be positive if the ability to drive is impaired.

In the case of a positive immunoassay, a 12-hour driving ban, renewable for a further 6 hours, is issued. In addition, the judicial authorities can order the immediate withdrawal of the driving licence in the event of dangerous driving, for example.

If the blood analysis turns out positive, the penalties range from 15 days to 6 months' imprisonment and/or a fine of between 100 and10,000 euros.

If the driving licence has been withdrawn, the judge must make the reinstatement of the right to drive subject to proof of abstinence.

Since the entry into force of the law in March 1999, certain problems have been resolved, such as the standardisation of the series of tests and official approval of the urine tests.

However, some problems in applying the law still remain, such as the types of substance and, especially, the methods of analysis specified in the law in considerable detail. The levels referred to in the law relate to drug detection and are therefore very low. The procedure for accrediting laboratories that prove they adhere in every respect to these analysis methods and to the very low detection levels is turning out to be long and difficult, with the result that few laboratories have been accredited and those that have been refused accreditation are appealing to the Council of State.

Introduction and development of French legislation on driving under the influence of drugs

by Claude Got (France)

Introduction

Almost ten years have passed between the Inter-ministerial Road Safety Committee's decision of 17 December 1993 to ask a group of experts to produce a white paper on the effects of drugs and medication on driving and the introduction of new legislation with three successive laws drafted between June 1999 and February 2003. This long period of drafting and subsequently amending legislation highlighted the difficulty of an approach in which the problems associated with the current state of knowledge, those caused by technical and practical limitations and, above all, those involved in dealing with complex social problems by means of simple and consistent legal solutions are all intimately connected,.

The current situation is certainly not static and will evolve in the next few years, especially as a result of the possibility of screening people at the roadside instead of the present procedure carried out in a hospital. It may also be influenced by public health considerations with regard to controlling the consumption of drugs, as a separate issue from road safety. As this has happened in the case of alcohol, the roadside may become the place where new methods of the social control of psychoactive products are developed. It is necessary to point out that the legislature has shied away from dealing with the control of the use of psychoactive medication by road users, but there is likely to be a shift in the legislative treatment of this problem in the years to come.

The features of this recent French debate to be noted are the diversity of opinions expressed, the passion with which it was often conducted and the obvious contradictions between the uncertainties in some areas of knowledge and the assertions that accompanied the drafting of this legislation. This is part of the normal working of democracy, even if it is sometimes hard to cope with for those who consider that the end does not justify the means and who try to contribute to the advancement of knowledge. The political demand for precise information may go beyond the ability of experts to meet it. This is a typical situation in the context of risk management and ultimately produces compromise decisions that are likely to be periodically challenged. This is what happened in France: it took eight years from the request for a white paper before the first law was implemented; this was amended twice in the two years that followed. After a very slow maturing period, the process gathered speed; in parallel, there was a very strong renewed interest in road safety on the part of decision-makers.

The results of this resurgence of political and media interest in the fight against death and injury on the roads were very significant, with about 1300 fewer people killed on French roads in the period April 2002/March 2003. We had not seen such a reduction in accidents on the road since the first major political decisions were taken in this area in 1973 (overall speed restrictions on the road network and compulsory wearing of seat belts). This development testifies to the importance of possible improvements to the situation; our "road safety reserves", to borrow the title of a recent report ("Gisements de sécurité routière") on the subject, are far from being exhausted.

The white paper commissioned by the French Government in 1993

This white paper represents the starting-point for the changes in the political approach in France to dealing with road accidents linked to the use of drugs or medication. The working party was made up of ten members under the chairmanship of Professor Georges Lagier, and its remit immediately posed a problem concerning the wording of the Inter-ministerial Road Safety Committee's request of 17 December. The working party was tasked with drawing up a "white paper on the effects of medication and drugs on road safety". At its first meeting, it decided to interpret the French word "drogue" in its broadest sense of a psychoactive substance capable of causing dependence and physical or mental damage, and therefore to include alcohol in the field covered by the report. This decision was reflected in the white paper's title: "Road safety, legal or illegal drugs and medicines" ("Sécurité routière, drogues licites ou illicites et médicaments").

It is unnecessary to produce a detailed summary of this document, but it will be useful to outline its main conclusions to enable comparisons to be made with the three laws subsequently adopted. The committee's conclusions concerning narcotics were as follows:

- inadequacy of the epidemiological studies,
- discrepancy between the large number of legislative and regulatory measures relating to alcohol and the virtual absence of specific provisions concerning medication and drugs, especially illegal drugs,
- the need to take account of the difficulties in proving the existence and ascertaining the dosage of illegal drugs likely to impair the ability to drive. The committee considered *"that it would not be realistic to require screening for a large number of substances in the case of all road accidents involving physical injury. Pending validation of saliva screening tests, it is necessary to have urine or blood samples in order to be able to carry out reliable studies"*.

The committee recommended:

- *"considering selective measures whose implementation arrangements are acceptable to users and compatible with the workload of the law enforcement agencies",*
- amending the road traffic regulations in order to organise screening for driving under the influence of illegal or misused substances,
- targeting the screening in certain cases in the light of clinical or police findings (particular behavioural problems, seizure of illegal products, presence of empty packages),

- *"if it is impossible to conduct the tests at the scene of the accident (subject unconscious), screening for illegal or misused substances should be carried out by means of a blood sample, as is currently the case for alcohol, or a urine examination".*

These proposals must be seen against the background of the knowledge and means available in 1993/1994. We were clearly aware of the practical difficulty in screening everyone involved in accidents resulting in physical injury without the availability of simple and practicable roadside tests that would avoid having to transfer people to a medical facility. The hope lay in the validation of these tests, which would permit the same screening function as chemical or electronic breathalysers. They took much longer to develop than envisaged by the committee.

Action taken on the report

The period following the submission of the drugs white paper to the Government was not conducive to its rapid implementation, since the parliamentary majority changed several times. In all parliamentary systems, such changes adversely affect continuity as the new team has its own priorities and may take a long time to accept that certain problems and their possible solutions are always the same. The government of Edouard Balladur, which had commissioned the white paper, was replaced by that of Alain Juppé in 1995 before being able to initiate Parliament's examination of a draft law on driving under the influence of narcotics. In 1996, a private member's bill was introduced by a deputy, Richard Dell'Agnola and was due to be studied by Parliament when the dissolution of the National Assembly by Jacques Chirac was followed by a change in the parliamentary majority in the spring of 1997. The government of Lionel Jospin then introduced a draft law on road safety, which was passed in 1999.

The Law of 18 June 1999

Section 5 of this law introduced the systematic screening for drugs among drivers involved in fatal road accidents. The wording chosen by Parliament was as follows: *"Provisions relating to the establishment of the systematic drug screening of drivers involved in fatal road accidents".* A new article is added to Title 1 of the Road Traffic Code (legislative part) which is Article L. 3-1 worded as follows*:*

"Article L. 3-1. – Law enforcement officers shall carry out screening tests on every driver of a vehicle involved in a fatal road accident. If these tests are positive, or impossible to carry out, or if the driver refuses to undergo them, they shall have analyses and medical, clinical and biological tests conducted to establish whether the driver was under the influence of substances or plants classified as narcotics. The results of these analyses shall be sent to the public prosecutor's office in the locality in which the accident occurred."

"Any person who refuses to submit to the medical, clinical and biological analyses and tests provided for by this section shall be subject to the penalties provided for in the first paragraph of Article L. 1. A Conseil d'Etat decree shall determine the implementing conditions for this section."

The Government and Parliament took account of the unavailability of validated tests for drug screening at the scene of an accident and decided in favour of urine screening in a medical facility in the case of all fatal accidents, to be followed by an epidemiological study of the results in order to produce a better assessment of the actual situation and the involvement of the various substances used. Pending submission of this study, the law did not create a new offence with a specific penalty. It is necessary to draw attention to an aspect of this law that has little justification: while the laws relating to alcohol treated all "users" involved in an accident equally, the provisions of screening for narcotics after fatal accidents only applied to the drivers - as if any pedestrians involved could not be affected by such a problem!

This law did not come into force until 1 October 2001. This period of more than two years between the publication of the law and the implementing decree (Decree of 27 August 2001) might appear surprising, but several difficulties arose that explain this delay.

- ✓ The necessity to define what was to be understood by a "fatal accident". It would have been absurd to have the screening done on those involved in cases where death occurred some time later. Certain substances would have been completely eliminated but not others, especially cannabis, but the active components could have disappeared and it would have been of little use to the judge to have undated proof of consumption that might even have taken place after the accident. It was hard to envisage specifying a period between the accident and a person's death, and the discussions at administrative level led to a decision to focus in practice on those accidents in which the police in charge of the operation on the ground and the investigations were aware that one of the people involved in the accident had died. The implementing decree defines as an accident covered by the law one *"that has had immediately fatal consequences"*.

- ✓ The need to define the screening tests to be used. The difficulty of the approach is well-known to participants here. The solutions adopted depend on the conditions for carrying out the various tests possible and how sensitive and specific they are. The regulations implementing the law (Decree of 27 August 2001 and the Order of 5 September 2001) opted for the method proposed in the white paper, i.e. urine screening carried out by doctors, to be followed, where necessary, by confirmation by means of a blood sample. The screening takes place for four classes of substances: cannabis, opiates, amphetamines and cocaine,

- ✓ The necessity to define a set of data sheets documenting the various steps taken by the investigators. There are three such sheets and they relate to the conditions and results of the screening (sheet D), the clinical examination of the user (sheet E) and the blood-level results (sheet E).

- ✓ Providing hospital emergency facilities and law enforcement units with urine screening equipment.

- ✓ The configuration of an epidemiological study announced by the minister during the parliamentary debate, which ended in the adoption of the law of 18 June 1999. This posed legal problems concerning access by researchers to judicial proceedings in progress. The French Drugs and Drug Addiction Observatory is a public body and has been given the task of leading the project, publishing the terms of reference agreed with the various ministries concerned and, finally, organising the tendering procedure and the selection of the teams to participate in this research.

The Law of 15 November 2001

Section 21 of this law ("day-to-day security") broadened the possibilities of screening for drugs of abuse after a road accident resulting in physical injury by introducing the following provisions: *"A subparagraph worded as follows shall be inserted after the first subparagraph of Article L. 235-1 of the Road Traffic Code: "Police officers may also have screening tests carried out on any driver of a vehicle involved in a road accident resulting in physical injury. When such tests are positive, are impossible to carry out or if the driver refuses to undergo them, they shall have analyses and medical, clinical and biological tests conducted to establish whether the driver was under the influence of substances or plants classified as narcotics"*. This amendment was important as it enabled police officers to screen people for narcotics in the case of non-fatal accidents without having to act on the public prosecutor's instructions, which inevitably led to a further delay in carrying out the screening and to the taking of a blood sample when the screening test was positive.

The Law of 3 February 2003

This law did not originate from the Government but is the result of a private member's bill drawn up by Richard Dell'Agnola, the deputy who had already taken action in this direction in 1996. The French Parliament works in such a way at the moment that the two chambers are able to put the examination of a draft law on their agenda without having previously obtained the Government's agreement. This system was impossible in the past as the Government was completely in charge of setting the agenda of the National Assembly and the Senate, which resulted in many parliamentary initiatives being blocked. There was no conflict in this case as the Government had announced its intention to support the private member's bill and the debate mainly focused on the details of its contents.

After the first reading before the National Assembly on 8 October 2002, the text passed made far-reaching amendments to the law of 1999. All the provisions in force for alcohol were applied to narcotics, namely:

- drug screening was extended to all accidents involving physical injury;
- driving under the influence of drugs carries the same penalty as that provided for in the case of driving under the influence of alcohol (up to two years' imprisonment, with the possibility of the sentence being doubled in the case of involuntary homicide or injuries);
- the screening may be carried out on anyone as a deterrent, even where there has been no accident or breach of the law, if there are *"one or more good reasons for suspecting that he or she has committed the offence defined in Article L. 235-2"* (driving after using substances or plants classified as narcotics).

The National Assembly debate revealed the broad support from the parliamentary majority for these provisions and the text was passed without any significant amendments. It was quickly sent to the Senate, which examined it in December 2002. An important modification was incorporated into the text, namely the abandonment of the systematic drug screening of all drivers involved in an accident resulting in physical injury. This change corresponded in practice to a return to the provisions of the law of 15 November 2001. It was realised that the workload of police officers who come to an accident involving physical injury would be doubled if it was necessary for an additional team to assume responsibility for transporting the people who are not injured to a hospital facility to carry out urine screening. The hospital emergency services are currently in crisis, waiting times are long and staff have to contend with a constant increase in calls on their services, an increase proportionate to the relinquishment by independent practitioners of responsibility for emergencies. The social difficulties affecting most industrialised countries have also contributed to this additional workload for the emergency services – a section of the population on the margins of society and in very poor health are making increasing demands on the hospital emergency services. If the provisions of the initial version of the text had been retained, this would not have responded to the desire to make optimum use of the law enforcement agencies.

This very important paragraph redefining the conditions for carrying out screening in the case of non-fatal accidents is worded as follows: *"Police officers may also have these tests carried out on any driver, or person accompanying a learner drive, if he or she is involved in any road accident whatsoever or is alleged to have committed one of the offences in these Regulations punishable by a driving ban or to have committed a speeding offence or failed to wear a seatbelt or crash helmet, or when there are good reasons for suspecting the use of drugs."*. As in the case of alcohol, it should be noted that the requirement that the accident involve physical injury laid down in the law of 15 November 2001, retained in the private member's bill and then adopted by the National Assembly was dropped. All accidents may result in the screening of those involved, but it must be remembered that in practice the police in France only become involved in accidents causing physical injury, which limits the scope of the provision.

The applicable penalties have been slightly modified and the maximum prison sentence has been changed to three years if the person who has consumed drugs is also under the influence of alcohol above the legal limit.

The text proposed by the Senate was adopted unchanged by the National Assembly on 23 January 2003 and the law was promulgated on 3 February 2003. Some provisions had to be further clarified in a decree and were included in the decree of 31 March 2003 consolidating the regulations relating to road safety. These are but minor changes to the text of the decree implementing the law of 18 June 1999 regulating the conditions for carrying out screening.

Comments

After several amendments to the various laws, we have reached a situation that will probably apply for several years to come without any significant amendments to the provisions adopted in early 2003. The situation is different regarding the rules and regulations as it is likely to change following the availability and, in particular, the proven qualities of the various roadside screening tests. It became clear in the course of the debate held between October and January that the screening issue was crucial for the broad application of a law on drug driving. Although urine tests were opted for, it is difficult to get police officers to carry them out at the scene of an accident and screening becomes expensive in terms of staff time taken up in transferring people to a hospital. For tests carried out as a preventive measure at places other than the scene of an accident or of the commission of an offence, consideration should be given to having vehicles suitable for screening similar to those used for doping tests at sports competitions. These are used in certain countries but the French police believe this type of screening must be carried out in a medical environment, and I should be surprised if they were to change their attitude in the next few years. Consequently, a change in the situation can only be brought about by a better knowledge of the specificity and sensitivity of tests on sweat or saliva that can be carried out in the field. When very many tests are carried out on a large number of users during a screening operation intended to act as a deterrent, the majority will be negative, and the problem is not so much the sensitivity of the tests as their specificity. It is necessary to avoid a large number of users being sent to a hospital casualty unit for a blood sample to be taken to confirm a test that is in fact falsely positive. The situation is different after an accident, so it is preferable to have a very sensitive test, even at the expense of a reduction in specificity. As the number of people concerned is low, the risk of a large number of false positives is acceptable if it leads to reduction in the number of false negatives that may be produced by a not very sensitive but very specific test.

The parliamentary debate took place with everyone more or less certain of its outcome as it had been obvious since September 2002 that the private member's bill would be supported by the Government and a very large majority of deputies and senators. The most important aspect of the debate concerned the extent of the screening to be carried out in the case of accidents involving physical injury, and wisdom prevailed with the return to the idea of possible but not compulsory screening. The obligation remains only in the case of fatal accidents. Against this background of a considerable political consensus, it was unnecessary to conceal the uncertainties that continued to exist with regard to the proportion of road accidents attributable to illegal drugs. Some parliamentarians in favour of the law supported its adoption by pointing out that it was not necessary to have a precise knowledge of the role of drugs in road accidents in order to legislate on psychoactive substances that could only impair the ability to drive.

The choice was therefore based on a sense of political responsibility, without waiting for a scientific consensus to be obtained following a concurring assessment of the risk level. Others were less cautious and mentioned specific assessments of the number of accidents attributable to the consumption of illegal drugs. They exaggerated, indeed distorted, information that had been disseminated by a group of ten toxicology experts at the time of the parliamentary debate. They had no difficulty in shifting their interpretations from the concept of the prevalence of the presence of a substance to the idea of causality in the case of an accident. This statement by toxicologists whose competence is recognised in the field of toxicological analysis posed several scientific and ethical problems. As far as the role of cannabis in road accidents is concerned, their assertion that *"Numerous studies abroad (Germany, the Scandinavian countries, Australia, the United States) have shown this link for 10 years now"* gave the impression of a consensus in the scientific community that did not tie in with the significant discrepancies produced by the case control studies available and reported on in France in the INSERM report published in 2001. On the other hand, this group of experts has published a review of the results of the 3751 analyses carried out in France under the law of 18 June 1999, without indicating the selection bias that characterised it. 13.8% of these analyses revealed the use of cannabis (27.2% in people under 27), and this group stated that the figures were *"underestimated in comparison with the actual situation as the minimum period between the accident and the taking of a sample is at least two hours and the present legal thresholds are set too high"*. These results combined blood samples taken in the absence of a urine test when the latter was impossible and blood samples taken after a positive screening test. Such a percentage has no epidemiological significance since it fails to take account of negative screening tests, which naturally do not result in any blood samples being taken and are therefore not included in the figures produced by the analysis laboratories. It is easy to increase a proportion by reducing the denominator, and such irregularities discredit those responsible and make parliamentary work more difficult. It would also have been in accordance with ethical principles for the experts who voiced their support for the law with debatable scientific arguments to indicate their conflict of interest in the area concerned - increasing the number of situations in which screening for drugs was to be carried out would provide them with more work as experts.

The law that was passed could only be a compromise given the persistent uncertainties concerning the proportion of accidents attributable to the sole use of cannabis. It is indisputable that, whatever the attributable risk level accepted (between 1 and 3 if the data available in the literature is adopted), the penalties provided for by legislation are very high and bear no relation to the penalties for exceeding the speed limit by about 30 km/h, which results in a more than three times higher risk of an accident, or to the failure to use a child-restraint system, which raises the risk of the child's death by a factor of between 2 and 3. I could also add to the list the much higher additional risk associated with the use of an unnecessarily powerful and fast vehicle, which encourages excessive speeds. The statistics of insurance companies have highlighted the relative risks of physical injury to third parties when the slowest vehicles are compared to the fastest (the risk factor can be as high as 15 or more). These comparisons are important as they demonstrate that the imposition of penalties for drug driving is not only a question of road safety but is associated with a strong motivation to deter people from using these substances. Since driving a car has become a convenience that often borders on necessity in the industrialised countries,

forcing people to choose between keeping their driving licence and consuming drugs is becoming a powerful lever in deterring them from using illegal psychoactive drugs – just as laying down a legal limit for the blood level alcohol was a deterrent with respect to the most popular legal drug consumed in France. Strangely enough, this motivation, which is constantly present in private discussions with policy-makers and administrators, is not very often to be observed in parliamentary debates (as if the politicians and the Government were reluctant to highlight this objective). We are living in a parliamentary democracy and I cannot see why the legislators should put forward road safety considerations as the only reason for taking action if the reason connected with it – perhaps the main one in their eyes - is to use the continued possession of the driving licence and the risk of severe penalties as a means of deterring people from using illegal drugs!

Is it possible to imagine the last law adopted making significant changes to the drug-driving accident rate? It is difficult to make a prognosis owing to the uncertainty with regard to the deterrent effect of carrying out preventive roadside screening tests in the future. Unless and until roadside tests are introduced in the regulations (the decision may be taken without a new decision by Parliament, since the law only specifies that the screening must be done on “biological fluids”) it is likely that urine screening at a medical facility will remain rare and therefore not constitute much of a deterrent. The only new development likely to change the behaviour of drug users is the imposition of severe penalties on drivers who use them. However, it has to be pointed out that screening in the case of fatal accidents will mainly lead to convictions when a breach of the traffic rules (exceeding the speed limit, ignoring the right of way, etc.) involves the presence of drugs and results in involuntary homicide, which enables severe sentences to be imposed. This will be all the more difficult to assess given that there is a tendency at present to increase sentences when a breach of the road traffic regulations results in a serious accident, especially one that is fatal. Prison sentences are being imposed more and more often than suspended sentences, which used to be very frequent. However, it will be possible to document the changes in the types of sentences handed down in the period between 1 October 2001 and the implementation of the law of 3 February 2003 (screening for drugs without a specific penalty) and after the implementation of the last law passed in order to assess the influence of the creation of the offence of “driving after using substances or plants classified as narcotics”. Before the law of 2003, a conviction was based only on the “traffic offence” and involuntary homicide, but can now be based at the same time on the traffic offence, involuntary homicide and the detection of drugs.

Conclusions

The ten years that have just passed have enabled France to develop both legislation and an evaluation instrument. In the years to come we shall improve our epidemiological knowledge in this area, especially of cannabis, which is the illegal drug most consumed in our country, and we shall have a better appreciation of the role of drugs in road accidents. This role will, of course, be found to be more significant than that claimed by the people who irresponsibly assert that "*cannabis has never killed anyone"* but it will also be much less significant than that reflected in the ridiculous claims we unfortunately read or heard at the time of the parliamentary debate, such as *"it is estimated that 1500 young drivers or passengers die each year in France because of drug-driving"*. We are living in a society in which people sometimes say things that have nothing to do with reality. It is not a question of having a worrying lack of critical acumen. Those who repeated this assertion knew that 2077 "young people" died on the roads in 2001 (if you include under this term everyone aged 15-25) and that it was impossible to attribute three-quarters of these deaths to drugs. One of the main concerns of a group like the one meeting in Strasbourg today is to avoid tendentious disinformation and to try to get to grips with a situation that is hard to understand because it is not enough to have assessments of the prevalence of drug use among people involved in accidents. Both we and the legislature need to have at our disposal assessments of the proportions attributable to drugs based on the usual scientific criteria.

Access to the documents mentioned

The white paper "Road safety, legal or illegal drugs and medicines" ("Sécurité routière, drogues licites ou illicites et médicaments") is not available in electronic form on the internet. It was issued in March 1996 as a 249-page publication by La documentation française in the "collection des rapports officiels".

All the recent parliamentary debates are accessible on the National Assembly and Senate websites (http://www.assemblee-nationale.fr/ and http://www.senat.fr/).

In order to facilitate access to the full text of the laws and regulations, I have put together on the website http://securite-routiere.org all the texts on the control of the use of drugs while driving. They can be accessed via a link on the site's homepage. These texts are also available via the website http://www.legifrance.gouv.fr The homepage provides access to several options. It is possible to go directly to the full text of the various regulations, in particular the Road Traffic Code (albeit with some delay as the consolidated edition is not put online as soon as the text is published). For recent texts, it is necessary to click on the link to the Official Gazette of the French Republic (Journal officiel de la République française) on the homepage of the legifrance website, where texts can be searched for by type (law, decree, order) and then by number and date.

The references are as follows for the six texts concerning driving under the influence of drugs that have appeared since 1999:

- **Law No. 2003-87 of 3 February 2003** on driving under the influence of substances or plants classified as narcotics (the law currently in force),

- **Decree No. 2003-293 of 31 March 2003** on road safety, amending the Code of Criminal Procedure and the Road Traffic Code (it sets out the implementing conditions for the law of 3 February in Sections 5 and 6, which amend the implementing decree for the law of 18 June 1999),

- **Law No. 2001-1062 of 15 November 2001** on Day-to-day Security. Only Section 21, amending Article L. 235-1 of the Road Traffic Code, concerns driving under the influence of drugs.

- **Order of 5 September 2001** establishing the arrangements for drug screening and the analyses and examinations provided for by Decree No. 2001-751 of 27 August 2001 on the screening of drivers involved in fatal road accidents for drugs, amending Decree No. 2001-251 of 22 March 2001 on the regulatory part of the Highway Code (Conseil d'Etat decrees) and amending the Road Traffic Code.

- **Decree No. 2001-751 of 27 August 2001** on the screening of drivers involved in fatal road accidents for drugs, amending Decree No. 2001-251 of 22 March 2001 on the regulatory part of the Road Traffic Code (Conseil d'Etat decrees) and amending the Road Traffic Code.

- **Law No. 99-505 of 18 June 1999** containing various measures relating to road safety and offences committed against staff of public transport network operators.

Drugs and driving in Slovenia : legislation and practical aspects of law enforcement

by Majda Zorec Karlovšek (Slovenia)

The Slovenian legal system punishes the sale and possession of illegal drugs, but it does not punish the consumption of drugs or the possession of small quantities (a single dose) for personal use only.

Slovenian traffic regulations prohibit driving under the influence of alcohol or drugs.

The legal limit for driving under the influence of alcohol is 0.5‰(w/w). The legal limit for professional drivers and new drivers is 0.00 ‰(w/w), while the limits representing severe drunken driving are 1.1‰ and 1.5 ‰(w/w).

According to Article 118 of the Road Safety Act (1), “A driver may not drive a vehicle in road transport, or begin to drive a vehicle, if he or she is under the influence of narcotic drugs, psychoactive medicines or other psychoactive substances, which impair his or her driving ability.”

“A driver shall be considered under the influence of substances from the previous paragraph when the presence of such substances in his or her body is detected by special tests, equipment or professional examination.”

In practice, the “presence of drugs in the body” is confirmed when such substances, and/or corresponding metabolites, are found in the blood or in the blood and urine.

Article 118 can be interpreted as signifying zero tolerance for illegal drugs, psychoactive medicaments and all other psychoactive substances. No legal limits, however, have been established with respect to illegal drugs, therapeutic psychoactive medicines or analytical parameters (drugs detection limits).

The phrase “under the influence of narcotics or psychotropic drugs” has yet to be defined. We are in the process of replacing the phrase in legal cases with an integral assessment of the factual system by combining the following acquired information:
Statements made by the police;
Results from the medical examination;
Results from the toxicological examinations; and
Information on the person under investigation (whether this person abuses medications, drugs, is a drug addict or takes part in a maintenance or other detoxification programme).

Article 120 of the Road Safety Act authorizes police officers, with due grounds for suspicion, to start the procedure of recognition and detection of a road user who is under the influence of drugs, psychoactive medicaments and other psychoactive substances.

Currently, the symptoms recognition procedure is not performed by police officers, but this is envisaged in the new draft amendments to the Road Safety Act.
The standard procedure and protocols for the medical examination performed in cases of alcohol intoxication have been expanded, which includes the selection of appropriate tests and observations of the driver's behaviour.

It is important to note that efforts have been made in the field of toxicological procedures and in the quality control of analytical work.

Road users who contravene the provisions of Article 118 are liable to a fine of at least SIT 90,000 (c. EUR 218), or imprisonment, and 5 to 8 penalty points; a driver involved in a road accident receives 18 penalty points and has his driving licence revoked.

The terms "narcotic drugs" and "illegal drugs" include controlled drugs and some psychoactive medications such as benzodiazepines. The sanctions, though, remain the same regardless of the type of substance.

If it is suspected that the driver is no longer capable of driving safely on public roads, due to illness or other medical factors, or due to consumption (abuse) of alcohol, drugs or other psychoactive substances, the driver must be sent for a medical inspection.

Suspicion, in particular, applies when a driver has been served with notice of a traffic violation on at least three occasions in the last two years.

Drivers can be ordered to undergo a medical examination by any of the following officials or bodies: police officer, public prosecutor, judge, magistrate, the administrative unit which keeps a driver's records, medical organisation, private doctor, and also the company, administrative body or private employer with whom the driver is employed.

The minimum standards for the physical and mental fitness of driving applicants already exist. According to this directive, driving licences shall not be issued or renewed for applicants or drivers who are dependent on psychotropic substances.

Cured drug addicts, however, can only fulfil the medical conditions for driving a motor vehicle after an attested 12 months of abstinence.

The draft for the new law proposes that people on methadone maintenance programmes should continue to be treated in the same way as all addicts. For example, to ensure safe driving, the person must prove that he/she has not taken any substances which affect the central nervous system (including methadone) for at least a year, and that he/she can pass medical and psychological examinations.

Nevertheless, research has shown that it would be possible in individual cases to change the original positions relating to methadone patients and the granting of driving licences.

The possibility of regaining one's driving licence is a special incentive in the treatment of heroin addiction.

People on methadone maintenance programmes, therefore, could be offered the opportunity of undergoing a control examination for the return of their driving licences even while they are taking the substitute medicine. Naturally, they would have to prove that they had been following the instructions of the maintenance programme doctor for at least a year, and they must confirm that in this period they had not taken any other psychotropic substances including alcohol. They must also confirm that they did not have any serious mental problems, and that they were well-adjusted people with the necessary degree of responsibility for themselves, as well as their actions. As a result, the opinion and recommendation of the doctor guiding and treating the patient would be very important.

Undoubtedly, there are people on methadone maintenance programmes who already fulfil these conditions.

The statistical data from Slovenia's roads, however, shows that the fulfilment of the set criteria must be checked in an objective way. Slovenia has a population of 2 million. In 1994, methadone programmes were officially introduced to treat opiate addicted persons. In 18 outpatient clinics, the number of opiate addicts treated with methadone increased from 530 (in 1995) to 1555 (in 2002). For some addicts, receiving their daily dose requires them to travel considerable distances, or they need transport to their job or activities.
Patients on methadone treatments are informed that driving during therapy is a violation of traffic regulations. For that reason, the daily transport cost of train or bus tickets to the outpatient's clinic is covered by the health insurance company.
According to the medical histories given by volunteers in the outpatient clinics, during field studies with the Dräger DrugTest® System in 2002, approximately one half of the patients receiving methadone treatment possessed a valid driving licence, whereas the remaining patients had lost their licence due to a traffic offence (20%) or they originally never even had a licence (30%).

Patients on methadone treatment complained that they were often stopped by police officers. These patients may already be well-known to the police as previous and potentially intoxicated drivers. Therefore, this prior knowledge about the local population plays an important role.

At the Institute for Forensic Medicine in Ljubljana, toxicological analyses of blood and urine samples taken from road users who were apprehended due to a suspicion of alcohol and drugs are performed.

Between 1994 and 2001, a total of 3602 traffic cases were analysed by the toxicological laboratory of the Institute of Forensic Medicine of drivers in Slovenia suspected of driving while under the influence of drugs. In 55% of these cases, the sample proved positive for the presence of psychotropic drugs.
The rate of positive findings in our epidemiological study was not very high (50-60%), though, compared to similar studies throughout Europe. In 1998, the detection rate of drug-influenced driving in Slovenia was 80 cases per one million inhabitants compared to 750 cases in Norway, 190 in Finland, 90 in Sweden, 40 in Denmark and 30 in the United Kingdom.

During the period from 1994 to 2001, the frequency of positive findings was lower for those involved in accidents rather than those from the non-accident group.

The positive findings revealed that 64.9% involved cannabinoids, 27.5% opiates, 23.2% methadone, 14.9% benzodiazepines, 9.3% amphetamines, 8.0% cocaine or metabolites, and 6.1% others.
Despite the fact that methadone is the third most prevalent drug among road users, only 76 cases identified methadone as the only drug (16.5% of all positive methadone cases). In 83.5% of all cases, methadone was combined with other drugs and alcohol: 53.6% cases with opiates, 33.2% cases with benzodiazepines, 32.1% cases with cannabinoids, 12.4% cases with cocaine or metabolites, 5.0% cases with amphetamines, and 5.6% cases with other psychotropic drugs.
Concerning recorded traffic offences, there is a high recidivism rate among methadone drivers.
Of the 111 drivers who tested positive for methadone, 63.0% possessed a valid driving licence in 1999. For sixteen of them, this was their first traffic offence. Therefore, 95 (85.6%) methadone positive drivers had prior convictions of driving under the influence of alcohol and/or drugs. A total of 41 drivers (37%) driving without a driving licence had a prior conviction for driving under the influence of alcohol and/or drugs.
In 2000, of the 106 methadone positive drivers, 78.3% possessed a valid driving licence. For just twelve of them, this was their first traffic offence. A total of 71 (77.1%) methadone positive drivers had prior convictions for driving under the influence of alcohol and/or drugs, and 23 drivers (21.7%) without a driving licence had a prior conviction for driving under the influence of alcohol and/or drugs.
Generally, the detection rate for driving under the influence of methadone, expressed as the ratio of positive methadone findings to the number of persons treated, is increasing in the period observed. In 1996 the detection rate of methadone driving was the lowest with 2.2 cases per 100 persons treated, and in 1999 the detection rate was the highest with 10.1 cases for every 100 methadone treated persons.

In Slovenia, the focus on driving under the influence of drugs is increasing. This is demonstrated by the fact that the police have been organising drug recognition programmes.
The increase in police activities is reflected in the fact that the number of requests for toxicological analyses is higher every year.
According to these numbers, during the period observed, the absolute number of methadone positive cases has increased, while the ratio of methadone positive to all positive cases has dropped.

From 1999 to 2001 an increasing proportion of methadone-only positive cases were detected: 17.1% in 1999, 19.26% in 2000 and 21.66% in 2001.

Drugs and driving in Ireland – forensic science and the law

by Denis A. Cusack (Ireland)

Introduction

Ireland has a population of 3.9 million with 376 fatalities due to road traffic crashes and collisions in 2002. Driving under the influence of intoxicants (including drugs) has been illegal since the 1961 Road Traffic Act. The most important piece of modern legislation is the Road Traffic Act 1994, Section 10 of which states "A person shall not drive or attempt to drive a mechanically propelled vehicle in a public place while he is under the influence of an intoxicant to such an extent as to be incapable of having proper control of the vehicle." In the legislation "intoxicant" includes alcohol and drugs and any combination of drugs or of drugs and alcohol. Under the current legislation proof of the offence of driving under the influence of drugs requires evidence of the presence of the drug together with evidence of impairment.
The Medical Bureau of Road Safety is the National Forensic Laboratory under statute one of whose functions is the determination in respect of blood and urine specimens forwarded by police officers nation-wide of the presence (if any) of a drug or any drugs in such specimens. It is also responsible for the issuing of statutory certificates with the result of this forensic analysis. In 1995 4,766 blood and urine specimens were analysed for alcohol concentration whilst only 8 blood and urine specimens were analysed for the presence of drugs. By 2002 12,668 blood, urine and breath specimens were analysed for alcohol and 388 blood and urine samples for the presence of drugs.

Table 1:

YEAR	SPECIMEN TYPE	ALCOHOL ANALYSIS	DRUG ANALYSIS
1995	Blood & Urine	4766	8
1996	Blood & Urine	5514	16
1997	Blood & Urine	6591	24
1998	Blood & Urine	7812	32
1999	Blood & Urine	8476	50
2000	Blood, Urine & Breath*	10,134	78
2001	Blood, Urine & Breath	12,503	131
2002	Blood, Urine & Breath	12,668	388

** Evidential breath testing for alcohol introduced in late 1999.*

As part of the Irish **Government Strategy for Road Safety 1998-2002** research was carried out by the Medical Bureau of Road Safety into the prevalence of drugs in driving in Ireland. This national survey of 2000 samples was completed over the two years 2000 and 2001 and the results are presented elsewhere in these proceedings.

Road traffic act 1994

Under Section 14 of the 1994 Act "Whenever a member of the Garda Siochana (Irish Police) is of the opinion that a person in charge of a mechanically propelled vehicle in a public place is under the influence of a drug or drugs to such an extent as to be incapable of having proper control of the vehicle, he may require the person to accompany him to a Garda Siochana (Police) Station." A member of the police may require the person either to permit a designated doctor to take a specimen of blood or, at the option of the driver, to provide a specimen of urine. Therefore under the current legislation it is the driver who determines whether a specimen of blood or urine is forwarded for analysis. This has clear scientific implications in relation to both screening and confirmatory analysis for the different categories of drugs. A driver cannot be forced to provide a blood sample against his will. The penalty for refusing to provide a blood or urine sample is the same as that for the actual offence: a fine up to €1270, a term of imprisonment not exceeding 6 months or both. There is also provision under the 1994 Act which obliges a driver to provide a blood or urine specimen while in hospital if the driver has been admitted or attended at the hospital as a consequence of an injury or claimed injury at the time.

The Medical Bureau of Road Safety is required to analyse the specimen of blood or urine and determine the presence of a drug or drugs. As soon as practicable after the analysis has been completed the Bureau is required to forward a completed statutory certificate to the police and a copy to the driver.

The DUID results for the last three years are set out in Table 2.

Table 2:

Year	No. of specimens analysed	No. of specimens positive	% no. of specimens positive
2000	78	56	72
2001	131	96	73
2002	388	117	30*

** Following the end of the National Survey in 2001, it was decided that in future all under the limit for alcohol specimens forwarded to the MBRS would be analysed for the presence of a drug or drugs. This, and a change in certification regulations, explains the increase in the number of DUID analyses but with a decrease in percentage of positive specimens in 2002.*

The legislation governing offences for driving under the influence of intoxicants is highly procedural. Superior Court challenges have been mounted against almost every aspect of these procedures. It should be noted that a prosecution for dangerous driving causing death
in the circumstances of driving under the influence of an intoxicant cannot be proved solely by the admission of a statutory certificate but requires full comprehensive evidence of all of the procedures (both police and scientific) carried out.

Impairment versus zero tolerence

The foregoing is set out in detail to illustrate to position of the current law in Ireland. Whilst a number of jurisdictions have recently updated their legislation to provide either for zero tolerance or for a mixed zero tolerance and impairment approach to driving under the influence of drugs, the Irish legislative approach reflects the situation in the majority of European countries at present. It is therefore in this context that any progress or updating of laws must be reviewed within the context of difficult task of reconciling forensic science, the law and prosecutorial and judicial outcomes. In each of the different jurisdictions and even within jurisdictions there is a wide variation at the level of forensic laboratories, legislative provisions and judicial approaches to DUID.

The absence of a reliable, convenient, sensitive and accurate roadside screening devises for drugs will remain a problem for at least the foreseeable future. The debate as to the approach between licit and illicit drugs continues. The legal provisions for the taking of the most appropriate samples for both screening and confirmatory analysis must be reviewed. Another of the difficulties is the interpretation of the term “as soon as practicable”. In some jurisdictions and in certain laboratories within those jurisdictions there is a guaranteed turnaround time of confirmatory analytical result for drugs of 15 days. In other jurisdictions this may extend to three months or more. There is also lack of consistency within the laboratories as to cut off levels for screening and confirmation and also for the different types of bodily fluids. These issues must be addressed at a scientific level and incorporated into effective legislation.

In jurisdictions where there are greater penalties in place for proven offences of driving under the influence of alcohol there will be the added question of how to view the presence of one or more drugs in addition to alcohol in these offences.

Updating legislation for the future

A fundamental decision relates to the confirmation of the differentiation between the road traffic legislation to promote safety and the general fight against the misuse and abuse of drugs in society.

There is a futility in updating legislation and having sound forensic analyses and procedures if there is lack of training and consistency in the approach of the prosecutors. To that end State Lawyers and police prosecutors must be integrated fully in the process of any updating of legislation and assisted in understanding the practice of forensic science.

In relation to the court process, in all of the jurisdictions of the European countries the separation of powers (legislative, executive and judicial) is central to the structures of society. The presumption of innocence is paramount and the preservation of judicial independence is essential. Forensic physicians and scientists must be proactive and willing participants in assisting judges understand the principles of forensic toxicology. Greater consistency in judicial pronouncements in the area of DUID is a necessary prerequisite to the effectiveness of the matching of science and law in the promotion of road safety.

One of the administrative and policy difficulties appears to be the dispersal of responsibility over various ministries in each of our countries. The Ministries of Health, Justice and Transport all deal with various aspects of road safety but rarely is there a fully integrated approach across this continent by these ministries.

Summary

The current law in Ireland for DUID is based on confirming the presence of the drug and evidence of impairment. This is the position in the majority of countries across Europe. All jurisdictions require the matching of science and law to address the updating of DUID legislation. Harmonisation of our laws will not be achievable in the short term. Particular questions to be addressed are: impairment versus zero tolerance; the provision of the appropriate body fluids specimens; regard to the meaning of the term “as soon as practicable” in forensic analysis; and an audit of the number of successful prosecutions in cases where the presence of drugs have been confirmed. Education and consistency in the prosecutorial services and amongst the judiciary are sensitive areas, but which must be tackled as part of any realistic audit of effectiveness of road safety policies and DUID.

Administrative sanctions against drug law offenders

by Brendan Hugues (EMCDDA)

1. Introduction

The 1988 UN Convention Against Illicit Traffic in Narcotic Drugs and Psychotropic Substances obliges states parties to establish possession of drugs for personal use as a criminal offence, subject to their constitutional principles and the basic concepts of their legal systems[3i]. At the same time, in a number of countries in the European Union there are certain occasions where the act of drug possession for personal use may be proscribed but sanctioned with a punishment that stops short of conferring the status of criminal on the offender. This may have a basis in the constitutional principle of proportionality, that the punishment should be in proportion to the harm committed; the principle of expediency, giving the prosecutor or judge discretion on how to proceed; or in the principle of balancing the rights of offenders and the concern of society for public safety and crime prevention. One such punishment is the suspension of the driving licence.

This preliminary paper has been drafted to contribute to the Pompidou Group discussion on drugs and road safety, with an emphasis on the possibility of suspension of the driving licence as an administrative sanction resulting from a charge of unauthorised possession of drugs. It aims to show whether EU member states permit any forms of administrative sanctions for drug possession offences or if they are limited only to criminal sanctions; the various forms of administrative sanctions available; and if and how that legislation might link drug possession to the permission to hold a driving licence. Caution should be taken in interpreting the data, firstly as information regarding driving licences was not submitted by all countries, and secondly as there is often a distinction between what the law may lay down as an option to the sanctioning authority and how that authority may choose to implement it.

The word “sanction” is generally used to mean a punishment. Therefore, this report on *administrative sanctions*, which have a deterrent or punitive objective, may omit details of countries’ various *alternative measures to punishment*, which may have therapeutic or treatment objectives.

Sanctions may be referred to as criminal or administrative. For the purposes of this paper, administrative sanctions are a form of punishment given to offenders that stops short of conferring the status of criminal on them (is not entered into a criminal record). This is different from effectively convicting an offender and then suspending and perhaps later removing the criminal status; it is also different from being exempt from criminal charges due to intoxication and therefore lacking the intent to commit the offence.

---

[3] Art. 3(2), United Nations Convention Against Illicit Traffic In Narcotic Drugs and Psychotropic Substances, 1988

Sanctions implemented directly as the consequence of a drug offence such as a fine for possession, are different from those implemented indirectly – e.g. the offender goes to court, is sentenced but diverted to a treatment programme, and does not follow the conditions of the treatment programme, thus is sanctioned. In this report, we shall concentrate on those sanctions implemented directly, rather than indirectly.

Sanctions may be distinguished by the authority empowered to award them – police, prosecution, court, or other specialist body (such as the Commission for Dissuasion of Drug Abuse in Portugal). The source and/or consequence of the sanction can be as important, if not more so, than its form. Regarding the source, a judicial authority with the power to issue a non-criminal sanction may be permitted to exercise discretion that comes with that position, whereas an administrative authority may not have such discretion[4]. A range of graduated penalties and sanctions should be determined, to be appropriate to each offender; flexibility is important to ensure that the court can arrive at the best possible inducements for that person's recovery[5]. Regarding the consequence, a fine can be issued as an administrative sanction or as a criminal penalty. A consequence of the fine such as entry in the criminal record may have a major legal and social impact on the offender.

2. International level

We have already addressed Art. 3(2) of the 1988 UN Convention in the introduction to this paper. Art. 3 (4)(d) of the same Convention refers to the sanctioning of offences related to personal consumption, but it has been argued that there is no obligation for a penal reaction, as "punishment" is not defined[6], and is listed as an alternative to conviction rather than a relation.

The INCB has specifically advised greater use of treatment and alternative penalties to prison for minor offenders. In its 1996 Annual Report, it noted "Making greater use of treatment and alternative penalties, as well as imposing shorter prison sentences on minor offenders, in accordance with the provisions of the 1988 Convention would result in more effective administration of justice and would free resources to deal more effectively with major instigators of drug-related crime. … There is a range of alternatives to conviction for relatively minor offences, including discontinuation of criminal proceedings, conditional discontinuance and admonishment or cautioning, as well as a range of alternatives to custody, including fines and suspended sentences, parole, probation, community service, corrective labour, treatment and supervision." However, at the same time the Board made it clear that it "is in no way suggesting that drug-related offences should be decriminalized or that the implementation of the international drug control treaties should at all be weakened."
It is interesting that the Board supports discontinuation of criminal proceedings for minor cases but refutes their decriminalisation. It could be argued that establishing something as a crime but not punishing it is actually more against the spirit of the Conventions than punishing an act but without the criminal record, which is usually the case with administrative sanctions.

---

4 De Ruyver, Vermueulen, Vander Beken, Vander Laenen, Geenens, in Multidisciplinary Drug Policies and the UN Drug Treaties (2002), p. 27. Maklu, Antwerpen

5 Commentary on the United Nations Standard Minimum Rules for Non-Custodial Measures (The Tokyo Rules) (1993), United Nations

6 United Nations Standard Minimum Rules for Non-Custodial Measures (The Tokyo Rules), para 2.3

Although there is no discussion of administrative sanctions in the three UN Conventions, the UN has issued Standard Minimum Rules for Non-Custodial Measures, known as the Tokyo Rules, and an accompanying Commentary[7]. These provide that not only should the criminal justice system provide a wide range of non-custodial measures[8], but that the use of these should be part of the movement towards depenalisation and decriminalisation, as international instruments require that penal measures should not be imposed where they cannot be justified using strict criteria[9].

3. National level

Austria

There is no administrative sanction available for drug use or possession. Police do not have discretion, and prosecution is mandatory. Illegal possession of drugs is a crime, with the payment of a fine of up to 360 times the daily unit fine (SMG art. 27 para.1). However, if a health-related measure is considered necessary, the fine can be deferred by the prosecutor and eventually dismissed after a probationary period of two years (SMG art 35-36), whereby no entry will be made in the criminal record.

Nevertheless, in Austria it is possible to suspend the driving licence for offences of possession of large amounts of drugs. The Austrian Driving Licence Act contains this sanction (§ 3 par. 1 lit. 2 together with § 7 par. 1, § 7 par. 3 lit. 12 and §§ 24 ff.; these regulations also lead to the Austrian Narcotic Substances Law, § 28 par. 2 to 5 and § 31 as well as to the Austrian Act Defining Big Amounts of Narcotic Drugs and the Austrian Act Defining Big Amounts of Psychotropic Substances). If a person has possessed a certain (big) amount of narcotic drugs or psychotropic substances he/she is not allowed to get a driving licence. If he/she is in possession of a driving licence, the licence is suspended for some time (minimum 3 months). These suspensions are set independently by administrative bodies, not by the court, and there is no option of a financial penalty instead of suspension.
As regards users, over the last year there has been discussion of the plan to amend the Driving Licences Health Decree. Experts have repeatedly pointed out that having a driving licence is important for reintegrating former drug patients into the labour market, and demanded that corresponding regulations be adopted.

---

7 Commentary on the United Nations Standard Minimum Rules for Non-Custodial Measures (The Tokyo Rules) (1993), United Nations, p. 10

8 De Ruyver, Van Impe and Vander Beken in Insights 5: Prosecution of Drug Users in Europe (2002), pp.92-97, EMCDDA

9 IACM-Bulletin of 21 July 2002

Belgium
With the directive of 8 May 1998, possession for use of cannabis is distinguished from possessing other drugs, and prosecutors are asked to apply the lowest penal priority to the punishment of this offence. In case of unique or occasional use of cannabis, a simplified policeman's report is to be filled in and (as in all other cases of drug offence) the drug should be seized. If a report is transmitted for action to the prosecutor, he/she will analyse the case and use discretion to propose one of the various instruments that he has at his disposal, rather than continuing the case. Options include monetary fines known as transactions, conditional dismissal (praetorian probation) which may include prohibition from certain areas, or mediation, which may include the obligation to pay damages or attend community service[10].

Under new legislation being adopted by the federal government, the law should be modified in order to reduce the penalty for non-problematic use of cannabis to a police fine for the first and second offences within a year. Production and sale will remain actively prosecuted as will the use of cannabis which leads to antisocial behaviour (problematic use).

Denmark
The Director of Public Prosecution in a circular of 1969 on the prosecution of violations of the Euphoriants legislation, recommends that the police should settle cases involving possession of small quantities of drugs by dismissing the offender with a warning, which is normally done for first offences. The prosecutor also has the discretion to levy an administrative fine, with the amount depending on the type and quantity of drugs.

France
The Directives of the Ministry of Justice and Ministry of Interior of 1999 on drug users arrested by the police recommend to avoid the short-term custodial measure of 'garde à vue', and to finish the case with a warning to the person.

For cannabis use, there might be no further action in most of the cases. The procedure could end with a summons of police or of the delegate of the prosecutor under the supervision of the prosecutor. Penal proceedings will be undertaken only if the user has already been arrested before or if another offence has been committed at the same time.

In most cases, mere drug users receive a warning which may be accompanied by a request to contact a social or health service, without obliging the person to undergo treatment or counselling (no further action with orientation, “classement avec orientation”), or accompanied by a specific instruction to undergo treatment (no further action under condition, “classement sous condition”).

[10] See for example: de Gier (2002) “Problems raised by the use/abuse of psychoactive drugs by drivers”, at http://www.coe.int/T/E/Social_Cohesion/pompidou_group/5.Publications/ ; ICADTS/Walsh et al (2000) “Illegal Drugs and Driving”, at http://www.icadts.org/reports.html ; EMCDDA (1999) “Literature Review on the Relation between Drug Use, Impaired Driving and Traffic Accidents”, at http://www.emcdda.eu.int/multimedia/project_reports/situation/drugsanddriving_report.pdf ; the EU’s ROSITA project (Roadside Testing Assessment) reports at http://www.rosita.org

The law of 23 June 1999 provides a legal base to the alternatives to prosecutions (art.41-1 and 41-2 of the penal procedural code). An instrument, the 'penal agreement', increases the possibility of waiving prosecution in case of certain minor offences, particularly related to mere drug use. The prosecutors have a various range of measures by which, if accepted and duly accomplished, they can end prosecution. These measures include the voluntary payment of a fine, confiscation of the object or product of the crime, or the execution of up to 60 hours of non-remunerated work useful to society. It can also include suspension of the driving licence or hunting permit for up to four months.

Finland

According to Chapter 50:7, revised in 2001 (654/2001), prosecution or punishment can be waived, if the offence is to be considered insignificant in view of the amount and quality of narcotics, the situation and circumstances, or if the suspect has sought the treatment specified by the Ministry of Social Affairs and Health (290/2002).

In case of a drug-user offence, the police may issue a fine, which the prosecutor must verify, unless the suspect demands a court hearing. The prosecutor can issue the punishment outside court (654/2001) or suspend the prosecution according to the non-public interest in the sanction, petty offence, the youth of the offender, or if the offender wants to undergo treatment. In practice most of the drug-cases which are brought to court involve drug use, and the most common punishment is indeed a fine, which is usually under 30 day-fines. This line of regular punishment by fine is expected to be asserted by the new legislation and of the directions recently issued by the Office of the Prosecutor-General (VKS:2002.3)

Germany

The police are obliged to report any offence to the public prosecutor's office (compare Section 163 of the Code of Criminal Procedure, StPO). The penal law provides for special provisions which allow the public prosecutor, as a special exception, to refrain from criminal prosecution ("principle of discretionary prosecution") without agreement from the court. Provisions relating to this principle of discretionary prosecution in the Narcotics Act are Sections 29 paras 5 and Section 31a, and in the Code of Criminal Procedure particularly the Sections 153, 153a to 153e as well as Section 154. There are therefore no administrative sanctions as such.

In 1994 the Constitutional Court stated that, in case of minor offences connected with cannabis for one's own consumption, the criminal prosecution authorities of the Federal Länder shall comply with the "ban on excessive punishment" inherent in the German Basic Law; furthermore, it requested the Federal Länder to take care of a "basically uniform practice of application" and, as a rule, to refrain from prosecution on the conditions set forth in Section 31a of the Narcotics Act.

To focus on driving, the suspension of the driving licence may be an administrative measure or a sanction imposed by the German Criminal Code, as a rehabilitative and preventive measure. The main objective of both measures is the safety of the general public.

The driving licence shall be suspended if its holder is unsuitable to drive a motor vehicle. For this, a doctor's expert opinion, and even a medical and psychological expert opinion, might be required if the person concerned is or has been in illegitimate possession of narcotic drugs.

According to Section 69 paragraph 1 of the German Criminal Code, the criminal court judge may also disqualify a person driving a motor vehicle from driving on grounds of an unlawful act which the latter committed during or **in connection with** driving a motor vehicle. The possession of illicit drugs may also rank among the "offences in connection with driving". However, the mere transport or possession of narcotic drugs is not sufficient to constitute a connection; the employment of a motor vehicle must have played a decisive role for the offence.

The suspension of the driving licence can be from six months to five years. There are no general guidelines on the area of drug-related crimes.

We cannot make any statements on the re-offending rates after suspension of driving licences. But it is known from the field of crimes under the influence of alcohol that pedagogical measures such as remedial driving instruction of the offenders considerably reduce the re-offending rates as compared to merely waiting for the end of the period of suspension.

The Federal Constitutional Court announced on 12 July 2002 that sole cannabis possession is not a sufficient reason to call in question driving ability. The court ruled in favour of a car driver who lost his driving licence after he refused to let his urine screened for drugs. The highest German court argued that there was no connection between drug use and driving in this case.[11]

Greece

Under the Greek legal system, the police do not have the discretionary power to dismiss a case or to handle it in alternative ways. The public prosecutor, after receiving a police report on the offence, is likewise obliged to prosecute. The prosecution can be initiated by a "summary" investigation, to be conducted either by a magistrate or by a police officer (misdemeanour); by an "ordinary" investigation that is conducted by an ordinary judge (felony case); or by transmitting the case directly to court. In relation to illegal use/possession of drugs, the chances of non-punishment (No Further Actions) are enhanced when it is a less dangerous drug. Occasional users, who are arrested, are reported to the district attorney but it is possible that they will not be brought to trial in consideration of the first time offence; an order to follow a counselling programme might be issued instead.

Ireland

All sanctions are decided by the court, rather than the police or prosecutor. The Court may strike out/ discharge proceedings, or may find the facts proved without recording a conviction. Otherwise, all sanctions are criminal sentences, and may include fines, suspended sentences, Probation Orders with or without intensive supervision, Community Service Orders, or Orders of Recognisance.

[11] 2003 data for Greece unavailable; source Verstraete et al (1999), ROSITA report "Operational, user and legal requirements across EU member states for roadside DRUG testing equipment"

A driving licence in Ireland would not be suspended as a result of being convicted of an offence involving the possession of controlled drugs.

Italy

Possession, acquisition, and import for personal consumption are prohibited, punishable by administrative sanctions only. These acts with intent to sell or traffic are criminal offences. It is left to the judicial authorities to assess the objective of the illegal act. The police must always report an offence to the prosecutor. Every offence reported to the prosecutor must be registered; then the prosecutor has the duty to initiate the investigation.

When a person is found in possession of drugs classified in tables II or IV (marijuana, hashish, (II); therapeutic drugs which can produce dependence (IV)) and they are only for personal use, the person will be summonsed for an interview with the Prefect of Police or his representative. If the person agrees to refrain from offending in the future, on the first occasion of the summons, he may receive a warning of the dangers of drugs and be formally requested not to use illegal substances again.

Should the person be found in unlawful possession of a controlled drug again, he may be re-summonsed to a meeting where the reasons for the violation are examined and new arrangements may be established to prevent further violations. In such instances the Prefect is assisted by advisers from local health/social services and at this stage the person may be subject to administrative sanctions. Listed in art. 75 of the Presidential Decree 309/90, these include suspension of driving and gun licences, of the passport and of other equivalent documents. As said the law makes a distinction between drugs in table I (opiates, cocaine, amphetamines, etc.) and table III (barbiturates and hypno-sedatives), and drugs in table II (cannabis) and IV. For the former group, the administrative sanctions are for a period of four months whilst for the latter group the sanctions are for a period of two months. An offender summonsed for an interview may voluntarily request a treatment or rehabilitation service, and proceedings are suspended whilst the user is referred to the Services for Treatments (Ser.T).

Two or more failures to attend the treatment may result in a wider range of administrative sanctions, including: prohibition to leave the place of residence without authorisation; obligation to present themselves at least twice a week to the police; be subject to a curfew; be banned from visiting certain locations indicated in the order; have suspended driving and gun licences, passport and equivalent documents; be obliged to undertake unpaid work for the benefit of the community at least one working day a week; seizure of any vehicle owned by the user which was used to transport or hold drugs, as well as confiscation of the drugs; probation assignment; and in the case of non-Italians, suspension of the residence permit.

Luxembourg
The 2001 law differentiates penalties in accordance with the type of substance involved (A: controlled drugs other than cannabis / B: cannabis and derivatives). Under this law, a user of cannabis may be sentenced to pay a fine of €250 - €2 500 ("peine correctionnelle" – more severe than a police penalty, less severe than a criminal penalty). In practice, entries into the police record may occur. In terms of prosecution policies, the offence is not prosecuted if there are no aggravating circumstances though a police penalty (fine of up to €250) might be levied in cases of recidivism.

For possession of drugs other than cannabis, the national police have no discretional power, which means that in case of a heroin-related offence a report must be sent to the public prosecutors' office. The prosecutor analyses the case and may make use of various instruments at his disposal (warning, conditional dismissal, charge, etc.) in accordance with the "principle of opportunity".

Under art. 16 of the drug law of 19 February 1973, the tribunal can suspend a driving licence in the case of detention of drugs in the vehicle (without being under influence of drugs) for 3 month to 15 years.

Netherlands
According to the so-called expediency principle (opportuniteitsbeginsel), the Dutch Public Prosecution Service can decide to refrain from prosecution if this serves the general interests of society. This power is used very frequently. In these cases, it is decided to impose a waiver of prosecution, which can be either conditional or unconditional.

A particular form of waiver of prosecution is the transaction. All criminal offences that are penalised with less than six years of imprisonment and additionally all minor offences can be processed and settled by the Public Prosecutor by offering the suspect to redeem the case. This means that the Public Prosecutor proposes to the suspect to pay a certain sum of money or to fulfil certain other conditions. In exchange the Public Prosecutor will not bring the case to court. The amount of money asked for by the Public Prosecutor cannot exceed the fine set for the criminal offence.

The Netherlands do not currently have the sanction to suspend the driving licence as a result of a drug possession offence. At this moment there is a discussion whether suspension of the driving licence should be a penalty, given by the prosecutor, in minor offences, but it is not clear yet if a drug possession offence is such an offence.

Norway
There are no administrative sanctions for drug offences in Norway. The legal status of use and possession of small amounts of drugs changed from misdemeanour to crime in 1984. Use and possession of such small amounts do not, however, fall under § 162 of the General Civil Penal Code, but under the more lenient provisions of the Act on Medicinal Products of 4. December 1992, no 132, § 31 second paragraph, cf. § 24. The punishment is fines or imprisonment for up to 6 months.

Portugal
The law in force from July 2001 maintains the status of illegality for all drugs and for using them without authorisation, but changes the punishment. For anyone caught in possession of a modest quantity of drugs for personal use, the police having no further suspicions or evidence that more serious offences are involved (sale, traffic), the drug will be seized and the case transmitted to a local Commission composed of a lawyer, a doctor and a social assistant. The Commission meets the person charged with illegal drug use/possession, in order to evaluate his/her situation with the aim of treating eventual addictions and rehabilitating the person; sanctioning, even if possible, is not the main objective in this phase. However, various sanctions available to the Commission are listed in Art 17 of the Law 30/2000, namely:

a) Prohibition of carrying on a licensed profession or activity when there may be a risk to the offender or third parties;
b) Prohibition of visiting certain places;
c) Prohibition to be in the company of certain people;
d) Prohibition to leave the country without authorisation;
e) Requirement to periodically attend a designated place;
f) Removal of firearms licence;
g) Confiscation of items which may threaten personal or public safety, or could be used to commit a crime;
h) Removal of management of funds or benefits given to an individual person by a public entity or service, which will be given to the body which runs or monitors the treatment process, subject to acceptance of the offender.

Spain
The law 17/1967 considered drug use and drug possession and possession illegal - but authorised for therapeutical reasons, among others – without imposing any punishment. Drug use and possession for personal use do not constitute a criminal offence under Spanish law.

Nevertheless, article 25 of the Organic Law 1/1992 of 21 February on the Protection of Citizens' Security, currently in force, considers drug consumption in public – as well as illicit possession, if not intended for trafficking - as a serious order offence punishable by administrative sanctions. Fines are the usual punishment ranging from €300 to €30 000. The execution of the fine can be suspended if the person freely attends an official drug treatment program.

As regards driving, Article 28.2 of the same Law establishes that the commission of the above infractions can be punished with the suspension of the driving licence for up to 3 months. However, in practice, the suspension of the driving licence only takes place when the conduct which led to the sanction, in accordance with the proportionality principle, is in connection with the driving of a motor vehicle and refers to the road safety.

Sweden

In Sweden the prosecutor has an absolute duty to prosecute. This means that the prosecutor must initiate proceedings for the prosecution of an offence, when he or she can foresee a conviction. Under certain conditions the prosecutor has a possibility to discontinue an investigation by issuing a fine, or to waive prosecution. It is important to state however that for drug offences, this possibility is limited to exceptional cases and in practice only in relation to minor offences.

A driving licence may be suspended if the holder of the licence is unsuitable to have it due to his unreliability concerning the use of alcohol or drugs. A driving licence may also be suspended if the holder has committed any crime and, because of this crime, there is reason to believe that he will not be responsible in the traffic or if he, because of other personal conditions, is not suitable as a driver. This may include drug possession offences, though the reasoning is more for public safety than for retribution.

If the competent authority learns of a possession offence it will make an investigation. This may show that a suspension is needed because the licence holder is unreliable concerning the use of alcohol or drugs; or that he is not unreliable in that concern and that the offence does not make him unsuitable as a driver. In a few cases the result of the investigation may be that the owner is not unreliable concerning alcohol or drugs, but that he is unsuitable as a driver.

Although no statistics were available, the reported *personal* impression of one official in charge of driving licences in Stockholm was that re-offending rates are low – which might be because most licences suspended after a possession offence are suspended because of the person's unreliability concerning the use of alcohol or drugs and because most of those people is unable to stop their abuse and thus stay unreliable (and consequently do not get another licence).

United Kingdom

Regarding unlawful possession of drugs, the police may give an Informal warning; a Formal warning, where the person is officially warned not to commit the offence again to avoid stronger consequences (no entry being made in the criminal record although a local record may be retained); and a Caution, where an entry is made in the Police National Computer. The police may decide to caution for a first offence of possession for personal use, and sometimes for a second or third offence where the use is in private and where the amounts are small, depending on the circumstances of the case and the character of the offender.

The UK does not disqualify from driving motorists who are convicted of drug possession offences. The driving licences of those who persistently misuse drink or drugs may be revoked on medical grounds because persistent misuse is prescribed in law as a relevant medical condition which precludes the holding of a driving licence. Drivers who are convicted of driving while under the influence of drink or drugs always receive a disqualification as part of their sentence. There is no specific proposition to suspend licences simply for drug possession.

4. Summary

Considering the definition at the start of this paper that an administrative sanction is one that punishes the offender but stops short of conferring the status of criminal upon him/her, then it is clear that a number of EU states have this form of sanction available in their options to punish drug user offenders. Such sanctions can be seen in Belgium, Denmark, France, Finland, Italy, Luxembourg, Netherlands, Portugal, and Spain.

All of these countries except Italy and Portugal list some form of pecuniary punishment as options. Denmark, the Netherlands and Spain list it as the only option. Only in Luxembourg is the possibility that this is a police fine, rather than a payment to the prosecutor as in the others.

Other common punishments, apart from suspension of the driving licence (discussed below), include:

- Prohibition to visit certain places (Belgium, Italy, Portugal)
- Unpaid work for the community (Belgium, France, Italy)
- Suspension of the firearms licence (France, Italy, Portugal)

It should be remembered that these forms of punishment may be available to authorities in other countries but carry the status of a criminal, rather than administrative, punishment.

More research should be undertaken to determine which states are able to apply administrative sanctions only for cannabis, and which apply them to possession for personal use of all drugs. It would also be of interest to clearly distinguish those states who provide for administrative sanctions specifically for drug law offences, as compared to those states whose prosecution of drug offences gives them access to a range of administrative sanctions for all minor offences, for instance via the Code of Criminal Procedure.

When focussing on the driving licence as an administrative sanction for a drug possession offence, it is apparent from the information given that some states such as Germany and Spain consider that the sanction should be relevant to the offence, in that the licence will be removed only if the offence was directly related to the vehicle or to public safety / the ability to drive. Although France and Italy also provide for suspension of the driving licence, in the former case to sanction any minor offence and in the latter case specific to drug possession offences, information was not available as to whether this was used as a punitive or public safety measure.

Against this background, provisions for licence suspension in Austria and Luxembourg suggest more an anti-trafficking measure, with Austria specifying that the amount of drugs found in the vehicle should be a “big” quantity (i.e. more than is considered normal than for personal use), and Luxembourg providing for an extremely long period of suspension in comparison with the other countries.

Drugs and driving

by Brendan Hugues (EMCDDA)

1. Introduction

With abuse of controlled drugs increasing, there is concern over the effects that this may have on the population. One of these effects is the possible reduction in ability to drive a motor vehicle safely on the public road, particularly when driving under the influence of narcotic or hallucinogenic substances. Although driving under the influence of alcohol is already established as an offence in all countries, drug abuse has not always been addressed before now. However, throughout the 90s there has been increasing research on this topic, by national and international bodies, to assess the prevalence rates, the effects, and various legal methods of control[12]. The public are equally concerned – the Eurobarometer survey of young people across Europe in Spring 2002 found that 79.4% of respondents agreed that police should test for drugs at the same time as alcohol.

Not wanting to repeat the excellent research already completed, this paper aims only to give a descriptive overview of the various legal mechanisms used to sanction this phenomenon in the EU and Norway – whether provisions exist in drug control laws or road traffic laws, the substances addressed, the status and levels of penalties, any levels of tolerance, and whether tests can be carried out at any time or if they require some form of suspicion beforehand. The study excludes provisions for driving or operating other forms of vehicles, such as rail, sea or air traffic.

2. European law

Up to now, the European Union has only legislated on the use or abuse of psychotropic substances which may affect physical and mental fitness to drive, rather than including narcotic substances. Annex III of Council Directive 91/439/EEC of 29 July 1991 on driving licences states that "Driving licences shall not be issued to or renewed for applicants or drivers who are dependent on psychotropic substances or who are not dependent on such substances but regularly abuse them". Recognising that such substances may be medicines issued on a valid prescription, it also laid down that "Driving licences shall not be issued to, or renewed for, applicants or drivers who regularly use psychotropic substances, in whatever form, which can hamper the ability to drive safely where the quantities absorbed are such as to have an adverse effect on driving. This shall apply to all other medicinal products or combinations of medicinal products which affect the ability to drive."

Under the EU Action Plan 2000-2004 3.1.2.5, the Commission and Member States are to undertake research into the effects of driving under the influence of illicit drugs and pharmaceuticals.

[12] 2003 data for Italy unavailable; source Verstraete et al (1999), ROSITA report "Operational, user and legal requirements across EU member states for roadside DRUG testing equipment"

3. National law

Austria

In Austria, the law controlling drugs and driving is the Austrian Road Traffic Act (art.5 para. 9 and 10, art. 99 para. 1b). The Road Traffic Act refers to "Suchtgift". By the meaning of the Austrian Suchtmittelgesetz (Narcotic Substances Law) "Suchtgift" are all substances and preparations listed in the Schedules of the Austrian Suchtgiftverordnung (Narcotic Drugs Act), which is generally those covered by the 1961 UN Convention and Schedules I and II of the 1971 UN Convention on Psychotropic Substances. This therefore includes most controlled drugs with the exception of most barbiturates and benzodiazepenes.

The fine is (according to art. 99 para. 1b of the Road Traffic Act) from €581 up to €3 633. In addition to this, a withdrawal of the driving licence for four weeks follows in these cases according to the regulations of the driving licence law. The offences are only of administrative status; there is no criminal record. As it is illegal to drive under the influence of drugs, the tolerance is one of impairment.

Drivers can be tested following "assumption" of driving under the influence of drugs. According to Austrian law, the assumption of driving under the influence of drugs is not the same as a suspicion; legally speaking, a suspicion has to be much more specific. The police have the right to take a person to the doctor for medical examination when there is an assumption of driving under the influence of drugs. Since January 1st, 2003, everybody who is taken to the doctor for that reason is obliged to provide a blood sample, if the doctor detects a possible intake of drugs affecting the person's ability to drive.

Belgium

The laws in force are:

- Loi du 16 mars 1999 (Moniteur belge du 30 mars 1999) modifiant la loi relative à la police de la circulation routière.
- Arrêté royal du 4 juin 1999 (Moniteur belge du 8 juin 1999) relatif au prélèvement sanguin en vue du dosage d'autres substances que l'alcool susceptibles d'avoir une influence sur les capacités de conduite d'un véhicule.

The substances targeted are the most common illicit drugs, namely:

THC
Amphetamine
MDMA
MDEA
MBDB
Morphine
Cocaine or benzoylecgonine

If these substances are detected at all, then the driver is guilty of an offence. The first penalty is prohibition of driving for 12 hours, renewable every 6 hours until signs of influence disappear – this is a safety measure. Following this, there can be suspension of driving licence by order of the judicial criminal authorities. If there is a criminal prosecution, the offender may be sentenced to imprisonment for 15 days to 6 months and/or a fine of €1 000 to €10 000, or imprisonment for 1 month to 2 years and/or a fine of €2000 to €25 000 in case of recidivism within three years.

Both the driver of a vehicle, and the supervisor of a learner driver, may be checked and penalised if drugs are found. Those who may be subject to the test include any person who is driving or about to drive in a public place, or who is accompanying a driving student. It is also possible to test the person presumed responsible for a car accident, or anyone who could have contributed to its cause, even if it is the victim.

Denmark

According to the Road Traffic Act (lovbekendtgørelse nr. 712 of August 2. 2001) section 54(1), driving is prohibited if the driver is incapable of driving in a fully reassuring way. The Road Traffic Act section 54(1) says as follows:

"A motor-driven vehicle may not be driven or attempted to be driven by somebody, who because of illness, weakness, over-exertion, lack of sleep, influence of exhilarating or anaesthetic drugs or because of similar causes is found to be in such a condition, that he is incapable of driving the vehicle in a fully reassuring way." It can be seen that there is no distinction between specific drugs, and by specifying “incapable of driving… because of [drugs]”, it takes an impairment approach.

Violation of this provision is a criminal offence. According to the Road Traffic Act section 117(5), offenders are punished with a fine or, under aggravating circumstances, imprisonment up to 1 year. The nature of sanctions (level of fine, period of licence suspension and imprisonment) depend on the specific particulars of the offence, i.e. how intoxicated the person is, whether an accident occurred, first time offence or not, income of the person in question etc.

According to the Road Traffic Act section 55(1), the police may order a person driving a vehicle to take a breath test at any time. Under section 55(2) the police may hold a person in order to have laboratory specimens of such person's blood and urine taken, if there is cause to suspect such person of having committed an offence under section 54(1) and (2), or if such person refuses or is unable to take a breath test. Further, if other causes than inebriation are suspected, the police may hold the person in question for a medical examination.

In practice, the police will stop a vehicle either as part of a general traffic inspection or because of strange driving. When stopping the vehicle the police will look at the driver, and if he has a strange appearance the police will ask him to blow in an alcoholmeter. If the alcoholmeter shows signs of alcohol the driver will be taken to the police station and examined by a doctor. If the alcoholmeter does not show any signs of alcohol but the driver has a strange appearance, the driver also will be taken to the police station and examined by a doctor. The doctor will make a clinical study of the driver and take a blood sample for examination for traces of alcohol, medicine and drugs.

No concrete changes are foreseen in the near future. The Ministry of Justice is however very aware of the increasing problems with people driving while under the influence of medicine and drugs.

Finland

Under the Penal Code, Chapter 23, section 3, an offence of “driving while intoxicated” is committed by a person who, after having used other narcotic substances than alcohol, so that there is a narcotic drug or its metabolite in his or her blood during or after driving. The punishment for driving while intoxicated is a fine or to imprisonment for at most six months. According to s.12, for the purposes of this chapter, *narcotic substance* means also performance-reducing pharmaceuticals. However, medical products, which the driver has had the right to use, are excluded from the zero-tolerance approach of section 3.

Under section 4, an offence of “driving while seriously intoxicated” is committed due to impairment: if his/her ability to perform as required in the operation is significantly reduced, and the conditions are such that the offence is conducive to causing a hazard to others. The punishment for this is at least 60 day-fines or imprisonment for at most two years. This does not have the same exclusion for medical products, suggesting that trace amounts are acceptable but impairing driving ability is not.

Section 8 defines a separate offence of relinquishing a vehicle to a person “who is apparently in such a state that he/she is guilty of an offence mentioned in sections 3 – 7”, which is punishable by a fine or imprisonment for at most one year.

A driver found guilty of driving while intoxicated, having been under the influence of a drug specified in the Narcotics Act (1289/93) may also be found guilty of a drug-user offence (Criminal Code 50:2a).

The offences are the type "zero-tolerance", with any detection of drug or metabolite. They have been changed from “impairment”, where no precise figures for blood/drug levels were given, only the verbal descriptions (reduced and seriously reduced ability, respectively). In the preparatory materials of the previous legislation it was explained that the levels of reduction should be comparable to those caused by the given levels of alcohol, in order to be punishable. According to the Ministry of Interior directions to the police (3/011/1999) the intoxication shall be detected by an analysis of a blood sample and a clinical medical examination, which includes filling an observation form on the suspect's performance.

Under Chapter 6 of the Coercive Measures Act (450/1987), drivers can be tested anytime in traffic in order to detect use of alcohol or other intoxicants. Practices also include stop checks where everyone is tested (quick tests for drugs are performed, but a positive result must be confirmed by a laboratory test), and tests after stopping an individual driver on grounds of suspicion. An alcohol test is taken as a rule after an accident, and the practice of drug testing in similar conditions is spreading, limited presently by availability of suitable test kits.

The driving licence must be suspended if a person has been found guilty of driving while intoxicated or seriously intoxicated. Suspension of driving licence is for maximum five years. Besides this, there are administrative sanctions on not issuing or returning the driving licence to persons with intoxicant addiction. The Road Traffic Act (267/1981) lays down provisions on licence suspension in section 75,76 (546/1999), 77,78 and 79 (676/1990). The practices are guided by directions laid down by the Ministry of Social Affairs and Health for physicians (1998:6), and by the Ministry of Interior for the police (Dno 3/011/99).

France

The law 2003-87 of 3 February 2003 on driving under the influence of substances or plants classed as narcotics has created a new crime of driving after using such substances. Although the title is “under the influence”, the text makes it clear that it will have a zero-tolerance approach. Testing may take place if the police have reasons to suspect that the driver has taken drugs, as well as standard testing in cases of death.

The penalties are comparable to those for driving under the influence of alcohol – two years in prison and €4 500 fine. If the offender drives after using narcotics and is under the influence of alcohol at the same time, the penalty rises to three years in prison and €9 000 fine. It is also possible to suspend or revoke the driving licence, and sentence to community service or day fines. The decrees necessary to implement the new law are currently being drawn up.

Before February 2003, driving under the influence of drugs was not subject to a specific sanction, as such a driver could always be charged for illicit use of drugs.

The law n°99-505 of 18 June 1999 on road safety, known as the Gayssot Law, added an article L. 3-1 to the first title of the road code, allowing systematic drug testing for all drivers involved in a fatal accident. The decree 2001-751 of 27 August 2001, effective from 1 October 2001, defined a fatal accident (accident having immediate fatal consequences), established that the drug tests should be carried out by a doctor, that the analyses and medical exams should include a clinical examination, a biological sample, and a search and dosage assessment of narcotics. When urine tests prove positive, a blood sample should allow testing for medicines as well. This decree also had epidemiological aims, to establish levels above which it was possible to state that the substance influenced the driver.

Art.21 of the Law no. 2001-1062 of 15 November 2001 relating to daily security had foreseen the possibility for officers of the judicial police to test for drugs all drivers implicated in an accident where injury was sustained, with a view to establishing if they were driving under the influence of drugs.

Germany

Three provisions in the German Criminal Code (*Strafgesetzbuch,* StGB) address drugs and driving:

1) § 315 c StGB, "Endangering road traffic", which prohibits driving while not in a condition to do so safely due to consumption of intoxicants, thereby endangering life, limb or property of significant value.

2) § 316 StGB, "Drunkenness in traffic", which prohibits driving while not in a condition to do so safely due to consumption of intoxicants, but without the risk of endangerment in s.315c
3) § 323 a StGB, "Total intoxication" may also be used on certain occasions; it provides for an offence when a person knowingly or negligently gets intoxicated and commits an offence in such condition, and lacks mental capacity to be judged guilty for that offence.

The provisions in the Criminal Code refer to “alcoholic drinks or any other intoxicating substances”, which includes all controlled drugs. Police are allowed to check for drug use in any situation, even random testing. These offences give rise to a fine or up to five years imprisonment, and for breach of s.316 a fine or up to one year in prison. Under s. 44 of the criminal code, they may also receive a driving ban from 1-3 months. They operate on an impairment level – there is no specified limits as there is no scientific proof of them yet, but this area is currently under research.

There is a separate provision in the Road Traffic Code, § 24 a StVG, "Ordnungswidrigkeiten wegen Genusses von Alkohol oder berauschenden Mitteln". This provision covers alcohol and the substances specified in the annex, namely cannabis (THC), heroin, morphine, cocaine (benzoylecgonin), amphetamine, and two designer amphetamines (MDE and MDMA). For detection, originally only a trace was needed to start the administrative procedure (a zero tolerance approach). However, there are specified limits for the named substances, over which the driver will clearly be impaired. On the basis of scientific advice, the government has proposed to set 50% of these limits as a new level, below which no procedure would be started, in order to reduce the number of cases. This must still be approved by the 16 Länder.

Breach of this provision is an administrative offence, enforced by municipal authorities. From 1 April 2001, this could be punished with an administrative fine of €250 and a 1 month driving ban, and a repeat offence by a €750 fine and a 3 month ban. A doctor’s advice may also be submitted regarding possible dependence or drug abuse.

Finally, there is a provision § 14 VeF, "Klärung von Eignungszweifeln im Hinblick auf Betäubungsmittel und Arzneimittel", contained in Verordnung über die Zulassung von Personen zum Straßenverkehr (VeF) vom 18. August 1998 (BGBl. I S. 2214), in Kraft ab 01.01.1999. The VeF lists three categories; “illicit” drugs, psychoactive medicines, and other psychoactive substances.

Greece[ii]

Since 23 May 1999, section 42 of the law (L. 2696 / 99) specifically refers to ”Driving under the influence of alcohol, toxic substances or drugs that according to their instructions for use influence driving ability”. It is requested in the law that the ministerial decrees applicable are replaced in the near future by appropriate regulations.

Ireland
The main law in this area is the Road Traffic Acts 1961 – 2002, and specifically section 10 Road Traffic Act (RTA) 1994, which forbids driving in a public place while a person "is under the influence of an intoxicant to such an extent as to be incapable of having proper control of the vehicle". Intoxicant is defined to include alcohol, drugs, or any such combination. There is thus a limit of impairment, and the law does not distinguish between specific drugs. Tests can only take place following suspicion.

All offences are heard in the criminal court. They would result in licence suspension and the driver is liable to a fine not exceeding €1270 or up to six months' imprisonment or both. Licence suspension would be not less than 2 years in the case of a first offence and not less than 4 years in the case of a second or any subsequent offence under the same section.

Italy[iii]
Art. 187 of Law 285/1992, the New Highway Code, covers narcotic and psychotropic substances (without mentioning specific substances or legal limits). In general, the Italian legislation pursues an impairment approach. Sanctions are imposed against drivers who have a documented impaired driving performance or who are involved in traffic accidents and found positive for drugs. Tests are made on the basis of suspicion.

Luxembourg
The Penal code meets the road traffic law in the 'Loi modifiant la loi du 14 février 1955 concernant la réglementation de la circulation sur toutes les voies publiques' article 12 - sections 1,4(1-3), 5, 6 and 7. The law refers to all controlled substances including psychotropic medicines; it does not distinguish between specific drugs. Under this law, a person driving a vehicle, showing disability or troubles which may affect their driving performance, or does not possess the required physical abilities, or shows a characteristic behaviour due to symptoms of drug consumption, may be sentenced to prison for 8 days to 3 years and/or a fine from €250 to €5 000. The public Prosecutor can order suspension of the driving licence by means of a judicial hearing.

The use of controlled substances other than cannabis is anyway a criminal offence under the modified drug law of 19/02/1973 (amended in 2001 by law of 27/04/2001), so there is effectively zero tolerance. The Prosecutor takes account of the level of intoxication or disability due to drug use in his judgement. There is no blood/ substance level limit foreseen by law. Police officers can order blood or urine analysis to detect drugs during random stopping as well as suspicious driving behaviour, if they suspect the driver being under the influence of drugs. A blood or urine analysis can be ordered following any traffic accident, and is mandatory in case an accident resulted in injury. Currently there are no other specific instruments to measure the drug consumption other than these laboratory-based analyses.

Since 1 November 2002 the ‘‘Point driving licence’ has been introduced, but driving under the influence of drugs other than alcohol has not been considered (i.e. no loss of points when driving under the influence of drugs other than alcohol unless dangerous driving behaviour is observed). However, during an official release, the current Minister of Transport addressed the problem of drugs and driving and was pleading for a global program favouring the settling of more strict surveillance measurements, more effective control equipment and better adapted penalties for driving under the influence of drugs and medicines.

Netherlands

According to the Road traffic law 1994 in article 8, section 1, there are three offences of criminal status:

- Causing a fatal traffic accident under influence of drugs may be punished with a maximum imprisonment of nine years or a maximum fine of € 45 000.
- Causing an accident under influence of drugs, which inflicted bodily harm, may be punished with a maximum imprisonment of three years or a maximum fine of € 11 250.
- If a person has driven a motor vehicle under influence of drugs which affect one’s ability to drive or has his motor vehicle driven by someone who is under influence of such drugs, his driving licence may be suspended for a maximum period of five years.

And one offence of administrative status:

- If a person is mentally unfit for driving a motor vehicle as a result of drug abuse, his driving licence can be suspended.

There is no distinction between drugs, and the tolerance is to a level of impairment. Testing can take place if there is a presumption of driving under influence of drugs, for instance after causing a traffic accident or after bad driving behaviour.

In the future there is a proposal to penalise driving a motor vehicle under influence of one or more drugs or medicines specified in a list, when the driver has a higher concentration in his blood than the maximum limit indicated on the list. The list contains drugs such as cannabis, heroin and cocaine.

Norway

In Norway, the subject of drugs and driving is addressed in the Road Traffic Act of 18 June 1965 No 4, Sections 21, 22, 22a. The law does not distinguish between specific drugs; section 22 prohibits driving under the influence of alcohol or “other intoxicating or anaesthetic substances”, thus operating the impairment principle. Tests on any drivers are permitted.

The offence has the criminal status of misdemeanour. Pursuant to Section 31, paragraph 1, of this Act, a penalty of fines or prison sentence of up to one year is generally prescribed for violations of the Act. If substantial injury or death is caused, the offence is penalised through the General Penal Code. Pursuant to Section 33 of the Road Traffic Act, the licence shall be suspended for at least one year if the holder is punished or convicted for violation of Section 22.

Developments and any need for changes are followed closely.

Portugal
Under Art. 81 of the Road Law 113/1994 (as amended by Decreto-Lei 265-A/2001), it is prohibited to drive under the influence of substances legally considered as narcotic or psychotropic substances. "Under the influence" is defined as any driver who, following the appropriate examination, has been so certified by a medical report. This will be punished by a fine of €360 to €1800, and (under Art. 139), suspension of the driving licence from 2 months to 2 years. Any driver or person about to drive may be tested, as may any pedestrians involved in an accident. Under art. 163, it is compulsory to test drivers or those about to drive if there is indication that they are under the influence, and also compulsory to test drivers and pedestrians after an accident that resulted in death or serious injury. Unless laboratory tests prove negative, they should also be prevented from driving for 48 hours.

Under Art. 134(5)(c) of the Road Law, a person who facilitates another person to drive, knowing that the other person is under the influence of drugs, is also guilty of an offence.

Spain
The Organic Law 10/1995, of 23 November, modified Article 379 of the Penal Code: "A driver under the influence of poisonous, narcotic or psychotropic substances or alcohol, will be punished by the penalty of 8-12 weekend arrests for 3-8 months, and in any case, suspension of the driving licence for one to four years."

The law on traffic and road safety (Real Decreto Legislativo 339/1990, of 2 March, amended by the Law 19/2001 of 19 December), lays down in article 65.5 the serious offence, when it can not already be considered a crime, of driving under the effects of any narcotic or psychotropic substances or any substance with analogous effects. Article 67.1 of the traffic law foresees a fine (€302 to €602) and the suspension of the driving licence (up to three months).

The offences can therefore be either a criminal offence or an administrative infraction. Drivers may be tested at any time, for instance during traffic checks.

Both levels of tolerance are addressed. Although both phrases refer to driving under the influence or under the effects, it is reported that when it is proven that the driver has taken drugs because the analysis is positive, it will be an administrative infraction. If the drugs taken have some effect on the road traffic, and other drivers are put at risk, it will be a criminal offence.

Sweden
The Act on Punishment for some Traffic Crimes (1951:649) section 4 and 4 (a) contains rules on punishment for driving under the influence. The Act on Driving Licences (1998:488) chapter 5 contains rules on cancellation of driving licences; and chapter 10 section 2 stipulates that a doctor shall report to the county administrative board if he finds a patient obviously unsuitable to hold a driving licence for medical reasons (a drug abuser may be medically unsuitable to hold a driving licence), if he believes that the patient will not follow instructions to restrain from driving.

No distinction is made between substances, but driving when using a narcotic or psychotropic substance in accordance with a doctor's prescription does not constitute liability for driving under influence. However, some other crime may have been committed, for example reckless driving. There is zero-tolerance for using narcotic or psychotropic substances; if the substance used is traceable in the driver's blood during or after the drive, they are have committed an offence. A person reasonably suspected of an offence for which imprisonment may be imposed may be subjected to leave a blood sample for examination (the Code of Judicial Procedure (1942:740), chapter 28, section 12).

The offences have both criminal and administrative status. Penalties for driving under the influence vary between day-fines and maximum two years imprisonment. Besides a penalty there may be an endorsement or cancellation of the driving licence. Cancellations of driving licences vary between one month and three years.

United Kingdom

In the UK, road traffic law governs this issue – section 4 of the Road Traffic Act 1988 says "A person who, when driving or attempting to drive a motor vehicle on a road or other public place, is unfit to drive through drink or drugs is guilty of an offence". Road traffic law does not distinguish between specific drugs. It simply deals with the impairment of driving.

Penalties are the same as for alcohol and driving, and are criminal. They are obligatory disqualification from driving for a minimum of 12 months (or 3-11 points licence endorsement if exceptionally not disqualified); a fine of up to £5 000 (approximately €7 000); and a prison sentence of up to 6 months at the discretion of the court.

Drivers can be tested on police suspicion after poor driving or after an accident – random stopping specifically for drug testing purposes is not permitted. However, at present, the police do not have the power to require suspects to be tested at the roadside. If they have sufficient grounds, however, they do have powers of arrest and to require the provision of samples at a police station for formal analysis. A legislative opportunity is still being sought to provide roadside testing powers.

4. Summary

It may seem strange that narcotic substances were not included in the provision in European law, but this may be because, at the time, the European Commission had no power to legislate on matters outside a public health domain. In light of this, it is interesting that some countries now seem to focus their legal provisions on road safety on illicit narcotics more than on psychotropic medicines.

Considering the wide variety of legal responses to this issue, it is clear that there are many ways to interpret the balance between being lenient towards the illegal act of taking/possessing drugs, protecting the public safety, and having a law that is clearly enforceable and therefore credible. It remains difficult to prove scientifically that a person was actually under the influence at the time of driving, i.e. their skills were affected, but the alternative approach, to penalise levels of detection (the zero tolerance approach) means the driving may not have been affected, as some metabolites may be detected for days or even weeks after taking the drug. In addition, some laws provide for a driver to be adversely affected, whereas others may simply mention being under the influence – this latter clause may lead to punishment of a person who has taken a controlled substance in order to be well enough to drive a vehicle.

All countries except Finland and France address the matter in their laws regulating road traffic, and these two, as well as Germany and Spain, cover the matter in their Penal Codes.

Nine countries[13] do not specify what substance may be the cause of an offence. Portugal specifies "those substances legally defined as narcotic and psychotropic", Austria names all except most benzodiazepenes and barbiturates, Sweden and Finland exempt medical substances which the person has a right to use, France prohibits only narcotic substances, and Belgium specifies seven substances. It is not clear how those countries who have chosen to specify their substances can legally react to a person driving under the influence of a new synthetic drug.

12 countries[14] make driving under the influence a criminal offence. Germany, Spain, Netherlands and Sweden have both criminal and administrative offences, and Austria is reported to have established this as an administrative offence only. Germany and Spain appear to link the status of the offence to the tolerance level, with zero tolerance for administrative offences but requiring impairment for a criminal charge.

Apart from Germany and Spain who operate both systems of tolerance, five countries[15] operate zero tolerance, whereas eight[16] use impairment as the level of offence.

Eight countries[17] allow testing in any situation, such as random traffic checks, whereas six[18] require some form of suspicion (in the case of Austria, assumption) in order to carry out the test.

[13] Denmark, Germany, Spain, Ireland, Italy, Luxembourg, Netherlands, UK and Norway
[14] Belgium, Denmark, Germany, Spain, France, Ireland, Luxembourg, Netherlands, Sweden, Finland, UK and Norway
[15] Belgium, France, Luxembourg, Sweden, Finland
[16] Denmark, Ireland, Italy, Netherlands, Austria, Portugal, UK, Norway
[17] Belgium, Denmark, Germany, Spain, Luxembourg, Portugal, Finland, Norway
[18] France, Ireland, Netherlands, Austria, Sweden

Only Austria and Portugal do not provide for some form of prison sentence – Spain has weekend arrests. Information on sanctions in Greece and Italy was not available.
Licence suspension can be for a few weeks or months as in Germany and Austria, to a maximum of five years in Netherlands and Finland, or a minimum of two years in Ireland. Fines also vary widely, from a few hundred euros to a maximum of €7 000 in the UK and €10 000 in Belgium.

The contribution of alcohol and other drugs among fatally injured drivers in Quebec : some preliminary results

by C. Dussault, Maxime Brault, J. Bouchard and A.M. Lemire (Canada)

1. Evaluation, Research and Innovation, Ministère de la Santé et des Services Sociaux

2. Highway Safety Research and Strategy, Société de l'assurance automobile du Québec

Keywords
Alcohol; Drugs; Case-Control Study; Responsibility Analysis; Roadside Survey; Fatally Injured Drivers

Abstract
This study presents some preliminary results regarding the contribution of alcohol and other drugs in fatal crashes in Quebec. The data comes out of two sources. First, coroner, forensic laboratory and police accident records were matched for 482 fatally injured drivers of passenger vehicles deceased between April 1999 and November 2001.

Among those 482 fatally injured drivers, both blood and urine samples were obtained in 354 cases (73.4%). Second, two roadside surveys were conducted in August 1999 and 2000. Representative of the Quebec driving population, the survey sample was distributed proportionately to the number of fatal crashes per time of day (eight 3-hour periods) and day of the week (seven days). During both daytime and nighttime, a total of 11,952 drivers participated in the two roadside surveys among which 11,574 provided a breath sample (96.8%), 8,177 a saliva sample (84.6% when requested: 8,177/9,671) and 5,931 a urine sample (49.6%).

The data collected allowed two different analyses: case-control (alcohol : blood/breath, other drugs : urine/urine) and responsibility (case-case approach) that compares drug cases to drug-free cases. Drugs under scrutiny included alcohol, cannabis, cocaine, benzodiazepines, opiates, barbiturates, amphetamines and PCP.

Results of case-control analyses show the following odds ratios for each drug alone [with 95% confidence intervals]: Alcohol: 51-80 mg%: 3.7 [1.6-8.3], > 80mg%: 39.2 [25.5- 60.2]; Cannabis: 2.2 [1.5-3.4]; Cocaine : 4.9 [1.4-17.4]; Benzodiazepines : 2.5 [1.4-4.3].

Other drugs (opiates, barbiturates, amphetamines, PCP) were detected less frequently but significantly increased risks were calculated for all cases (regardless of the presence of another drug) for amphetamines and PCP. For all drugs including alcohol, polyusage is systematically associated with an elevated risk. Responsibility analyses corroborate those results although odds ratios are always less high and sometimes not statistically significant, which could be explained by the limitations inherent to that methodology (lack of statistical power).

Introduction

Over the past century, alcohol has been identified as the most problematic drug on the road while other drugs have received little attention. As elsewhere, the contribution of alcohol to fatal crashes has substantially decreased in Quebec over the last two decades or so. That improvement on the alcohol front has raised the issue of a substitution risk, from alcohol to other drugs.

Facing that situation, the Société de l'assurance automobile du Québec (SAAQ), a Quebec government agency responsible for road safety promotion, decided to undertake a major endeavor in order to establish the role of alcohol and other drugs in traffic crashes in Quebec.

The research plan integrates the results of two different analyses. The first one uses a case-control approach which compares drug presence in fatally injured drivers to drugs detected in drivers participating in a roadside survey. The second one is a responsibility analysis (case-case approach) which compares drug cases to drug-free cases (Terhune, 1983). This paper focuses on the role of alcohol and other drugs among fatally injured drivers using the data available at the end of 2001.

Methods

Since April 1999, a procedure established by the Office of the Coroner-in-chief calls for the systematic collection of both blood and urine samples of all fatally injured drivers in Quebec. Coroners have routinely collected blood samples since more than a decade in order to detect alcohol presence. However, blood samples are usually not collected when death occurs more than 24 hours after the crash as the presence of alcohol has probably vanished. The call for a systematic collection of urine is a new procedure and, as reported by others (Marzuk & al., 1990), urine is not readily available at autopsy in some cases.

Both blood and urine samples were sent to the Laboratoire de sciences judiciaires et de médecine légale (Forensic laboratory of the Quebec ministry of public safety) for a complete toxicological analysis (screening and confirmation). Only drivers of passenger vehicles, deceased between April 1999 and November 2001, on whom the coroner, forensic laboratory and police accident records have been matched were considered in this study. Passenger vehicles were defined as cars, minivans, sport utility vehicles and pick-up trucks but excluded motorcycles.

The roadside survey design used a two-stage stratified sampling procedure with 348 sites representative of the Quebec driving population. The first level of stratification divided the province of Quebec into four main regions: Northeastern, Central/Eastern, Central/Western and Western. The second level involves seven categories of municipalities starting with a 2,500 to 4,999 inhabitants cluster and up to a more than 1,000,000 inhabitants cluster. The sample was also distributed proportionately to the number of fatal crashes per time of day (eight 3-hour periods) and day of week (seven days). For obvious practical reasons – including winter conditions from November to April – it was not possible to account for monthly variations. For both 1999 and 2000 surveys, the month of August was selected for its favourable weather and availability of nursing students (interviewers).

On each site, a roadblock was set up and drivers were directed to an adjacent emplacement with enough space to simultaneously process three vehicles. In order to ensure that drivers were chosen on a random basis, police officers were instructed to intercept the first passenger vehicle that could be stopped safely when an interviewer indicates he or she is available. Interviewers were mostly students in nursing and all received four-days' training. Seven teams of three interviewers and one supervisor were formed in 1999, and eight teams were formed in 2000. The supervisor was responsible for managing logistics and handling problems.

After a brief introduction, respondents were asked to answer a brief questionnaire and to provide a breath sample, and then a urine sample. Two well-maintained portable toilets (men/women) were available on each site. During the 1999 survey, in case of a refusal to provide a urine sample, the driver was asked to provide a saliva sample that was basically used as a control for non-response. That procedure was changed for the 2000 survey when all drivers were asked to provide breath, urine and saliva samples. All urine and saliva samples were placed in small containers with icepacks. At the end of each period, the samples were transported to the lab located in Montreal and kept frozen (-15 0C) until analysis.

All analyses were performed by the same forensic laboratory although the samples collected at the roadside were analyzed under contract for the SAAQ. Preliminary screening (immunoassay) was performed applying the following cutoffs for urine (for blood in brackets): THC-COOH for cannabis: 25 (40) ng/ml, benzoylecgonine for cocaine: 300 (100) ng/ml, opiates: 100 (50) ng/ml, PCP: 25 (10) ng/ml, benzodiazepines: 50 (25) ng/ml, barbiturates: 200 (200) ng/ml, amphetamines: 300 (200) ng/ml. All positives were confirmed by mass spectrometry (HPLC-MS and GC/MS).

CASE-CONTROL ANALYSIS – The case-control analysis compares the presence of a drug (or drug combination) in urine samples of fatally injured drivers to the presence of a drug (or drug combination) in urine samples of drivers participating in the roadside survey (urine/urine comparison). For alcohol, the case-control analysis compares the presence of alcohol in blood samples of fatally injured drivers to alcohol detected in breath samples of drivers stopped at the roadside (blood/breath comparison). The control sample was post-stratified in order to eliminate the voluntary over-sampling during the nighttime period. That over-sampling was performed in order to obtain a number of observations similar to previous alcohol nighttime surveys conducted in 1981, 1986 and 1991.

For the purpose of the case-control analysis, the cases/controls included in the analysis were only those for which both biological specimens were obtained: blood and urine for cases, and breath and urine for controls. That procedure is necessary in order to have comparable cases/controls (blood/breath for alcohol and urine/urine for other drugs) and control simultaneously for both the presence of alcohol and other drugs. For instance, if only a blood sample is available for a case, there is no comparable control to assess drug presence since only breath and urine samples were collected at the roadside.

Data were analyzed using Statistical Analysis System (SAS) case-control standard method. Ninety-five (95%) confidence intervals around odds ratios were calculated.

Case-control analyses were performed for each drug alone, most frequent drug combinations as well as all cases combined for each drug (regardless of the presence of another drug).

RESPONSIBILTY ANALYSIS – The responsibility analysis is a case-case approach. Cases with a specific characteristic are compared to similar cases but without the specific characteristic in order to identify etiological factors (Last, 1994). In this study, cases were split in a two by two design: drug versus drug-free cases and responsible versus non-responsible cases and odds ratios were calculated using the Terhune (1983) method which is similar to the case-control method.

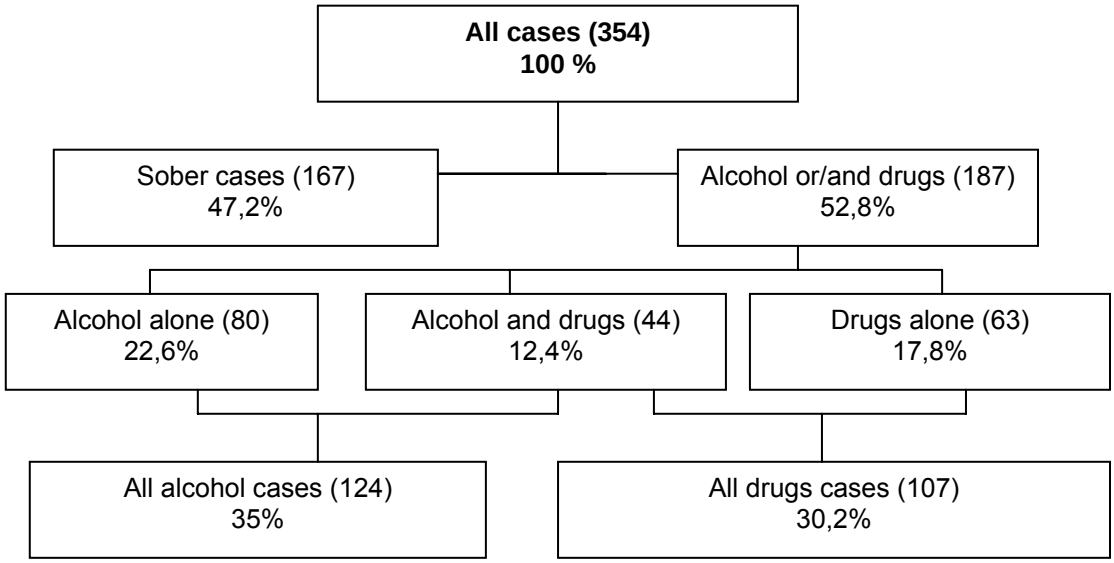
The responsibility analysis was performed by three different judges, otherwise not involved in the study, who assessed responsibility without knowing drug presence. The determination of responsibility was established using the crash responsibility scale (Terhune & al., 1992). In a separate paper (Brault & Dussault, 2002), the Terhune method was compared to Robertson & Drummer (1994) method, showing consistent results.

Results

FATALLY INJURED DRIVERS (CASES) – For the April 1999 to November 2001 period, it was possible to match coroner, forensic laboratory and police accident records for 482 fatally injured drivers of passenger vehicles. Among those 482 fatally injured drivers, both blood and urine samples were obtained in 354 cases (73.4%). Alcohol was found in 35% of blood samples (124/354) with the following BAC: 20-49 mg%: 2.0% (7/354), 50-80 mg%: 3.1% (11/354) and > 80mg%: 29.9% (106/354). Alcohol alone cases accounts for 64.5% (80/124) of all alcohol cases and thus, another drug was found in 35.5% (44/124) of all alcohol cases.

Other drugs were found in 30.2% (107/354) of urine samples in the following proportions: cannabis: 19.5% (69/354), cocaine: 6.8% (24/354), benzodiazepines: 8.5% (30/354), opiates: 1.4% (5/354), PCP: 1.1% (4/354), amphetamines: 0.8% (3/354), barbiturates: 0.3% (1/354). Alcohol was also found in 41.1% (44/107) of all drug cases.

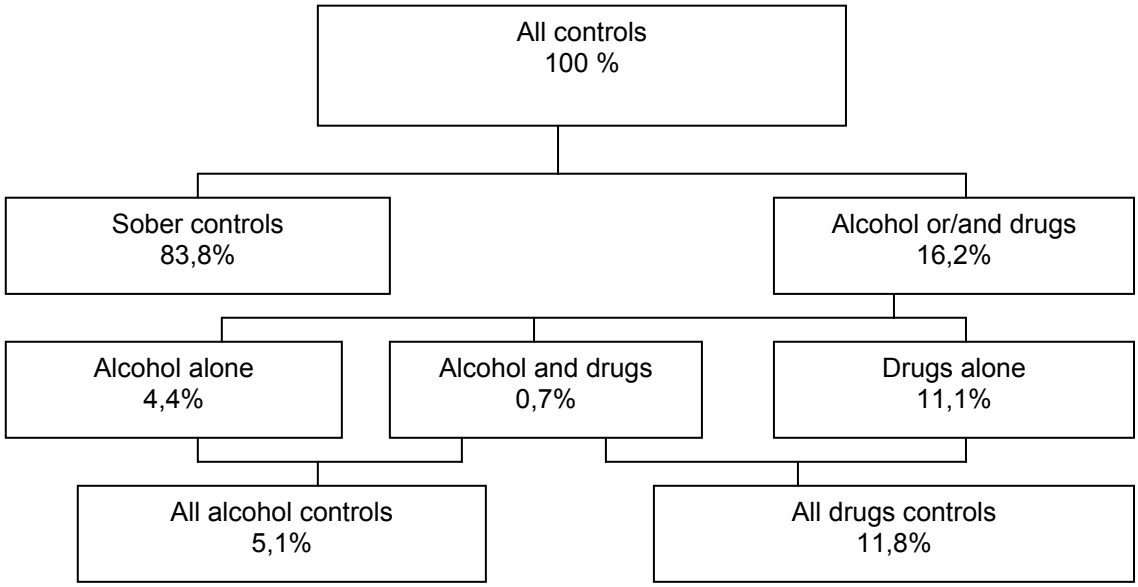
Figure 1: Alcohol and/or other drugs among the 354 fatally injured drivers (cases)



DRIVERS AT THE ROADSIDE (CONTROLS) – During both daytime and nighttime, a total of 11,952 drivers participated in two surveys among which 11,574 provided a breath sample (96.8%), 8,177 a saliva sample and 5,931 a urine sample (49.6%). The actual participation rate for saliva is 84.6% (8,177/9,671) since saliva samples were asked after urine refusals in 1999 but both systematically in 2000. Regardless of the time of the day, alcohol was found in 5.1% of breath samples. During the nighttime (9PM-6AM), alcohol was detected among 8.7% of the drivers and 2.0% had a BAC exceeding 80 mg%.

Other drugs were found in 11.8% of 5,931 urine samples obtained at the roadside (weighted results): cannabis: 6.7%, cocaine: 1.1%, benzodiazepines: 3.6%, opiates: 1.2%, PCP: 0.03%, amphetamines: 0.1%, barbiturates: 0.5%. Among controls, the concomitant use of alcohol accounts for only 5.9% of all drug cases.

Figure 2: Alcohol and/or other drugs among the 5,931 drivers at the roadside (controls)
Sober controls



CASE-CONTROL AND RESPONSIBILTY ANALYSES – Table 1 shows the results for both case-control and responsibility analyses for each drug and most common drug combinations.

Table 1: Results of case-control and responsibility analyses

Drugs	Case control analyses Odds ratio (95% CI)	Responsability analyses Odds ration (95% CI)
Alcohol alone		
20-50 mg %	1,0 (0,4-2,5)	0,2 (0,0-0,7)
51-80 mg %)	3,7 (1,6-8,3)	1,6 (0,2-1,5)
> 80 mg %	39,2 (25,5-60,1)	8,1 (1,9-34,8)
All alcohol > 20 mg %	**9,2 (6,8-12,5)**	**2,3 (1,0-5,3)**
Cannabis		
Cannabis alone	**2,2 (1,5-3,4)**	**1,2 (0,4-3,9)**
Cannabis+cocaïne	8,0 (3,1-20,7)	Infinite
Cannabis + alcohol > 80 mg %	80,5 (28,2-230,2)	2,5 (0,3-20,2)
Cannabis+cocaïne + alcohol > 80 mg %	85,3 (9,5-767,0)	Infinite
Cannabis + benzodiazepines	21,3 (5,3-86,0)	Infinite
Cannabis + benzo + alcohol > 80 mg %	63,9 (6,6-618,0)	Infinite
All cannabis cases	**4,6 (3,4-6,2)**	**2,3 (0,9-6,3)**
Cocaine		
Cocaïne alone	**4,9 (1,4-17,4)**	**Infinite**
Cocaine + cannabis	8,0 (3,1-20,7)	Infinite
Cocaine + cannabis + alcohol > 80 mg %	85,3 (9,5-767,0)	Infinite
Cocaine + alcohol > 80mg %	170,5 (21,2-1371,2)	Infinite
All cocaine cases	**12,2 (7,2-20,6)**	**Infinite**
Benzodiazepines		
Benzodiazepines alone	**2.5 (1.4-4.3)**	**3.6 (0.5-28.2)**
Benzo + cannabis	21.3 (5.3-86.0)	Infinite
Benzo + alcohol > 80mg %	Infinite	Infinite
Benzo + cannabis + alcohol > 80mg %	63.9 (6.6-618.0)	Infinite
All benzodiazepines cases	**4.2 (2.7-6.3)**	**5.8 (0.7-44.4)**
Other drugs		
All opiates cases	**2.1 (0.8-5.3)**	**Infinite**
All PCP cases	**28.4 (6.3-128.0)**	**Infinite**
All amphetamines cases	**12.8 (3.0-54.0)**	**Infinite**
Tous les cas de barbituriques	**0.9 (0.1-6.6)**	**Infinite**

Discussion

There are several findings that can be drawn from those preliminary results. The first and obvious one is that alcohol remains the #1 problematic drug. A blood alcohol concentration (BAC) above 80 mg% was detected in 29.9% of fatally injured drivers and both case/control analysis (O.R. = 39.2) and responsibility analysis (O.R. = 8.1) reveal a significantly increased risk. Accounting for 3.1% of all cases, a BAC between 50 mg% and 80 mg% is also associated with an increased risk.

Regarding other drugs, three drugs emerged as being more frequently detected among urine samples of fatally injured drivers, namely cannabis (19.5%), benzodiazepines (8.5%) and cocaine (6.8%). Although drug presence in urine does not equate impairment, the case/control (urine/urine) analysis shows an elevated crash risk for those three drugs. The results for cocaine (O.R. = 4.9) appear more convincing since they are confirmed by the responsibility analysis. All 24 cases cocaine cases were judged as responsible for the crash causation. As observed in earlier studies, cocaine – a central nervous system (CNS) stimulant – is often accompanied by a "calming" substance like alcohol, cannabis and less frequently a benzodiazepine (Marzuk & al., 1990; Terhune & al., 1992; Dussault & al., 2001).

The role of cannabis in traffic crashes is often controversial and subject to an increasing number of studies. Based on the case-control analysis, this study suggests that cannabis use is associated with twice the risk of being fatally injured (O.R. = 2.2). However, the responsibility analysis for cannabis is not conclusive as observed in many other studies using that methodology (Bates & Blakely, 1999). Benzodiazepines are also associated with an increased risk (O.R. = 2.5) corroborated by the responsibility analysis. Another study conducted in Quebec with a completely different methodology (matching driver records and health insurance files) has shown an increased risk for long-life benzodiazepines among elderly drivers (Hemmelgarn & al., 1997).

Other drugs (opiates, PCP, amphetamines, barbiturates) were detected occasionally in urine samples of fatally injured drivers (<1.5% for each drug). However, PCP (a hallucinatory substance) and amphetamines (CNS stimulants like cocaine) usage appear to prompt significant risks. For all drugs including alcohol, there is one consistent pattern: polyusage increases the risk, the more different drugs are involved, the higher the risk.

There are limitations to this study that must be presented. The first one is that results are preliminary. While the roadside part (controls) of the study is completed, only 482 fatally injured driver records (cases) have been matched. Some coroner reports (mostly for 2001 crashes) are soon expected and the computerized matching of coroner, forensic laboratory and police accidents records has not been fully successful (further matching will require more labor expensive techniques). When completed, the expected number of cases should be around 700.

The presence of a drug in urine is more indicative of exposure to the drug than impairment itself (Lillesunde, 1997). When establishing the risk, the case/control comparison is made with the same biological specimen and thus, the same bias for both cases and controls. Usually, such a misclassification bias would lead to an underestimation of the real odds ratio.

On the contrary, the participation rate among controls (49.6% for urine samples) may suggest a possible selection bias, which could inflate odds ratios. With a participating rate of 84.6%, saliva samples were basically used as a control for non-response. In all likelihood, if the motive for refusing to provide a urine sample was the fear of being detected, the driver would normally also refuse to provide a saliva sample. The most compelling argument against the selection bias is the face value of the results (Dussault & al., 2000). For instance, the fact that 24.3% of 16-19 year-old drivers (n=333) and 22.4% of 20-24 year-old drivers (n=636) were positive for cannabis during the nighttime suggests that young cannabis users were rather collaborative with the roadside survey.

This study offers the first direct comparison between a case-control analysis and a responsibility analysis by using the same set of data for the cases. In the study design, the responsibility analysis serves to validate the results of the case-control analysis. When both concur – like for alcohol and cocaine - the results appear robust. When there is a divergence – like for cannabis – a debate may arise.

Responsibility analysis generally has two main limitations. One, the fact that some cases can be misjudged on the real responsibility might cause a misclassification bias, which leads to an underestimation of the real relative risk (Bates & Blakely, 1999). Second, fatally injured driver samples have generally very high responsibility rates (including drug-free drivers), which requires extremely high responsibility rates for a drug in order to have a statistically significant effect (Terhune & al., 1992). The results obtained in this study for alcohol clearly support that responsibility analysis might run short of sensibility. On the methodological front, there is certainly a need to compare directly case-control and responsibility analyses in other studies.

References

Bates MN & TA Blakely. The Role of Cannabis in Motor Vehicle Crashes. Epidemiologic Reviews 21(2): 222-232. 1999.

Brault M & C Dussault. Comparison of Two Responsibility Analysis Methods Regarding Fatal Crashes. Proceedings of the 16th International Conference on Alcohol, Drugs and Traffic Safety. Montreal. August 4-9, 2002.

Dussault C, Brault M, Lemire AM & J Bouchard. The Role of Cocaine in Fatal Crashes: First Results of the Quebec Drug Study. 45th Annual Proceedings of the Association for Advancement of Automotive Medecine. 2001.

Dussault C, Brault M, Lemire AM & J Bouchard. Drug Use among Quebec Drivers: The 1999 Roadside Survey. Proceedings of the 15th International Conference on Alcohol, Drugs and Traffic Safety. Stockholm. May 22-26, 2000.

Hemmelgarn B, Suissa S, Huang A, Boivin JF & G Pinard. Benzodiazepine Use and the Risk of Motor Vehicle Crash in the Elderly. JAMA 278: 37-67. 1997.

Last, J.M., ed. A Dictionnary of Epidemiology, 3rd Ed. New York, Oxford University Press, 1994

Lillesunde P. Analysis of Drugs Hazardous for Traffic Safety – Applications of Different Specimens. Journal of Traffic Medicine 25: 103-108. 1997.

Marzuk PM, Tardiff K, Leon AC, Stajic M, Morgan EB & JJ Mann. Prevalence of Recent Cocaine Use Among Motor Vehicle Fatalities in New York City. JAMA 263: 250-256. 1990.

Robertson MD & OH Drummer. Responsibility Analysis: A Methodology to Study the Effects of Drugs in Driving. Accident Analysis and Prevention 26: 243-247. 1994.

Terhune KW. An Evaluation of Responsibility Analysis for Assessing Alcohol and Drug Crash Effects. Accident Analysis and Prevention 15: 237-246. 1983.

Terhune KW, Ippololito CA, Hendricks DL, Michalovic JG, Bogema SC, Santinga P, Bloomberg R & D Preusser. The Incidence and Role of Drugs in Fatally Injured Drivers. DOT HS 808 065. Washington, DC. 1992.

Clinical impairment of benzodiazepines – relation between benzodiazepine concentrations and impairment in apprehended drivers.

by Jørgen G. Bramness (Norway)

Introduction

Benzodiazepines are drugs that are widely used as anxiolytics and hypnotics, and that have additional medical indications, as well. They are commonly abused drugs. Among the drivers who are apprehended for suspected impaired driving, 10-15% will have benzodiazepines in their blood upon testing (1, 2).

The majority of the research regarding the concentration effect relationship of benzodiazepines has been performed with healthy volunteers who were given acute moderate doses of the drugs. In such studies, benzodiazepines have shown a deteriorating effect on psychomotor performance and cognitive function (3, 4). For practically all benzodiazepines, an almost linear relationship between drug blood concentration and the effects has been established (5).

Less research, however, exists which concerns the concentration effect relationship amongst experienced benzodiazepine users. Tolerance, though, is known to develop more rapidly for hypnotic sedative effects than for anticonvulsant and anxiolytic effects (6). In addition, with regard to motor effects there appears to be a development of tolerance in animal models (7). In fact, some authors have studied psychomotor impairment after an acute intake of benzodiazepines among chronic benzodiazepine users (1, 8-10).

The aim of the present study was to determine whether the levels of blood benzodiazepine concentration, detected in a population having taken the drug at diverging times and in varying doses, were related to a physician's conclusion of "not impaired" or "impaired" when assessed by a clinical test for impairment (CTI). A group of drivers who were drunk with solely alcohol in their blood was used as a reference group.

Methods

During the period of 1987 to 1998, out of nearly 90 000 blood samples from cases in which drivers were suspected of driving under the influence, approximately 9 500 samples contained benzodiazepines. Moreover, 1201 samples containing only one benzodiazepine were drawn for further study. In these cases, no other drugs or alcohol were detected. The detection and quantification of benzodiazepines, as well as the exclusion of alcohol and other drugs in these samples, was based on a battery of analytical methods utilized according to forensic toxicological principles. For various non-analytical reasons, 383 samples were excluded. As a result, the remaining 818 cases constituted the material for this study.

Blood samples (10 759) containing only alcohol from suspected drivers in 1987 were used as a reference group. In the reference group, no background variables were available. The only information included was the physician's conclusion and blood alcohol concentrations (BAC).

A physician performs the CTD shortly after the apprehension of drivers suspected of driving under the influence of non-alcoholic drugs. The test consists of 27 observations and simple psychomotor tests that were designed to evaluate driving fitness (11). In this report, the main dependent variable was the physician's conclusion regarding CTD. The main independent variables were the results from the drug analysis. For more advanced analysis, the different benzodiazepines were grouped together into four groups with drug levels designated as either "therapeutic," "mildly elevated," "moderately elevated" or "highly elevated." The background variables were related partly to the suspected driver, partly to the incident resulting in an examination and partly to the test situation itself.

Results

The study of the background characteristics of our material revealed few interrelations. The only exceptions were expected gender differences, with respect to BMI, and an age difference between male and female drivers, in which the female drivers were older than the male drivers ($P < 0.01$).

Generally, neither the type of benzodiazepine found in the blood samples nor the blood concentration of the benzodiazepine related to the background variables. The blood drug concentrations of benzodiazepines were high with average concentrations greatly above what would be considered a therapeutic level. The average BAC that was found in our reference sample was also relatively high. After combining all of the different benzodiazepines and grouping them into four groups according to drug blood concentration, the different levels did not relate to the background variables.

Of the suspected drivers, 159 (19%) were determined to be "not impaired," while 659 (81%) were determined to be "impaired." Consequently, the background variables did not predict the physician's conclusion regarding CTD. In the reference group, in which only alcohol was detected, 1002 (9%) suspected drivers were determined to be "not impaired," while 9757 (91%) suspected drivers were determined to be "impaired."

The type of benzodiazepine detected, however, did not differ significantly between the "not impaired" and "impaired" groups. The "impaired" drivers had significantly higher levels of diazepam ($P < 0.01$) and oxazepam ($P < 0.05$) compared to the "not impaired" drivers. Furthermore, a similar trend was present for flunitrazepam, nitrazepam and alprazolam.

The odds ratio for being determined "impaired" rose significantly from one group to the next when the different benzodiazepines were combined into groups according to the level of blood drug concentration. There appeared to be no increase in the odds ratio moving from the moderately to the highly elevated drug level. The odds ratio differences, though, persisted when adjusting for the background variables (tab. 1).

The relation was also checked for interactions between the background variables and drug level. However, no interactions were found.

According to the reference group in which alcohol was detected, the average BAC (SD) for drivers determined to be "not impaired" was 0.102% (0.055%) and 0.161% (0.071%) for drivers determined to be "impaired" ($P < 0.001$).

Table 1 Odds ratio (95% CI) for being determined "impaired" on different elevated levels of drug concentration compared to the therapeutic drug level; and odds ratio for being determined "impaired" on different BAC compared to the 0.025-0.050% BAC.

	Blood benzodiazepine concentration			
Binary regression analysis for drug concentration	Therapeutic[a]	Mildly elevated	Moderately elevated	Highly elevated
Drug concentration	1	1.61 (1.05-2.46)*	3.65 (1.88-7.08)***	4.11 (2.22-7.60)***
alone				
Adjusted for all	1	1.60 (0.84-3.05)	3.71 (1.34-10.27)*	3.75 (1.46-9.63)**
background variables				
			BAC (%)	
Binary regression analysis for BAC	0,025-0,050[a]	0.051-0.100	0.101-0.150	>0.150
BAC alone	1	1.49 (1.22-1.83)***	2.94 (2.38-3.63)***	10.49 (8.36-13.16)***

[a]reference category, * $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$

Discussion

In this study, we have used the physician's conclusion regarding the CTD as our dependant variable, while also suggesting that this conclusion is a "gold standard" for the determination of impairment in the context of this paper. The CTD may have a low sensitivity for detecting roadside traffic relevant to impairment (12-17). When subjects were given lower doses of benzodiazepines in controlled laboratory settings, psychomoters that are more sophisticated were needed to demonstrate drug impairment. Some studies indicate that the CTD may be a reliable tool in revealing impairment in a clinical setting when higher doses of benzodiazepines, or a combination of drugs, are given (16, 18, 19).

Our use of the CTD as a dependant variable implies that there is some knowledge regarding the reliability of the test. In fact, we have only a theoretical idea of this test's reliability, and a reliability problem would obscure the concentration effect relationship in a study like the present.

There is a well-established concentration effect relationship between blood drug concentration of a certain benzodiazepine and the psychomotor effects (5). At the individual level, however, considerable intra- and inter-individual differences in the response to a certain dose have been demonstrated (3). Constitutional differences, acute or chronic tolerance to drug effects can partially explain these phenomena.

In the present study, we obtained very limited background information about the subjects' intake of drugs. In most instances, though, neither the dose nor the time of intake was known. A pharmacodynamic phenomenon, such as acute tolerance, would greatly vary depending on the time when the last drug intake occurred and when the dose was ingested. The discussion of acute tolerance is beyond the scope of this article, but if it were to exist, it would obscure a concentration effect relationship in the present study.

A pharmacodynamic or functional mode of action can cause tolerance after repeated dosing. Pharmacodynamic tolerance for benzodiazepine effects is well-established (20), as it is for alcohol (21) as well. There are probably also differences in the degree of tolerance development when considering specific drug effects (22). In any case, chronic tolerance would have had the capability to obscure a concentration effect relationship in the present study.

Some of the subjects in the present paper may have taken benzodiazepines as part of a therapeutic scheme for the treatment of epilepsy, anxiety or insomnia. Others might have ingested the drug for non-medicinal purposes and, therefore, as part of drug abuse. Different indications could theoretically produce different responses (23), as well as obscure a concentration effect relationship.

Despite all of these possible uncertainties and limitations, we still found a clear concentration effect relationship between the benzodiazepine drug concentrations measured and the clinically assessed impairment. This relationship was maintained once an adjustment was made for the background variables. The relationship is of a similar magnitude, at least for mildly and moderately elevated BAC, to that found in the reference group of drunken drivers.

One of the arguments against setting legal limits for benzodiazepine concentrations and driving has been the lack of relationship between blood drug concentration and impairment (24). When comparing the present results on benzodiazepines and alcohol, it appears that some arguments against the establishment of legal limits for benzodiazepines will be reduced in value.

The present research, however, offers little information for determining at what blood concentration level a legal limit for benzodiazepines and driving should be established. Many of the drivers, however, even in the therapeutic blood drug concentration level, are judged "impaired." Our research probably supports a limit for benzodiazepines and driving as low as the "therapeutic range." It should be noted, though, that these blood concentration levels often reflect use within the defined daily doses, at least for anxiolytics.

Future studies, such as the application of sensitive tests relevant to traffic safety instead of CTD on a population of individuals with different patterns of benzodiazepine use, would further contribute to the background knowledge for setting such limits.

References

1. Mørland J. Driving under the influence of non-alcohol drugs. Forensic Sci Rev 2000;12:79-105.

2. Christophersen AS, Mørland J. Drugged driving, a review based on the experience in Norway. Drug and Alcohol Dependence 1997;47:125-135.

3. Ingum J, Bjorklund R, Bjørneboe A, Christophersen AS, Dahlin E, Mørland J. Relationship between drug plasma concentrations and psychomotor performance after single doses of ethanol and benzodiazepines. Psychopharmacology Berl. 1992;107:11-17.

4. Ingum J, Beylich KM, Mørland J. Amnesic effects and subjective ratings during repeated dosing of flunitrazepam to healthy volunteers. European Journal of Clinical Pharmacology 1993;45:235-240.

5. Berghaus G, Grass H. Concentration-effect relationship with benzodiazepine therapy. In: Mercier-Guyon C, editor. Alcohol, drugs and traffic safety. Annecy, France: The International Council on Alcohol, Drugs and Traffic Safety; 1997. p. 705.

6. File SE. Tolerance to the behavioral actions of benzodiazepines. Neurosci Biobehav Rev 1985;9:113-21.

7. Khanna JM, Kalant H, Chau A, Shah G. Rapid tolerance and crosstolerance to motor impairment effects of benzodiazepines, barbiturates, and ethanol. Pharmacol Biochem Behav 1998;59:511-9.

8. O'Hanlon JF, Vermeeren A, Uiterwijk MM, van Veggel LM, Swijgman HF. Anxiolytics' effects on the actual driving performance of patients and healthy volunteers in a standardized test. An integration of three studies. Neuropsychobiology 1995;31:81-88.

9. Linnoila M, Erwin CW, Brendle A, Simpson D. Psychomotor effects of diazepam in anxious patients and healthy volunteers. J.Clin.Psychopharmacol. 1983;3:88-96.

10. van Laar MW, Volkerts ER, van Willigenburg AP. Therapeutic effects and effects on actual driving performance of chronically administered buspirone and diazepam in anxious outpatients. J.Clin.Psychopharmacol. 1992;12:86-95.

11. Alha AR. Blood alcohol and clinical inebriation in Finnish men. A medico-legal study. Ann Acad Sci Fenn 1951:1-92.

12. Kuitunen T, Mattila MJ, Seppala T, Aranko K, Mattila ME. Actions of zopiclone and carbamazepine, alone and in combination, on human skilled performance in laboratory and clinical tests. Br J Clin Pharmacol 1990;30:453-61.

13. Kuitunen T, Mattila MJ, Seppala T. Actions and interactions of hypnotics on human performance: single doses of zopiclone, triazolam and alcohol. Int Clin Psychopharmacol 1990;5:115-30.

14. Kuitunen T. Drug and ethanol effects on the clinical test for drunkenness: single doses of ethanol, hypnotic drugs and antidepressant drugs. Pharmacology & Toxicology 1994;75:91-98.

15. Kuitunen T, Aranko K, Nuotto E, Lindbohm R, Mattila MJ, Korte T, et al. The relationship between blood benzodiazepine concentrations and the clinical test for drunkenness in drivers suspected of driving under the influence of drugs. Alcohol, Drugs and Driving 1994;10:135-146.

16. Kuitunen T, Mererinne E, Seppala T. Correlation between blood diazepam concentrations and performance on clinical test for drunkenness in acute and chronic diazepam users. J Traffic Med 1994;22:105-111.

17. Mattila ME, Kuitunen T, Veilahti J. Related coordinative, reactive and cognitive performances as impaired by drugs and alcohol: comparison with clinical test for driving fitness. J Traffic Med 1993;21:101-114.

18. Anderson EW, Burns M. Standardized field sobriety test: a field study. In: Mercier-Guyon C, editor. 14th International Conference on Alcohol, Drugs and Traffic Safety; 1997; Annecy, France: The International Council on Alcohol, Drugs and Traffic Safety; 1997. p. 635-9.

19. Penttila A, Tenhu M, Kataja M. Examination of alcohol intoxication in cases of suspected drunken drivers II. A mathematical analysis of the relationship between the results of clinical testing and blood alcohol. Helsinki: Liikenneturva, Central Organization for traffic safety in Finland; 1974. Report No.: 15.

20. Hobbs W, Rall T, Verdoorn T. Hypnotics and sedatives; ethanol. In: Hardman J, Limbird L, editors. Goodman & Gilman's Pharmacological basis of therapeutics. 9 ed. New York: McGraw-Hill; 1995. p. 361-96.

21. Goldberg L. Quantitative studies on alcohol tolerance in man. The influence of ethyl alcohol on sensory, motor and psychological functions referred to blood alcohol in normal and habituated individuals. Acta Physiol Scand. 1943;5.

22. Curran HV. Benzodiazepines, memory and mood: a review. Psychopharmacology (Berl) 1991;105:1-8.

23. Berghaus G, Friedel B. Aspects of time for the assessment of driver fitness under therapy with benzodiazepines. In: Mercier-Guyon CTICoA, Drugs and Traffic Safety, Annecy, France), editor. Alcohol, Drugs and Traffic Safety; 1997. p. 711.

24. Ellinwood EH, Jr., Linnoila M, Easler ME, Molter DW. Profile of acute tolerance to three sedative anxiolytics. Psychopharmacology (Berl) 1983;79:137-141.

Experimental research on benzodiazepines and driving : determinants of impairment intensity

by Günter Berghaus (Germany)

Benzodiazepines are potentially dangerous substances for traffic safety
Indisputably, benzodiazepines appear to be the most dangerous substances among medicaments with regard to traffic safety:

- Pharmaco-epidemiological studies showed an increased danger of benzodiazepines (f.e. Neutel, 1995; Barbone et al., 1998);
- A meta-analysis of epidemiological studies demonstrated that approximately 70% of the medicaments detected in the blood of drivers who were guilty for an accident were benzodiazepines (Graß and Berghaus, 1998);
- The research project CERTIFIED classified benzodiazepines into the group of "high risk" drugs together with alcohol (Brookhuis et al., 2000).

These statements may give the impression that "benzodiazepines" can be treated as a single substance like alcohol, for example. However, one knows that there are differences between the active substances in the group of benzodiazepines, and that there are a lot of dependences influencing the degree of effects.

Some of the most important determinants for benzodiazepines are:

- active substance (half-life)
- dose
- galenic, mode of application
- the time period between application and driving
- the period of therapy; adaptation
- the type and intensity of disease
- the individual physical and psychological situation of the patient (for example age or concomitant diseases)
- other influencing factors (such as biorhythm, individual reactions to the substance)
- the compliance of the patient
- simultaneous intake of other drugs

What has been well-established by research concerning the determinants of the degree of impairment?
In previous years, detailed knowledge on the potential risk of benzodiazepines was established by expert judgments (Wolschrijn et al., 1991) and by experimental research. This was exemplified by comparing different medicaments in the same test procedure ("Maastricht school", see f.e. Vermeeren, 2003 for summary) and by a meta-analysis of experimental studies through a computer-aided evaluation of a number of published experimental studies (Berghaus, 1997). The approaches of comparing drugs through the same test procedure and through the meta-analysis open the chance to compare the effects of medicaments with the effects of different levels of BAC (blood alcohol concentration).

Even if there are differences in the results, due to shortcomings of the different approaches, one can, in my view, establish three facts:

- firstly, benzodiazepines have the potential to impair performance—especially at the time of maximum effect—in a degree that equals an alcohol content of more than 0.05%;
- secondly, the degree of impairment depends on the special benzodiazepine; and
- thirdly, the degree of impairment is dependent on the dose—especially in an intra-individual perspective.

In order to verify these statements, on the one hand, I would like to make reference to a summary by Mrs. Vermeeren (2003): for example, among the intermediate half-life hypnotics temazepam, lormetazepam, oxazepam and loprazolam, the substances/doses of lormetazepam (2 mg capsule), oxazepam (50 mg) and loprazolam (2 mg) impair weaving (a special driving task) 10 hours p.a. in a degree similar to an alcohol content of more than .05% BAC. On the other hand, according to our meta-analysis (Berghaus, 1997), there are several substances/doses among the tranquilizers that, during the period of maximum effect, significantly reduce performance similar to an alcohol content of more than 0.05% BAC (e.g. 2-2.5 mg of lorazepam; 15 mg of oxazepam; 5, 10, 15 and 20 mg of diazepam). Furthermore, substances separately analysed for different doses illustrated that an increased dose also increased the degree of effects.
With both methodological approaches, one can show that dosage and the absorption rate may sometimes be more important than half-life. This indicates that a short half-life substance in a higher dose may induce a greater impairment than a long half-life substance in a lower dose.

But looking deeper into the methods of the experimental research, one must state that the results at most are gained by single oral application of a benzodiazepine in healthy subjects—frequently young people such as students. This approach may be the “worst case scenario” in which the negative effects of a medicament will express more clearly. This approach, though, is of course not representative of the “patient”: In general, he is more than 40 to 50 years old and he takes the medicine over a longer period in order to cure his disease which, itself, could impair performance. Hence, the question concerning the effects of those determinants emerges.

What should be better established by research concerning the degree of impairment?
It would be too time consuming to report on all determinants that are in my view not systematically tested in experimental research. Therefore, I would like to confine myself to three important determinants: the difference between resorption and elimination, the period of application and the fact that the consumers of medicaments are ill.

Resorption versus elimination
We know from the research on alcohol that the degree of impairment depends on the kinetic: with a defined BAC in the increasing part of the kinetic curve (resorption) there is a higher degree of impairment than with the same BAC in the decreasing part (elimination) of the BAC-curve. The effect difference equals between 0.02% and 0.03%

BAC. The same seems true, and more evident, for benzodiazepines: making use of the meta-analytic data in healthy subjects, we established the effect-concentration-profile for an application of 20 mg diazepam; using a defined concentration in serum, for example 125 mg/L, in the resorption part the test results were significantly reduced in about 70 to 80%, whereas with the same concentration in the elimination part it was only 10 to 20% of the test results. This means that in the resorption phase the intensity of effects is probably equivalent to an impairment of more than 0.10% BAC, whereas in the elimination phase there is an impairment of less than 0.03% BAC. Presently, we are engaged in controlling this outcome in other benzodiazepines. There seems to be, however, a really strong dependence.

Period of treatment

There are at least a handful of publications that concern the period of therapy. They correspond in that by increasing the period of application, the performance improves.

Unfortunately, there are too few studies to be valid for a statement on a special benzodiazepine. Thus, we summed up in our meta-analysis the results for different benzodiazepines after the first application in healthy subjects: overall, 30% of the 3603 tests analysed were significantly reduced; after treatment up to one week, the percentage improved to 17 out of 503 tests; and after treating the subjects for more than one week, only 7% of 117 tests were significantly reduced against placebo or performance without taking the medicament.

This result, together with the above mentioned facts, illustrates that the situation after the first application of a medicament is the most dangerous. At the first time of application there may be a performance reduction equivalent to a BAC-effect of more than 0.05%, but in the course of treatment of a general increased concentration of the active substance in the blood to the therapeutic window, the performance deficit drops under the 0.05% BAC-equivalent. Hence, with regard to the intra-individual performance profile, the same blood concentration of a benzodiazepine will produce a degree of effects that will be quite different between the initial application and the steady state. With regard to the inter-individual view, however, two subjects showing the same blood concentration will possibly perform quite differently depending on their individual period of therapy.

Disease

The fundamental difference between medicines, on the one hand, and alcohol or illicit drugs, on the other hand, is the fact that one takes medicines with a physician prescribed dose to cure a disease. But many diseases, themselves, that are treated by benzodiazepines cause, as symptoms, performance impairment. Hence if the patient remains untreated, he may become a greater threat to traffic safety than if he was adequately treated by a physician.

To perform such experimental studies with patients in a methodologically accurate manner, though, is very difficult because the patient has the right to be adequately treated. This means that a patient group of a defined disease will take different medicaments with different doses. Beyond that, the patient groups are not homogeneous: for example, with regard to age, gender, kind and intensity of disease, concomitant disease, concomitant medication, period of therapy and the compliance of out-patients. In addition, contrary to experiments with healthy subjects, different comparison groups are used in the studies: healthy subjects (difficulty with matching criteria), the untreated patient itself (placebo or without medicament) or a group of patients with another therapy.

There exist only a very few number of experimental studies per benzodiazepine. The existing relevant studies are at most too inhomogeneous to be summed up over all benzodiazepines in a table. In general, if compared to untreated status, the studies illustrate at the start of the therapy a significantly reduced performance that improves with an increasing period of therapy (see for example Berghaus und Guo, 1995). The optimal dose seems to be an essential influencing factor in cases of hypnotics. In comparison with healthy subjects, patients do not reach the level of performance of healthy subjects. Due to the very few published studies, though, it is impossible to determine the degree of performance deficits, especially in comparison to BAC-levels.

Conclusions concerning research, information of physicians, legislation

What are the conclusions facing the research on benzodiazepines which means facing multiple influencing factors pertaining to the intensity of performance deficits?

- Concerning experimental research, it is of fundamental importance to know more about the influencing factors, especially “disease” and “duration of therapy.”
- Concerning information, we must begin with a better understanding from physicians and drivers regarding the danger of benzodiazepines: not in the general mode “they are dangerous,” but details relating to the differences between active substances, the duration of impairment, the time period of maximum effects, the residual effects the next morning after nocturnal intake and so forth. (Today, for example, a doctor will hardly be able to answer correctly the question of how many hours p.a. of a benzodiazepine his patient should not drive.)
- Possibly, we may succeed in urging the manufacturers to improve the package inserts of benzodiazepines with regard to these aspects.
- Concerning legislation, it will be, in my view, hardly possible to establish per se limits (adaptation, differences between resorption and elimination, medicaments as positive against diseases), and it will be difficult to label some benzodiazepines as more dangerous than others (dose-dependence of effects).

References

Barbone F, McMahon AD, Davey PG, Morris AD, Reid IC, McDevitt DG, MacDonald TM (1998) Association of road-traffic accidents with benzodiazepine use. Lancet 352: 1331-1336

Berghaus G, Guo BL (1995) Medicines and driver fitness - findings from a meta-analysis of experimental studies as basic information to patients, physicians and experts. In: Kloeden CN, McLean AJ (ed) Proceedings of the 13th International Conference on Alcohol, Drugs and Traffic Safety, p:295-300

Berghaus G (1997) Arzneimittel und Fahrtüchtigkeit – Meta-analyse experimenteller Studien. (Medicines and driver fitness – meta-analysis of experimental studies.) Bericht über das Forschungsprojekt FP 2.9108 der Bundesanstalt für Straßenwesen

Brookhuis KA, Riedel WJ, Mathijssen MPM, Tunbridge R, Clark A, Ward NJ, Dye L, Berghaus G (2000) Conception and evaluation of roadside testing instruments to formalise impairment evidence in drivers (CERTFIED) Summary report on EU project Contract No RO-98-RS.3054

Graß H, Berghaus G (1998) Impairment of driving ability by medicines – a meta-analysis of epidemiological studies. Proceedings VTI Conference 1998, 10 A part 4: 45-60

Neutel CI (1995) Risk of traffic accident injury after a prescription for a benzodiazepine. Ann Epidemiol 5: 239-244

Vermeeren A (2003) Residual effects of hypnotics: epidemiology and clinical implications. In: Vermeeren A: Hypnotics and antihistamines - effects on cognitive functions and driving performance. Neuropsych Publishers, Department of Psychiatry and Neuropsychology, Maastricht, p: 31-76. Will be published in “CNS Drugs”

Wolschrijn H, de Gier J, de Smet P (1991) Dugs and driving - a new categorisation system for drugs affecting psychomotor performance. Institute for Dugs, Safety and Behaviour, University of Limburg

The influence of cannabis on the risk of accidents : analysis of scientific data at international level

by Marie-Berthe Biecheler-Fretel (France)

This text is based on the analysis carried out as part of the joint experts' report on cannabis produced in France in 2001 by the National Health and Medical Research Institute (INSERM) at the request of the Interdepartmental Task Force for the Fight against Drugs and Drug Addiction (MILDT).

In the majority of the studies carried out in the last ten years in Europe, the United States, Canada and Australia, the use of cannabis was identified in approximately 10% of the drivers injured or killed in a road accident, and sometimes more. Parallel to this finding, the experimental studies also revealed the deterioration under the influence of cannabis of certain abilities necessary for driving a vehicle: reduced steering control, slower reaction times, impaired attention mechanisms and weaker or inappropriate responses in emergency situations. On a simulator or in a real situation, the effects are sometimes hardly noticeable and can more easily be detected in the case of large doses. In certain situations, drivers who have consumed a moderate dose and are aware that their abilities are impaired will modify their behaviour by taking fewer risks (such as keeping a greater distance from the vehicle in front or reducing their speed). The adverse effects of cannabis on driving ability may therefore appear relatively slight in a normal situation. In contrast, there are situations where the influence of the consumption of cannabis can be very dangerous, such as emergency situations, monotonous long journeys and situations where cannabis is combined with other drugs, especially alcohol.

The proportion of drivers who have used cannabis and are involved in accidents is sufficiently high (1 in 10) and the harmfulness of the product in certain situations is sufficiently well established for the drug to be considered an important potential accident factor. However, it is still impossible today to quantify the role of this factor with sufficient certainty. The first difficulty facing epidemiologists is to identify a control sample, while the second is the absence of a synchronous relationship between the presence of cannabis in the blood or urine and its effects on behaviour. The following questions are dealt with in this study: what studies have been carried out to date? What have been the results obtained? And what is their significance? This paper also looks at the difficulties encountered when producing an epidemiological analysis and the hypotheses that researchers are moving towards.

Methods and difficulties inherent in the epidemiological approach

Under the conventional epidemiological approach, establishing the effects of cannabis on the risk of an accident consists in comparing the presence and level concentration of cannabinoids in the drivers involved in accidents with those of a control sample of drivers travelling at the same time on the same roads. The model study for determining the accident risk due to alcohol continues to be the one produced by Borkenstein (1974), but in the case of cannabis epidemiologists are confronted with several types of difficulty.

The difficulty in obtaining a control group

Identifying the recent use of cannabis involves taking a sample of the control subject's blood. While a sample is generally taken from subjects who have died or have been injured in an accident, it is not possible to compel a control subject to provide a sample. The tests in an alternative medium (urine, saliva) are, in contrast, not very practicable on subjects who have been seriously injured and have only rarely been carried out simultaneously on people who have had an accident and on control subjects, an exception being the study by Dussault (2002) in Quebec. In order to provide a comparison with people hospitalised after a road accident, doctors in France like to choose as their control sample patients who have been hospitalised for a different reason (Mura, 2001). However, this approach does not guarantee the validity of the control subject.

The tenuous link between changes in behaviour and the detection of THC

It is accepted that the presence of a certain level of THC in the blood confirms the recent consumption of a sufficient amount of cannabis to impair the faculties. However, it is difficult to rely solely on the THC value detected after an accident in order to divide up the subjects between those who are under the influence ("exposed to the risk of cannabis") and those who are not. In view of the rapid fall in the level of THC in the blood, its detection in the case of an accident is only possible if the blood sample is taken very shortly after the event (less than one to two hours), but this limiting factor is not always borne in mind. In addition, the adverse effects may last when the THC is no longer detectable, which is why researchers also use the THC-COOH values detected. THC-COOH is the principal metabolite to be found in urine but can remain in the blood for several hours after consumption and for several days in the urine even though the psychoactive effects have disappeared.

The confusion factors (alcohol and age)

There are lifestyle factors associated with the use of cannabis that constitute independent risk factors: age or the consumption of alcohol in particular are significant "confusion" factors in the assessment of the risk associated with cannabis. It is known that the presence of cannabis is especially frequent among young drivers and that a substantial proportion of drivers who test positive for this drug also do so for alcohol.

The difficulty of dividing participants up into culpable and non-culpable groups

Given the difficulty in matching a control sample, most studies that have attempted to establish a link between the use of cannabis and accidents have employed a *responsibility analysis* approach, which involves comparing a group of people responsible for an accident with a group of people who are not (who act as controls).

This division between responsible and non-responsible must itself be treated with caution since it is not strictly independent of the consumption of cannabis or of variables related to it, especially alcohol. In point of fact, the responsible/non-responsible selection remains under the control of the researchers, and there may be a tendency for their judgment to be based on the consumption of alcohol or drugs. Consequently, the subjects who have drunk alcohol may be excluded from the analysis, but the samples then become extremely small.

Whether *case control analyses* or *responsibility analyses* are involved, each of these methodological considerations has an impact on the interpretation of the results. Bates and Blakely (1999) have provided a critical review of the analytical epidemiology data available from 1980 onwards in the United States and Australia. Austroads (2000) has published an analysis by a group of experts of all the Australian data. The study by Dussault et al (2002) proposes a responsibility analysis combined with a case control analysis.

Responsibility analyses

The studies that have employed the responsibility approach are set out in Table 1. Research into cannabis is generally carried out on blood samples, except in the studies conducted by Drummer before 1999, for which urine samples were used instead.

Dividing participants up between responsible and not responsible depends on the information available, and several criteria have been applied in the various studies involving variations in the make-up of the group to be compared. Following on from Terhune et al (1992), Drummer (1994) and Longo et al (2000) defined three levels of responsibility (culpable, contributory, non-culpable) with the same method, i.e. the one described by Robertson and Drummer (1994), by taking account of any mitigating factors (road conditions, condition of the vehicle and general driving conditions). Differentiating between the levels is independent of the data on the drugs used. Dussault et al (2002) also use Terhune's accident responsibility scale. Williams et al (1985) base their classification on a diagram and accounts of the accident provided by the investigating officer. Schermann (1992) employs the responsible/non-responsible criterion proposed by the police.

The index of the relative over-representation of consumers of alcohol or cannabis among people responsible for accidents (responsibility ratio or odds ratio) serves as an indicator of the increased risk of being responsible for the accident.

Table 1 . Responsibility and odds ratios relating to cannabis according to the principal studies (based on Bates and Blakely (1999), adapted and supplemented)

Reference	Population	Detection medium	Responsibility	No drug	Alcohol alone	Cannabis alone	Alcohol and cannabis
Terhune and Fell, USA, 1982	497 injured	Blood Alcohol >1 g/l THC	Yes Odds ratio Interval 95%	94 179 1.0	45 16 5.4 (2.8-10.5)	9 8 2.1 (0.7-6.6)	
Williams et al, AL, 1985	440 killed (died within 2 hours)	Blood Alcohol > 0 THC and THC-COOH	Yes No Odds ratio Interval 95% Odds ration vs alcohol	55 23 1.0	120 10 5	10 9 0.5 (0.2-1.5)	123 6 8.6 (3.1-26.9) 1.7[1] n.s
Terhune et al, USA, 1992	1882 killed (died within 4 hours)	Blood Alcohol :>1 g/l THC	Yes. No Odds ratio Interval 95%	541 258 1.0	587 38 7.4 (5.1-10.5)	11 8 0.7 (0.2-1.8	35 2 8.35 (2.1-72.1)
Schermann et al, France, 1992	2471 hospitalised	Blood	Yes No Odds ratio	1015 799 1		66 48 1.1	27 5 6.9
Drummer, Australia, 1994	1045 killed (several states) Vict, NSW and WA	Urine THC-COOH sometimes blood (THC) Alcohol >0	Yes Contributory No Odds ratio nterval 95% Odds ratio vs alcohol	339 53 140 1.0 l	245 16 17 6 (3.1-10)	21 8 14 0.6 (0.3-1.2)	54 5 4 5.6 (2.0-16) 0.9 [1] n.s
Hunter et al, 1998 ; Longo et al, Australia,2000	2500 injured (2282 no further action) South Austr	Blood THC and THC-COOH Alcohol >0	Yes No .Odds ratio Interval 95% Odds ratio vs alcohol	944 821 1.0	173 22 6.8 (4.2-11.0)	83 81 0.9[3] (0.6-1.2)	66 5 11.5 (4.6-36.7) 1.7[1] n.s
Drummer, Australia, 1999	1058 killed (several states) Vict., NSW and WA	Blood THC, sometimes THC-COOH Alcohol > 0	Yes Contributory No Odds ratio	395 37 89 1.0	248 7 8 7	29 1 0	

Reference	Popula-tion	Detection medium	Responsibility	No drug	Alcohol alone	Cannabis alone	Alcohol and cannabis
Drummer et al, Australia, 2001	2564 killed Vict., NSW and WA	Urine THC-COOH Blood (THC) Alcohol >0	Yes No Odds ratio	924 279 1.0	562 29 5.8	84 25 1[3]	
Dussault et al, Quebec, 2002	354 killed	Blood Alcohol>0.8 g/l	Odds ratio Interval 95%		8.1 (1.9-34.8)	1.2 (0.4-3.9)	2.5 (0.3-20.2)

[1] Alcohol + cannabis vs alcohol alone (n.s: non significant)
[3] The samples can be differentiated according to THC-COOH and THC: odds ratio respectively 0.9 (0.6-1.4) and 0.8 (0.4-1.5) with Hunter et al (1998) et 1 and 2.1 (without confidence interval) with Drummer et al (2001)

The responsibility study with the broadest scope and the most precise results is the one by Longo et al (2000): 8% of 2500 drivers injured tested positive for THC-COOH alone and 2.8% for both THC-COOH and THC. The responsibility analyses focused on the drivers who tested positive for cannabis and only secondarily on the drivers who tested positive for THC (61, divided up between responsible and non-responsible).

The most recent publication by Drummer et al (2001) is a compilation of results relating to 2564 people killed in several Australian states between 1990 and 1998. Until 1996, without exception, the detection of cannabis focused on the metabolite THC-COOH. Recent studies have generally involved testing for THC, with the procedures differing from one state to another (detection thresholds of 0.1, 2, or 5 ng/l). Drummer et al also analyse the responsibility of drivers who have tested positive for cannabis by separating from the rest those who have tested positive for THC alone (34 drivers). The results obtained by Drummer et al (1998), which were similar to those obtained by Drummer (1994), have not been incorporated in Table 1. On the other hand, we have included the 1999 study, based only on the THC values (30 cases assessed), the results of which are debatable.

The small-scale study by Dussault et al (2002) has the advantage of merging the two approaches: the case control analysis (employing a blood/breath comparison for alcohol and urine/urine for cannabis) and the responsibility (case-case) approach using blood samples.

Odds ratios relating to cannabis alone

Of the eight studies[19] referred to in Table 1, five relate to drivers killed and three to drivers injured in accidents. As far as drivers killed are concerned, three of the responsibility ratios are lower than 1 (0.5, 0.7, and 0.6) and two close to 1 (1 and 1.2). With regard to drivers injured, two of the ratios are approximately 1, the third being 2.1 (note that the odds ratio of 2.1 in Terhune and Fell (1982), with a 0.7-6.6 confidence interval, is less precise than that of 0.9 in Hunter et al (1998) with a 0.6-1.2 confidence interval).

While these studies are largely in agreement in the case of alcohol, none of the odds ratios with cannabis is significantly different from 1. It remains an open question whether this absence of an overall statistical link between the use of cannabis and the responsibility for the accident is to be put down to the method bias, the compensation phenomena suggested by the experimental studies or other social data on the use of cannabis on the road.

The Australian experts (Austroads, 2000) recognise the difficulty in drawing conclusions on the link between the use of cannabis and the question of responsibility, on the basis of the studies available. Contrary to the previous results, Drummer (1999) identifies among 1058 drivers a group of 30 who tested positive for THC and were virtually all responsible. This new evidence, subject to the possibility of a statistical aberration, leads one to assume that the proportion of the users of cannabis driving under the influence of THC has considerably increased from one period to the other. These experts recommend focusing the responsibility studies on THC, the active constituent of cannabis, and handling bigger samples in order to clarify the situation (as in the case of the 2001 study).

While no clear general link emerges between the presence of THC and the responsibility for an accident, this lack of a link is more obvious with weak concentration levels of THC. The fine-grain data (Longo et al 2000, Drummer et al 2001) indicate the possibility of a more radical effect of the cannabinoids in sufficiently high concentrations. According to Longo et al, drivers with THC above 2ng/ml are at a greater risk than those with weaker concentrations (the odds ratio rises from 0.8 to 1.7). According to Drummer et al, the odds ratio calculated for drivers with THC above 5ng/l rises to 2.8 (versus 2.1 for all those testing positive for THC).

Odds ratios relating to a combination of cannabis and alcohol

Generally, the odds ratios relating to a combination of alcohol and cannabis are not significantly different from those relating to alcohol alone. Owing to the high responsibility rate for the alcohol group, the responsibility method has little discriminatory power to separate the effects of the alcohol-cannabis combination from those of alcohol on its own. While Bates and Blakely conclude that the effect of this combination is probably more serious than that of alcohol alone, they stress that this inference remains limited owing to the weak statistical discrimination.

[19] Not included is that by Drummer (1999) with no odds ratio.

The results ultimately confirm the significance of the risk due to alcohol but largely fail to demonstrate that cannabis alone affects the risk of a person being responsible when he or she is involved in a accident that is either fatal or causes serious physical injuries. Nevertheless, the most recent data suggests that the risk of being responsible increases with strong concentrations of THC. This would apply in particular to the consumption of cannabis immediately before driving and perhaps also to chronic consumption.

Case control analysis

The study by Dussault et al (2002) uses two sources of parallel data: the analyses of blood and urine from all the drivers who died in Quebec between April 1999 and November 2001 (482) and the analyses of breath and urine from control drivers sampled at 348 locations representing the population of drivers in Quebec (total sample of 11942 drivers).

The case control analysis by Dussault et al (2002) uses a urine/urine comparison for cannabis and a blood/breath comparison for alcohol. For example; for cannabis the 354 deceased drivers from whom urine and blood samples were taken were compared to the 5931 controls who had provided a sample of their urine and breath. The responsibility analysis carried out at the same time enables the results obtained by the two methods to be compared.

Both the case control analysis (odds ratio 39.2) and the responsibility analysis (odds ratio 8.1) indicate a significant increase in the accident risk for a blood alcohol level higher than 0.8 g/l and also for a blood alcohol level between 0.5 and 0.8 (ratios 3.7 and 1.6 respectively). On the other hand, while the responsibility analysis is not conclusive (ratio 1.2 non-significant), the case control analysis indicates in the case of the consumption of cannabis a two times higher risk of a fatal accident (odds ratio 2.2; confidence interval at 95% 1.5-3.4). The divergence between the two types of analysis in the case of cannabis makes the authors very cautious with regard to setting out their results. Moreover, the results confirm the harmful effect of the combination of alcohol and cannabis (here, too, the responsibility analysis is less conclusive than the case control analysis).

Conclusion

The experimental data enable one to assume that the consumption of cannabis poses a danger to road safety but, owing to a lack of consistency between the results of the epidemiological studies, it is still impossible today to reach consistent and sound conclusions proving that the use of cannabis is a significant accident factor. However, the methods and hypotheses are becoming more refined.

The studies based on the responsibility approach have, owing to their lack of statistical power (small sample sizes) failed to show that the consumption of cannabis alone increases the probability of being responsible for an accident. The situation is clearly different from the case of alcohol.
As far as the method is concerned, progress can be made, and detection sensitivity should be improved with bigger samples. The Australian studies have emphasised the benefit of focusing the analyses on the fine detection of THC, the presence of high levels of which is linked to an increase in responsibility in the case of an accident. The responsibility studies available are characterised by one particular defect: they do not consider the information about the drivers who have neither been killed nor injured in an accident but could nevertheless have caused it. This reduces the scope of the results.

Whatever the advances in knowledge possible on the basis of *responsibility* analyses, the latter will not replace case control analysis, which is the only means of establishing a relative risk of *involvement* in an accident. Case control studies, however, still remain the exception. The very recent analysis in Quebec leads one to assume that the consumption of cannabis doubles the accident risk, but this result – not backed up by the responsibility approach – is still the subject of debate in the team, which is continuing its work. This risk analysis method based on the dual approach of responsibility and involvement, with the comparisons it makes possible, is particularly innovative and we await the final results.

Apart from the questions that remain on the role of cannabis as a risk factor population-wide in the case of accidents (quantification of the risk), immense progress has been made in the observation system itself: biological media, thresholds and devices adapted for roadside use. Saliva tests are very promising in this regard. The correlations between saliva/blood concentrations for THC (analogous to the air/blood concentrations for alcohol) make us hope that devices will emerge that can be used in roadside tests and pave the way for proper epidemiological (case control) studies. However, there is an underlying difficulty in that THC on its own is not predictive of impaired performance.

Bibliography

AUSTROADS. Drugs and driving in Australia, Sydney 2000.

BATES M.N. and BLAKELY T.A., “Role of cannabis in motor vehicle crashes”, *Epidemiol. Rev.,* 21, 1999, pp. 222-232.

DRUMMER O, CHU M and GEROSTAMOULOS J., “Involvement of drugs in accident causation, Aust Roads Working Group, 2001 (personal communication).

DRUMMER O., “Drugs in drivers killed in Australian road accidents: the use of responsibility analysis to investigate the contribution of drugs to fatal accidents”, Victorian Institute of Forensic Pathology, Department of Forensic Medicine, Monash University, Victoria, 1994.

DUSSAULT C, BRAULT M., LEMIRE A.M. and BOUCHARD J., “Le rôle de l’alcohol et des autres drogues dans les accidents mortels de la route au Québec – Résultats preliminaries”, presented at the France-Quebec-Belgium co-operation seminar in Montreal in May 2002 and communicated in Montreal in August 2002 (16th International conference on alcohol, drugs and traffic safety).

HUNTER C.E., LOKAN R.J., LONGO M.C., WHITE J.M. and WHITE M.A., “The prevalence and role of alcohol, cannabinoids, benzodiazepines and stimulants in non-fatal crashes”, Adelaide, South Australia, Forensic Science, Department for Administrative and Information Services, 1998.

INSERM, *Cannabis: Quels effets sur le comportement et la santé*?, Editions INSERM, joint report, November 2001 (section 8, pp. 165-199).

LONGO M.C., HUNTER C.E., LOKAN R.J., WHITE J.M. and WHITE M.A., “The prevalence of alcohol, cannabinoids, benzodiazepines and stimulants amongst injured drivers and their role in driver culpability: part ii: the relationship between drug prevalence and drug concentration, and driver culpability, *Accid Anal Prev* 2000, 32, pp 623-632.

MURA P, GAULIER J.M., GOULLE J.P., VINCENT F, MOULSMA M and KINTZ P., “Prévalence de l’usage récent de psychotropes licites et illicites chez 900 conducteurs accidentés: comparaison avec 900 témoins”, *Annales de Toxicologie Analytique*, 2001, 13 : 306

SCHERMANN J. M., GIRRE C. and FACY F., “Evaluation du risque d’accident de la circulation lié à l’absorption de drogues illicites”, Rapport de convention DSCR,1992

TERHUNE K and FELL J., “The role of alcohol, marijuana, and other drugs in the accidents of injured drivers”, Report DOT HS 5 001179, NHTSA ed, 1982.

TERHUNE K, IPPOLITO C, HENDRIKS D, MICHALOVIC J, BOGEMA S and SANTIGA P., “The incidence and role of drugs in fatally injured drivers, Report DOT HS 808 O65, NTHSA ed, 1992.

WARD NJ. AND DYE L., “Cannabis and driving. A review of the literature and commentary”, Ed Department of the environment, transport and the regions. London road safety research report no. 12 , 1999, p. 94.

WILLIAMS A, PEAT M, CROUCH D, WELLS J and FINKLE B., “Drugs in fatally injured young male drivers”, *Public Health Report* 1985, 100, pp.19-25.

Alcohol and cannabis and their impact on driving

by Robert Tunbridge (United Kingdom)

Keywords
Alcohol, Cannabis, Impairment, Driving, Simulator

Abstract
The objective of this research was to provide reliable data, under laboratory conditions, on the impairing effects on driving of cannabis alone, and also in combination with alcohol. It was concluded that driving under the influence of cannabis adversely affects driver performance. The consumption of alcohol, at the relatively low doses used in this study, added to this adverse effect, but not to a degree that is statistically significant.

Introduction
The most recent of TRL's major studies investigating the incidence of alcohol and drugs in road accident fatalities (1) has shown a large increase in the incidence of drugs present in fatal casualties (drivers, riders, passengers and pedestrians). Among all road users illicit drugs were present in 18% of fatalities. These figures represent a six-fold increase in the detected incidence of illicit drugs present in fatalities since the previous, similar, study 12 years earlier (2). In the most recent research cannabis constituted around two thirds of the illegal drugs found in fatalities. In the study of fatalities referred to above, 24% of the drivers who had consumed cannabis were also over the drink/drive limit, and a further 16% had consumed some alcohol but were below the legal limit.

Anecdotal evidence suggests that regular cannabis users often consume alcohol during a cannabis-smoking session. The amount of alcohol they consume is usually below the legal limit, and hence they may believe that their driving is unaffected by the alcohol. It is therefore important to establish the degree of impairment caused by such a dose of alcohol in combination with a typical cannabis dose. In 1999, the (now) DfT (Department for Transport,) commissioned a review of the latest evidence of the impairment effects of cannabis. The report of that review provided an overview of the effects of cannabis on driving and accident risk and identified areas where current knowledge was deemed to be insufficient to guide road safety policy.

This raised important questions, which have now been addressed by a research project carried out by TRL for Road Safety Division, DfT (Department for Transport), to investigate the degree to which cannabis impairs psychomotor and cognitive skills relevant to the driving task. Phase 1 (3) of this first UK study had the following objectives.

- To provide reliable data, under laboratory conditions, on the impairing effects of cannabis on driving.
- To determine the duration and extent of any impairment under different degrees of intoxication (using different levels of cannabis).

- To provide an overview of attitudes and habits of cannabis users in relation to driving and explore factors which may influence the decision to drive under its influence.

The objectives were addressed using male drivers who were experienced cannabis users. These subjects carried out a variety of laboratory-based tasks and drove in the TRL simulator under four cannabis conditions: placebo; low Δ^9-THC (the main active cannabinoid of tetrahydrocannabinol); high Δ^9-THC; and cannabis resin.

The second phase, reported here, considers the influence of alcohol in combination with cannabis. This research has two objectives:

- To provide reliable data, under laboratory conditions, on the impairing effects of the combination of moderate doses of cannabis and alcohol on driving;
- To investigate whether police surgeons can readily distinguish between unimpaired individuals and those impaired by alcohol, cannabis and by a combination of the two.

Background

It is well known that cannabis is often taken in conjunction with alcohol. Previous comparative studies have generally compared the effects of high doses of alcohol with those of medium-to-low doses of the active ingredient in cannabis, Δ^9-THC. It has been well established that alcohol has severe impairing effects at high blood alcohol concentrations whilst performance decrements have been demonstrated at concentrations as low as 30mg/100ml. It has also been shown that approximately 10 mg Δ^9-THC is required to induce a close to 'normal use' level of cannabis intoxication.

Previous studies have shown that simulated and actual driving and divided-attention tasks are severely affected by alcohol. Simple vigilance tasks are not so much affected and tasks such as tracking and reaction-time tasks are only affected at relatively high blood alcohol levels. Alcohol may, therefore, be seen as first disturbing the higher cognitive processes. Such disturbances are greater than the losses in psychomotor skills and simple attentional processes. However, it is well recognised that at alcohol levels of 80mg/100ml (the UK legal limit), or more, impairment effects are significantly increased.

In contrast, previous studies with cannabis show that it first seems to affect all tasks requiring psychomotor skills and continuous attention. Thus, tracking tasks, which are very sensitive to short term changes in attention, are very sensitive to cannabis impairment. On the other hand, multi-task processes and higher cognitive functions are less time-critical: a short attention lapse can be compensated for by increased activity later.

In the case of the driving task, this may explain the frequently repeated observation that drivers under the influence of cannabis drive more slowly, presumably to lower the difficulty of the driving task and its time-critical aspects in an attempt to compensate for the impairment of psychomotor skills and losses in continuous attention.

Method

The study was designed for a classic crossover design analysis of variance with planned comparisons. Participants (n=20) were male drivers who were experienced cannabis and alcohol users. They were recruited, medically screened and tested under conditions of a strict protocol that had local ethics committee approval. They were required to carry out laboratory-based tasks and to drive in the TRL driving simulator under two cannabis conditions. These conditions were placebo and low dose cannabis. The low dose was herbal cannabis ('grass') containing about 10mg active ingredient (Δ^9- THC). There were also two alcohol conditions: placebo and a dose to give a blood alcohol concentration (BAC) of 50mg of alcohol per 100ml of blood. Participants received one of 4 treatments: placebo cannabis and placebo alcohol, cannabis dose plus placebo alcohol, placebo cannabis plus alcohol dose or cannabis and alcohol together.

Experimental procedures included the formal sobriety testing of participants, conducted by two experienced Police Surgeons/Forensic Medical Examiners. Participants also completed a mood questionnaire at different times during their visit.

The alcoholic drink was administered before smoking so as to allow the maximum impairment effects to occur at about the same point in time. In this way the typical low level use of these substances was replicated within the trial, so that the impairing effects could be related to 'real life' situations.

Samples of saliva were taken 10 minutes after smoking and 25-35 minutes after smoking. A final saliva sample was taken 95 minutes after smoking. Participants attended once for each treatment level, and had a week washout period between treatments.

A range of different measures was obtained during the trial, using the TRL driving simulator, hazard perception task and adaptive tracking test. Participants were tested with a Breath test meter (Lion SD-400) on arrival to check that they had not been drinking. They were asked to complete a mood questionnaire at various stages of their trial session. They also took a sobriety test that was administered by a Police Surgeon.

A range of measures was derived for each participant when driving the TRL simulator[20]. These measures were designed to assess different skills. A motorway driving section assessed reaction times to adverse events; a 'figure of eight' measures control skills in staying within a lane on a road with changing radius curve.

For the hazard perception task video films of different driving sequences were shown on a large screen. The assessment measures derived were the average reaction time and proportion of hazards that were detected. The TRL Adaptive Tracking Test is based on one developed at the RAF Institute of Aviation Medicine in Farnborough and tests a subject's ability to co-ordinate eye and hand. The mean speed is used in the analysis, the higher it is the better tracking task ability.

[20] The TRL driving simulator is a real medium-sized saloon car (a Rover 414Sli) surrounded by three 3 metre x 4 metre screens to the front providing 210° front/side image and one rear screen providing normal rear vision using vehicle mirrors. It has been shown to be a valuable tool for measuring drug-induced impairment in drivers.

Sobriety tests were conducted by Police Surgeons (Forensic Medical Examiners) who are very familiar with the usual procedures followed for suspects in police custody. A standardised examination form used was used, adapted from the Police Research Group report (4). This included impairment testing covering pupil size and reaction to light; presence of lateral and vertical nystagmus and convergence; walk and turn test; one leg stand; finger-nose test; Romberg test (internal clock); and an example of handwriting. The physical examination included the general demeanour and behaviour of the individual, examination of speech, pulse, temperature, ears, eyes, heart, lungs, blood pressure and reflexes. The physician was asked to conclude whether, in their opinion, the individual was impaired, or whether there was a condition that might be due to the presence of a drug.

Results

The principal results and those of statistical significance are summarised below. A full report is now available from TRL or DfT.

Table 1. Minimum, maximum and average speeds on the motorway drive

			Sample size	Mean (mph)	Std. Error	95% Confidence Interval for Mean	
Speed	Cannabis	Alcohol				Lower Bound	Upper Bound
Min	No	No	21	30.77	2.47	24.79	36.75
	Yes	No	20	28.25	1.28	25.13	31.36
	No	Yes	19	29.20	2.75	22.47	35.93
	Yes	Yes	20	30.86	1.88	26.28	35.44
Max	No	No	21	94.27	1.45	90.75	97.78
	Yes	No	20	89.41	1.50	85.77	93.05
	No	Yes	19	97.54	3.06	90.06	105.02
	Yes	Yes	20	89.78	2.40	83.95	95.61
Ave	No	No	21	72.49	1.60	68.61	76.37
	Yes	No	20	67.41	1.63	63.45	71.37
	No	Yes	19	72.45	2.51	66.32	78.58
	Yes	Yes	20	65.87	1.94	61.16	70.58

Table 1 shows the average speeds while driving the motorway section, also the mean of the minimum and maximum speeds of the individual drivers. The mean values for maximum speed suggest that subjects drive slower when they have smoked cannabis, and this effect was not offset by drinking a relatively low dose of alcohol. Average speed was at least 5 mph slower with a cannabis dose. The maximum speed of drivers under the influence of alcohol alone was significantly faster than that of those driving under the influence of cannabis either alone or with alcohol.

The mean time headway values (distance between own vehicle and the target vehicle) to pulling-out and braking events are shown in Table 2. There is an increase in average headway times when doses involving cannabis (or cannabis & alcohol) are compared to doses with no cannabis.

Table 2. Time headway (secs) on the motorway drive

			Sample size	Mean (secs)	Std. Error	95% Confidence Interval for Mean	
	Cannabis	Alcohol				Lower Bound	Upper Bound
Pulling-out	No	No	21	0.55	0.049	0.43	0.67
	Yes	No	20	0.78	0.087	0.57	1.00
	No	Yes	19	0.65	0.068	0.48	0.82
	Yes	Yes	20	0.80	0.102	0.55	1.05
Braking	No	No	21	0.68	0.052	0.56	0.81
	Yes	No	20	1.02	0.113	0.74	1.30
	No	Yes	18	0.73	0.068	0.57	0.90
	Yes	Yes	20	1.00	0.080	0.81	1.20

The time headway increases when subjects have been given cannabis (on average between 0.2 and 0.3 seconds), which suggests that they are driving at a more cautious distance from the vehicle in front.

The measure being assessed when participants are driving round the 'figure of eight' was the SDLP (Standard Deviation of Lateral Position), in the road lane. This was measured by the variability in the lateral lane position and the standard deviation of the lateral position was used as a metric. The mean values of the SDLP are given in Table 3.

Table 3. Average standard deviation of lateral position on figure of eight drive

			Sample size	Mean (metres)	Std. Error	95% Confidence Interval for Mean	
	Cannabis	Alcohol				Lower	Upper
Left curve	No	No	21	0.23	0.015	0.19	0.26
	Yes	No	19	0.22	0.016	0.18	0.26
	No	Yes	19	0.22	0.014	0.19	0.26
	Yes	Yes	19	0.23	0.017	0.19	0.27
Right curve	No	No	21	0.21	0.011	0.18	0.24
	Yes	No	20	0.24	0.016	0.21	0.28
	No	Yes	19	0.21	0.014	0.18	0.25
	Yes	Yes	20	0.25	0.013	0.22	0.28

Measurements of the adaptive tracking task (a laboratory task which measures ability to track a moving object on a computer screen) also produced statistically significant results. The adaptive tracking performance deteriorated as the dose level increased, with the tracking performance under the influence of alcohol or the combined influence of cannabis and alcohol being significantly worse than participants' tracking performance under no active dose.

It is clear from the results presented in Tables 1-3, that there were some significant effects on driver's performance of driving under the influence of cannabis. Their tracking ability is impaired and an awareness of their own impairment appears to result not only in slower average speed (about 7% slower on average), but causes them to leave a larger gap from the vehicle in front. This observation however, does not necessarily imply that their driving is safer, because the effects of cannabis on higher cognitive functions are more difficult to measure, but may have an adverse effect on safety. Cannabis therefore appears to impair tracking ability and also to reduce a driver's confidence, which can also be regarded as an impairing effect.

The results of sobriety testing showed a correlation between the active cannabis dose received and whether impairment was judged to be present. On the basis of these observations, the general medical examination and standardised impairment testing applied by the police surgeons were judged to be effective in determining impairment. The police surgeons drew preliminary conclusions as to the number and combination of failures of impairment-test elements needed to determine that a subject was significantly "impaired". The sobriety test findings can only be regarded as a preliminary assessment of how people under the influence of drugs and/or alcohol experience impairment and how this impairment may be independently judged and recorded. It does, however, suggest that individual participants are aware of their own impairment to a greater extent than is generally realised, and that this impairment may be detected in sobriety or performance tests.

The results of this study confirmed those of the previous trial involving cannabis alone. It was concluded that cannabis has a measurably worsening effect on psychomotor performance, particularly tracking ability. Drivers under the influence of cannabis seem to attempt to compensate to some extent for the impairment (that they recognise) by driving more slowly, but there are some aspects of the driving task where cannabis-impaired drivers cannot compensate and where their performance deteriorates (e.g. staying in lane on a bend). Within the sample of drivers, the effect of alcohol (at a dose of just more than half of the UK legal limit) and cannabis together were slightly greater than with cannabis alone; a larger sample would be needed to determine whether this is likely to apply to the population as a whole. There was no evidence that either alcohol or cannabis offset the effect of the other: impairment levels for cannabis or cannabis with alcohol remained significantly greater than placebo.

Conclusions

This research has:

- demonstrated the practicability of assessing the effects of cannabis and alcohol on driving performance in controlled experimental clinical trials;
- confirmed the results from previous studies that drivers under the influence of cannabis are aware of their impairment, attempt to compensate for their impairment by driving more cautiously, but are unable to compensate for the loss of capability in some psychomotor skills;
- confirmed previous observations that cannabis adversely affects drivers' tracking ability;
- found that tracking performance deteriorated with increasing dose level;
- judged that the general medical examination and standardised impairment testing applied by the police surgeons were generally effective in determining impairment.

In terms of road safety the results show a worsening of driver capability following the ingestion of cannabis or the ingestion of cannabis and alcohol together at the doses used, in comparison with placebo (i.e. having taken neither). Within the sample of drivers, the effects of alcohol (at a dose of just more than half of the UK legal limit) and cannabis taken together were slightly greater than with cannabis alone. Given that other research has extensively shown the rapid increase in the risk of accident, particularly fatal accident, with increasing blood alcohol level, the present results show how important it is to avoid any combination of alcohol and cannabis, as well as avoiding alcohol and cannabis taken on their own, before driving or riding.

References

1. Tunbridge RJ., Keigan M. and James FJ(2001). The Incidence of Drugs and Alcohol in Road Accident Fatalities, TRL Report 495, Transport Research Laboratory Crowthorne.

2. Everest JT, Tunbridge RJ and Widdop B. (1989). The Incidence of Drugs in Road Accident Fatalities. TRRL Report RR202. Transport and Road Research Laboratory, Crowthorne.

3. Sexton B F, Tunbridge R J, Brook-Carter N, Jackson P J, Wright K, Stark M M and Engelhart K, (2000) The Influence of Cannabis on Driving. TRL Report 477, Transport Research Laboratory, Crowthorne, Berkshire.

4. Fleming P and Stewart D (1998) Drugs and Driving: Training Implications for Police Officers and Police Surgeons. Police Research Group. London. Home Office.

Prevalence of drugs and driving in Ireland

by Pauline Leavy (Ireland)

Introduction

Driving under the influence of drugs (DUID) has been illegal under statute since the 1961 Road Traffic Act (RTA) in Ireland. The Medical Bureau of Road Safety (MBRS) is the independent statutory body responsible for the chemical testing of intoxicants in driving. Under the current 1994 RTA, the MBRS is responsible for analysis of specimens for the concentration of alcohol and for the presence of a drug or drugs. The alcohol limit is 80 mg/100ml of blood, 107mg/100ml urine and 35ug/100ml breath. The DUID situation in Ireland can be divided into two areas, the Drugs and Driving National Survey undertaken in 2000-2001 and analysis for DUID prosecution purposes 2000 – 2002.

Drugs and driving national survey 2000 –2001

Survey Set-up

The government's first strategy for Road Safety to reduce the level of fatalities and serious injuries on our roads was introduced in 1998. One of the aspects targeted in the strategy was driver behaviour. As well as changing drink- driving behaviour the strategy also identified the need for research into the area of drugs and driving. The MBRS was commissioned to carry out a nation-wide survey on the current trends and epidemiology of DUID in Ireland.
In 2000, the MBRS chose 7 drugs or drug classes to examine, these are as follows: Amphetamine, Methamphetamine, Benzodiazepines, Cannabinoids, Cocaine, Opiates and Methadone.

Table 1 outlines the drug classes, analytes and cut-off levels for screening and confirmatory analysis.

Drug or Drug class	Analyte	Screening Cut-off (ng/ml)	Confirmation cut-off (ng/ml) at lod
Amphetamine	Amphetamine, MDA	50 (B) 300 (U)	50 (B & U)
Methamphetamine	MDMA	50 (B) 300 (U)	20 (B) 50 (U)
Benzodiazepines	Diazepam, Flunitrazepam, Flurazepam, Nitrazepam, Nordiazepam, Temazepam	100 (B & U)	20 (B & U)
Cannabinoids	11 nor-, delta – 9 – Carboxy-Tetrahydrocannabinol	20* (B & U)	5 (B & U)
Cocaine	Cocaine, Benzolyecgonine, Ecgonine methyl ester	100 (B & U)	50 (B & U)
Methadone	Methadone, EDDP	25 (B & U)	30 (B & U)
Opiates	Codeine, Dihydrocodeine, Morphine, 6MAM	100* (B & U)	50 (B & U)

These drug types were chosen in consultation with the toxicology section of the State Laboratory who also undertook to carry out the confirmatory analyses on all of the drugs found. The Garda National Traffic Bureau (GNTB) also undertook to provide additional data such as, age and sex of the driver as this information is not currently available on the Section 18 Doctors Form which accompanies the specimen to the MBRS. Information such as location, date and time of provision of specimen are provided.

The Bureau receives specimens from the whole country, and 1000 over the limit and 1000 under the limit for alcohol blood and urine specimens where chosen for examination. The number chosen was considered to be large and random enough for an epidemiological survey.

Another action of the government's strategy was the introduction of evidential breath alcohol testing. This commenced in late 1999 with the installation of four instruments in Garda stations, increasing to sixty nation-wide by end 2002.

The 1000 over the limit were split into 2 batches, the first 500 where taken at the beginning of 2000 before the nation-wide implementation of Evidential Breath Alcohol Testing (EBT). The second 500 were taken from the end of 2000, when 25 instruments had been installed in Garda stations. As expected it took over 2 years to accumulate the 1000 under the limit for alcohol specimens.

There is no provision for collection of specimens from the ordinary motorist without evidence of impairment (no random testing) therefore it was decided to use the specimens already provided under the Road Traffic Act for this survey. This is a limitation on the information collected, as it does not give a complete survey of the general driving population.

Another aspect of the survey that was beyond the control of the MBRS was the driver option under the road traffic act to provide a blood or urine specimen.

Approximately 60% of the specimens received were blood specimens.

Results of Survey

Screening Results

All specimens were analysed in the Bureau for all 7 drugs or drug types using an enzyme immunoassay technique. Microplate kits were purchased from Cozart UK. The preliminary results indicated 46% under the legal alcohol limit and 26% over the legal limit contain drugs. Poly-drug use was observed at a level of 31% in the over the legal alcohol limit and 62% under the legal limit. The most common class found was cannabis and the least common drug was cocaine. The MBRS conducted a limited survey previously (1987-1991) which indicated 14.6% of urine under the limit samples screened positive for drugs and 6.6% over the limit urine specimens screened positive for drugs. This latest survey while it cannot be directly compared gives rise for concern however with the obvious increase in preliminary detection of drugs found.

Confirmatory Results

All positives were then forwarded to the State Laboratory for confirmatory analysis. This was carried out using GC/MS or LC/MS analysis. 65% of the results were confirmed positive, 34% were not confirmed and 1% had no results available due mainly to insufficient specimen amounts to complete the analysis.
The disparity of confirmed to unconfirmed highlights the possibility of false positives and the need for the further analysis. Also in our case the screening cut off values chosen at the beginning of the survey were considered too low and were adjusted.

The frequencies of individual drug or drug class are outlined in Table 2 and Poly-drug Frequency is outlined in Table 3.

Table 2:

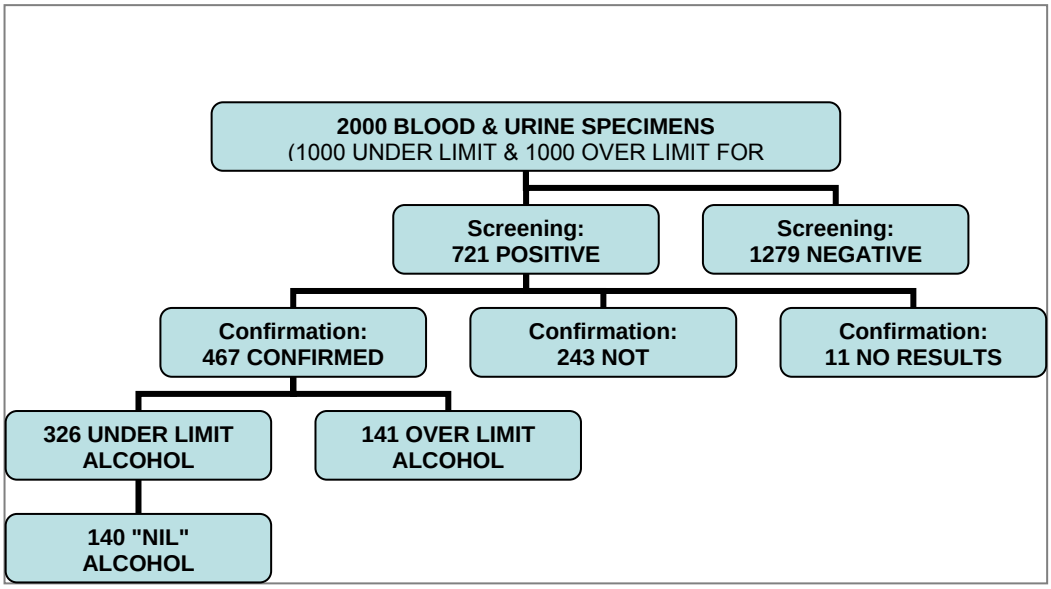
Alcohol limit/ Drug class	**Under limit**	Over limit
Amphetamine	84	15
Methamphetamine	90	20
Benzodiazepines	90	34
Cannabinoids	209	85
Cocaine	25	9
Methadone	69	8
Opiates	68	6

Table 3:

Drug classes positive	Under alcohol limit	Over alcohol limit
1 drug	156	120
2 drugs	87	12
3 drugs	58	8
4 drugs	20	1
5 drugs	5	0

Chart 1 outlines an overview of the survey.

Chart 1. Overview of Survey



Further Epidemiological Analysis

The additional information obtained in this survey is presently being analysed by our colleagues in the Department of Public Health Medicine and Epidemiology in University College Dublin. Our final report is due for completion later this year.

Outcome of Survey

The analysis of the data collected from this survey will be useful to many interested parties. It will establish current trends of DUID in Ireland. It will be invaluable to the government in formulating legislation on drugs driving for Ireland such as alcohol and drug use, poly-drug use and the need for roadside screening for drug detection in its fight for road safety. It will provide the MBRS with knowledge of DUID issues especially in the areas of analysis, analytical support for Court purposes and training of gardai. It should also be useful to the general Medical Practitioner and general public to raise awareness of the dangers of driving with medicinal drugs. Finally it should be very useful in assisting prevention strategies for the future.

Analysis for duid prosecution purposes 2000 –2002

Table 4 outlines the numbers of specimens analysed for alcohol and drugs since 1995. The numbers for drug analyses while increasing remains a very small proportion of the overall numbers analysed by the MBRS for intoxicated driving. Almost 400 drug analyses compared with over 12,500 alcohol analyses in 2002.

Table 4:

Year	Specimen type	Alcohol analysis	Drug analysis
1995	Blood & Urine	4766	8
1996	Blood & Urine	5514	16
1997	Blood & Urine	6591	24
1998	Blood & Urine	7812	32
1999	Blood & Urine	8476	50
2000	Blood, Urine & Breath	10,134	78
2001	Blood, Urine & Breath	12,503	131
2002	Blood, Urine & Breath	12,668	388

** Evidential breath testing for alcohol introduced late 1999.*

The DUID results for the last three years are set out in Table 5.

Table 5:

Year	N° of specimens analysed	N° of specimens positive	% N° of specimens positive
2000	78	56	72
2001	131	96	73
2002	388	117	30

Drug analyses were only carried out on specimens specifically requested for drug analyses in the years 2000 and 2001. Following the end of the National Survey in 2001, it was decided that in future all under the limit for alcohol specimens forwarded to the MBRS would be analysed for the presence of a drug or drugs. This explains the apparent increase in the number of DUID analyses in 2002. Another influence on the increased numbers was the introduction in mid 2001 of a statutory certificate for the presence of drugs under the 1994 RTA. This has assisted the Gardai in increasing its enforcement and prosecution of DUID.
An area of disappointment to the MBRS is the very small number of drug requests received following EBT testing. Only 3 requests (2 blood & 1 urine) were received in 2001 and 4 requests (2 blood & 2 urine) received in 2002. This is certainly unlike the experience of Norway!

Table 6 outlines the frequency of drug or drug class found over the three years. It is difficult to see any trends in this small collection of data. This could also be due to the changes in the selection criteria as mentioned but also to a change in the confirmation analyses selection criteria. Again following the completion of the National Survey, the State Laboratory now only confirm two analytes in poly-drug cases. The sample amounts and the need for faster turnaround times have resulted in the adoption of this two-analyte policy.

Table 6:

Year/ Drug class	2000	2001	2002
Amphetamine	22	24	14
Amphetamine	22	18	13
Benzodiazepines	16	20	35
Cannabinoids	20	54	32
Cocaine	6	10	10
Methadone	17	25	39
Opiates	14	24	37

Conclusion

DUID is as significant a problem in Ireland as in other European countries. The numbers detected are very small compared to the apparent problem as estimated from the data already known from the National Survey. There is an urgent need to improve detection at the roadside. The introduction of a DRE programme is needed while we await the development of efficient roadside screening devices. There is a need to educate drivers and the relevant statutory agencies on the issues of DUID. Finally there is a need to improve analytical support for court purposes.

The study of DUID in Ireland is an ongoing process.

The French national study on the role of drugs in fatal road accidents

by Hélène Martineau (France)

A large-scale epidemiological study looking into the link between fatal road accidents and the consumption of drugs has been under way in France since 1 October 2001. The task of overseeing this work was assigned to the French Drugs and Drug Addiction Observatory. This contribution sets out to provide information on the structure of the study, the information gathering system put in place at that time and the difficulties encountered since 1 October 2001.

Context of the study

This study is being carried out in application of Law No. 99-505 of 18 June 1999 on various road safety measures, including the establishment of the systematic drug screening of drivers involved in fatal accidents (Section 9). The implementing regulations for this law were published on 27 August 2001 (Decree No. 2001-751 on the screening for drugs in drivers involved in fatal road accidents).

During the debate on these legislative instruments, attention turned again to the question of creating a specific offence of driving under the influence of drugs, a question that has been regularly raised in France since 1995. A decision on this had been postponed owing to a lack of scientific data on a causal link between the consumption of drugs and road accidents and a lack of a roadside testing and analysis system. The Bill for the above law called for systematic screening in the case of fatal accidents in order to make it possible *"to improve knowledge in this area and, in due course, to base thereon specific and appropriate prohibition and punitive measures concerning driving under the influence of drugs"* (Draft Law No. 302 of 19 February 1998).

Recently, this issue has again been raised before the National Assembly and provisions making it an offence for "any person driving a vehicle […] and found after a blood analysis to have used substances or plants classified as drugs" were introduced by Law No. 2003-87 of 3 February 2003. Screening remains compulsory in the case of fatal accidents and is optional in other circumstances. No-one doubts the necessity for carrying out a national study based on these tests[21].

[21] As the state of knowledge was insufficient, the legislature did not make it an offence to drive "under the influence" of drugs but to drive "after having used" drugs.

The development of French legislation over the last ten years is the subject of a parallel contribution by Professor Got[22], who goes into the background to the conception of this study, the issues involved, the problems raised during the examination of the texts between February 1998, the date of the tabling of the draft law and August 2001, the date of the adoption of the Decree[23], as well as the impact of the most recent legislative developments on these screening arrangements. It is therefore not necessary to elaborate on these aspects here.

Presentation of the study

Since 1 October 2001, drivers involved in fatal road accidents have been subject to a drugs test. The results of the analyses carried out and the accident procedures will enable a national study to be carried out.

Aims of the study

In compliance with the legislature's expectations, the principal aims of the study, as mentioned in the terms of reference, are as follows:

"This study should provide a response to the question of the role of the consumption of drugs in fatal road accidents.

The main aims of this study are:

- to assess the quality of the screening tests;
- to define and implement the appropriate measurement methods enabling the role of drugs in fatal accidents to be ascertained (especially in terms of prevalence, relative risks and attributable risks);
- to assess the extent to which the consumption of alcohol and psychoactive drugs contributes to accidents.
-

Particular attention should be paid to possible confusion factors, and precise details will have to be given of how they have been taken into consideration together with proposals for how they are to be assessed."

The planned analysis

Researchers were therefore required to establish the role of drugs of abuse in these accidents (calculation of the relative risks) and comment on the quality of the tests employed (urine screening and confirmation with a blood sample by means of gas chromatography combined with mass spectrometry).

[22] See his presentation in this publication

[23] This issue was also the subject of a paper at the conference organised by the ICADTS (International Council on Alcohol, Drugs & Traffic Safety) in August 2002: H. Martineau, "Political context of the setting up of a national epidemiological study in France", in Mayhew and Dussault (eds.), *Proceedings of the 16th International Conference on Alcohol, Drugs and Traffic Safety*, 2002, pp.431-436.

In order to calculate the relative risks, the control population would consist of drivers who were not responsible for the accident. The degree of responsibility would be determined by various experts in accordance with the method known in international literature as "*responsibility analysis"* and close to that developed by K.W. Terhune: the accident details would be submitted to the experts but the elements likely to constitute confusion factors, such as the possible consumption of alcohol, the age and gender of the persons involved, etc would be omitted. The experts would thus determine the degree of responsibility (on a scale of 6) and therefore establish a confidence level for this assessment.

The arrangements for carrying out, monitoring and evaluating the study

The team selected to carry out this study comprises some twenty researchers and specialists in epidemiology and accidentology[24] to ensure that all the areas of investigation covered by the study are dealt with.

At the same time, two bodies are carefully monitoring the progress of the study:
A scientific committee, made up of French and foreign researchers chosen for their competence in the fields of accidentology and epidemiology, was set up to examine and select offers to contribute to the study before the work on it began. Their role will also be to assess the final report submitted by the lead team, at the end of 2004. It is also possible to call upon their expertise in the course of the study.

A steering group made up of representatives of the institutions involved was set up to implement the drug screening procedure and ensure the smooth running of the scientific study. This committee has played a decisive role in improving the screening arrangements in the case of fatal accidents, as we shall see below.

The information gathering arrangements

In response to recommendations made by several experts, the law provides for a systematic urine test for drugs (cannabis and derivatives, opiates, cocaine and amphetamines) on all drivers involved in an immediately fatal road accident between 1 October 2001 and 1 October 2003. When the test is positive, a blood sample is taken and sent to a laboratory, which informs the authorities of the dosage of drugs and of any medication taken (anxiolytic drugs, hypnotic drugs, anti-depressants and substitute products – methadone or Subutex). At the same time, a medical examination is carried out when the subject's condition permits it. Any alcohol-related results are automatically provided in this type of accident[25].

[24] The team is made up of researchers from various laboratories of the National Transport and Road Safety Research Institute (INRETS), the National Health and Medical Research Institute (INSERM), the European Centre for Safety and Risk Analysis Studies (CEESAR) and the Laboratoire d'Accidentologie, de Biomécanique et d'Études du comportement humain PSA Peugeot-Citroën/RENAULT (LAB).

[25] Initially, the only penalty provided for was for refusing to undergo these tests. Since 31 March 2003 (the date of the decree implementing Law No. 2003-87), driving after using drugs of abuse has carried a prison sentence of two years and a fine of 4,500 euros (the sentence is increased if the person was also under the influence of alcohol).

What advantages and shortcoming does this instrument have for the study currently under way?

- The study only deals with fatal accidents and not all accidents involving physical injury, which some MPs or senators called for. It was actually not possible to carry out drug screening after all accidents involving physical injury (about 120,000 annually in the last few years), since the procedure is relatively cumbersome for the police (see below) and costly for the authorities. Fatal accidents, which total about 7,000 in France, provide a very satisfactory statistical basis for conducting the epidemiological study.

- The accidents concerned are ones that are "immediately fatal". An accident is usually considered fatal in France if one of the persons involved dies within six days, but in the case of drug screening the period between the accident and the taking of the urine or blood sample must be as short as possible. Police officers must not look for the people involved several days after the accident in order to have them undergo a test.

- The first estimates were of approximately 6,000 immediately fatal accidents a year (i.e., about 12,000 for the entire period of the study).

- Screening is only carried out on drivers involved in these accidents. Pedestrians are excluded (as they are from alcohol screening) even though their action may play an important role in the accident.

- In the terms of reference, the annual number of drivers involved (and therefore subjected to a urine test or blood analysis) has been estimated at around 9,500.

- When the procedure was being drawn up, the substances to be screened for were also discussed. Screening for alcohol is automatic, and tests for "substances or plants classified as drugs" (the purpose of the study) concern products belonging to the cannabis family, amphetamines, cocaine and opiates.

  On the other hand, there was much more debate on the question of screening for psychoactive drugs. The desirability of testing for them is undeniable: it is recognised that the use of medicinal drugs is a risk factor for a driver and it is essential to know all the psychoactive substances used by the driver examined. However, screening for these drugs is more complicated and more expensive than for narcotics (as the number of products to be tested for is very high) and it was decided that it should be the subject of another study. Screening for medicinal drugs is therefore only envisaged after a positive result has been obtained on the dosage of narcotics abuse, as a possible confusion factor.

  The new law of 2003 modifies this provision. It was considered that the question of medicinal drugs must be dealt with separately from the legal provisions created to deal with the use of narcotics while driving, since medicines are legal products that "cannot be the subject of a purely punitive approach". Screening for them will therefore be done at the request of the public prosecutor or the person concerned – or perhaps his or her dependants – in the case of a second expert opinion, in order

to prove, for example, that the driver was under medication (substitute opiates, morphine derivatives, etc.).

New difficulties arose between the definition of the drug screening procedure and its implementation.

Difficulties encountered in gathering information

There were three main difficulties, namely:

a) carrying out roadside screening
b) the transmission of police reports to the OFDT
c) the quality of the police reports

Roadside tests

Like any new legislation, it takes a certain amount of time for it to be digested by the bodies responsible for implementing it, in spite of the large number of circular letters sent out by the ministries concerned. In February 2002, a memorandum was prepared by the OFDT and distributed to all the departments by their headquarters in order to make certain points of the procedure clear:

- The concept of an "immediately fatal" accident was not understood in the same way by all departments. The circular from the Ministry of Justice states that the study concerns "*accidents that have resulted in the immediate death of one or more persons whose decease has been established at the location of the accident by a doctor of an emergency service "* (or a local doctor if it is not necessary to call out the emergency services). The subsequent analysis of the police reports makes it possible to verify if the accidents for which drug-screening tests have been carried out meet the conditions defined in the legislative instruments. A large number of authorities continue to call the OFDT for clarification on this point (especially with respect to cases where death occurs on the way to the hospital).
- The choice of screening method was specified in an order from the Ministry of Health. A urine sample is required for the test and a blood sample to establish the dosage of drugs. When a person has died, it is recommended that a blood sample be taken immediately (an attempt is sometimes made to take a urine sample). The problem is that certain hospitals take a blood sample straightaway whatever the driver's condition, so it is necessary to remind those concerned of the importance for the study to test the effectiveness of the urine screening method with a view to broadening the detection of drugs in vehicle drivers.
- The period between the adoption of the decree and the launch of the study was very short (1 month) and the materials (screening tests, equipment necessary for taking blood samples, fact sheets for the results) were not necessarily available everywhere.
- At the moment, some units are still complaining about the time-consuming procedure, which requires them to spend several hours of their time accompanying the driver to a doctor competent to carry out screening tests and then waiting for the results before perhaps having a blood sample taken. This is why in 2003 the legislature did not make screening for drugs compulsory in the case of accidents involving physical injury. The procedure could not have been carried out at the roadside.

After describing the drug screening procedure, the legislation states that the information must be sent to the OFDT after it has been entered in the police report and when the investigation or inquiry or investigation has been completed. The documents to be attached are also mentioned. These two aspects raise new difficulties.

Transmission of police reports to the OFDT

Here, too, like any new procedure, it took a certain amount of time for the accident files to reach the OFDT. At 10 June 2003, the OFDT had received more than 6,500 files but only 55% of them had been sent automatically, the others having required specific action on the part of the OFDT. This action is described below

What are the principal obstacles to the transmission of files to the OFDT?

- At the moment, police forces must make four copies in the case of a fatal accident (one for their files, one for the public prosecutor's office, one for the insurers[26] and one for the OFDT). Sometimes, this extra work has been all the less welcome as the aim is to carry out an epidemiological study, without any direct legal consequences. This is an approach that the law enforcement officers are not used to.
- It was also necessary to state that all police reports were important for the researchers, and not only those where the test is positive. Here, too, the justification is solely scientific (setting up the control group for the responsibility analysis).
- The main problem is the police reports that are sent directly to the judicial authorities by the police forces and therefore reach the OFDT in a roundabout way. This is the usual police procedure. The decree adopts this arrangement (the case file is transmitted to the OFDT on the instructions of the public prosecutor), even though the aim of this provision was to enable the public prosecutor to object, in exceptional cases, to a case file being sent off. Failing any explicit instructions, many forces prefer to send to the public prosecutor the copy intended for the OFDT, which, in order to obtain it, will have to request it by letter.

Apart from dealing with the problems on a case-by-case basis, the OFDT periodically sends out a considerable number of reminders to try to obtain the files it has not received automatically. A letter is sent to all the police units that have reported a fatal road accident asking them to send the police report if they have forgotten to do so or to state why this has not been done. They must first state whether the accident was immediately fatal. Only a list of accidents involving death within six days exists at the moment[27], but it is indispensable for this study as it will also make it possible to examine the representative nature of the accidents studied.

[26] TransPV is sent a copy of all the files pertaining to road accidents involving physical injury, death or material damage and forwards one copy to the insurance companies concerned. This transmission is governed by a departmental circular dating from 1983 but remains subject to the approval of the public prosecutor's office.

[27] The National Interdepartmental Road Safety Observatory (ONISR) has placed at the team's disposal the national register of accidents involving physical injury, which has been compiled on the basis of the road accident reports produced by all the services involved at the time. This register contains information on the characteristics of the accident as well as the location, the vehicles and the road users involved.

As a result of the reminders sent out by the OFDT, 2,500 police reports have been obtained in response to the almost 5,000 letters despatched. About 13% of accidents have been identified as not being immediately fatal and have thus been excluded from the study. The OFDT estimates it has received approximately 75% of the police reports relevant to the study.

This work, which aims to be exhaustive with respect to the reports on the immediately fatal accidents that took place between October 2001 and 2003, means that the OFDT is no longer able to verify the contents of the reports received, which are sent to the research team as they are. It is up to the latter to bring the missing items to the notice of the OFDT, which will have to recover them from the units in the field.

The quality of the police reports

The decree lists the documents to be sent to the OFDT in order for the epidemiological study to be carried out: one copy of the complete police report, comprising the transcripts of the accident reports, interviews with the parties and the witnesses, the sketches produced at the scene of the accident, the photographs taken and, of course, the documents on the screening procedure and the dosage of drugs, alcohol and, in some cases, medication. Fact sheets, based on the model of those existing for alcohol and enabling the clinical acts performed to be recorded, have been produced for this purpose.

Here, too, it is difficult for the OFDT to receive all these documents automatically, since the police units are not familiar with this procedure[28]. The main difficulties are due to:

- The poor quality of the photocopies, making the examination sheets and, more often, the photographs taken at the scene of the accident illegible and therefore useless. This latter element is, however, indispensable as the determination of the responsibility of the people involved is based on an in-depth appraisal of the circumstances of the accident.
- Some packets sent by mail contain only the results of the screening for products, but, for the same reasons as those mentioned above, the entire report is necessary.
- The absence of the results of the toxicological analysis (sheets not filled in or not supplied), either because the laboratory has sent the results directly to the judicial authorities without informing the police unit (which retains the incomplete file) or – more often than not – the laboratory is behind with its analyses. In certain regions, the delay can be six months or more[29].

[28] It should be noted that many police units only record one fatal accident a year, which makes it difficult for them to familiarise themselves with the procedure.

[29] And the delays risk becoming longer with the implementation of the Law of 3 February 2003, which reduces the number of laboratories authorised to carry out these analyses to experts of the judicial authorities since the procedure now takes place within a strictly judicial framework.

The arrangements for the epidemiological study expire on 1 October 2003 but it will take several months for the OFDT, together with the team of researchers and the steering committee, to obtain the police reports and the missing documents. The first results of the study, at least with respect to the main objectives, are expected at the end of 2004. However, the database thus built up will be a mine of information for complementary studies.

Conclusion

As Ms Biecheler pointed out in the preceding contribution[30], we still only have a partial knowledge of the role of cannabis in traffic accidents. Although this study is not based on the case control method recommended, it does have the advantage of being based on a large accident sample (12,000 police reports expected, thus providing the responsibility analysis method with the sound basis it has often lacked in previous studies. Moreover, in contrast to the other studies, drug screening is also carried out on drivers who have not been injured, since they might be responsible for the accident. From the methodological point of view, the French study currently under way is relatively pioneering.

The setting up of the study is interesting since it reveals a situation in which a scientific argument has had a considerable impact on a political decision, namely to delay making driving under the influence of drugs a criminal offence, owing to the lack of scientific evidence of a causal link between this action and the occurrence of an accident. The new French legislation has got round this difficulty by creating an offence of driving “after having used drugs”, leaving open the possibility of revising the law following the results of the epidemiological study considered here.

The legal context of this study presents both advantages and drawbacks. First of all, this is the only way to carry out large-scale screening without having to obtain the consent of the persons concerned[31]. The sample thus put together should cover nearly 12,000 accidents and some 19,000 drivers, while the major epidemiological studies concern 2,500 deceased individuals. This legal framework also provides a guarantee of being able to obtain information from the police, who are required to comply with the wording of the law (even if the scientific argument is not automatically accepted).

On the other hand, the procedure is inflexible and very difficult to modify now that the laws have been passed,. Most of the difficulties encountered in implementing the study arise from ambiguities in the wording or interpretation of the texts, so it is essential to ensure good co-operation with everyone involved in the procedure. The role of the steering group is crucial in this connection. It is also necessary to anticipate all these difficulties by gathering together both experts and the parties involved on the spot in the early stages of the drafting of new laws and designing the investigation form. Let us hope that the difficulties encountered in the work monitoring this study can serve other countries interested in such a project as examples of what to avoid.

[30] See her presentation in this publication

[31] In the context of this study, refusal is possible but is a punishable offence.

The use of alcohol and other psychoactive substances by victims of traffic accidents in Greece

by Constantin Maravelias (Greece)

Scientists, today, are convinced that alcohol impairs driving skills and increases crash risk (1). During the last decade 21.3% of all fatal accidents, within the European Union, were related to alcohol consumption (2). Recent data also reveal that illicit and certain medicinal drugs can also impair driving skills. This has particularly drawn the attention of governmental officials since this use reaches from 42% to 74%, respectively, among the 13 European countries studied (3-4).

With regard to Greece, alcoholism does not seem to exist as a major socio-medical problem. The consumption of alcoholic beverages, however, is very frequent and sometimes beyond the 'normal' or socially 'accepted' limits. Alcohol consumption is considered to be one of the main causes of traffic accidents in this country. Moreover, due to the synergistic actions of both alcohol and other psychoactive substances on the CNS and their prevalence in traffic accidents, their use by drivers or even pedestrians, has become the object of increasing interest.

This study presents the results of a toxicological investigation concerning cases of traffic accidents that were performed by the Department of Forensic Medicine and Toxicology of the University of Athens during the years I995 to 2002. It must be mentioned that our Department covers the major part of Greece which includes the entire area of Attica, including Athens, where most of the population of Greece lives. The results are classified according to blood alcohol concentrations (BAC), the kind of psychoactive substance detected, as well as gender and age of drivers or pedestrians involved in these traffic accidents.

Alcohol analysis was performed in whole blood samples while utilizing a GC headspace method [5]. Psychoactive substances were detected in urine samples using screening techniques (TDx, Abbott, ETS, Syva, and Triage, Merck), and their presence was confirmed by GC/MS according to the standardized procedures and methods for both urine and blood [6,7].

According to the existing legislation today in Greece, individuals with a BAC higher than 0.5%0 (50 mg/dl) are considered to be driving ‘under the influence’ of alcohol. If the individual has a BAC level between 0.5-0.8%0 (50-80 mg/dl), 0.8%-1.1%0 (80-110 mg/dl) or it is higher than 110 mg/dl, the fines and punishment which are enforced on the driver become even stricter. This can even result in the suspension of the driving licence of the individual or even imprisonment. If an individual is prosecuted for a second time for ‘driving under the influence’ of alcohol, his or her car could also be confiscated. Supportive evidence, however, concerning his or her behaviour and driving performance, is required to be co-evaluated in order for the individual to be considered incapable of driving a vehicle, and whether or not he or she must face the legal, penal or civil responsibilities.

In Greece, a significant percentage (37%) of the drivers that were involved in traffic accidents during the years 1995 to 2002 had consumed an alcoholic beverage alone, or in combination with other drugs, shortly before the accident (Fig.1). This percentage, however, is somewhat smaller than the 41% which was determined during the first 3 years of the study. In 25% of the drivers the BAC was higher than 80 mg/dl, in 4% of the drivers it was between 50-80 mg/dl and in 5% of the drivers it was below 50 mg/dl (Fig.2). It must be mentioned, though, that the above percentages are only an approximation since the concentrations reported here refer to the time of sampling. The exact time that the victims survived or elapsed after the accident is not known for most of the cases, considering that at the time of the accident the victims had higher BACs. It should also be noted that the percentages presented here are in agreement with the ones observed in previous studies that came out of our Department in the past [8,9].

The use of psychoactive substances, other than alcohol, appears to be increasing among the Greek drivers. In other words, 9% compared to 6% five years ago (9). The psychoactive substances that were most commonly detected are: cannabinoids 4%, CNS stimulants (mainly cocaine) 1%, opiates 3.7% and benzodiazepines 4%, whose therapeutic use cannot be excluded (fig.3). This increasing number of psychoactive substances used by the Greek drivers may be partially due to the tendency of young Greek people to use psychoactive substances today. It may also be partially due to today's better collaboration between our lab and the police on correct sampling procedures.

Fig. 4 shows that the majority of the drivers that were involved in traffic accidents were between the ages of 15 and 34. The positive cases for alcohol consumption, though, seem to be almost the same between the ages 15-24, 25-34, and 35-44. The majority of both positive and negative cases, as illustrated in Fig. 5, involved men. This is expected since many more Greek men possess a driver's licence than Greek women. Moreover, it should be emphasized that, according to our data (Fig.6), traffic accidents occur in Greece at the same rate at all hours of the day. However, in 60% of the accidents that occurred during the hours of 22:00-6:00, alcohol and/or psychoactive substances were found in the blood of the drivers. This number of course was greater during the week-ends (Fig. 7). Furthermore, most of the accidents took place at our national or rural road networks, which are mostly used by men. These findings are in agreement with the ones reported in the literature for other countries [10,11].

The number of the pedestrians that died in a traffic accident during the years 1995 to 2002 is nearly 10% of the total number of cases studied (n=235, Fig. 8). Alcohol was detected in the blood of 31% of all pedestrian victims which indicates that alcohol probably contributed to the cause of the accident. Benzodiazepines were detected alone, or in combination with alcohol, at a percentage of 3% which differs with the one detected in Greek drivers. The number of positive cases is small and could not be further evaluated. Benzodiazepines, mainly flunitrazepam, lorazepam, diazepam and bromazepam, were the major groups of psychoactive substances detected.

More importantly, a significant factor for the involvement of pedestrians in traffic accidents seems to be their age. The majority of the victims (61%) were older than 65 years (fig.9). Decreased reflexes, impaired vision and hearing ability, reduced attention and slowness while crossing a road are all characteristics of older people [12,13]. These 'characteristics' are enhanced by the use of alcohol and/or psychoactive substances, and they seem to be responsible for the involvement of the pedestrians in a traffic accident. The gender of the pedestrians seems irrelevant in this case (52% men, 48% women) (fig.10). However, the actual number of the pedestrians that were involved in a traffic accident during the years studied is much larger than the one reported here. Unfortunately, the cases that were investigated in our laboratory were only the fatal ones. Even though the data presented in this study is considered an approximation it can still be used to draw some conclusions.

The results of our study prove indeed that alcohol still remains one of the major factors of traffic accidents in our country. Alcohol is responsible for 33% of traffic accidents when it is used alone and 37% of accidents when it is combined with other drugs. The extent of its use among Greek drivers has remained at approximately the same levels for the last 20 years. During the last five years, though, this seems to have been decreasing. Male drivers between the ages of 15 to 34 years old and pedestrians of both sexes aged greater than 65 are more likely to be involved in traffic accidents. The use of psychoactive substances, other than alcohol, by the victims of traffic accidents in Greece appears to be increasing when one compares this number with the one in the past. This unfortunate conclusion, however, coincides with the fact that the use of drugs in Greece, in general, is increasing.

The continuous and systematic follow-up studies will help to monitor the problem and to better estimate its extent. Essentially, the studies will assist the responsible authorities in planning and evaluating preventive measures and methods of intervention in order to decrease the number of traffic accidents caused by the use of alcohol and/or other psychoactive substances in Greece.

References

1. H. Moskowitz, D. Fiorentino. A review of the literature on the effects of low doses of alcohol on driving-related skills. National Highway Traffic Safety Administration (NHTSA), Washington, DC, 2000.

2. European Commission , Communication from the Commission to the Council. The European Parliament. The Economic and Social Committee and The Committee of The Regions: Priorities in EU Road Safety Progress Report and Ranking of Actions (COM 2000 125 tinal), European Commission, Brussels, 2000.

3. Pompidou Group, Road Traffic and Drugs, Council of Europe, Pompidou Group, Strasbourg, 1999.

4. J. J. de Gier, Review of investigation of prevalence of illicit drugs in road traffic in different European Countries, in: Road Traffic and Drugs, Council of Europe, Pompidou Group, Strasbourg, 1999, pp. 13-61.

5. B. Ioffe, A.G. Vitenberg, Headspace Analysis and Related Methods in Gas Chromatography, John Wiley, New York, 1984.

6. Recommended Methods for the Detection and Assay of Heroin, Cannabinoids, Cocaine, Amphetamine, Methamphetamine and Ring-Substituted Amphetamine Derivatives in Biological Specimens, Manual for Use by National Laboratories, *ST/NAR/27,* United Nations, 1995.

7. Recommended Methods for the Detection and Assay of Barbiturates and Benzodiazepines in Biological Specimens, Manual for Use by National Laboratories, *ST/NAR/28,* United Nations, 1997.

8. N. Benardis, C. Maravelias, G. Dimopoulos, S. Athanaselis, H. Spiliopoulos, A. Koutselinis, Alcohol consumption: one of the main factors of traffic accidents (a statistica1 eva1uation of cases in Greece), in: VIIes Joumées Intemationales Mediterranéennes De Médecine Légale, Seville, 3-6 September, 1986.

9. S. Athanaselis, A. Dona, S. Papadodima, G. Papoutsis, C. Maravelias, A. Koutselinis, The use of alcohol and other psychoactive substances by victims in Greece, Forensic Sci. Int.102(1999) 103-109.

10. O.T. Holubowycz, C.N. K1oeden, A.J. McLean, Age, sex, and blood alcohol concentration of killed and injured drivers, drivers, and passengers, Accid. Anal. Prev. 26 (1994) 483-492.

11. P.F. Walle, F.C. Blow, Women, alcohol, and driving, Alcohol 12 (1995) 103-123.

12. O.T. Holubowycz, Age, sex, and blood alcohol concentration of killed and injured pedestrians, Accid. Anal. Prev. 27 (1995) 417-422.

13. J. Oxley, B. Fildes, E. Ihsen, J. Charlton, R. Day, Differences in traffic judgments between young and old adult pedestrians, Accid. Anal. Prev. 29 (1997) 839-847.

Figure 1

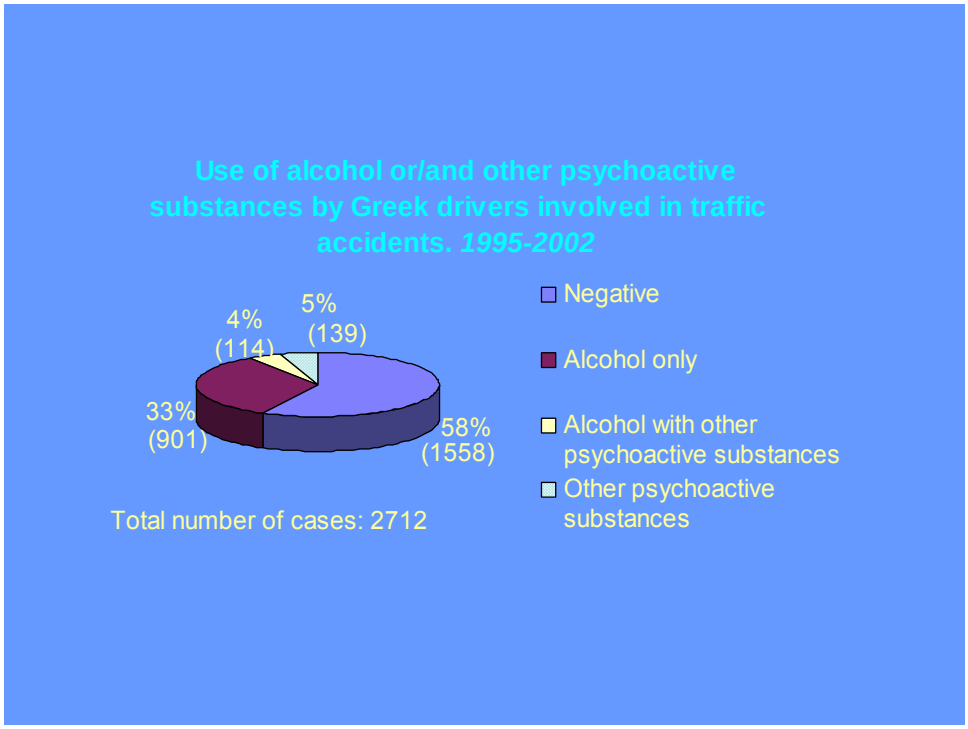


Figure 2

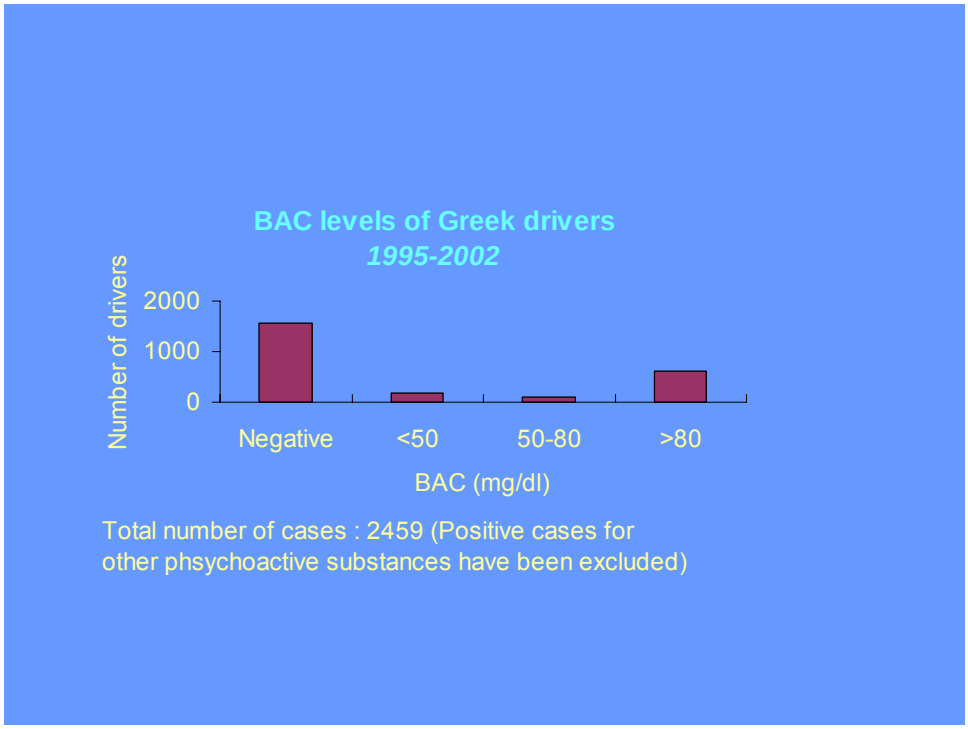


Figure 3

Use of alcohol and other psychoactive substances by the Greek drivers involved in trafic accidents. *1995-2002*

Alcohol*	**37,2%**
Cannabinoids*	**4,0%**
Central stimulants*	**1,0%**
Opiates-Opioids*	**3,7%**
Benzodiazepines*	**4,0%**

*each class of substances is found alone or in combination with others

Figure 4

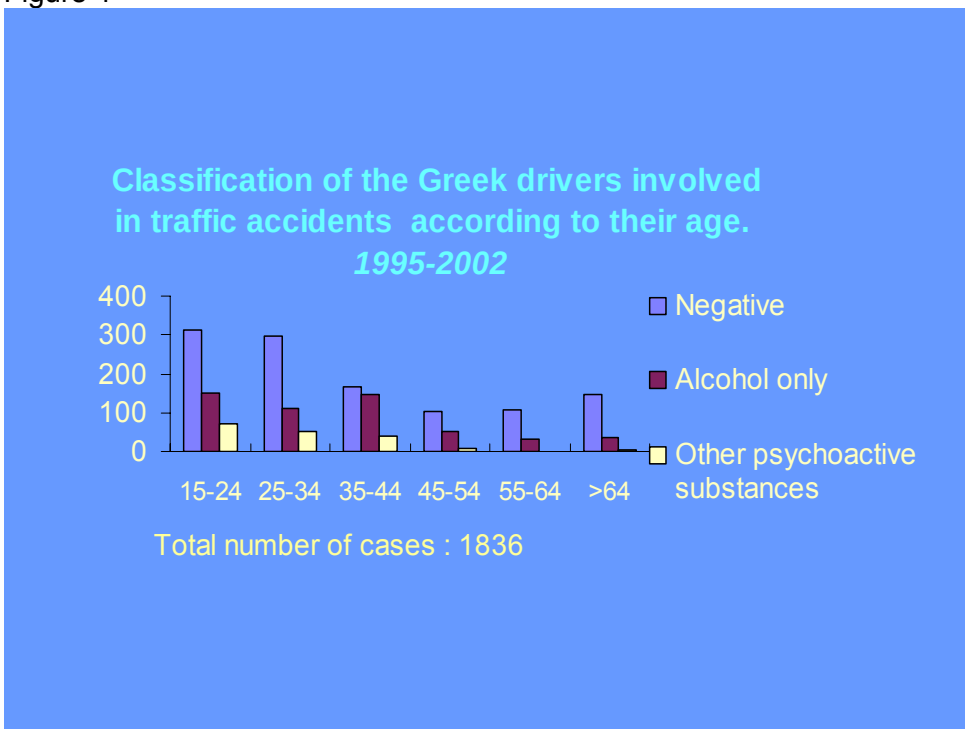


Figure 5

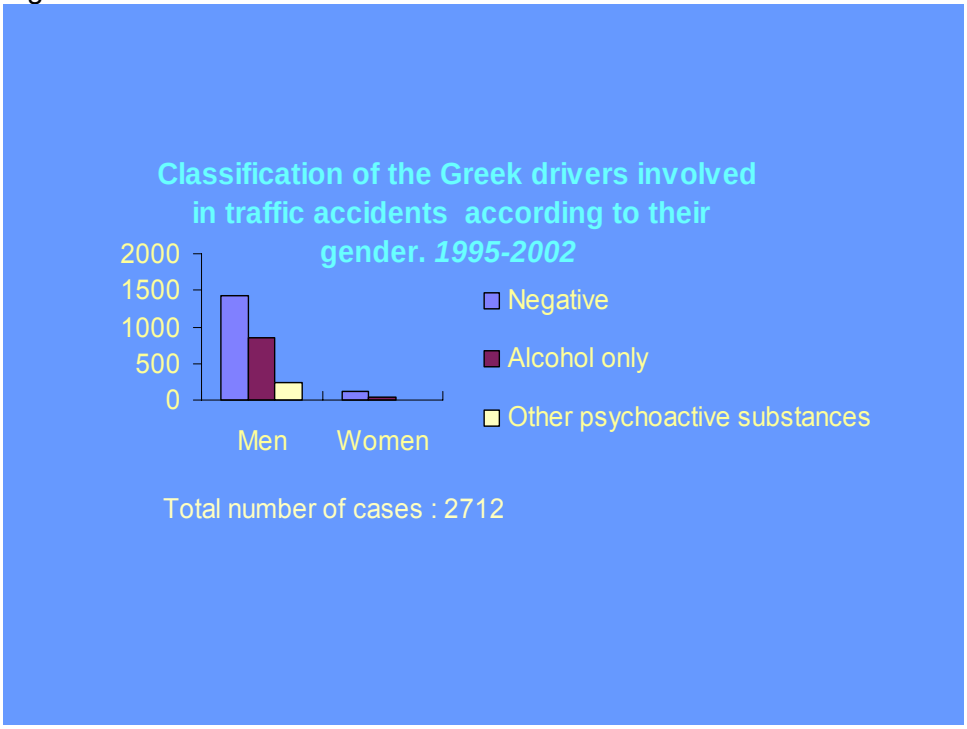


Figure 6

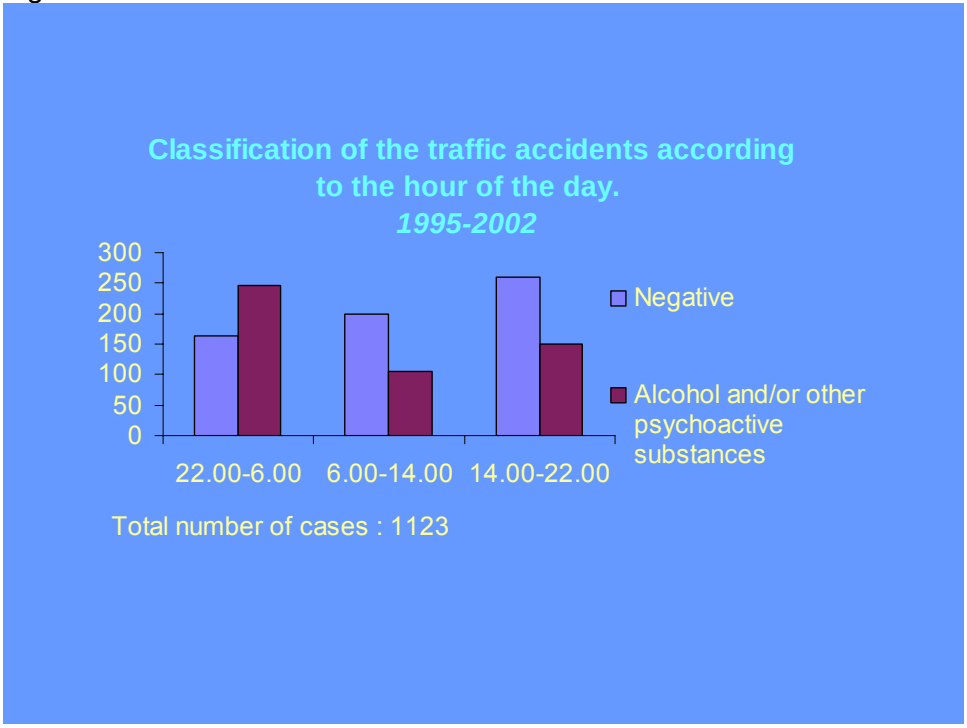


Figure 7

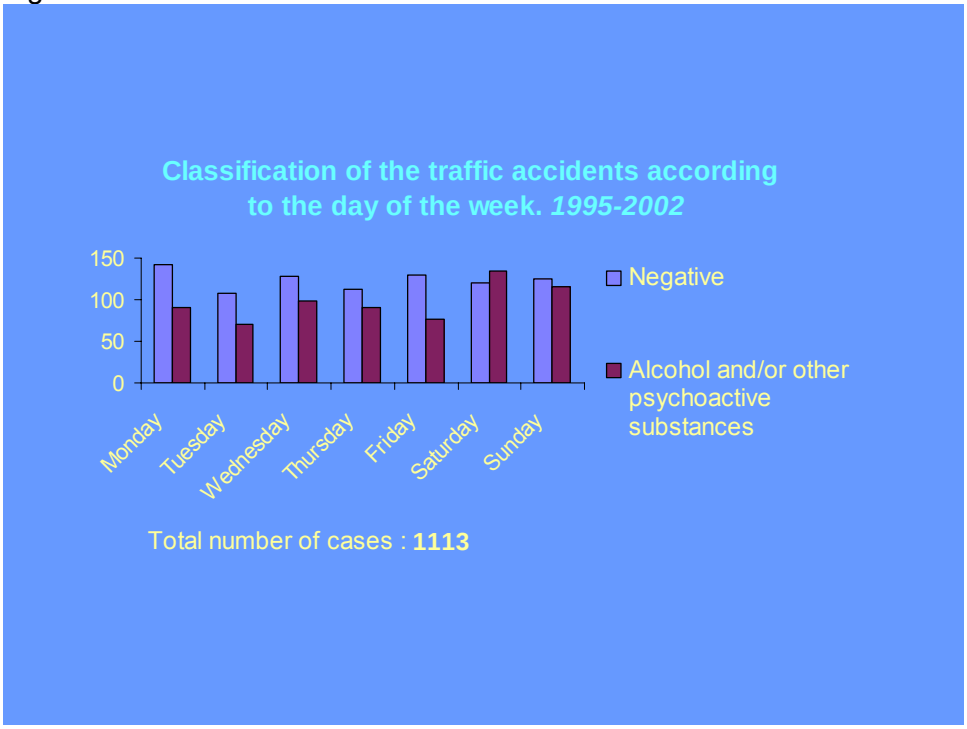


Figure 8

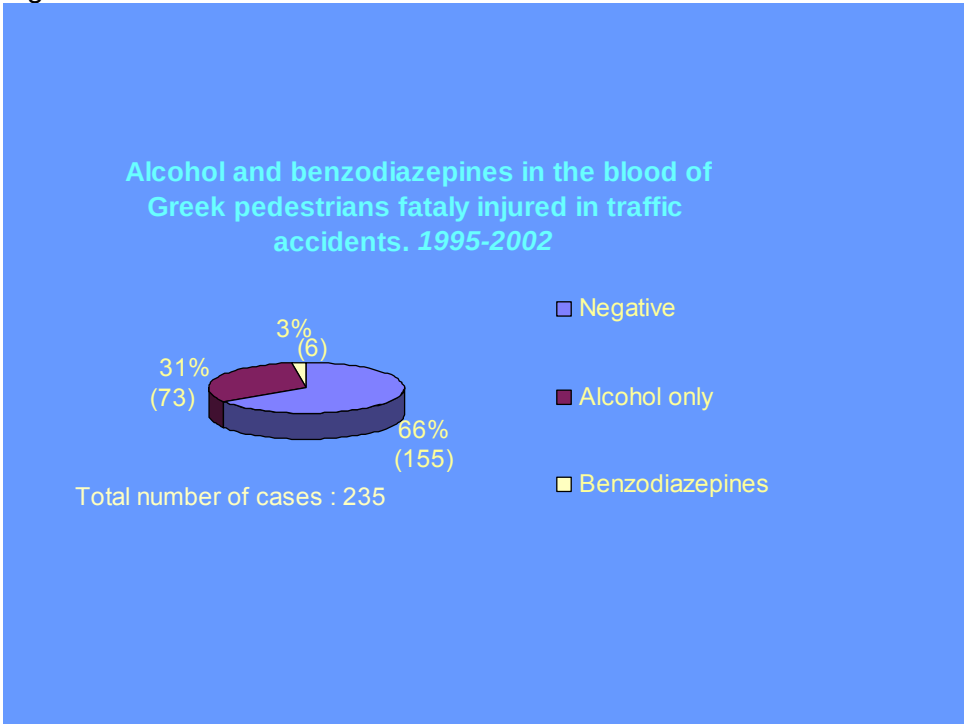


Figure 9

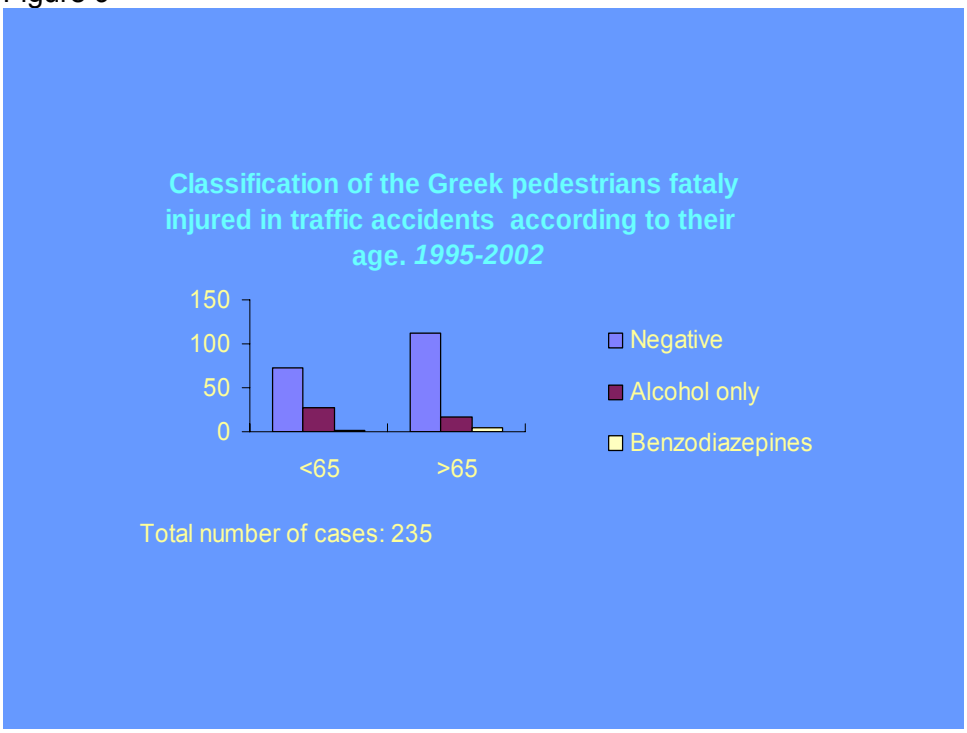
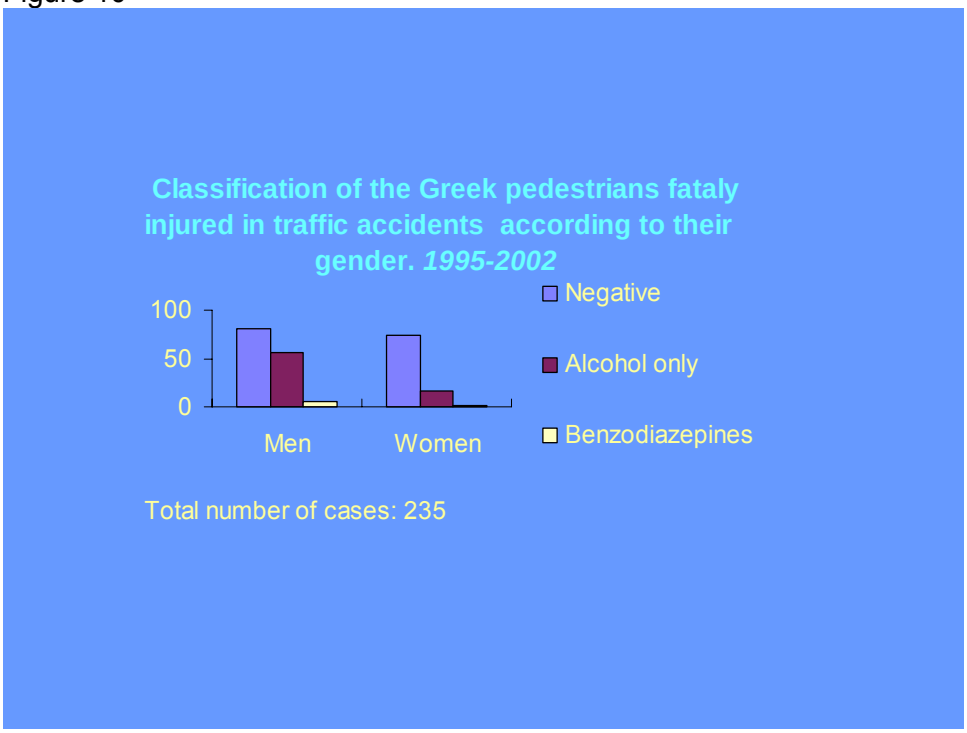


Figure 10



DRE training: what's new in the United Kingdom

by John S Oliver (United Kingdom)

Traditionally, the policing of drivers who drive under the influence of alcohol or drugs in the United Kingdom has been based on driver impairment. Police Officers would make arrests based on their subjective judgement on manner of driving and observations of the driver (e.g. smell, slurring of speech, inability to stand etc). Medical examination was used to confirm findings as a requisite part of the procedure prior to a charge being made.

In 1967, the Road Safety Act introduced a fixed level offence for alcohol in blood or urine whilst driving. It introduced the use of initial roadside breath testing for screening purposes. A failure required the driver to be arrested and conveyed to the Police Station were he was subjected to another breath test. Where the second breath test gave a positive result, the driver would be required to provide a specimen of blood or urine which would be analysed for evidential purposes. For the Forensic Science Laboratory, the analysis of the biological specimens had a significant impact on the workload. The Strathclyde Police Forensic Science Laboratory, for example, required the input of two scientists operating 4 days per week to cope with the demands.

The analysis of biological specimens quickly demonstrated the scale of the problem. For the drivers arrested, the mean blood alcohol level was more than twice the United Kingdom legal limit of 80 milligrams of alcohol per 100 millilitres of blood set in the United Kingdom with some drivers driving with levels in excess of 400 milligrams of alcohol per 100 millilitres[32].

The 1981 Road Transport Act introduced a fixed limit for alcohol in breath and gave Police Officers a more rapid means of dealing with motorists through the introduction of the evidential breath-testing device. The requirement to wait until a Medical Practitioner could take a blood sample was mostly removed allowing the Traffic Officer to return quickly to his duties.

These measures provided an efficient means of controlling driving under the influence of alcohol and they were easy to apply. This meant that basic Police skills in judging impairment was largely lost. The effect of this was that the Police lacked the skills to judge the impairment of drivers driving under the influence of non-alcoholic substances. Anecdotal evidence is available to the effect that drivers who were obviously impaired but did not fail breath tests were not processed further through the uncertainty of the Police Officer in how to handle the case. Impairment based Law was never repealed and is still contained in our legislation.

[32] J.S. Oliver, W.J. Rodger, E. Sloan and H. Smith. *'Alcohol and Driving'*, Medicine, Science and the Law, (1975), 15.3, pp 211-217.

Two Strathclyde Police Officers were so concerned that they made a case to study procedures in other jurisdictions. They were funded by the Home Office and, as a result, their report was published in 1998.[33] In addition, they reviewed the training given to Police Officers and Police Surgeons. The response to their questionnaire demonstrated that those concerned felt that their required training was inadequate and left them ill equipped to deal with the drug impaired driver. Following a study visit to the United States, they recommended that Police Officers be trained in both the use of Drug Recognition techniques and the use of a standard set of divided attention tests to be applied at the roadside. The roadside testing involved the observation of driver pupil size having due regard to the lighting conditions, Romberg test, One leg stand test, Walk and Turn test and Finger to Nose test. Each test would be carried out in a standard format with clear instructions read to the driver from a card carried by the Officer.

A brief trial was conducted by the Transport Research Laboratory and the Department for Transport (the then DETR) in1998. The results were published and demonstrated a good correlation between the analytical results and the observations of the Police Officers.[34]

Subsequent to this, in 2001, the Department for Transport commissioned research into the effectiveness of Field Impairment Testing. This project involved the collection of data over a two-year period ending on 30th June 2003. Thereafter, all observations will be subject to statistical analysis prior to reporting. Drivers were selected for participation if the Police Officer had sufficient evidence from manner of driving to instigate the impaired driving procedure. Additionally, the driver would not have failed a roadside breath alcohol test. If impairment were still suspected, the driver would be asked to participate in the field impairment test on a voluntary basis. If this testing of the driver did not show signs of impairment, the procedure for his arrest would be stopped and he would be asked to provide a saliva sample on an anonymous basis for the purpose of this study. This was used to verify that the driver was indeed clear of drugs. Both this sample and the form containing the observations of the Police Officer would be sent to the research team for analysis.

If testing of the driver continued to show signs of impairment or if he did not participate in the field impairment testing, he would be arrested. Thereafter, a Forensic Medical Officer would examine him. If found to have a condition that may be due to drugs, the driver would be required to provide a blood or urine sample for analysis. Refusal to provide a sample would result in the same penalty as being found guilty by the court for driving under the influence of drugs. Normally this would be loss of driver's licence for a period of one year and a monetary penalty for a first offence.

For drivers that provided a biological sample, the laboratory result is matched to the roadside testing form and sent to the research team for analysis.

---

[33] Fleming, P and Stewart, D. "Drugs and Driving: Training Implications for Police Officers and Police Surgeons" Crown Copyright, Home Office, January 1997

[34] Tunbridge, RJ, Keigan, M. and James, FJ. "Recognising Drug Use and Drug Related Impairment in Drivers at the Roadside" TRL Report Number 464, Transport Research Laboratory, Old Wokingham Road, Berkshire, RG45 6AU, 2000

The details of the final outcomes of this research are not yet available since data is still being collected. It is proposed to release full details at the forthcoming conference of the International Council on Alcohol Drugs and Traffic Safety to be held in Glasgow, Scotland in August 2004[35]

Initial observations do, however, give a positive indication of their effectiveness. Prior to the introduction of the tests, out of 824 samples received between 1995 and 2001 in Scotland, 87% were found to contain drugs and/or alcohol. If alcohol positives are removed from the equation, 72% were found to contain drugs. This clearly identified a problem with the processing of the drivers. Over the study period for the current testing, the number of samples received on an annual basis has, if anything, increased. Also, between 94 and 97% of the samples received were found to contain significant levels of drugs. Similar results have been obtained from other Forensic Laboratories in England[36]. This does demonstrate a positive outcome of the introduction of the Field Impairment Test.

The use of only one drug was confirmed in 24% of the positive cases. The remaining cases involved two or more drugs. Although this would tend to suggest that drug recognition would be a problem for the Police Officer, initial examination of the results did show that their predictions were fairly good. They were able to predict at least one of the drugs found in many of the cases.

Drugs and driving in the United Kingdom demonstrates a pattern of drug misuse that is very similar to that found in deaths from drugs of abuse. It rarely involves prescription medicines unless, like the benzodiazepine group, they are abused and taken in excess of normal therapeutic usage. This is illustrated by the findings in the former Strathclyde Region of Scotland (Table 1).

Although roadside testing for drugs using saliva would be acceptable to the public, the ROSITA 1 project demonstrated that no suitable device was available at that time.[37]
The results of the new ROSITA project are awaited with interest and it is hoped that the extra years' of development will result in a roadside testing device that will fulfil the requirements of the Police. However, such a device is not an infallible answer to the question of impairment. Unless a portable instrument can be found to link psychometric test results to an individual's ability to drive, we neglect the training of our Police Officers at our peril.

[35] www.icadts2004.com

[36] Personal Communication, Mr R Agombar, Police Liaison Officer, Department for Transport.

[37] www.rosita.org

TABLE 1 : Driving Under the Influence of Drugs vs Drug Related Deaths (Strathclyde, Scotland, 2001)

	DIAZEPAM	MORPHINE	CANNABIS	METHADONE	COCAINE	ECSTASY	TEMAZEPAM	DIHYDROCODEINE	AMPHETAMINE	CARBAMAZEPINE	OTHER
DUID	108	53	41	24	19	13	7	5	3	2	6
DRDs	94	142	23	29	11	7	6	20	4	4	

Recent developments in United States drug evaluation and classification, and implications for further adaptation in Europe

by M.W. Bud Perrine and Frances B. Huessy (United States of America)

1. Abstract

The behavioral basis for the systematic recognition and evaluation of drug impaired drivers was developed in Los Angeles in the late 1970s. These early efforts were motivated by the need to fill an important gap in the knowledge and methods necessary to control and arrest drug-impaired drivers, in the absence of a rapid, valid drug-screening test. The emerging Drug Evaluation and Classification Program (DECP), in which police officers are trained as Drug Recognition Experts (DREs), was implemented and then tested both in the field and in the laboratory. It was concluded by the relevant federal agencies (the National Highway Traffic Safety Administration and the National Institute on Drug Abuse) that the DECP was sufficiently valid to merit broad support and distribution throughout the United States.

To date, 37 (of the 50) states and the District of Columbia are participating in the DECP, which now has 5,551 certified DREs. In addition, there are certified DREs in Canada, the United Kingdom, and South Africa.

The DECP is described briefly, and the training requirements are summarized. Legal and court challenges to the DECP and to the testimony of DREs are also briefly considered.

Two new program developments are discussed. First, a training module for identification of psychoactive prescription and over-the-counter medications was added to the DECP curriculum in 1999. Second, Drug Impairment Training for Education Professionals (DITEP) was recently developed and has been provided to schools in 17 states. The relevance of this program to law enforcement in road traffic, and implications of further adaptation of the DECP program in Europe are discussed.

2. The Need, the Response, and the Validity Tests

Several years ago, we provided an analysis of experience in the United States in developing and validating the Drug Evaluation and Classification Program (DECP; Perrine, 2000). Our review of the program indicated that the DECP training for police officers in detecting recent drug use among impaired drivers showed significant promise in providing an effective and valid model for use in a wide variety of jurisdictions and law enforcement climates.

The need for effective identification of recent drug use among suspected drug drivers emerged from a common experience among seasoned police officers: All too often, they were unable to prove their suspicion that a motorist was driving under the influence of drugs (DUID). Because there was, and continues to be, no reliable, valid instrument for testing a driver at roadside for drugs other than alcohol, the only other method available to the officer has typically been a laboratory blood or urine test. Costly, time-consuming, and in some cases, inconclusive, this method is so problematic that many drivers suspected of DUID go free and are released back onto the road.

In response to this important gap in law enforcement practice and public safety, a small group of officers from the Los Angeles Police Department began in the late 1970s to develop a behaviourally based drug recognition procedure for use in the field (Compton, 1986). The series of clinical and psychophysical examinations on a suspected DUID driver was designed to yield evidence that a suspected DUID driver was impaired at the time of the stop or collision. Early training of police officers was sufficiently comprehensive that, prior to implementing the techniques in the field, they were able not only to distinguish correctly which subjects in a laboratory study were impaired or unimpaired, but also to identify correctly the category of drug for nearly 92% of the impaired subjects (Bigelow et al., 1985). Other studies later continued the validation of the training, and in 1990, the DECP was implemented by the National Highway Traffic Safety Administration (NHTSA) and the International Association of Chiefs of Police (IACP) for use among jurisdictions qualifying for the program (Adler & Burns, 1994; Burns & Adler, 1996). The procedures used in training and certifying DREs are reviewed by a technical assistance panel of the IACP, meeting semi-annually and making revisions to the standards, as necessary (Cockroft, 2003).

3. Description of the DECP and Training Requirements

The primary function of the DECP is to train Drug Recognition Experts. The coursework and requirements are consistent across all DECPs, thus ensuring consistency for certification. Briefly, certification requires: (1) successful completion of the Standard Field Sobriety Test (SFST) Course, culminating in a proficiency examination; (2) completion of 9 days of initial briefing and subsequent classroom instruction; and (3) on-the-job training to be completed within 6 months of completing the SFST course. Students must test a minimum of three drug categories and perform 12 supervised evaluations, six of which must be conducted personally (Cockroft, 2003). Further, the DRE candidate's performance must be endorsed by two instructors (Page, 2000). Re-certification every two years requires successful completion of four examinations, eight hours of IACP-approved training, and submitted documentation of current DRE activity (Cockroft, 2003).

Although it is considered an effective, valid, and reliable method of detecting recent drug use among impaired drivers, the time-intensive training involved in certification and re-certification requires a significant commitment of personnel time and funds by local law enforcement agencies and the communities that support them. Thus, to maximize the cost-effectiveness of training DREs, the program tends to be limited to larger cities with a high population density.

A 12-part process for evaluating drug presence includes a standard breath alcohol test; interviews with the driver at the scene; clinical tests of the eyes, vital signs, muscle tone, blood or urine assays; and a written opinion of the evaluator (Page, 2000; Cockroft, 2003).

4. The Four Criminal Justice Elements of a DEC Jurisdiction

A prevailing attitude exists among many Americans that impaired driving is a life-threatening offence that can be reduced by the increased use of enforcement checkpoints and saturation patrols (IACP, 2001). Statistics indicate that 1 in 3 Americans will be affected by DUI or DUID, termed collectively by the IACP as a "violent crime," in their lifetime (IACP, 2001). It is not surprising then that behavioral tests such as SFSTs and observations by trained police – procedures that help determine impairment – are considered so important in the United States, and why their use is increasing. This is an important consideration in recognizing the limits of portability of a DEC program from the United States to another country: The program cannot consist only of training procedures for police officers; it also requires a criminal justice system approach.

Legislation, enforcement, prosecution, and toxicology are the four broad areas in a criminal justice system that establish criteria for a state's qualifying to become a drug evaluation and classification site (Cockroft, 2003; Preusser et al., 1992).

With regard to **legislation**, implied consent laws that allow chemical testing for drugs other than alcohol must be in place. The IACP identifies the "ideal" consent law as one under which the person arrested for impaired driving is considered to have provided consent to all of the following: (1) submitting to more than one test; (2) submitting to a test that uses blood and / or urine, as well as breath; and (3) recognizing that the purpose of the test is to determine the alcohol and / or drug content of the driver's blood.

Law enforcement communities must be willing to designate individuals who will complete the prescribed training and serve as DREs. The police agencies must meet the following criteria: (1) traffic police officers must have already completed Standard Field Sobriety Test (SFST) training that is recognized as consistent with NHTSA / IACP standards; (2) processing of intoxicated arrestees must be reasonably centralized; and (3) good cooperation must exist among the region's various police agencies.

With regard to **prosecution,** the top decision makers of all prosecuting agencies must agree to accept DRE cases. Specifically, they must agree to direct their staff to pursue convictions of the drug-impaired drivers investigated by DREs, and seek acceptance in court of the unique evidence provided by the DREs. This and other elements of the required prosecutorial environment presume that drug drivers are primarily a law enforcement, or criminal, problem. It is uncertain how this requirement could be adapted to a jurisdiction that views drug driving as a public health, not a law enforcement problem.

Finally, with regard to **adequate chemical testing** laboratories, the DEC site must have access to laboratories that have:

(1) adequate equipment, appropriate analytic methods, and skilled personnel to permit detection of common drugs at concentrations associated with impairment;

(2) the ability to maintain an appropriate chain of custody to ensure the admissibility in court of the analytic findings;

(3) the ability to produce the findings quickly enough so that defendants do not lose their rights to a speedy trial;

(4) sufficient, secure funding to cover the costs of the toxicology screens;

(5) a willingness and ability of the laboratory personnel to serve as prosecution witnesses in court; and

(6) the recognition by the laboratory personnel that their role in the DECP is to ascertain the presence of drugs to corroborate the DRE's opinion. That is, it is not the laboratory's role to determine whether impairment exists.

5. Legal Challenges

DECP procedures have been sufficiently evaluated as a valid method for accurately predicting acute administration of psychoactive drugs that, in certain doses, are typically considered illegal in the United States. These include: alprazolam, *d*-amphetamine, marijuana, ethanol, cocaine, and to a lesser extent, codeine. An accurate prediction does not mean that the police officer has proven recent drug consumption in a suspected driver; but current DECP training does allow him / her to reach an opinion about the driver's consumption of any of seven different categories of psychoactive drugs (Heishman et al., 1996; Heishman et al., 1998).

These drug categories are: (1) central nervous system depressants (alcohol, derivatives of barbituric acid, anti-anxiety tranquilizers, etc.); (2) central nervous system stimulants (cocaine, amphetamines, etc.); (3) hallucinogens (peyote, psilocybin, LSD, Ecstasy, etc.); (4) phencyclidine (PCP or angel dust); (5) narcotic analgesics (heroin, opium, morphine, codeine, methadone, etc.); (6) inhalants (volatile solvents, aerosols, anesthetic gases, etc.); and (8) cannabis (marijuana, hashish, hashish oil, etc.).

Because most of the United States' legal system relies on case law (courts hand down written legal opinions on each criminal action that comes before a judge), a defendant charged with a crime is motivated to reduce or otherwise limit the potential for conviction and / or the maximum penalty. If a driver has been arrested following a DRE opinion of drug involvement, case law allows the driver the right to a defence in court. In an effort to avoid a conviction, the defendant may attempt to challenge the legitimacy of the police procedure used in the arrest, citing either new or previously used defences. Until recently, for example, challenges by defendants have occasionally been successful in traffic cases that relied on what could not be proven to be foolproof radar equipment readings to arrest speeding drivers. Further, interpreting drug-driver legislation can be challenging for individual judges (ICADTS Working Group, 2000).

In the United States, numerous cases have been brought before regional courts, as well as in federal courts, challenging the legitimacy of drug recognition expertise, as well as the admissibility of testimony from DRE police officers (National Traffic Law Center, 2001). The list of both federal and local cases does not reveal any successful challenge to the admissibility of a DRE officer's testimony.

6. New Program for Educators (DITEP)

Because the DECP is reviewed semi-annually by the technical assistance panel of the IACP, the curriculum has undergone several revisions. The most recent change to the program was the addition in 2002 of a drug recognition training module for school administrators and nurses (Cockroft, 2003). Known as the Drug Impairment Training for Education Professionals (DITEP), this module is not expected to be implemented in the context of an entire DECP, and this category of professionals is not seeking certification. Instead, these designated school employees learn a systematic approach to recognizing and evaluating students who are impaired by or are abusing drugs. While this development does not have a direct effect on drivers, it is expected to have an indirect effect by reducing the number of drug-using students in jurisdictions where an aggressive evaluation and detection program in schools has been implemented. Thus, fewer young drivers in such jurisdictions are expected to be under the influence of psychoactive or impairing drugs when driving to and from schools. To date, 17 states out of the 50 United States contain schools in which DITEP training has been provided (Cockroft, 2003).

7. Is the DECP Effective? Is the DECP Cost-effective?

The success of DECP in the field can be measured on several fronts: (1) the prosecution and conviction rates of DUID cases among states both prior to and subsequent to the implementation of a DECP; (2) the diminishing number of challenges, whether successful or not, in court to Drug Recognition Expert testimony; and (3) a reduced social cost, if it can be measured, in communities where DECP is in place.

Obtaining the prosecution and conviction rates has been difficult. The National Traffic Law Center (2001) does not keep such statistics, partially because it recognizes that there appears to be no standard for reporting prosecution and conviction rates throughout the United States. In this respect, the varying reporting standards in the United States reflect the reality of varying reporting standards throughout Europe. There are, however, intermittent anecdotal reports of communities supporting a DECP that have experienced increases in drug-driving convictions (e.g., Colorado Department of Transportation, 1995; NHTSA, 1996). This absence of data is one remaining gap in proving the overall effectiveness of the program.

Another gap yet to be addressed is the economic analysis of reduced social costs, if any. Blincoe (1996, 2002) has conducted comprehensive and increasingly detailed analyses of the economic impact of motor vehicle crashes, and has been able to determine the economic and social costs of alcohol involvement in such crashes. Understandably, however, he has not been able to determine such costs in drug-involved crashes. And because Blincoe's analyses focus only on crashes, the value (or put another way, the reduced social cost) of detecting and apprehending a drug-involved driver, before a crash has occurred, is still elusive. This information would be extremely useful in helping local decision-makers decide whether it would be cost effective to train its police officers in drug evaluation and classification.

8. Summary and Conclusions

The number of DREs has grown, and the number of states containing jurisdictions with DREs has increased in the past several years, as has the presence of DECPs in countries outside the United States. Although this trend alone provides some evidence of the effectiveness of the program, DECP's widespread use is still apparently limited by its relatively high cost. To date, DECPs in the United States exist in 37 states and the District of Columbia. Nevertheless, does DECP have a future among the remaining 14 states that do not currently have such programs? And does it have a place throughout Europe, where traffic law enforcement practices vary considerably?

Despite the wide variety of drug laws, traffic laws, and drug-driving laws throughout Europe, not to mention a wide variety in political attitudes toward drug impairment (Krüger, Perrine, Mettke, & Huessy, 2000), detection of drug-impaired drivers at roadside is the key to keeping them off the road. Because of the absence of a rapid, reliable, and valid roadside screening instrument for drugs, standardized roadside testing of drivers does not exist, either among states in the United States, or among nations in Europe. Drug evaluation and classification presumably could be used as an effective screening method among countries with varying judicial, political, and public safety systems, but it would require some adjustments in how such a program could be administered. Because of the current requirements in the United States for consent laws, centralized and comprehensive law enforcement procedures, consistency in prosecution decisions, and adequate toxicology laboratories (Cockroft, 2003), DEC programs are not necessarily capable of being adapted without modification throughout Europe.

9. References

Adler, E.V., & Burns, M. (1994). Drug recognition expert (DRE) validation study. Final report to Governor's Office of Highway Safety, State of Arizona.

Bigelow, G.E., Bickel, W.E., Roache, J.D., Liebson, I.A., & Nowowieski, P. (1985). Identifying types of drug intoxication: laboratory evaluation of a subject-examination procedure. NHTSA Technical Report DOT HS 806 753. Washington: U.S. Department of Transportation.

Blincoe, L. J. (1996). The economic cost of motor vehicle crashes, 1994. NHTSA Technical Report HS 808 425. Washington: U. S. Department of Transportation.

Blincoe, L. J. (2002). The economic impact of motor vehicle crashes, 2000. NHTSA Technical Report HS 809 446. Washington: U. S. Department of Transportation.

Burns, M., & Adler, E.V. (1996). Study of a drug recognition expert (DRE) program. In: C.N. Kloeden & A.J. McLean, Eds., Alcohol, Drugs and Traffic Safety, T'95, Vol. 1, pp. 437-441. Adelaide: International Commission on Alcohol, Drugs and Traffic Safety.

Cockroft, C. (2003). The Drug Evaluation and Classification program. Alexandria, VA: The International Association of Chiefs of Police.

Colorado Department of Transportation (1995). The State of Colorado's Drug Recognition Expert (DRE) program. Denver: Available on the Internet at the following address: www.dot.state.co.us/Programs/Safety/Alcohol/whatisit.htm.

Compton, R.P. (1986). Field evaluation of the Los Angeles Police Department drug detection procedure. NHTSA Technical Report DOT HS 807 012. Washington: U.S. Department of Transportation.

Heishman, S. J., Singleton, E.G., & Crouch, D.J. (1996). Laboratory validation study of Drug Evaluation and Classification program: Ethanol, cocaine, and marijuana. Journal of Analytical Toxicology, 20: 468 – 483.

Heishman, S.J., Singleton, E.G., & Crouch, D.J. (1998). Laboratory validation study of Drug Evaluation and Classification program: Alprazolam, *d*-amphetamine, codeine, and marijuana. Journal of Analytical Toxicology, 22: 503 – 514.

Krüger, H.-P., Perrine, M. W. B., Mettke, M., & Huessy, F. B. (2000). Overview of the legal provisions, difficulties faced by police, and analysis of prevention attempts in selected European countries. Road Traffic and Drugs. Strasbourg: Council of Europe Publishing, pp. 63 – 86; Appendix, pp. 87 - 186.

International Association of Chiefs of Police (IACP) (2001). The message is clear – Americans support getting tough on impaired drivers. Buckle Up America Dispatch. Alexandria, VA: IACP, p. 3.

ICADTS Working Group on Illegal Drugs and Driving (Walsh, J. M., Chair), (2000). Illegal drugs and driving. ICADTS (International Council on Alcohol, Drugs and Traffic Safety) Working Group Report.

NHTSA (1996). Drug Evaluation and Classification Program. Washington: Department of Transportation. Available on the Internet at the following address: www.nhtsa.dot.gov/people/outreach/SafeSobr/pub/drepp.pdf.

National Traffic Law Center (2001). Drug Recognition Evaluation (DRE) case law. Alexandria, VA: American Prosecutors Research Institute.

Page, T.E. (2000). The Drug Recognition Expert police officer: A response to drug-impaired driving. Stockholm: International Council on Alcohol, Drugs and Traffic Safety, (pages not numbered).

Perrine, M.W. (2000). The United States experience in developing and validating DRE / DEC in the field. Road Traffic and Drugs. Strasbourg: Council of Europe Publishing, pp. 259-264.

Preusser, D.F., Ulmer, R.G., & Preusser, C.W. (1992). Evaluation of the impact of the Drug Evaluation and Classification program on enforcement and adjudication. NHTSA Technical Report DOT HS 808 058. Washington: U.S. Department of Transportation.

Slovenian drug recognition system for traffic police officers

by Robert Sušanj (Slovenia)

The problem of driving under the influence of drugs

Anything that results in the decline of a man's ability to recognise and process information, to capably think effectively and decreases his relevant motor reaction, also directly results in a decline of traffic safety and increases the possibility of causing a traffic accident. Drugs, psychoactive medicaments and other psychoactive substances are, undoubtedly, included among such factors.

The expansion of such problems on European territory, and also in our country, is in any case likewise reflected in the field of traffic. During the last decade, increased problems in this field have been recorded in all European countries. The number of accidents caused by drivers under the influence of psychotropic substances and the gravity of their consequences has been growing intensively.

In addition to the emerging problems, when acting against violators, all policies have started to face the limitations imposed by legislation in this field. The majority of European laws namely require that a blood test may be ordered only in case of an obvious suspicion that a driver is under the influence of psychotropic substances. In most cases, the laws, therefore, do not allow testing drivers on a random basis, even though it is in some cases allowed for alcohol.

There is an issue, however, still met by the majority of policies, on how and in which way a policeman should professionally confirm such a suspicion. A policeman, that is to say, is not a doctor. On the other hand, to a certain extent, to give a commission for a professional examination requires an intervention in the human body, which is fully protected by law, and interventions may only be exceptional. Such findings have led to an intention to establish a specific procedure to assess and confirm such suspicions and, in addition, to professionally train the policemen.

The increase of traffic accidents, along with a growing number of violations, in which the police determine the reasons directly connected with driving under the influence of drugs, psychoactive medicaments and other psychoactive substances, is also the Slovene reality.

Statistical data about drivers with a positive toxicological analysis and those who rejected professional examination is presented in further paragraphs.

1.1 Driving Under the Influence of Drugs or Other Psychoactive Substances in Traffic Accidents in Slovenia

The Graph (No. 1) below, in particular, illustrates the status in the field of ordered professional examinations for participants in traffic accidents. The suspicion that the participants are under the influence of drugs, psychoactive medicaments and other psychoactive substances is given more and more frequently. As a result, the given suspicion is an occasion for ordering professional examinations in an authorised institution.

Graph 1: Growth of Ordered Professional Examinations for Participants in Traffic Accidents

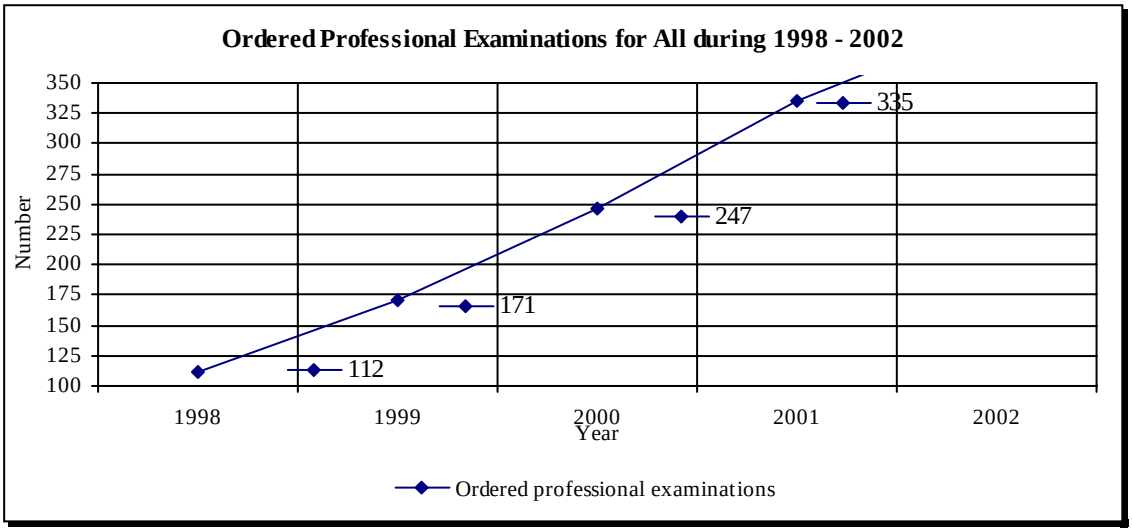


Table (No. 1) shows the frequency of drugs most commonly detected by the toxicological analysis from samples taken of blood and urine between 1998 and 2000. The number of discovered drivers who showed the presence of cannabis, opiates and benzodiazepines in the samples taken has been growing. After the increase in 1999, the presence of methadone and cocaine has remained the same, while the presence of amphetamines has been decreasing.

Table 1: Number of Positive Results According to the Type of Drugs

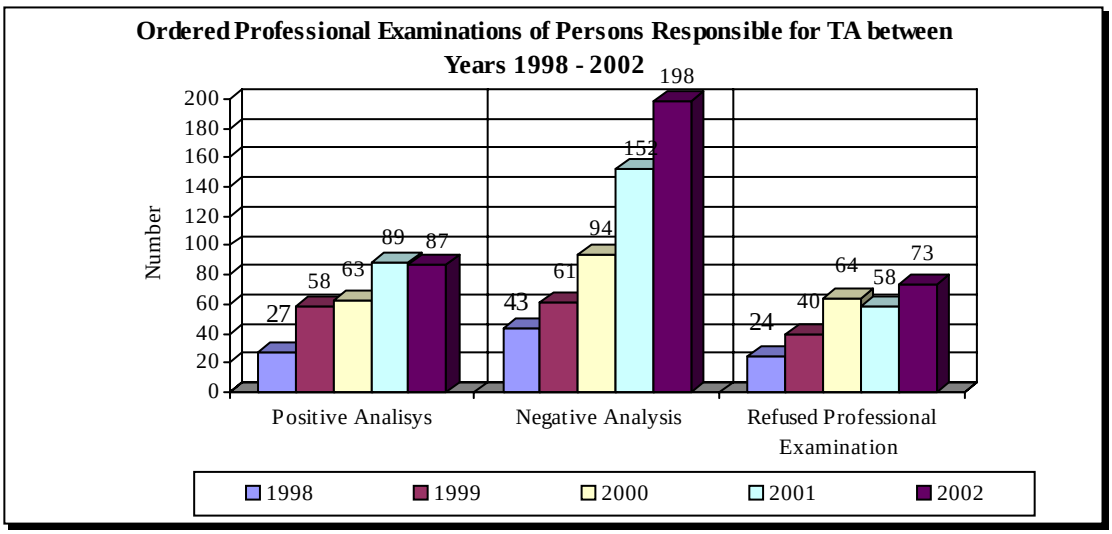
	1998	1999	2000	TOTAL	
Benzodiazepines	36	68	71	175	10.3 %
Opiates	57	101	125	283	16.7 %
Cannabis	72	239	357	668	39.4 %
Cocaine	6	43	41	90	5.3 %
Methadone	51	111	109	271	16 %
Amphetamines	20	68	46	134	7.9 %
Others	24	31	19	74	4.4 %

Data has been collected by the Forensic Institute which officially analyses blood and urine samples in Slovenia.

According to the results, the following was detected in the samples: cannabis (39.4%), opiates (16.7%), methadone (16%), benzodiazepines (10.3%), amphetamines (7.9%), cocaine (5.3%) and other psychoactive substances (4.4%).

The graphs (No. 2 and 3) and Table (No. 2) in the following text depict the status among the persons responsible for traffic accidents. It is obvious that the biggest proportion of ordered professional examinations of persons responsible for traffic accidents is negative. (This is also the same in the compared years.)

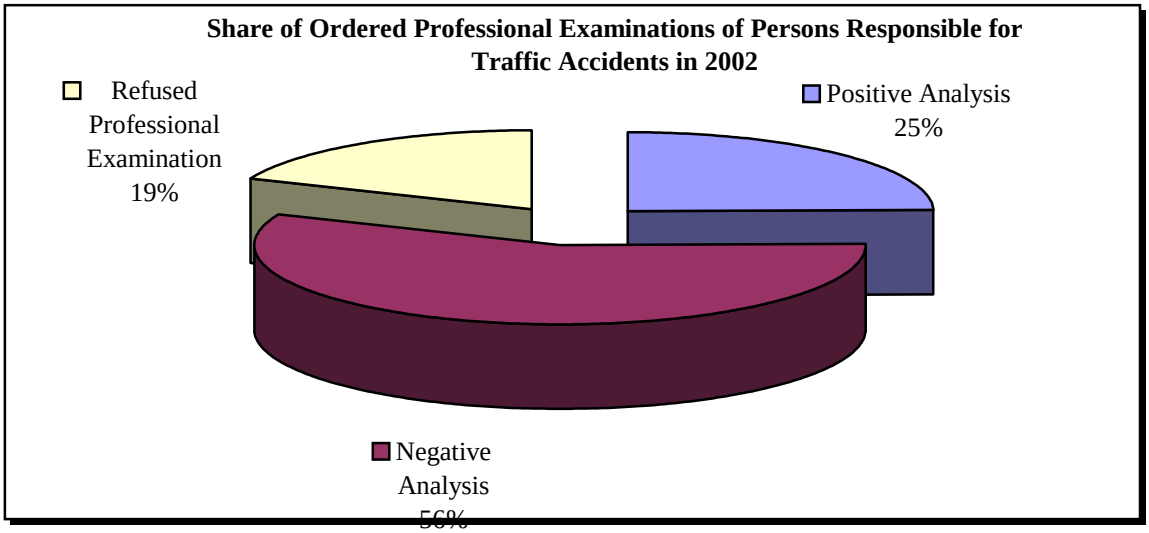
Graph 2: Ordered Professional Examinations of Persons Responsible for Traffic



Accidents

Table 2: Ordered Professional Examinations in Traffic Accidents in 2002

	Ordered Professional Examination	*Refused Professional Examination*	*Positive Analysis*	*Negative Analysis*
Responsible persons	**350**	**65**	**87**	**198**
Total – All	**401**	**73**	**99**	**229**
Proportion of Responsible persons	**87 %**	**89 %**	**87.8 %**	**86.4 %**



Graph 3: Results of Ordered Professional Examinations of Persons Responsible for TA in 2002

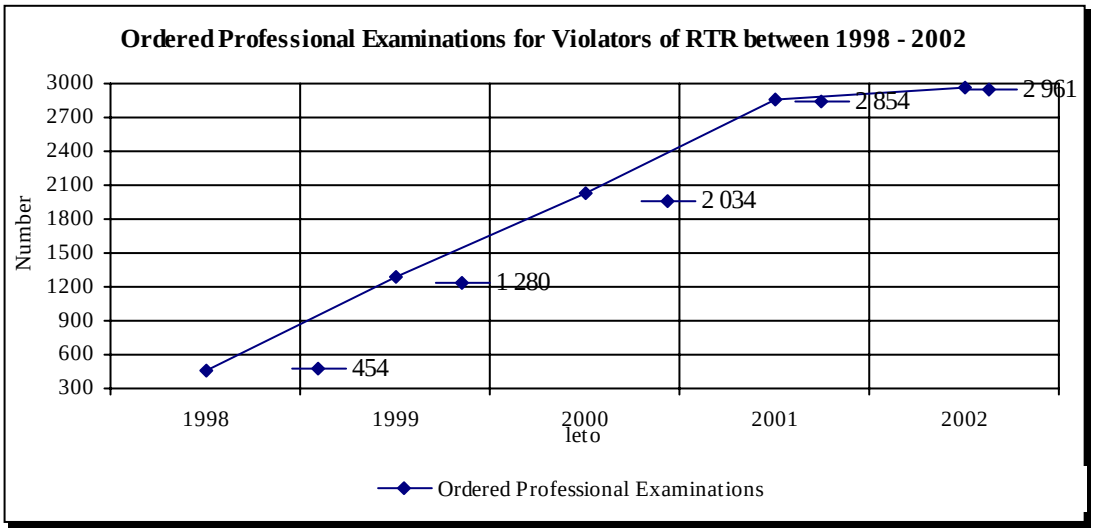
If we summarise the findings on persons[38] responsible for traffic accidents with a positive analysis, we find that, in most cases, the driver of a personal vehicle is a man between 18 and 24 years of age who is driving with a non-adjusted speed, and who causes a traffic accident in a settlement with a street system on Sunday between 17.00 and 20.00 hours. These are the following consequences recorded among the responsible persons with positive analysis:

- 6 responsible persons died,
- 15 responsible persons had severe physical damages,
- 22 responsible persons had light physical damages, and
- 44 responsible persons were not physically damaged at all.

1.2 Driving Under the Influence of Drugs or Other Psychoactive Substances as a Road Traffic Trespass in 2001 and 2002

The graph (No. 4) shows the growth in the number of ordered professional examinations for drivers in trespassing or in the regular monitoring of road traffic during the last four years. The order of a professional examination is conditioned by a given suspicion that a driver is driving under the influence of drugs, psychoactive medicaments or other psychoactive substances.

Graph 4: Growth in Numbers of Ordered Professional Examinations for Violators of RTR between 1998 - 2002

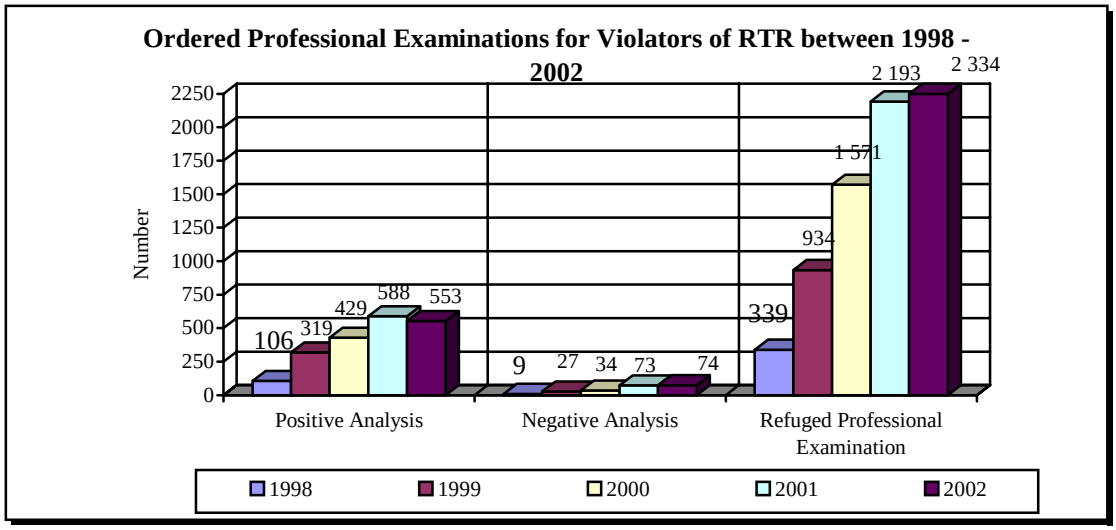


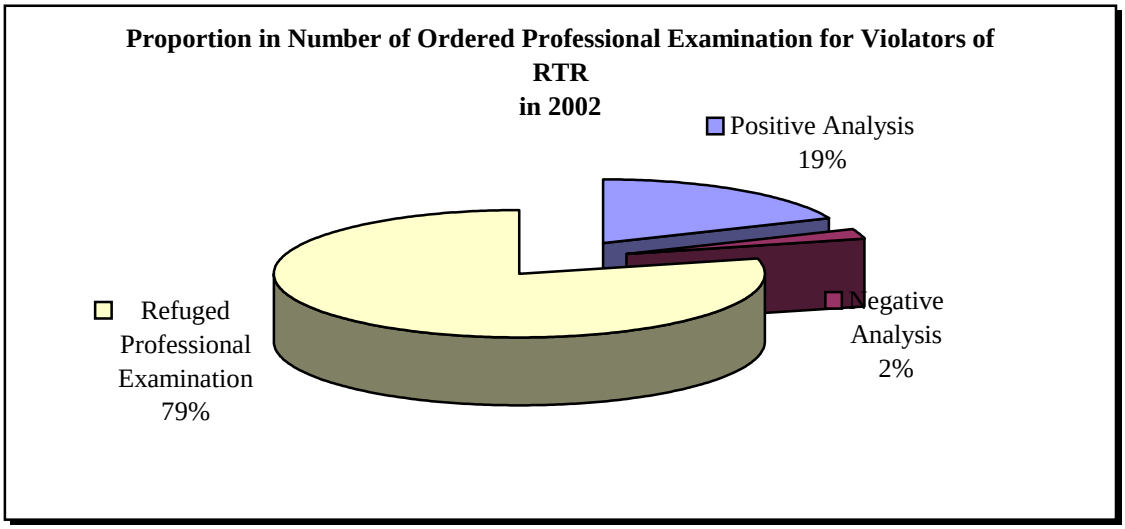
Driving under the influence of psychotropic substances is in most cases detected in combination with the following violations:

- Alcohol intoxication
- Exceeding the speed limit and non-adjusted speed
- Wrong side and direction of driving
- Not following the rules of right of way
- Wrong overtaking, etc.

[38] In 2002.

Graph 5: Results of Ordered Professional Examinations for Violators of RTR





Graph 6: Proportion of Results with Ordered Professional Examinations for Violators of RTR in 2002

In 2002, a typical violator of road traffic regulations, with a positive analysis result, was a man between 18 and 24 years of age, the driver of a personal vehicle and he was caught at trespassing in a settlement with a street system between 21.00 and 24.00 hours on Sunday.

Definition of driving under the influence of alcohol and psychoactive medicaments in the Slovene legislation

Article 118 of the Road Safety Act (Official Journal of the RS, No. 30/98) provides:

(1) A driver must not drive a vehicle in road transport or start to drive if he/she is under the influence of drugs, psychoactive medicaments or other psychoactive substances which decreases his/her ability to drive.

(2) A driver is considered under the influence of substances from the previous paragraph when the presence of such substances in his/her organism is detected by special means, equipment or by a professional examination.

A driver is sentenced for the violation of the first paragraph of this Article by both a fine of at least SIT 90,000 and 5 to 7 penalty points, or by a penalty of imprisonment and 5 to 7 penalty points.

Article 120 of the same law stipulates the policemen's procedure. Upon suspicion that the road traffic participant is under the influence of drugs, psychoactive medicaments or other psychoactive substances, which decreases his/her ability to drive, the Article authorises a policeman to take the following measures against such a driver:

- to order a test with special means or equipment or
- professional examination
- forbids him/her to continue driving and
- temporarily takes away his/her driving licence.

The law envisages also a possibility of objection to the policeman's order. This is decided immediately—or within 4 hours at the latest—by the policeman's superior. The objection, though, does not stay the execution of the test or professional examination.

Considering the fact that a different approach is needed to detect the characteristics of driving under the influence of drugs and other psychotropic substances, changes and amendments of the Road Safety Act have been planned to Article 120. These amendments will adequately authorise policemen to execute a standardised procedure to detect the relevant symptoms.

The proposed changes authorise a policeman, at given reasons for the suspicion that the participant in road traffic is under the influence of drugs, psychoactive medicaments and other psychoactive substances, to order and execute the procedure on recognising the characteristics or symptoms that result from the presence of these substances in the organism.

If the policeman during this procedure recognises, in the form of relevant symptoms, a direct impact of substances that influence the driver's ability, or if the road traffic participant refuses any cooperation or the procedure cannot be executed at all, the policeman will decide on whether or not to issue a professional examination.

The above mentioned changes of current regulations will provide the policemen with a direct legal foundation for the execution of the symptoms detection procedure, as well as other measures taken that relate to proving a driver of being under the influence of drugs.

3. Certain trouble linked with detection of driving under the influence of drugs

The most obvious problems are those observed in the Slovene police practice, as well as in foreign countries. In the world, in spite of scientific efforts, one has not yet defined the limit values for concrete psychoactive substances which would enable a conclusion regarding their influence on the driver's ability to drive safely. Apart from this basic reason, there is without a doubt also a problem that technical means, such as the breath test, can be used in detection for the presence of alcohol. For several reasons, however, the Slovene police do not use quick tests for detecting drugs. Currently, the quick tests that are accessible in the market do not provide data on effects, are only available for certain groups of substances and their reliability level is unsatisfactory. When determining the trouble, though, we cannot avoid the fact that individual characteristics of driving under the influence of alcohol and drugs are very similar (Zajc 1998: http://www.mnz.si/slo/promet/zajc.html).

4. The development of monitoring driving under the influence of drugs system

Due to all the facts mentioned above, the developed European policies have started to seek a system that would enable recognition of the symptoms of driving under the influence of drugs. This is a result of the scepticism related to the development of quick tests on drugs is more and more present and legitimate. They have come to the point that a success can be achieved only by an adequately trained policeman equipped with knowledge which will enable him/her to confirm the suspicion and decide, with a high probability, on taking blood and urine for analysis.

The development of the police's procedure on detection of driving under the influence of drugs is, therefore, one of the priority tasks of all European policies. For that, there are two essential reasons.

Undeniably, the first reason is the fact that driving under the influence of drugs and psycho-active medicaments has been growing intensively. Secondly, despite all their efforts the experts have not yet succeeded in developing a technical device, or an indicator, to replace the procedure. The technical device, or indicator, would enable policemen to effectively confirm or reject in a simple way (similar to the breath test) the suspicion of driving under the influence of drugs and psychoactive substances. In addition to that, more and more new drugs, with new substances and mixtures, appear permanently which furthermore hinder the development of such a device.

For this reason, as well, the majority of the European countries are inclined to the solution that implements a specific procedure which is put into effect by the policeman to the driver. This procedure enables a detection of drug influence characteristics, which is the most reliable method of detecting these types of symptoms. The external signs are, namely, the most reliable and recognisable.

5. Slovene policy procedures for the detection of symptoms while driving under the influence of drugs

The background for its elaboration has been based on the following presumptions:

- Drugs can be classified into categories
- In its use, each category shows characteristic effects and signs that can be observed
- A policeman can be trained to recognise these signs and detect by a systematic process that:
  - the status of the examined person is not a consequence of consumed alcohol
  - the individual is under the influence of drugs, and his/her status is not a consequence of a bad health condition
  - the individual is under the influence of a determinable category (or several categories) of drugs.

  The programme is based on two fundamental tasks:
  - recognition of drugs in the participants in road traffic; and
  - assessment of the drug influence on the ability of driving.

5.1. Testing the driver by breath test

The policemen decide on the examination of a driver by a breath test or by the alcohol meter - ethylometer. The minutes on the test are taken. Since the signs of driving under the influence of consumed alcohol and drugs are identical or similar, the policeman needs information about the level of the examinee's alcohol intoxication. A low value of alcohol can be an indicator for the presence of psychotropic substances, but the examinee might have, however, taken both drugs. The test enables the policeman to confirm or exclude the influence of alcohol. The driver's behaviour will be in most cases strange and unreliable. By the breath test, the policeman will exclude the possibility that this behaviour is caused by alcohol. Thus, the possibility of drug and psychoactive substance influence is higher. Such a result provides the reason for the implementation of an additional symptom detection procedure.

Before the policeman takes the next step, he/she is obliged to warn the driver that he/she will start with an additional procedure on detecting the symptoms of the presence of drugs or psychoactive medicaments.

5.2 Examination of eye shivering (nistagmus)

The examination of eyes includes three separate parts. The procedure checks the horizontal and vertical eye's shiver (nistagmus) and the eye direction towards the selected points.

a) Horizontal and vertical nistagmus

For this examination, the policeman uses a ballpoint pen, or other relevant object, which he/she moves, approximately at eye height, from the left to the right side and back before the examinee's eyes.

The examinee has to follow the top of the object by his/her look only and without turning his/her head around.

The policeman then repeats the examination of horizontal nistagmus by stopping the object in the extreme right and left position for about four seconds.

The examination of vertical nistagmus is done in the same way. The only difference is that in this case the ballpoint pen, or other relevant object, is moved up and down and inversely.

During this procedure the policeman observes the eyeball reaction.
When the examinee follows the object by look, the characteristic eye's shiver can appear in the case that some psychotropic substances (PCP, depressor, inhalant, etc.) were taken.

The irregularity detected at examination of vertical shivering without the presence of the horizontal one (which is done first) can indicate a serious sickness status or brain damage.

b) Eye direction to the selected points

With this test the policeman moves a pencil, or some other object, towards the examinee's nose end, and the examinee has to follow it by his/her look. A »look collected in the point« appears at the end point, which the examiner can observe as squinting.
In some cases, a person under the influence of psychotropic substances is not capable of following the object by look and keeping a look on the object.

5.3. Examination of the eye pupil size

a) Examination of the eye pupil size in light

The test includes measurement of the examinee's pupil size by the pupil size assessment accessory. The eye pupil normal size ranges between 3.0 to 6.5 millimetres. Persons under the influence of psychotropic substances can show a contraction or expansion of pupils which exceeds the normal size.

The policeman makes the test by placing the pupil size assessment accessory beside the examinee's face, at eye height, and compares the pupil size with the measurement. The test is made at daylight or in a lit place at night.

b) Eye pupil reaction test

The eye pupils of an examinee under the influence of drugs do not react normally to direct light. At sudden light, the eye pupils of a person under influence of drugs slowly narrow or do not narrow at all. When direct light is turned off, the pupils expand slower or do not expand at all.
The policeman makes the test by shining the light to the examinee's eye area and observes the pupil reaction to the light. For observing the reaction or change, the policeman must use the pupil size assessment accessory.
Individual types of psychotropic substances cause the expansion or contraction of pupils and slow down their reaction to direct light. The findings on the status of the examinee's eyes and pupils are very important information for determining the influence of drugs on his/her ability to drive.

5.4. Examination by quick drug test

The policeman will execute the examination by quick drug test in the case that the Slovene police obtain it.

The test result is, therefore, an additional step to all those mentioned earlier and not an alternative.

The procedure is made pursuant to manufacturer's instructions in the space where relevant quantities of samples can be obtained for the quick test analysis (perspiration, saliva, urine).

5.5. Professional examination

If the previous steps have confirmed a suspicion, the policemen take the examinee to the nearest health station where they order a professional examination by taking blood and urine.

The professional examination is done by a doctor.

The result of the toxicological analysis is the only credible evidence to initiate the proceeding before the judicial bodies.[39]

[39] The policemen will write an Official Note about the procedure in which they will record all their observations.

6. Conclusion

All procedures used, or that are still being developed by the police in Europe, are based on the American DRE programme. Each procedure is adjusted to regional characteristics, meaning that it considers the level of the policemen's skills, volume of problems related to driving under the influence of drugs and legislative characteristics of the country. The fundamentals of these types of procedures are simplified. In most cases, they deal with various examinations of the eye pupils, but some of them additionally include tests of balance, orientation and so forth.

Despite their simplicity, the quality of procedures does not lag behind the well-known American system. It is necessary to consider that they only confirm the suspicion, while the blood and urine test results represent the only final and most credible evidence for the court.

With no regard to the above mentioned, it is obvious that the police procedure, as well as legislation, will have to be permanently adjusted to the expected changes in this field where, above all, we have in mind the new types of synthetic drugs and behaviour of the consumers adjusted to the police procedures.

At the end of this year a new Road Traffic Safety Act is anticipated to be adopted. It will give authorisation to the police that when a driver is suspected to be under the influence of drugs or psychotropic substances, the police may order a special procedure for symptoms recognition (also presented in the present article).

Training of police officers for carrying out such procedures is presently under way. Currently, one third of our road traffic police officers have already been trained.

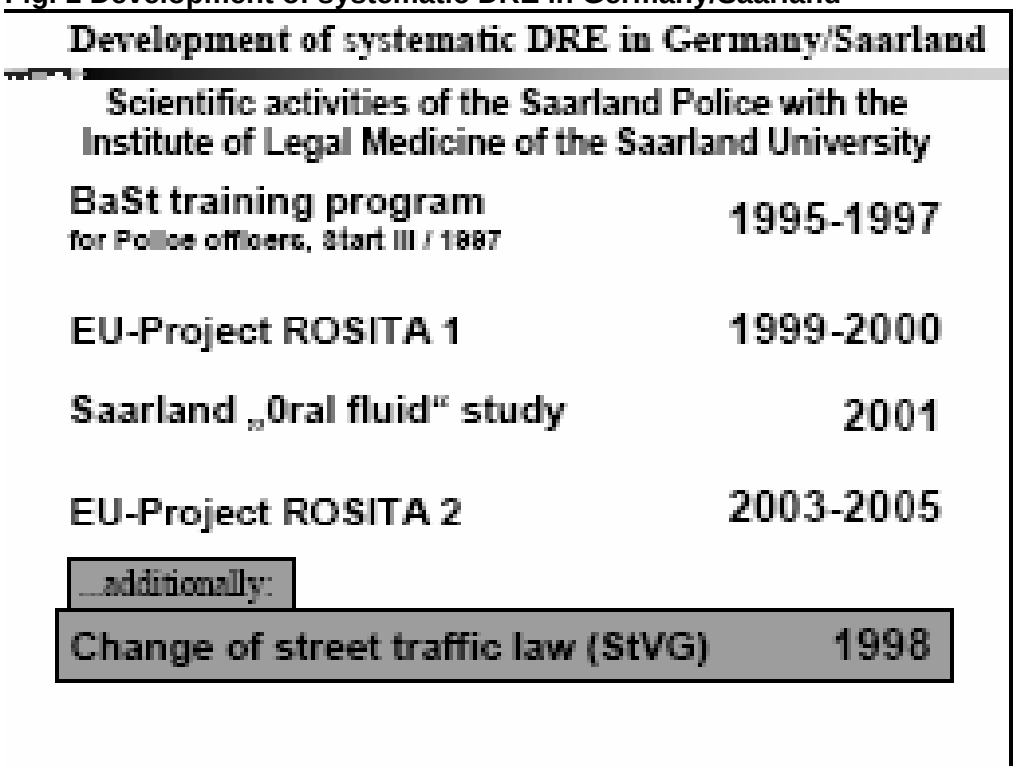
At the same time, I also propose that the Pompidou Group organise a special seminar dedicated to police procedures for recognition of drugged-driving. The seminar shall include presentations of representatives of police forces that have already implemented such procedures. They would present the methods applied, as well as the difficulties and problems encountered. Such a seminar would also be an opportunity for the participants to exchange experience; participants from the countries that are still seeking such information would thus be able to implement their own drug recognition procedures more effectively and faster. Last but not least, during the seminar the already mentioned recommendations of the Council of Europe could be drafted, as well.

Drugs of abuse and driving: where does discussion now stand on blood drug levels in Germany

by Manfred R. Moeller (Germany)

The development of a systematic drug evaluation in the Saarland is closely connected to the partnership of the Saarland Police and the Institute of Forensic Medicine of the Saarland University.

Fig. 1 Development of systematic DRE in Germany/Saarland



In 1997, the systematic DRE was established when the Police officer training programme of the Federal Highway Traffic Agency (BASt) was completed. Meanwhile, the programme has been entirely adopted, or in parts, in the majority of other German states. With the EU-project ROSITA 1, an important step forward was made which Hans-Jürgen Maurer will explain in further detail[40]. The Saarland "oral fluid" study in 2001, in which we collected and analysed about 200 saliva and blood samples, showed that the detection window of these two body fluids seems to have the best correlation. We are also involved in the ROSITA 2 project.

[40] See his presentation in this publication

An important occasion for the development of systematic drug recognition in Germany was the introduction of a new Road Traffic Act in 1998. For a better understanding, I have to make some introducing remarks.

The legislation regarding alcohol and driving in Germany differentiates two kinds of offences: administrative, according to § 24a of the Road Traffic Act (StVG), with blood alcohol concentration between 0.05% and 0.11%; and criminal, according to §§ 316, 315c of the Penal Code (StGB), when the blood alcohol concentration is above 0.11%. In the latter case, the unfitness to drive is automatically proven, either with endangering a person or things of important value, whether or not an accident occurred (§ 315c), or without (§ 316). Even if the blood alcohol concentration is below 0.05% (down to 0.03%), it can be considered a criminal offence if an accident happened or any other severe traffic violation occurred.
The same situation exists with drugs. However, there are no legal limits for driving under the influence of drugs of abuse or pharmaceuticals (DUID). If the unfitness to drive can be proven, then it is a criminal offence. Since 1998, the new act has come into force which identifies **any** concentration of certain drugs of abuse in blood (zero tolerance) as an administrative offence.

Fig. 2 German DUID Legislation

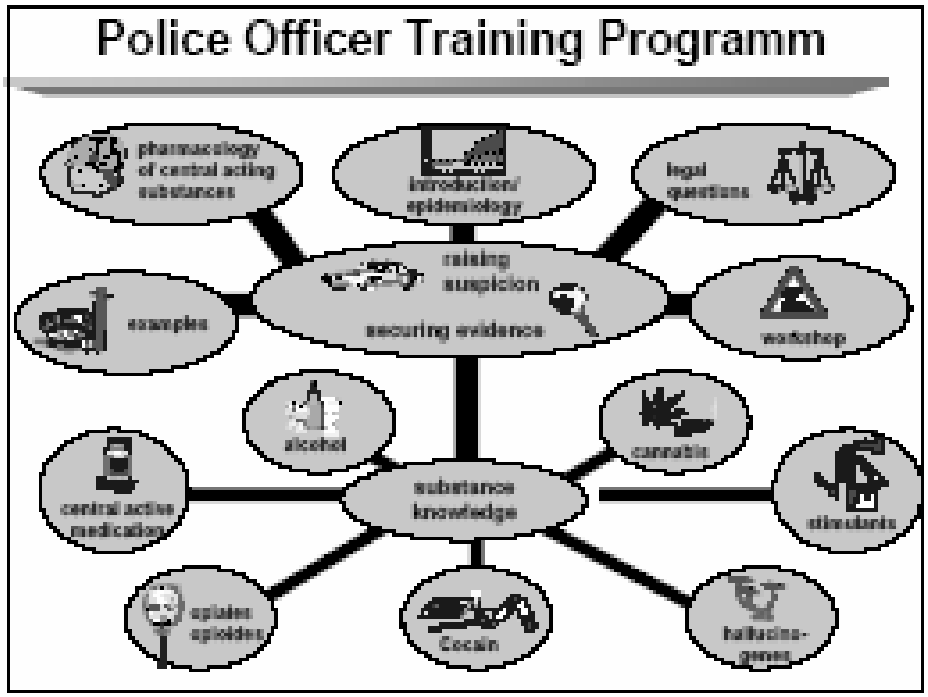
The synopsis of the two laws is shown in Figure 2. In cases of an administrative offence, the scope of investigations is limited to the drugs, which are listed in the appendix, including alcohol. In criminal offences all psychoactive drugs must be screened. In both cases, though, mandatory blood testing can be enforced. Urine tests, however, cannot be enforced, and the law does not provide any sanctions if the subject refuses. The banned drugs include amphetamine, MDMA, MDE, cannabis, cocaine, heroin and morphine. The corresponding analytes are amphetamine, MDMA, MDE, Tetrahydrocannabinol, Benzoylecgonine and morphine. They are listed in an appendix to the law. The prohibition, though, excludes morphine that has been consumed in accordance with a medical prescription.

At checkpoints the police officers identify drivers mostly in cases of administrative offences. This comes from the focus of suspicion. Investigations according to §§ 316, 315c ('criminal offence') are made after accidents, severe driving faults or when a subject shows visible signs of impairment such as extremely slow reaction. Investigations are also made upon strong psychophysical deficits such as disorientation, motor coordination impairment, confusion, unsteady walk, and so forth. Offences against the administrative law are already fulfilled when recent drug consumption can be assessed (i.e., red conjunctiva, slow pupil reaction to light, delayed reaction, sleepiness). The level of evidence must be high in criminal offences. For administrative offences, where the sanctions are much lower, the level of evidence can be less. However, the determination of the drugs in blood must be of the same high quality in both cases and require gas chromatography-mass spectrometry as gold standard. According to the Road Traffic Act, when the presence of the substance in the blood is undeniably proven, the elements of the fact are fulfilled. This has resulted in different cut-offs in the analysing laboratories which depend on the technical performance and quality of the lab. I will comment on this in a few moments.

Further sanctions, in cases of administrative offences, include the revocation of the driver's licence, a driving ban for one to three months and a fine up to €500. The problem in these cases is neither the driving ban nor the fine, but instead that the conviction is reported to the driving licence authorities. They can then check whether the subject is generally able to drive a car, either by a medico-psychological investigation or a series of urine and/or hair tests, upon which the subject has to prove that he/she is drug-free. This procedure lasts in general about one year resulting with the return of the licence.

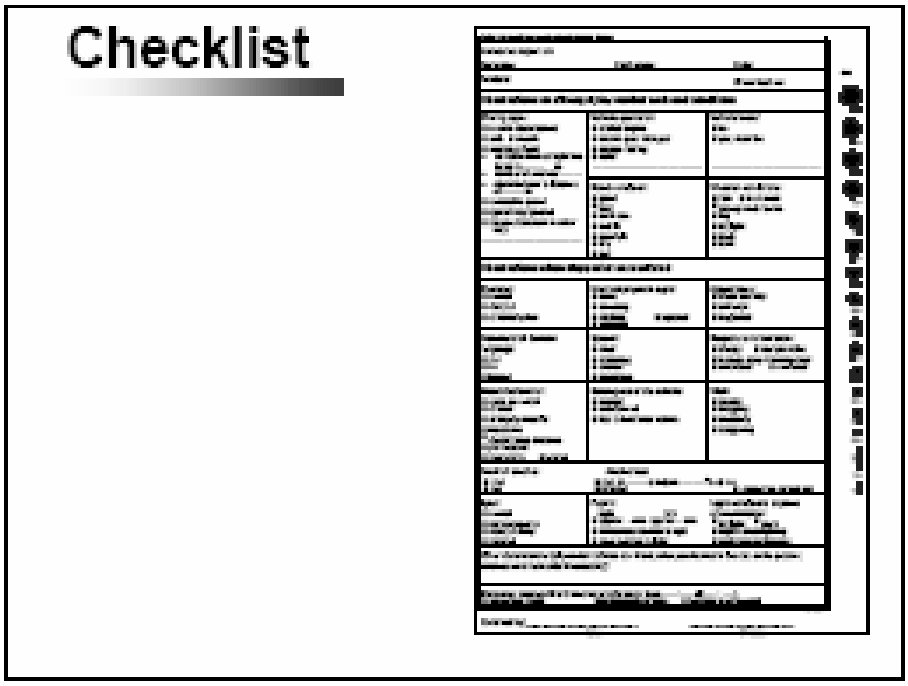
To effectively fulfil the legislative intent, the police officers who control drivers must be trained to recognize subjects driving under the influence of drugs. The already mentioned programme enables police officers to more reliably recognize people driving under the influence of drugs and/or pharmaceutical products.

Fig. 3 Training programme for police officers to recognize drug use



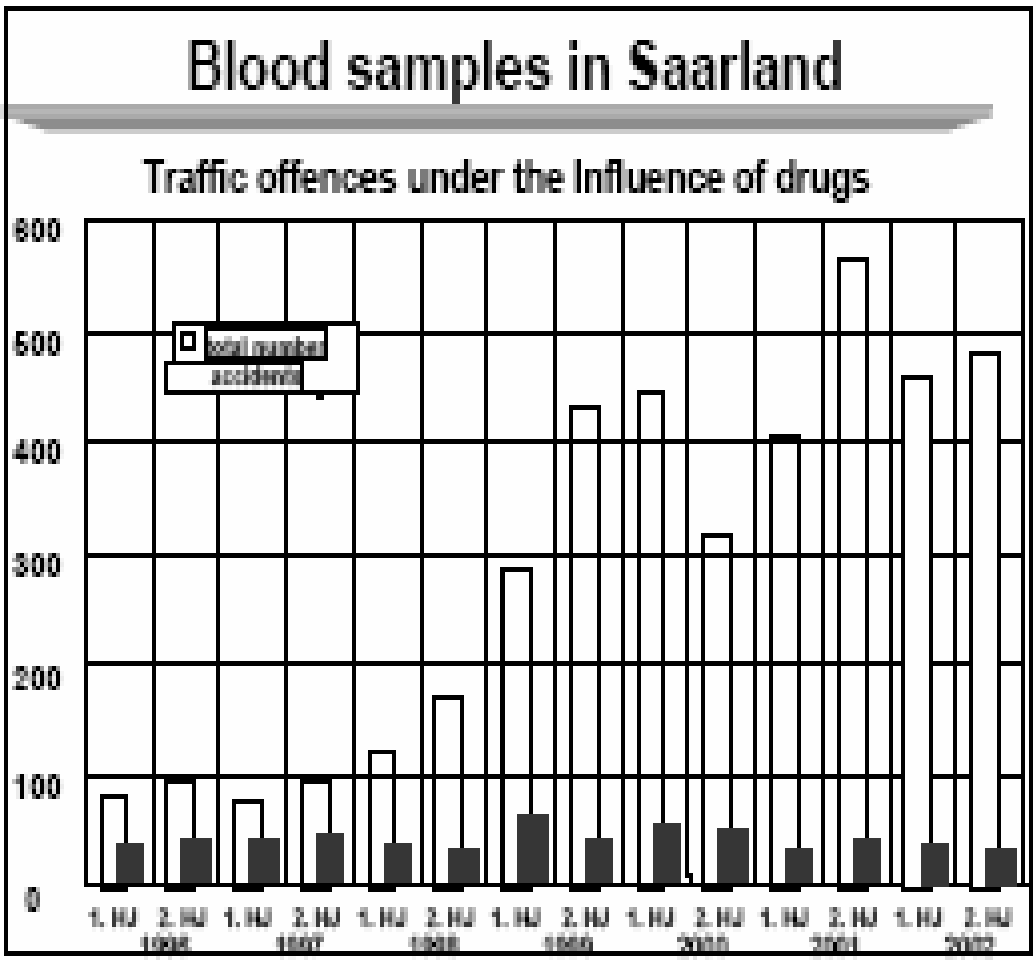
The programme has been developed on the basis of the American DRE programme, but with major modifications because of the differences in laws (rights of police officers, evidence in court), technical procedures (mandatory blood sampling in Germany) and drug panorama. It is a one-week training programme for “drug recognition experts,” and a second lower level educational programme of two half-days with basic facts for the training of all police officers. The whole programme has been translated into Finnish and Polish, while parts have been translated into English, Czech and Slovenian. Two weeks ago, Hans-Jürgen Maurer and I were in the Polish police academy near Warsaw training police officers in DRE.

Fig. 4 Checklist for DUID



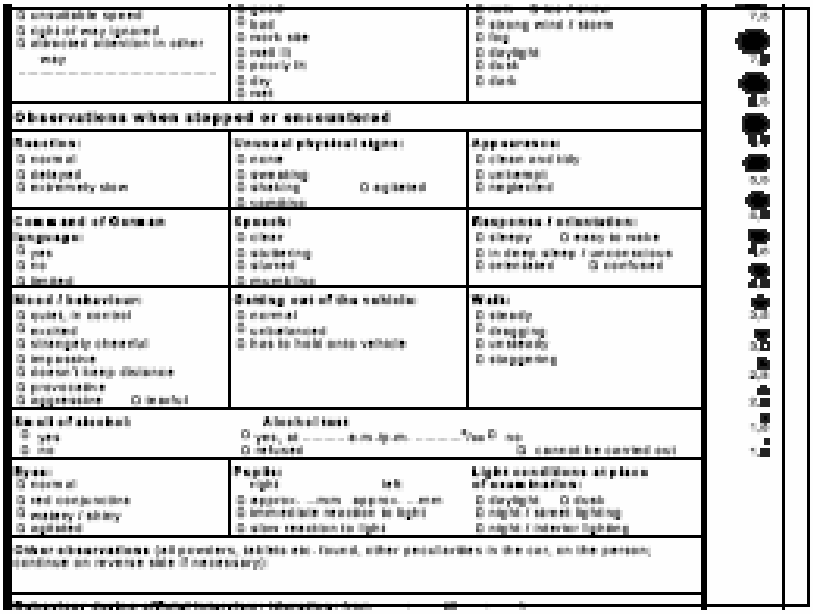
The heart of the training programme is a check list for the police officer so that he/she can note any special observations, symptoms of drug use and signs of impairment. Hans-Jürgen Maurer will explain in more detail the procedure and, in particular, the differentiation between an administrative offence and a criminal offence from the view of the police officer.

Fig. 5 Evolution of the number of analysed blood samples in cases of DUID



The programme was introduced in May 1997 in the state of Saarland. Figure 4 shows the expansion of the number of cases up to the year 2002. The Institute of Forensic Medicine analyses all forensic cases in the State, of which there are nearly 1 million inhabitants. There was a continuous increase in the number of blood samples collected for suspicion of DUID: in 1998 with the new act (§ 24a StVG), 1999 and 2000 with the EU-ROSITA project and further with the state-wide introduction of on-site drug tests (urine and saliva tests), and 2001 with a special “Oral fluid” study. However, the actual number of accidents under the influence of drugs remained rather constant. This is partly due to the fact that in cases of accidents the police officer, actually on duty at the police station, is called to the scene. The drug recognition experts are working mostly in night shifts at road blocks or at general traffic controls. Presently, we are working on a training unit that especially focuses on the “scene of the accident.”

Tab. 1 Cut-off concentrations of drugs of abuse: proposal of the *Grenzwertkommission*



In cases of administrative offences (§ 24a StVG), only the substances listed in the appendix are checked. Therefore, the *Grenzwertkommission*, a group of experts, with members from the German Society of Forensic Medicine (DGR), the German Society of Traffic Medicine (DGV), the Society for Toxicological and Forensic Chemistry (GTFCh), the Ministry of Justice, the Ministry of Transportation (BMVBW), and the Federal Highway Traffic Agency (BASt), decided on cut-offs for these substances in November 2002 (Table 1) to be uniformly introduced in all German states since each state, due to the federal system, has to confirm the values. The ministry of transportation and the ministry of justice proposed that concentrations below the cut-offs should not be sanctioned. However, some federal states have not yet agreed.

In more than 75%, the prosecuting authorities and the court follow in their final decision the initial charges of the police. This is at least apparent in the Saarland which shares a border with France. However, the described procedure differs slightly from state to state, according to the federal system in Germany, because police and administrative affairs are under state laws.

Conclusions

The new “zero-limit” law is a powerful tool for the fight against DUID.

Well-trained police officers can recognize and classify symptoms of drug use and signs of impairment.

Well-documented protocols will facilitate the decision of the judge in court.

Well-documented protocols and convincing statements from the police officers, when they testify in court, together with the expert opinion, are essentials.

The cut-offs of the *Grenzwertkommission* for the drugs which are listed in the appendix to § 24a StVG have yet to be accepted by the German states.

Drug driving checks carried out by the Belgian police

by Paul Deblaere (Belgium)

Several laws, regulations and orders are in force in the area we are discussing. They include:

- the Law of 16 March 1999 amending the Law on the Traffic Police (co-ordinated by the Royal Decree of 16 March 1968) and setting out in particular the policing conditions and procedures, the offences and penalties and the procedure for disqualifying people from driving and withdrawing their driving licence;

- the Royal Decree of 4 June 1999 (amended by the Royal Decree of 26 May 2002) supplementing this law by laying down the rules for taking and analysing a blood sample;

- Circular 14/2000 of 5 December 2000 issued by the Board of Principal Crown Prosecutors at the Court of Appeal and the Labour Tribunal. This circular was sent to the public prosecutors' departments for the purpose of ensuring harmonised prosecution procedures and setting out the offender's rights and obligations;

- Circular 15/2000 of 5 December 2000 issued by the Board of Principal Crown Prosecutors at the Court of Appeal and the Labour Tribunal. This circular was sent to the police departments for the purpose of ensuring the application of harmonised police procedures and setting out the offender's rights and obligations. It also contained a model police report.

These legal provisions are a means of clamping down on and running checks on people under the influence of any of the substances covered by the law for the purposes of road safety.
There are five groups of substances covered by the law:

- Cannabis (THC)
- Amphetamines
- Methamphetamines (MDMA, MDEA and MDBD)
- Morphine (Heroin/Opiates)
- Cocaine (or Benzoylecgonine)

The procedure for establishing whether a driver is under the influence of drugs is a standardised **2-STAGE** method designed to enable us to ascertain whether this is the case and, if so, which drug or combination of drugs have been taken.

These two stages are:
Preliminary **tests** and **verification**

- The preliminary stage involves carrying out a series of **standard tests** looking for positive external signs that a person is under the influence of certain drugs that affect their ability to drive (suspicion of driving under the influence);

These preliminary tests include:

- ✓ a) physical signs (eyes, face, behaviour, language, walk, other signs);
- ✓ b) divided attention tests:
  - ♦ Romberg test, which consists in having a person tilt their head backwards with their eyes closed and count to 30 and then bring their head forward and open their eyes;
  - ♦ standing on one leg
  - ♦ finger-to-nose test
  - ♦ walk-and-turn in a straight line
  - ♦ strabismus

For a valid positive result, the entire series of tests must have been completed and several signs must have been observed, with at least one physical sign and one observed during the divided attention tests.

In the event of a positive result, we proceed to the **verification** stage:

- A urine sample is taken for an immunoassay test (qualitative). This shows us whether a drug is present in the body (above the specified level) and, if so, which.

In the event of a positive result:

- A blood sample is taken in order to identify, and determine the quantity of, a drug present in the body (= basis for prosecution and sentence).

The circular issued by the Board of Principal Crown Prosecutors has imposed a number of restrictions concerning the carrying out of traffic controls.
In the field of staff training, although nothing is strictly laid down, the procedure for screening and verification is to be carried out only by competent police officers who have been given prior training.

This training relates to:

- the laws and regulations, including circulars;
- familiarisation with verification procedures: the series of standardised tests, the external signs of suspicion of driving under the influence;
- familiarisation with the technique of taking a urine sample on which an immunoassay must be carried out;
- the practical organisation of the series of standardised tests and the immunoassay, the essential precautions for guaranteeing respect for private life, discretion and hygiene (precautions laid down by law).

This training consists of a two-day theoretical component and eight hours of practical training in the field.

It would therefore seem desirable to train certain police officers as specialists in the use of testing equipment – for the series of tests and the immunoassay on a urine sample – and to enable them to build up the necessary experience as quickly as possible.

With regard to the preparation of checks and the practical organisation on the spot, it will be necessary:

- to set up a specific location (in line with the legislature's wishes) focusing on
  - ✓ the problem of weekend road accidents;
  - ✓ the routes taken by people going for an evening out (to rave parties, large dance establishments, etc);
  - ✓ the routes used in connection with drug tourism.
- to organise a system for:
  - ✓ selecting vehicles for checks;
  - ✓ carrying out in complete safety an external examination of drivers on the basis of external signs;
  - ✓ taking urine and blood samples with due regard for hygiene requirements (choice and equipping of premises, careful attention to receptacles used) and the need for discretion (respect for personal privacy).

The necessary infrastructure will therefore be relatively extensive.

Initially, 97% of the urine tests were confirmed by the blood analysis. On the basis of the results obtained in 2000-2001 (896 cases), this rate has fallen to 85%. The 15% of false positive results, as they are generally called, is explained by

- the fact that the result obtained is below the measuring threshold;
- the presence of alcohol or a combination of a drug and alcohol;
- the presence of medication;
- other reasons.

In conclusion, I shall provide you with the results of a one-day seminar held on the initiative of the Belgian Road Safety Institute on 28 May 2002. The various speakers highlighted the following problems with regard to the implementation of the law on driving under the influence of drugs.

- Lack of training and experience
  All the police officers of the Provincial Road Traffic Units belonging to the Federal Police Force have been trained by police academy specialists, while officers of the local police forces have often been trained internally.
  From the practical point of view, it was noted that after eight hours of field operations it is quite possible that a student will not manage to go through the complete procedure.
- Raising the awareness of law officers
  The present circulars give law officers a certain amount of discretion with regard to their prosecution policy. It might be helpful to issue uniform prosecution guidelines for the whole country.
- Length and complexity of the procedure
  The current procedure is quite long and complex (from one to one and a half hours), but an experienced officer sometimes only takes 30 minutes to draw up a report. This length and complexity is relative and it is necessary to be certain of having determined whether a person is under the influence.

The series of standardised tests is an important stage in the overall procedure since it determines what follows. As it is possible to detect the presence of certain drugs in the urine over a very long period of time, it is important to conduct the series of tests properly and without leaving anything out. In the event of adverse weather conditions, such as rain, snow or frost, it is impossible to carry out a proper test outside.

Moreover, the section of the Road Traffic Act laying down that tests are to be carried out does not specify how this should be done. Furthermore, the law does not enable any clear conclusions to be drawn as to what parameters must be positive, and in what quantity, in order to be able to speak of a driver being under the influence. Everyone will understand that we do not all have the same sense of balance and that a person who loses their balance is not necessarily under the influence of drugs.

The legislators wish to remain as pragmatic as possible and provide the greatest possible degree of flexibility. A sufficiently experienced police officer will immediately be able to detect whether or not a person is under the influence of drugs or alcohol.

- Possibility of falsification
  Some police officers are convinced that some urine samples are falsified. Although it is not known precisely what quantity of liquid has to be drunk for the urine sample to produce a negative result, there is general agreement that these practices can indeed constitute a problem when screening people for drugs. As regards “in vitro” falsifications, certain generally available products, such as bleaching agents, cooking salt and soap, can enable a urine sample to be falsified. Moreover, a number of companies (no less than 65 were found on the internet) also offer special products to influence the result.
  The police officer’s experience is very important here.
  The consequence of this complexity is that such checks are only carried out in the context of a specific operation and to a much lesser extent in the execution of ordinary duties.

- Illegal substances not covered by the law (LSD, hallucinogenic mushrooms)
  There should be checks to detect as many illegal drugs as possible.

DRE - the Saarland experience

by Hans-Jürgen Maurer (Germany)

The EU ROSITA-Study, in addition to the BASt Training Programme, was a decisive step for Drug Recognition (DRE) in road traffic in Saarland.

The participation of the Saarland Police in the EU Project ROSITA showed that in addition to the free availability of on-site drug tests, the Drug Recognition in road traffic was dependent on a permanent and competent maintenance of the user. This is guaranteed by “multipliers” who are located at the particular organisation units. A coordinator takes care of the “multipliers” who are responsible for the whole state.

Concerning the specimen that can be tested on-site, ROSITA showed that urine was only the second best specimen. The test demonstrated that users preferred saliva as the ideal specimen for on-site tests. The Saarland Saliva Study proved that saliva (Oral fluid) is qualified for on-site tests.

Drug Recognition – a problem for the Police
Measured at the temporary position of the training of police officers—except for a few specialists—Drug Recognition is a problem for the police.

Concerning drugs and alcohol, the police have had great experiences in recognition of which there are fully developed test systems.
But for illegal drugs these points are not standardized for daily use by the police.
The problem of recognizing illegal drugs has come up in the last few years when the industry was successful in developing adequate test systems.
The problem for the police is that illegal drugs differ from alcohol.
Contrary to alcohol, other drugs are more difficult to determine as impairment to the driver.
The classification by police officers for the recognition of drugs will still be necessary in the future because of the specific features of the drugs. Therefore, the police have to integrate this technique into the training programme for police officers.

Systematic Traffic Observations
It is usually difficult to detect drug-impaired road users in daily traffic and, therefore, special traffic observations are accomplished systematically.

By using selection, road users belonging to the target group (between 18-24 years old) are filtered out.

The action tactics differ in various occasions, such as great events or routine controls.

Systematic Traffic Observations -
Action Tactics
Using modern media, such as the internet, the police's attention can be drawn to events early enough in order to react effectively.
The police have reacted to the great number of detected drug users in road traffic belonging to the target group ("young drivers") on their way to a great event or on their way back home.

Within a systematic traffic observation, the arrival and departure of such an event is observed.

In order to control the frequency of the road users, the checkpoints are critically chosen. For the practical use, this means that every single car can be checked so that a selection is possible. This means that the speed of every car has to be reduced to a minimum so that the police officer can observe every passenger. However, it is more efficient to completely stop the cars.

Due to the great number of drug-impaired persons, an adequate logistic has to be formulated. Police officers, who are specially trained and experienced in the area of classification, talk to the drivers and accomplish the classification. For the following measurements, that take some time to complete, the persons are passed on to other police officers.

Still, only a small part of the drug-impaired drivers can be detected using these action tactics.

Systematic Traffic Observations
Measures at the Location
The police officer at the location collects, while conceiving suspicion, mosaic pieces that make a picture of suspicion concerning the checked person when put together.

The detected conspicuous symptoms are split into conspicuous appearances and deficiencies during the following examination of suspicion using the drug detection programme.

If there are no other grave impairments of reaction or perceptive faculties, the case is then handled as an administrative offence (§24a StVG), as Manfred Moeller already explained[41].

If the person, however, shows any additional deficiencies during examination, such as
- Problems with speech communication,
- Little or no pupil reaction, or
- Motor impairment,

then the case will be handled as a criminal offence (§ 316 StGB).

This will also be the case if the driver has been stopped because of driving mistakes, and if the following examination detects signs for drug consumption (drugs or alcohol over 0,03%).
If there are any signs of drug consumption found by using the checklist and after the legal classification of the case, the person can choose, after he has been advised, that a blood sample can be ordered if he wants to do a roadside drug test (if on-site tests are available) in order to clear away the suspicions.

If the test is negative and the examination showed only signs for an administrative offence, the person is forbidden to drive in order to prevent any dangers and no blood samples are taken.

But if the examination showed any signs for a criminal offence, then a blood sample will be taken even if the on-site test is negative. Realising that the on-site tests can only detect a few tests (normally the four drugs that are listed in §24a StVG), this procedure is still plausible.

Depending on the legal classification, a positive test result leads to a blood sample and the confiscation of the driving licence.

A transportation team at great events is responsible for the transport of the suspects to the police station.

Systematic Traffic Observations
Measures at the police station
A doctor will be called to the police station in order to take the blood samples and, if the person agrees, to do a medical examination. It is more efficient, if possible, to ask a doctor to come to the police station, instead of driving to the hospital, because the doctor in the hospital is often under time constraints or even refuses to take the blood sample.

It is also efficient to classify the person with a second checklist, especially if the person shows any changes in behaviour, in order to note this behaviour.

After finishing the legal measures, the person is released.

[41] see his presentation in this publication

Results and Evaluation
The classification made with the checklists is noted in the record in order to help the judge to get an individual picture of the conspicuous symptoms and deficiencies of the person, for example.

The first and the second checklist are part of the record. A copy of the medical examination, the blood sample and the urine sample—if taken—will be sent to the toxicological laboratory.

After the examinations, the toxicological expert opinion is sent to the public prosecutor and a copy is sent to the police.

In compliance with §2 Abs. 12 StVG, the Driver Licence Authority has to be informed about the suspicion that the driver has consumed drugs.

The police officer has to be prepared for the court because he will be a witness, and he has to be informed about different drugs and their effects.

Conclusions
Drug users can be detected using systematic traffic observations.

Suspicions are produced from conceived suspicions which consist of driving, accident proceeding or behaviour of the suspicious person during the traffic observation.
Conspicuous symptoms and deficiencies are put together with the suspicion tests to a mosaic of conclusive suspicions.

The documentation of the suspicions is made with the help of the checklists.

In order to verify the first suspicions on-site tests are utilized, such as urine, sweat or saliva.
If the case is a criminal offence or an administrative offence, then the classification in the report, the two checklists, the medical report, the protocol of the blood sample taken and the toxicological expert opinion are the basis for the decision of the court.

The necessity of a differential prevention concerning alcohol, illegal drugs and medication in traffic

by Anke Siebers, Charlotte Meindorfner, Yvonne Koerner & Hans-Peter Krueger (Germany)

Psychoactive substances represent a major problem in traffic safety. Although the statistics of the last years show a continuous increase in drug and medication caused accidents, alcohol still brings about the highest even though slightly decreasing traffic safety risk. Comparing the risks arising from psychoactive substances in traffic with the rare amount of already existing prevention campaigns in different countries, there is an urgent need for more action. But how should these measures be designed? Should they address the general population of substance drivers or should they focus on the individual substances, i.e. alcohol, drugs and medication?

Some arguments in favour of an equal treatment of psychoactive substances in general prevention programmes can be specified. First of all, alcohol, illegal drugs and medication share the same psychoactive effects (e.g. mood improvement, aggression, reduction of anxiety) and influence the same performance parameters relevant to driving (e.g. decrease in reaction, attention, psychomotor activity and activation). Hence, they show comparable accident risks. Besides, substances are often consumed in combination and this multiple substance use increases the effects and dangers for traffic. In addition, an increasing acceptance of illegal drugs as a substitute or alternative to alcohol as well as a decreasing problem awareness concerning the risks and illegality of drugs can be observed. At first glance, an equal treatment of alcohol, drugs and medication in traffic seems absolutely reasonable. On the other hand major differences concerning consumer attributes, image, consumption motives and driving habits outweigh these arguments and demonstrate the need for differential prevention measures. We will go through these differentiating characteristics in detail.

Whereas the portion of alcohol consumers remains relatively stable over different age groups, the consumption of illegal drugs strongly decreases with increasing age (drug intake mainly between 18 and 24). Psychoactive medication (such as benzodiazepines, stimulants) is primarily consumed by elderly people (medication intake mainly in the age group of 50 and older) (Kraus & Augustin, 2001; see figure 1).

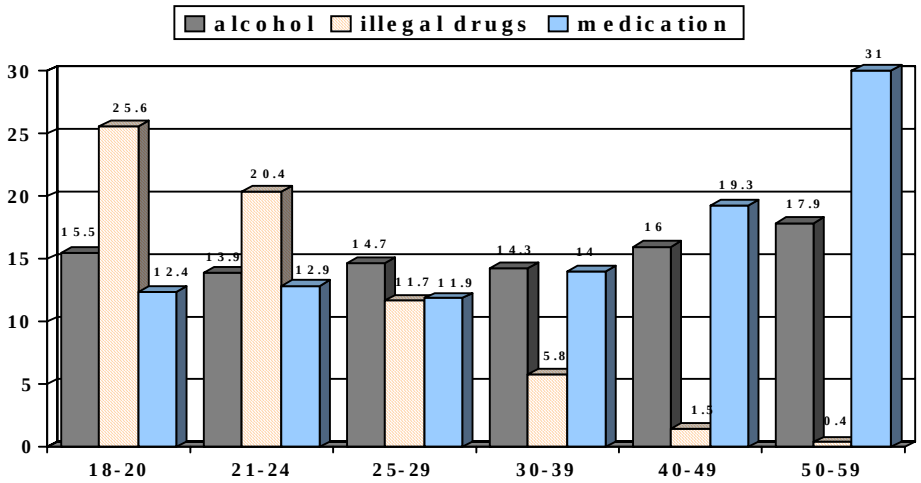


Figure 1: **Use of psychoactive substances among adults in Germany in the year 2000 (Kraus & Augustin, 2001)**

In addition, gender differences can be found. Whereas females are more likely to consume psychoactive medication than men (e.g. benzodiazepines only: 67,1% female; in combination with alcohol 66,2% female), alcohol and drugs are to a higher portion consumed by men (e.g. alcohol only: 80,4% male, Cannabis only: 86%)(Longo et al., 2000; see figure 2).

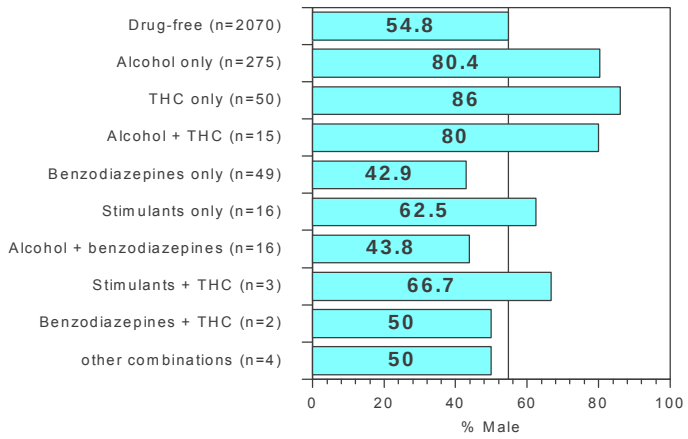


Figure 2: **Percentages of injured drivers tested positive for each drug and drug combination (Longo et al., 2000)**

Concerning socio-economic status, alcohol drivers are over-represented in the lower socio-economic class, especially in the unemployed population (Everest & Lyman, 1993; Baum, 2000), whereas only 12,6% of cannabis users come from a lower class and the majority from middle or upper class (Kleiber et al., 1998). Consumers of hard drugs on the other hand very often show a low education level. More than 30% did not graduate from school, more than 50% did not finish their vocational education (z.B. Kemnesies, 1995; Tiel et al., 1995). However, medication users seem to be independent from socio-economic class. In conclusion, several differences in consumer attributes exist among substance consumers and drivers. The “typical” alcohol driver seems to be male, rather young and middle-aged and low in socio-economic status whereas the “typical” drug driver is male, young and depending on the substance from a low, middle or upper class. “Typical” medicated drivers are characterised by female gender, old age and are to find in any socio-economic class.

But the consumers of psychoactive substances do not only differ in their personal attributes but also in the way they are perceived and judged by other people and each other. Generally, alcohol seems to be a socially tolerated drug, as long as the consumption does not contradict certain social standards, i.e. too much or in inadequate situations. People who drink a little even hold a better public image than those being completely abstinent. In contrast, the picture of a drug consumer in the general population still is more that of a filthy junkie fallen into bad ways who is not in control of himself. However, drug consumers themselves describe especially cannabis as “natural” and “healthy” whereas alcohol they call “loathing” and “the substitute drug for the less gifted”. The intake of medication on the other hand most people understand as necessary, based on health reasons and not avoidable by the individual (except medication abuse).

Concerning the consumption motives, the intake of alcohol and illegal drugs mainly serves the purpose to increase fun, reach a state of well-being and euphoria. They help to get along in social situations. Especially young consumers are very often influenced by their peer group, they want to pertain to the rest of their friends and make a good impression. In addition, many users consume especially in situations where problems and stress arise. In contrast, medication mostly is taken out of health reasons and to compensate dysfunctions. Some pharmaceuticals even make it possible for people to participate in traffic (e.g. anticonvulsants). Still not to forget that the group of medication is especially broad. They can also function asr drug substitutes and also a differentiation between use and abuse is necessary. Under consideration of the increasing isolation of old people, we should bear in mind that for medicated drivers the restriction of driving under substance influence implies a dramatic loss of mobility and in consequence of life quality.

Major differences between substance drivers can be found in the area of driving habits. Alcohol drivers are more likely to drive under the influence of alcohol the earlier they start drinking and the more the quantity of their consumption. Drug users generally estimate a higher risk for health and traffic safety from alcohol than from drug use.

They believe that „cannabis users drive more carefully than alcohol users“. In addition, they show a strong believe in their ability to compensate for their impairments. They argue to drive even more carefully under substance influence. The more frequently alcohol as well as drug drivers consume, the more likely they are willing to drive under substance influence and the lower they estimate their accident risk. In contrast, medicated drivers (therapeutical medication) in majority show a responsible participation in traffic. They are less convinced of their performance ability and aware of the risks emerging from their medication. Many patients taking medication reduce or even quit driving. In a detailed survey more than 6000 patients with Parkinson´s disease (PD) were questioned (Krüger et al, 2002). When asked how long they estimate themselves as capable of driving (driving duration in minutes without a rest), patients with a sedating medication report fewer minutes than patients without a sedating medication. In addition, they drive less km per year (see figure 3).

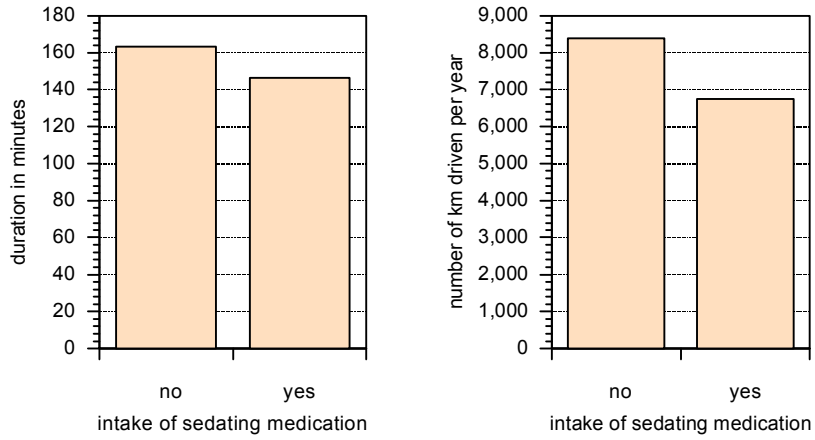


Figure 3: **Time subjects rate themselves as capable of driving in minutes (left) and number of km driven per year (right) depending on the intake of sedating-medication of PD patients (Krüger et al., 2002).**

In conclusion, alcohol, drugs and medication share several effects and in consequence show comparable risks in traffic. But the heterogeneity of substance drivers concerning attributes, attitudes perception and driving habits shows the need of group-specific substance-dependent prevention measures. But what could differential prevention messages look like?

- For alcohol prevention it is important to appeal for a dissociation of drinking and driving. The prevention message could read e.g. “If you drive, do not consume!” or “If you are not fit for driving, do not drive!” or even more simple “Don’t drink and drive!”.

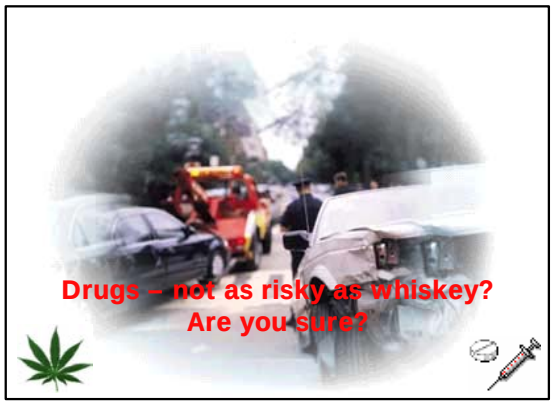
- The drug prevention message should try to enhance the awareness that driving under the influence of drugs increases the accident risk in traffic (“Drug driving is dangerous!”).

- Medicated drivers already show a responsible participation in traffic and should be encouraged to extend the already existing responsibility. Their attention must be called on the importance to read the information in the package inserts of medication and to ask their doctor or pharmacist (“Get informed!”).

An individual message adjusted to the characteristics of each substance group is an important approach to differential prevention. In addition the specific prevention measure needs to be adjusted to the message, e.g. decision to address consumers personally or to involve mediating persons.

Exemplary prevention programmes

Alcohol



Illegal Drugs

Medication

The prevention of driving under the influence illegal drugs: the experience of Belgium

by Sylvie Delcourt (Belgium)

Introduction

In 1995 and 1996, the Belgian Toxicology and Traumatology Study (BTTS), based on 2,053 drivers who had had a road accident involving physical injuries, highlighted the prevalence of drugs in drivers of road vehicles. 10% of these drivers are under the influence of illegal drugs and the risk of fatality is twice as high as that for people who have not consumed any drugs. The study also revealed the substances that were over-represented and therefore which drugs were the most likely to create a problem for road safety. It was on the basis of the results of this study that the Law of 16 March 1999 making it an offence to drive while under the influence of illegal drugs was drafted.

In order to raise public awareness, the Belgian Road Safety Institute conducted a campaign between 1996 and 1999 entitled "Young but not dumb". This campaign, which was directed at young drivers and focused on risk-taking, tackled a number of issues: alcohol, speed, wearing a seatbelt, and drugs.

Several reasons led us to organise a campaign to prevent driving under the influence of drugs. Firstly, the entry into force of the new law; secondly, the lack of information made available to the police, public prosecutors and, more particularly, medical and psychosocial staff responsible for dealing with problems of drug abuse; and; finally, the policy memorandum from the federal government concerning the drugs problem – which, amongst other things, provided for greater tolerance of cannabis – led to confusion among consumers. It was therefore essential to reiterate the ban on driving under the influence of illegal drugs.

Originally, the campaign was supposed to comprise two elements: an information campaign for the staff and officers involved and a prevention campaign for drivers/consumers.

2001 – The 1st campaign: "I drive with a clear head" ("Je roule clean")

It was not a question in this campaign of tackling the general problem of the consumption of drugs but only of their impact for driving. The approach adopted differs fundamentally from that of the "drink driving" campaigns, since the archetype of the drunken driver differs significantly from that of the driver under the influence of drugs. This was therefore a prevention campaign that specifically targeted drug driving and was especially directed at young drivers/consumers.

The target group were drivers who occasionally or regularly consume drugs.

The BRSI's communication approach is also a targeted one. As it is directed exclusively at drug consumers, the message is about reducing risks and not preventing consumption.

The information provided focuses on the effects of the illegal drugs covered by the law relating to fitness to drive, the procedures for carrying out checks, the penalties incurred by persons driving "under the influence" and the driver's rights and obligations. The leaflet also provides some advice to follow. The general approach is non-judgmental and non-moralising.

The leaflet was drawn up in collaboration with all bodies involved: representatives of the police services, the judicial authorities, the world of science and associations responsible for dealing with problems of drug abuse.

The draft of the leaflet was submitted to a test group made up of drivers/consumers in order to ensure the credibility of the message and its acceptability vis-à-vis the consumers of illegal drugs.

As the campaign was not directed at the general public but only at drivers/consumers of drugs, the conventional methods of disseminating information (radio and television commercials, roadside hoardings, etc) were not used. The leaflet was therefore distributed through associations involved in looking after drug addicts or occasional consumers, the police and the drug prevention services present at the venues of festive events or discotheques.

2002 - The 2nd campaign: "Drug driving - going on a bad trip"

This second campaign did not change the contents of the message we wanted to put across. Only the means employed were changed.

When the campaign was launched, the BRSI organised a one-day seminar on driving under the influence of illegal drugs, our intention being to inform and raise the awareness of people from both the judicial and the medical or voluntary sectors. In the afternoon, a working group met to discuss raising awareness, and the contributions by the participants underscored the necessity systematically to organise awareness-raising activities and educate people on the risks of consumption of illegal drugs and driving. The following issues were also dealt with: the relevance of a risk-reduction campaign with regard to the subject of drug consumption as a whole – must the target audience be limited to actual consumers or also include potential consumers? – and the necessity to separate awareness-raising activities by social sector staff from law enforcement action. Owing to the lack of resources, it has not been possible to deal more thoroughly with the questions raised by the working group.

At the moment, although the BRSI has not organised any new campaigns, the distribution of leaflets and small posters is continuing. This material has to be regularly reprinted in order to meet the demand.

Difficulties encountered

The main difficulty we encountered in preparing this campaign was the lack of information on the effectiveness of specific campaigns for preventing drug driving. Very few studies have been devoted to this subject and the rare campaigns carried out to date have not been evaluated.

There are also difficulties of a budgetary nature. The lack of funds prevents us from:

- evaluating the campaigns already conducted, with the result that we do not have the information necessary to modify or reorganise our activities,
- developing the educational component,
- arranging for the training and supervision of voluntary sector staff.

Finally, the implementation of a programme specifically aimed at drivers/consumers may be perceived by the public as a whole and the political world as incidental to the general phenomenon of the consumption of illegal drugs.

Conclusions

It is essential to organise prevention campaigns but in order for a prevention policy to be effective it is not only necessary to know, identify and monitor the substances involved but also to have the financial resources to make the potential consumers aware of the risks associated with their consumption and the consequences of this when driving.

The campaigns must be preceded by studies on the consumers' knowledge of the legislation and the possible influence the latter may have on their behaviour.

It is also necessary to have the financial resources to be able to conduct an in-depth evaluation of the campaigns already carried out.

Medicinal drugs and driving: from drug-categorisation to driver information. The Spanish experience

by Javier Álvarez and Carmen del Río (Spain)

Abstract

This article analyses the Spanish experience with the topic of drugs and driving. It focuses on the activities addressed to health professionals (physicians and pharmacists), such as the elaboration of a guide for prescribing medicinal drugs to patients who drive, the establishment of a categorisation of drugs into three levels according to their properties to impair, as well as activities that are addressed to the public at large.

Medicinal drugs and driving: a different problem to illicit drugs / alcohol and driving.

One of the aspects which, in our opinion, should be made clear right from the start, is that the problem of alcohol, illicit drugs, medicinal drugs and driving cannot be dealt with in the same manner.

The relation between alcohol and driving is well-established. The alcohol model, however, cannot be used for illegal and medicinal drugs. Unlike alcohol, most illicit and medicinal drugs do not have a clear relationship with blood plasma levels, impaired psychomotor performance and accident risk (1,2).

On the other hand, medicinal and illicit drugs are two completely different categories of substances. Medicine, unlike an illegal drug, is a legal product whose authorisation is regulated by the competent bodies and is prescribed by doctors and sold by pharmacists.

What sometimes causes confusion is that medicines and illicit drugs are sometimes lumped together because, from the point of view of traffic, they have many similarities: i) what is important is not the type of substance but the accident risk, ii) it is sometimes difficult to establish whether the substance had been prescribed or whether the person had been consuming it illegally [benzodiazepines, opiates, etc.], iii) the person may frequently be under the effects of several substances at the same time, including alcohol (2).
Finally, while alcohol is only one substance, illicit drugs include various groups of substances with different profiles (depressants, like inhalants; stimulants like cocaine; psychedelic drugs, like LSD); and there is a great variety of medicinal drugs on sale in developed countries. (For example, there are nearly 4,000 medicinal drugs in Spain in about 12,000 pharmaceutical preparations.) Moreover, most medicines have little or no effect on psychomotor performance and/or driving ability (3).

Thus, in our opinion, the topic of medicinal drugs and driving should be dealt with differently from that of alcohol / illicit drugs and driving, even though they may overlap in some cases.

Finally, the role played by health professionals in this field should be stressed, since most medicines are prescribed to drivers suffering some kind of pathology, which some can, in themselves, adversely affect the fitness to drive (4-6). The pharmacological treatment prescribed can, in some cases, stabilise or improve the clinical situation of the patient, thus improving their ability to drive safely (7). However, it should also be taken into account that some of these medicaments adversely affect the psychomotor performance (8) and the ability to drive safely. Furthermore, patients taking some class of medication also have an increased risk of involvement in road accidents (4,9). The relationship between illness, pharmacological treatment and driving is complex, and it should be the doctor/pharmacist who assesses the risk/benefit ratio at the time of prescribing the medication (3,7).

Basis for the development of medicinal drugs and driving campaigns

In the last few years, informative campaigns concerning medicinal drugs and driving have been carried out in several European Union countries. Recently, and within the framework of the Working Group on Alcohol, Drugs and Medicines and Driving (1998-2000) from the Directorate-General VII Transport of the European Commission, we have analysed the campaigns addressed in the different countries (10,11).

The large majority of campaigns relating to medicinal drugs and driving have been aimed towards: i) the professionals who prescribe these drugs (physicians and pharmacists), ii) the patients who take them, or iii) the general public. It is logical that the contents, dissemination and depth of these campaigns should differ according to the individuals targeted, and even depending on the promoting organisation or enterprise, whether it is public or private.

Four pieces of information appear to be necessary (10):

- ✓ In all cases it seems appropriate to convey the idea that certain drugs or groups of drugs may impair the ability to drive safely.
- ✓ It seems to be a good idea to draw attention to four factors which significantly influence the final effect of the drug on the ability to drive safely, namely polypharmacy (i.e., taking several medicinal drugs at the same time), taking medicinal drugs in combination with alcohol, dosage and self-medication.
- ✓ In the case of those campaigns targeting patients and drivers in general, emphasis should be laid upon the advisability of always following the instructions given by the physician/pharmacist, and of consulting them whenever there is any doubt or whenever adverse effects appear.
- ✓ As far as health professionals are concerned, extra information on drug-driving categorisation and the labelling of medication with regard to driving performance may be of relevance.

Medicinal drugs and driving: the Spanish experience

Some examples of activities carried out in the field of medicinal drugs and driving by the public agencies, mainly by the National Traffic Agency (Dirección General de Tráfico), Home Office, are presented next.

1. Campaigns aimed at the general public.

The activities aimed at the general public regarding the role of medicinal drugs and driving have pointed out that some medicinal drugs can impair the ability to drive safely. Likewise, informative campaigns to heighten awareness among the population are, without a doubt, measures that can contribute to a more adequate use of medicinal drugs while driving a motor vehicle.

As an example, Figure 1 shows a recent advertising campaign [2001] addressing some factors than can impair the ability to drive safely, one of them being medicinal drugs.

2. Campaigns aimed at patients.

Figure 2 shows a poster produced by the National Traffic Agency that states: “If you suffer from any of the following diseases -depression, high blood pressure, heart disease, rheumatism, allergies, insomnia- you may be taking medicaments that reduce your capacity to drive. Consult your doctor or the chemist.” At the bottom of the poster, 24 of the most prescribed medicinal drugs are mentioned along with a statement that they can affect the driving performance. This poster was placed in the rest areas and surgeries of primary health care centres in Spain.

More recently, the National Traffic Agency has produced a leaflet that mainly addresses the older population of drivers. The main medicinal groups, their main “side-effects” on the ability to drive, and the consequences if the patient takes the medication together with alcohol are presented on one side of the leaflet (Figure 3). On the other side (Figure 4), there are some recommendations to the driver who takes these medicinal drugs.

3. Campaigns aimed at health professionals: physicians and pharmacist; the categorisation of medicinal drugs on driving.

Most activities carried out on medicinal drugs and driving are aimed at physicians and pharmacists—especially towards the former.

On the same lines, and within the framework of achieving an adequate prescription of medicinal drugs to patients who drive, this project has set about creating a guide for the prescription and selection of medicinal drugs, establishing a categorisation of these medicinal drugs into three levels according to the extent to which they affect a person’s capacity to drive and, while at the same time, laying the foundations for the prevention of traffic accidents caused by the use of medicinal drugs (12).

3.1. The categorisation of the medicinal drugs which affect the capacity to drive

With respect to the influence that medicinal drugs can have on the capacity to drive, Spanish law (Real Decreto 2.236 of 17 December, 1993)(13), conforming to EU legislation Directive 92/27/ EEC, last update Directive 2001/83/EC (14), establishes the rules on labelling and the package inserts of medicinal drugs for human use. In particular, paragraph 4.7 of the package inserts refers to the medicament's effect on the capacity to drive.

However, not all medicaments affect the capacity to drive in the same way. Thus, using these effects as the basis, a classification of the medicinal drugs into three different levels has been proposed (CPMP, III/9. 163/90 of the EEC) (15,16). Unfortunately, this categorisation has not been implemented in the EU. We believe it would be enormously useful at the time of prescribing and selecting a medicinal drug for a patient who drives, from the point of view of the doctor or pharmacist, since it would allow them to evaluate the possible effect it could have on a driver's capacity with a lot more precision, and thus be able to choose the appropriate medicinal drug more easily. It would also help them to decide whether or not to recommend to a patient that he/she should not drive while taking a particular medicinal drug (12).

Using the said categorisation proposal as our basis, we have carried out a classification of the main products sold commercially in our country into three levels:

Category I:	Presumed to be safe or unlikely to produce an effect.
Category II:	Likely to produce minor or moderate adverse effects.
Category III:	Likely to produce severe effects or presumed to be potentially dangerous.

The categorisation was carried out as follows (12):

1. Review of the information contained in the package leaflets concerning the medicaments and their influence on the capacity to drive.

A review of the prospectus (package leaflets) and product characteristics of the main medicaments sold commercially in Spain, according to the Catalogue of Pharmaceutical Specialities 2000 and 2001 (17), includes a warning concerning the capacity to drive.

Of the medicinal drugs on the market in our country, 303 contain a warning in the package inserts concerning the effects on the capacity to drive (3). Of these, the most common are those that affect the cardiovascular system, the nervous system and the respiratory system.

2. Categorisation of the therapeutic groups that can potentially affect the capacity to drive.

Ten therapeutic groups were selected with medicinal drugs that could affect the capacity to drive. Given that not all of the medicinal drugs within the same therapeutic group have the same effects, the classification into three levels is useful for a doctor when prescribing medicinal drugs so that he/she can consider which will have the smallest effect on the capacity to drive.

The following are the 10 groups of medicinal drugs that have been categorised regarding their effect on driving ability:

- Analgesic-narcotic drugs
- Antidiabetic drugs
- Antihistamine H-1 [including, as other antihistamine H-1 drugs, some antiparkinsonian drugs]
- Antihistamine H-2
- Antipsychotic drugs
- Antidepressant drugs
- Antianxiety-Hypnotic drugs
- Antiepileptics
- Beta-blockers
- CNS stimulant drugs

For each of the medicaments classified, a bibliographical review was carried out of the studies concerning the effects of the medicaments on the functions related to driving performance and the capacity to drive.

Table 1 shows an example of the categorisation of the antidepressant drugs as it appears in the 'Guía de Prescripción Farmacológica y seguridad Víal' ('The Pharmaceutical Prescription Guidelines and Road Safety') (3,18). Besides the therapeutic classification in each of the groups, it also shows the effects that the medicinal drugs in this group have on the capacity to drive, as well as some recommendations concerning driving under the effects of these medicinal drugs.

Table 2 shows this categorisation but regarding antihistamine H-1 drugs (3,18) instead.

3. Publication and distribution among health professionals of 'The Pharmaceutical Prescription Guidelines and Road Safety'.

'The Pharmaceutical Prescription Guidelines and Road Safety' (3) has been published and distributed among the Primary Health Services of the National Health Service, Scientific Societies of Primary Health Care and Traffic Medicine Associations. The first edition comprised of 3,000 copies and, due to its success among the health professionals, a second updated edition (18) of 5,000 copies has been recently distributed.

The Guide has several different sections (3,18): i) information for the health professional on the effects of the medicaments on the capacity to drive, ii) basic principles for the prevention of accidents caused by medicaments, iii) the categorisation of the medicaments sold commercially in Spain grouped therapeutically and based on their effects on the capacity to drive, iv) a list of the medicaments that appear in the catalogue of pharmaceutical specialities and which have a warning concerning their effects on the capacity to drive, and v) a list of the main pharmacological groups which interact with alcohol.

Thus Spain, after Belgium (19), is the second European Country to introduce the drug categorisation system for medicinal drugs that potentially impair driving performance. France has also recently introduced a categorisation for antihistamine H-1 drugs (20).

Although the "efficacy" and use of the categorisation by health professionals has not been formally evaluated, indirect facts suggest that this has been well accepted by physicians/pharmacists, as well as by pharmaceutical companies.

3.2. Promoting rational prescription as part of the prevention of road accidents.

Figure 5 shows an informative report carried out by professionals from the National Traffic Agency and the University of Valladolid, which has been published in several medical journals, and which deals with the 'Consumption of medicinal drugs and the capacity to drive: prescription and rational use of medicaments for patients who drive motor vehicles.'

In the last few years several publications, such as the booklet edited by the Ministry of Health (Figure 6), have been addressed to physicians and pharmacists to promote their involvement in the prevention of road accidents.

3.3. Medicinal drugs and fitness to drive

As we pointed out previously (2), the relation, from the point of view of the traffic authorities, between medicinal drugs and driving can be seen from a dual perspective.

First, countries have regulations against driving under the influence of certain substances (alcohol, illegal drugs and medicaments) that impair the ability to drive. Most countries take one of two positions: "zero-tolerance," that is, if the substance is detected, the law has been broken; or "impairment," that is, it would be necessary to provide evidence of impairment in the driver who is under the effect of the said substance (21).

On the other hand, Directive 91/439 EEC on driving licences establishes in Annex III the minimum standards for the physical and mental fitness to drive a motor vehicle (22). This indicates that "driving licences shall not be issued to, or renewed for, applicants or drivers who regularly use psychotropic substances, in whatever form, which can hamper the ability to drive safely where the quantities absorbed are such as to have an adverse effect on driving. This shall apply to all other medicinal products or combinations of medicinal products which affect the ability to drive."

Several recent publications by the National Traffic Agency address the topic of diseases and fitness to drive, as well as specifically the topic of medicinal drugs and driving (Figures 7 and 8).

Future perspectives

The EU legislation (Article 2 of the said Directive 92/27/EEC) (14) establishes that the outer packaging may include symbols or pictograms designed to clarify certain information. As we have pointed out previously (2), the novelty in this sense has been the recent inclusion in France of a pictogram on medicinal drugs that have this warning. The pictogram already existed in other Northern European countries but without the car pictogram, as seen in France, which seems to be more informative.

One of the priorities, in our opinion, is to introduce this pictogram in Spain. However, it should be pointed out that the best way would be the implementation of this pictogram by the EU agency EMEA (The European Agency for the Evaluation of Medicinal Products). This would mean a pan-European implementation of the pictogram. The same would be applicable to the drug categorisation system, as well.

Furthermore, a permanent update of the drug categorisation system should be conducted since new medicinal drugs are constantly being registered. Again, rather than a national approach, an international approach should be encouraged.

Acknowledgements

Support for the preparation of this article has been obtained by Ministry of Health, Instituto de Salud Carlos III, grant on Redes Temáticas de Investigación Cooperativa, Red de Trastornos Adictivos G03/005, 2003. We thank the National Traffic Agency (Dirección General de Tráfico), Home Office, and Ministry of Health for allowing us to use the material from their campaigns. The opinions given in this article belong to the authors and not to the public agencies or private companies that carried out activities in the field of medicinal drugs and driving in Spain.

References

1. Consensus Development Panel. Drug concentration and driving impairment. JAMA 1985; 254, 2618-2628.

2. Álvarez FJ, Del Río MC. Medicinal drugs and driving: from research to clinical practice. Trends Pharmacological Sciences 2002; 23: 441-443.

3. Del Río MC, Álvarez FJ, González-Luque JC. Guía de Prescripción Farmacológica y Seguridad Vial. Madrid: Dirección General de Tráfico, 2001.

4. McGwin G, Sims RV, Pulley L, Roseman JM. Relations among chronic conditions, medications and automobile crashes in the elderly. A population-based case-control study. Am J Epidemiol 2000; 152: 424-431.

5. Petridou E, Moustaki M. Human factors in the causation of road traffic crashes. Eur J Epidemiol 2000; 16:819-826.

6. DVLA. For medical Practitioners. At a glance guide to the current medical standards of fitness to drive. Swansea: DVLA, 2002.

7. Alvarez FJ, Del Río MC. Prescribing medication for the driver: Informing the patient on the effects of medication on driving ability. In Mercier-Guyon C, ed. Alcohol, Drugs and Traffic Safety -T'97, vol. 3. Annecy: CERMT, 1997: 1283-1295.

8. Riedel WJ, Vermeeren A, Van MPJ, Vuurman EF, Verhey FR, Jolles J, Ramaekers JG. Mechanism of drug induced driving impairment: a dimensional approach. Hum Psychopharmacol Clin Exp 1998; 1: S49-S63.

9. Barbone F, McMahon AD, Davey PG, Morris AD, Reid IC, McDevitt DG, MacDonald TM. Association of road-traffic accidents with benzodiazepine use. Lancet 1998; 352: 1331-1335.

10. Álvarez FJ, Del Río MC. Medical drugs and driving: European experience with dissemination and information to physicians, pharmacists, patients and the public. In Laurell H, Schlyter F eds., Alcohol, drugs and Traffic Safety -T'2000, Vol 4. ICADTS: Stockholm: 2000:1205-1209.

11. Alvarez FJ. To review and compare available lists of concerned substances and the measures taken in the different Member States. In Directorate General for Energy and Transport. Report on drugs, medicines and driving, Brussels: Directorate General for Energy and Transport, 2002.

12. Del Río MC. Strategy for the implementation of a new categorisation system in Spain. In Mayhew DR, Dussault C, eds., Alcohol, Drugs and Traffic Safety - T'2002, Vol 2. ICADTS: Montreal: 2002: 547-552.

13. Real Decreto 2236/1993, de 17 de Diciembre por el que se regula el etiquetado y el prospecto de los medicamentos de uso humano. BOE 42, de 18 de Febrero de 1994.

14. Directive 2001/83/EC of the European Parliament and the Council on the Community Code relating to medicinal products for human use. Official Journal of the European Communities L 311/67-128.

15. De Gier JJ. Drugs and driving Research: Application of Results by Drugs Regulatory Authorities. Hum. Psychopharmacol. Clin. Exp. 1998; 13: 133-136.

16. Álvarez FJ, Del Río MC. Drugs and driving (Commentary). Lancet 1994; 344: 282.

17. Consejo General de Colegios Oficiales de Farmacéuticos. Catálogo de Especialidades Farmacéuticas, 2001. Madrid: Consejo General de Colegios Oficiales de Farmacéuticos, Madrid, 2001.

18. Del Río MC, Álvarez FJ, González-Luque JC. Guía de Prescripción Farmacológica y Seguridad Vial. Segunda edición. Madrid: Dirección General de Tráfico, 2002.

19. Toxicological Society of Belgium and Luxembourg asbl. Influence des médicaments sur les capacités de conduire. Bruxelles: Toxicological Society of Belgium and Luxembourg asbl, 1999.

20. Mercier-Guyon C, Wessel F. Allergies et aptitude a la conduite. Paris: La Prévention Routière & Association Nationale de Formation Continue en Allergologie, 2001.

21. Krüger, HP, Perrine B, Huessy F, Mettke M. Overview of legal provisions, difficulties faced by police, and analysis of prevention attempts in selected European countries. In Road traffic and drugs. Strasbourg: Council of Europe Publishing, 1999: 63-85

Table 1: Antidepressant drugs

Tricyclics		***Heterocyclics***	
Amineptine	***II***	***Maprotiline***	***II***
Amitriptyline	***III***	***Mianserine***	***III***
Amoxapine	***III***	***Mirtazapine***	***III***
Clomipramine	***II***	***Trazodone***	***III***
Dosulepina	***III***		
Doxepin	***III***		
Imipramine	***II***		
Lofepramine	***II***		
Nortriptiline	***II***		
Trimipramine	***III***		
Serotonin Selective Reuptake Inhibitors		***Monoamine Oxidase Inhibitors***	
Citalopram	***I***	***Moclobemide***	***I***
Fluoxetine	***I***	***Tranylcypromine***	***II***
Fluvoxamine	***I***		
Nefazodone	***II***		
Paroxetine	***I***		
Reboxetine	***I***		
Sertraline	***I***		
Venlafaxine	***II***		
Viloxacine	***II***		
Lithium	***II***		

Effects which influence the capacity to drive

Sedation (variable with respect to the molecule), postural hypotension, fatigue, vertigo, anxiety, changes in behaviour, shaking, blurred vision, visual accommodation disturbances.

Recommendations

SSRI's are the ones which have the least effect on the capacity to drive. Patients should be clearly warned of the risk of driving motor vehicles while taking these medicinal drugs. Driving during the first few days of the treatment in particular should be avoided, as well as during changes in the dosage.

Table 2: Antihistamine H-1 drugs

First Generation		Second Generation	
Alimemazine	III	Astemizole	I
Azatadine	II	Azelastine	I
Clemastine	III	Cetirizine	II
Chlorpheniramine	II	Desloratadine	I
Dexchlorpheniramine	III	Ebastine	I
Diphenhydramine	III	Fexofenadine	I
Hydroxycine	III	Lebocabastine	I
Mequitazine	II	Loratadine	I
Mizolastine	II	Terfenadine	I
Oxotamida	II		
Prometazine	III		
Tripolidine	III		

Effects which influence the capacity to drive

Sedation (variable with respect to the molecule), anxiety, sleep disorders, blurred vision, visual accommodation disturbances.

Recommendations

The most common side effects of antihistamine H-1 drugs are sedation and sleepiness. The intensity of these side effects varies between the different antihistamine H-1 drugs. It is more noteworthy during the first days of treatment. Most of the second generation antihistamine H-1 drugs are less sedative and have minimal effects on driving performance.

Patients should be clearly warned of the risk of driving motor vehicles while taking first generation antihistamine H-1 drug.

Figure 1: Advertising produced by the National Traffic Agency, Home Office, focussing on risk factors (sleepiness induced by medicinal drugs; fatigue; mobile phone and distraction).

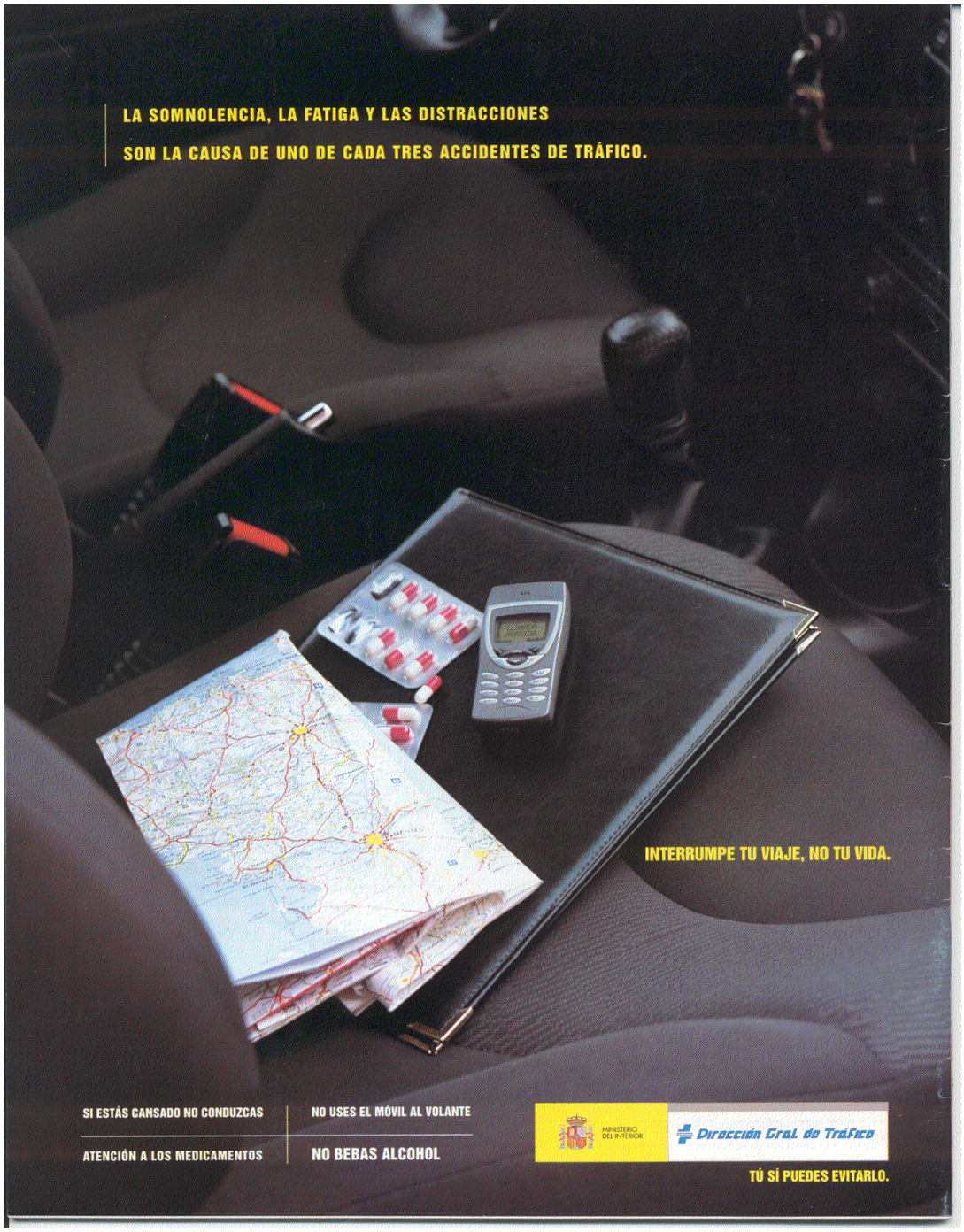


Figure 2: Informative campaign by the National Traffic Agency, Home Office.

Figure 3: Main groups of medicinal drugs affecting driving performance and ability to drive safely, National Traffic Agency, Home Office.

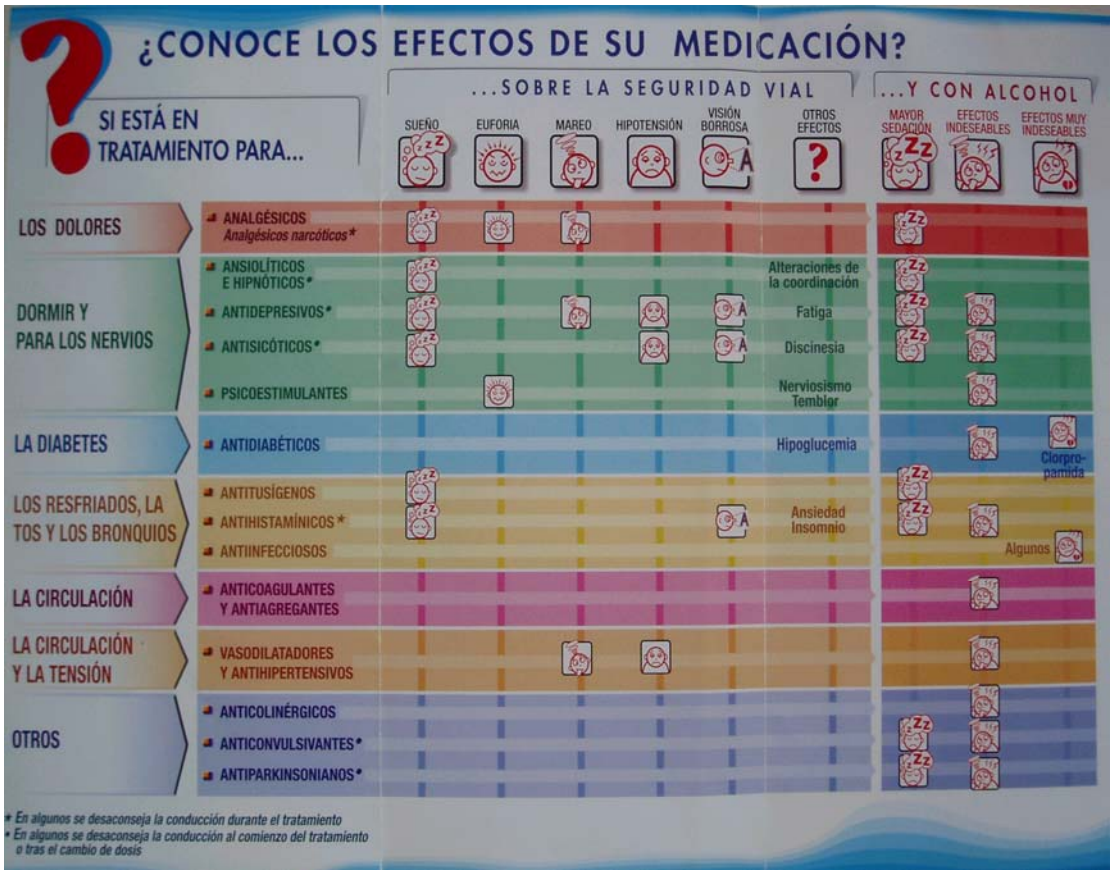
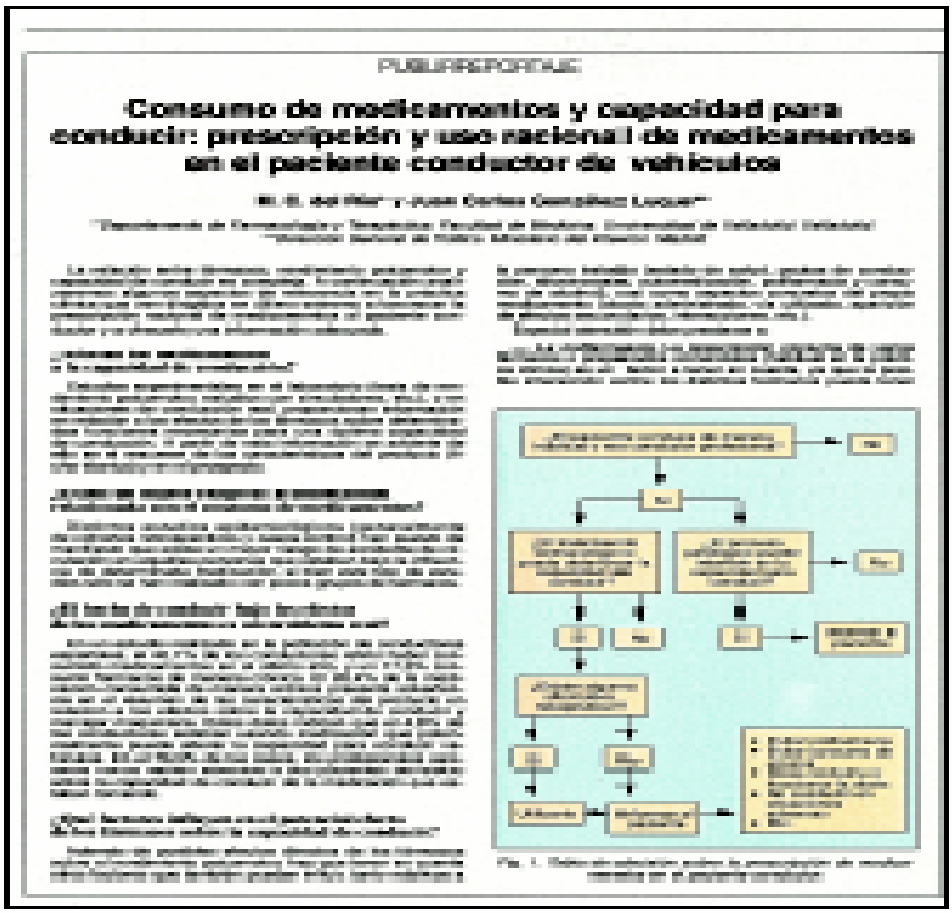


Figure 4: Front page of the leaflet: Driving a motor vehicle or walking may be adversely affected by an irresponsible consumption of medicinal drugs, National Traffic Agency, Home Office.

Figure 5**: Report for medical journals**



PUBLIREPORTAJE

Consumo de medicamentos y capacidad para conducir: prescripción y uso racional de medicamentos en el paciente conductor de vehículos

Figure 6**: Guide on how to help prevent, Ministry of Health.**

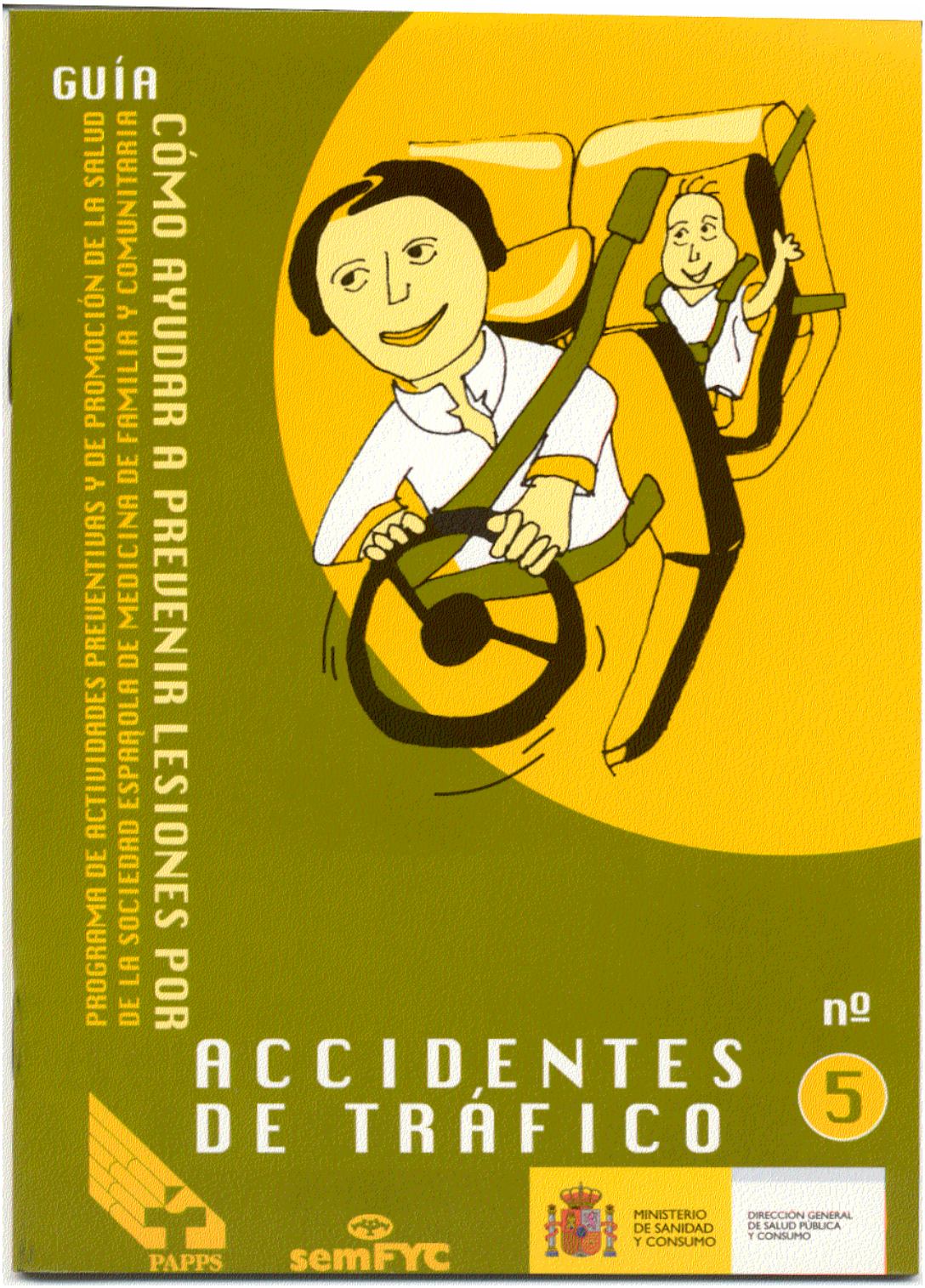


Figure 7: Manual on the medical aspects related to the capacity to drive motor vehicles, National Traffic Agency, Home Office.

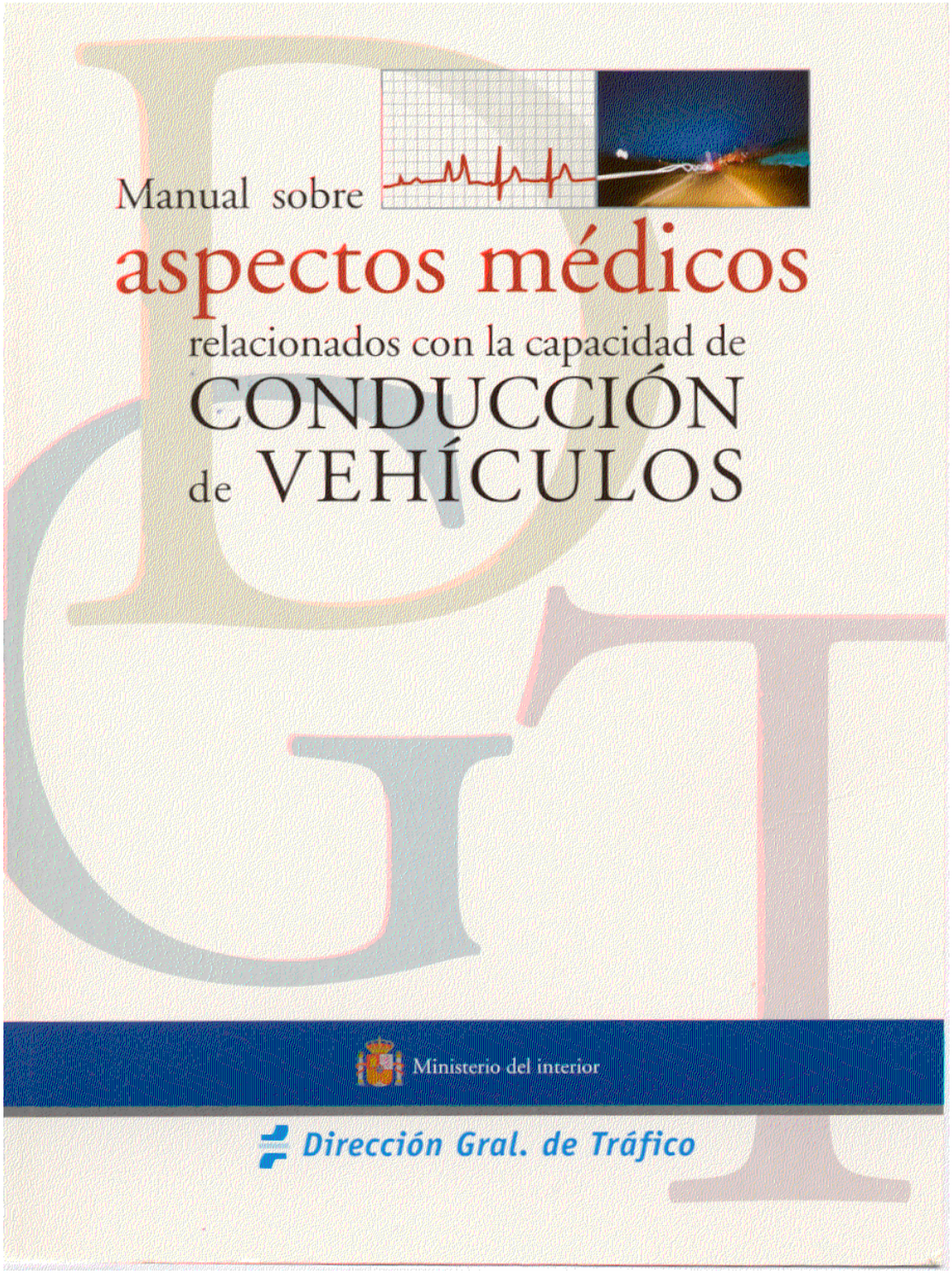
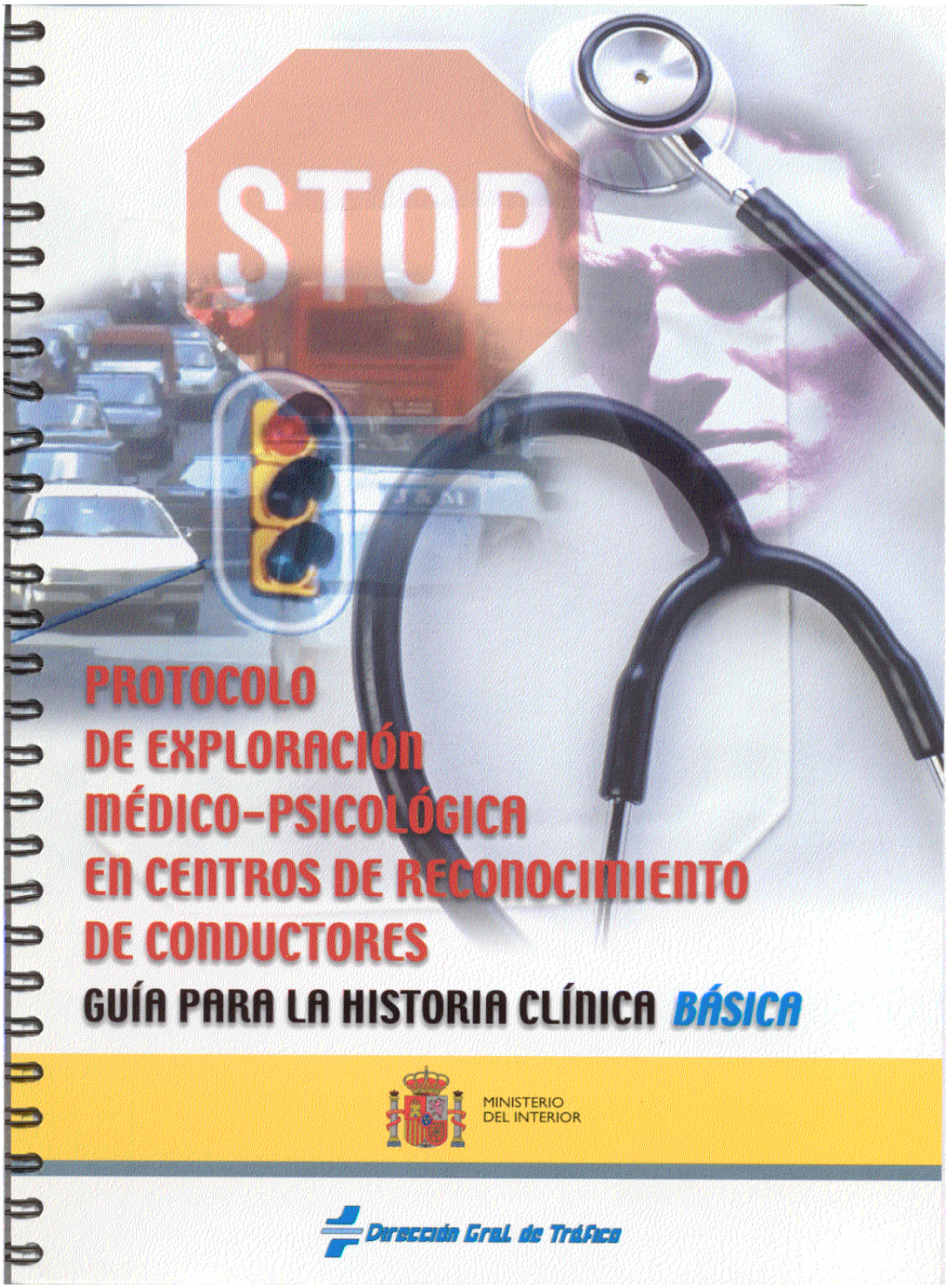


Figure 8: Protocol of medical-psychological examination in Medical-Psychological centres, National Traffic Agency, Home Office.



Classification of psychotropic drugs and driving licence vehicle groups

by Charles Mercier-Guyon (France)

For a number of years now, doctors, pharmacists and patients have had their attention drawn to the information contained in the instructions for the use of certain drugs to the effect fact that they *may cause drowsiness in vehicle drivers or machine operators.*

Since this type of notice appears very frequently, is often vague and is sometimes qualified in some way or even ambiguously or hypothetically worded, it often results in the opposite of what is intended because it trivialises the information and makes it a secondary concern among those involved.

The introduction in France four years ago of a specific pictogram (a red triangle depicting a car), which must be printed on the boxes of drugs that constitute a risk to vehicle drivers and will thus supplement the existing statutory product information regulations, is in danger of coming up against the same problem of the trivialisation of the information, both owing to the large number of proprietary drugs concerned and the uniform nature of the warning: all the drugs involved will have the same type of warning, whether the product is extremely dangerous when used by drivers or is one for which just a few simple precautions need to be taken.

Since the beginning of the 1990s, several international bodies and research institutes have proposed categorising drugs according to the risks they pose to car drivers in order to enable patients to be provided with differentiated information.

Classifications based on the opinions of experts and on epidemiological and experimental studies have been proposed but they are too impractical for the prescriber as they are merely indicative and do not permit going beyond simple prevention advice. Moreover, they are only based on a pharmacological viewpoint and fail to take account of the treatment indications of the products.

At the same time, however, a major development has recently emerged in French law, namely the obligation imposed on the doctor to be able to furnish proof of having given complete and appropriate information to a patient with regard to the side effects of medical treatment provided or prescribed (even where such effects are rare).

This obligation to inform patients imposed on the doctor by several decrees of the Conseil d'Etat and the Court of Cassation also – theoretically for the moment at least – concerns the prescribing of medication.

This development in the law will profoundly change medical practice and requires us to provide, in the interests of both patients and doctors, a set of data and guidelines for deciding on the treatment to be given.

It took a major incident – the Thalidomide affair - for legislative controls, which now date back a long time but remain relevant today, to establish the principle that care has to be taken when prescribing drugs for pregnant women. This principle is reflected in the initial restriction on the use of a product when it is introduced on to the market and in specific research.

In view of the many deaths due every year to road accidents (probably 5 to 8% of which involve a medicinal drug or its mode of use), we are calling for a comparable cautionary approach.

A report drawn up by the Traffic Medicine Study and Research Centre at the request of the road safety organisation *Prévention Routière* and with the support of the French Federation of Insurance Companies proposes a classification of drugs based on the risks they pose to vehicle drivers and the various driving licence classes.

This classification is not only based on the pharmacological effects of products, such as the effects that can be observed in the course of experimental studies, but also takes account of the treatment indications of the products, since these indications may themselves be a source of problems relating to fitness to drive.

It would, for example, be paradoxical in the context of informing a patient if a doctor were to prescribe a professional driver an anti-diabetic drug without informing him or her about the potential lack of fitness to drive resulting not only from the treatment but also, and above all, from the diagnosis.

The qualification to drive a road vehicle is defined in both French and European regulations according to two groups:

- **the "heavy vehicle" group** comprises class C, D and E driving licences for "heavy" vehicles, i.e. lorries, public service vehicles, taxis and ambulances.
- **the "light vehicle" group** comprises class A, B and E driving licences for "light vehicles", i.e. motor cycles, cars and vehicles pulling light trailers.

The decree of 7 May 1997 incorporating a European regulation into French law defines the medical fitness criteria for the issue or renewal of a driving licence for these two groups.

For example, epilepsy, even when treated, and insulin-dependent diabetes are incompatible with the possession of a licence for the "heavy vehicle" group but may, under certain conditions, not rule out a person holding a licence for the "light vehicle" group.

The prefectural Driving Licence Primary Medical Board is responsible for issuing medical certificates for applicants for the heavy vehicle group and for verifying whether patients who have declared they are suffering from a risk condition are fit to hold a licence for the group of light vehicles.

We propose establishing a classification of drugs according to these two groups.

- **Class III**: drugs the use of which is incompatible with driving any motor vehicle, unless an exception has been made by the Driving Licence Medical Board (or its equivalent in other countries).
- **Class II**: drugs the use of which is incompatible with driving a heavy vehicle, unless an exception has been made by the Driving Licence Medical Board, but does not preclude driving a light vehicle.
- **Class I**: drugs the use of which does not preclude driving either a light or a heavy vehicle but which require the patient to be informed and precautions to be taken
- **Class 0**: no known effects on driving according to the current state of knowledge.

This classification does not in any way call into question the therapeutic benefits of such drugs but requires account to be taken of the consequences of prescribing them as far as driving is concerned.

The main aim of this classification is to help doctors, pharmacists and patients to assess the implications of medical prescriptions in terms of the risks to vehicle drivers.

This classification is very imperfect as few pharmaceutical laboratories have had specific studies carried out on the effects of drugs on drivers.

The data used to define a reference to “driving” or side effects in relation to driving has often been gathered from patients in specific therapeutic studies or in preliminary studies on healthy volunteers.

For this reason, the side effects are rarely quantified and references to driving are worded too imprecisely for all the substances that have or may have an effect on drivers or with regard to the group of drugs to which these products belong.

This classification will change over time. It is based today on the terms of use of products in their drug registration file at the French Health Safety and Health Products Agency or the European Agency for the Evaluation of Medicinal Products and also draws on the epidemiological and experimental studies available as well as the opinions of international experts and existing pharmacological classifications.

This classification will need to be adapted every year and will in future take account of new experimental studies and thus encourage the pharmaceutical companies to set up the relevant studies in this area.

We therefore hope to see the number of products concerned decline as and when specific studies enable products to become better known and better defined in terms of the risks they pose to drivers.

As of now, the aim will be to encourage doctors to choose, when faced with a specific treatment indication, the classes of products that are less harmful to vehicle drivers and, within each class, the products that are most suitable for patients who drive. It is in fact conceivable that, in the event of a serious road accident involving a driver who has been prescribed drugs that affect his or her ability to drive, a doctor could be prosecuted for failure to provide the relevant information.

The legal foundations for the prescribing of medication

Medicine is often described as an art. While the prescribing of medication is still based on the obligation to exercise due care and diligence, this notion must take account of two factors:

- the obligation not to cause harm
- the obligation to inform the patient.

The obligation not to cause harm, which has been based since Hippocrates on the primum non nocere principle, as defined in Article 8 of the French Code of Medical Ethics:
"Within the limits laid down by law, doctors are free to prescribe any drug that they find the most suitable in the circumstances. Without neglecting their duty to provide moral support, they must limit their prescriptions and action taken to what is necessary in order to ensure the quality, safety and effectiveness of the care provided."

The obligation to inform the patient:
This has undergone a major development in France since 1997.
While the concept of consent to treatment has always involved informing the patient, it has until the last few years been up to the latter to provide proof or having been inadequately informed by the doctor, who was in some way assumed to have done his or her work properly.

In its judgment of 25 February 1997, the Court of Cassation reversed this case law by stating that:
"The doctor has a particular obligation to provide the patient with information and must furnish proof of having fulfilled that obligation".

For a long time, judicial opinion had held that this information was only required in the case of risks normally foreseeable, the doctor being exempt from this obligation in the case of a risk that materialises only in exceptional cases.

However, in two judgments delivered on 7 October 1998 the French Court of Cassation took up a different position in this area by stating:
"Apart from emergencies or situations where it is impossible to inform the patient or the patient refuses to be informed, the doctor must provide truthful, clear and appropriate information on the serious risks involved with the medical investigations or treatment proposed and he or she is not exempt from this obligation simply because these risks only materialise in exceptional cases."

In short, doctors are now obliged to inform their patients about the risks involved in carrying out treatment, even if these risks are only slight. They may refrain from doing so only in an emergency, when it is impossible to obtain the patient's consent or when the patient turns the information down, as well as in cases where the information might harm the patient. Although the decisions of the Conseil d'Etat and the Court of Cassation have until now only related to invasive or surgical treatments, there is nothing in principle to prevent them from being applied to the prescribing of medicines too.

It is, in particular, conceivable that a doctor could be prosecuted for failure to provide the relevant information in the case of a serious road accident involving a driver who has been prescribed drugs affecting his or her ability to drive.

In the opinion of many lawyers, this development is foreseeable and would probably apply in the first instance to accidents that are either fatal or have serious consequences.

In order to cover themselves, doctors will have to take account of the risks involved in drivers taking medication, i.e. they will have to consider

- the patient's occupation and, more widely, his or her driving habits or risk activities
- the effects, either known or at least mentioned in the terms of use, of the drugs they wish to prescribe.

As we can see, the principles on which the prescribing of medication is based have changed considerably in the last few years and, apart from certain specific cases (emergencies; inability to supply or refusal to be given information; "therapeutic" contra-indication to the provision of information) doctors are obliged today:

- to choose the safest treatment for their patient (including with regard to the consequences of treatment as far as fitness to drive or behaviour at the wheel is concerned)
- to inform the patient clearly about the risks (even where such risks are slight) of the treatment and to be able to prove that this information has been provided
- to comply with certain rules
  - by assessing alternative treatments
  - by graduating the prescription, i.e. by prescribing a sedative only in the case of the failure or inadequacy of a less sedative or non-sedative drug,
  - by questioning the patient about his or her sensitivity to the cognitive effects of any drugs previously used,
  - by providing information and suitable advice when a drug is prescribed, such as the need to refrain from combining it with other products, including those available over the counter without a prescription, or to refrain at the beginning of the treatment from long or difficult journeys or from travelling at night,
  - by being vigilant in this connection with regard to new products put on to the market.

For example, with regard to treatments for anxiety - the main condition for which sedatives are prescribed - it is possible to imagine defining Level 1 treatments for patients who are economically active or drive a vehicle and Level 2 treatments specially reserved for patients who are temporarily unable to work or drive.

This proposal for a classification on no account conflicts with previous proposals for pharmacological classifications but incorporates and supplements them and makes it possible to use them on a practical and regulatory level.

Bibliography

ALLAIN H., PATAT A., LIEURY A., LE COZ F., JANUS C., MENARD G. GANDON J.M. "Comparative study of zopiclone (7-5 mg), zolpiden, flunitrazepam and a placebo on nocturnal cognitive performance in healthy subjects, in relation to pharmacokinetics", *European Psychiatry*, 10, (Suppl. 3), 1995, pp. 129-135.

ALLEN R.W., STEIN A.C., "The driving task, driver performance models and measurements", presented at the Second International Symposium on Medicinal Drugs and Driving Performance, Maastricht, The Netherlands, 1987.

ALVAREZ F.J., DEL RIO C.M., "Drugs and driving", *Lancet,* 344.282, 1994.

ORDER OF 7 MAY 1997, setting out the list of physical disorders incompatible with the acquisition or continued acquisition of a driving licence, and the circumstances giving rise to the issue of a driving licence valid for a limited duration. Official Gazette. 29 May 1997.

BERGHAUS G. FRIEDEL B., "Empirical man-machine interaction studies. Proposed flow-chart", in FERRARA S.D., GIORGETTI R. (Eds), *Methodology in man-machine interaction and epidemiology on drugs and traffic safety. Experiences and guidelines from an International Workshop*, Addiction Research Foundation of Italy (ARFI), Research Monograph Series No. 6, Padua, 1992.

BIECHELER-FRETEL M.B., EL OUADRANI A., "Médicaments et conduite automobile: hypothèse pour la sécurité routière", Programmes locaux de sécurité routière, Institut national de recherche sur les transports et leur sécurité (personal communication), 1989, p. 51.

BROOKHUIS K., DE WAARD D., BEKIARIS E., "Development of a system for detection of driver impairment", in *Alcohol, Drugs and Traffic Safety*, T'97, Mercier-Guyon (Ed), CERMT, Annecy, 1997, pp. 581-586.

CALLAWAY E., "The pharmacology of human information processing", . Psychophysiology 20, 1983, pp. 359-371.

DE GIER J.J., “Drugs and Driving Research: Application of Results by Drugs Regulatory Authorities”, Department of Pharmacoepidemiology and Pharmacotherapy, Faculty of Pharmacy, Utrecht Institute for Pharamceutical Sciences, Utrecht University, P.O. Box 80082? 3508 TB Utrecht, The Netherlands. Hum. Psychopharmacol. Clin. Exp., 13, 1998, pp. 133-136.

DE GIER J.J., “Drugs other than alcohol and driving in the European Union”, Institute for Human Psychopharmacology (U. Limburg, Maastricht, NL) Tech Rep IHP 95-54,1995.

DE GIER J.J., O’HANLON J.F., “Medicinal drugs and driving safety: movement towards a graded level package label warning system”, *World Safety Journal* III-1-89; pp. 26-29.

DE GIER J.J., “Driving licences and known use of licit or illicit drugs”, Institute for Human Pschyopharmacology, University of Limburg, Report IHP 93-39, November 1993.

DEVEAUX M., MARSON J.C., GOLDSTEIN P., LHERMITTE M., MULLER P.H., Alcool et psychotropes chez les accidentés de la route dans la région Nord-Pas-de-Calais. Urgences ,1989, 8, pp. 123-127.

DICTIONNAIRE VIDAL, O.V.P., Ed. Paris, 2000 (and quarterly updates).

FDA, Guidelines for the format and content of the clinical and statistical sections of new drug applications, U.S. Department of Health and Human Services, Public Health Service, Food and Drug Administration, Center for Drug Evaluation and Research, Rockville, MD, 1988.

FILLIARD P., “La recherche de la responsabilité du médecin en cas d’accident ayant causé un dommage”, *La tribune juridique du médecin généraliste*, January 1998.

FRIEDEL B., JOO S., “Drugs and driver incapacity”, *Journal of Traffic Medicine*, Volume 22, Number 3, 1994, pp. 97-99..

GARRIOT J.C., DIMAIAO V.J., ZUMWALT R.E., PETTY C.S. “Incidence of drugs and alcohol in fatally injured motor vehicle drivers”, Journal of. Forensic Science 22, 1977, pp. 283-389,.

GIRRE C., FACY F., LAGIER G., DALLY S., “Présence de benzodiazépines dans le serum de sujets accidents”, La Presse Méd., 17, (22), 1988, pp. 1135-1137.

GUIDELINES ON PSCYCHOTROPIC DRUGS FOR THE EC. “Clinical investigations of medicinal products”, *Eur. Neuropsychopharmacol.*, 4, 1994, pp. 71-77.

HENDERSON M., “The effects of drugs on driving: a literature review”, Research Note RN 12/94, Roads and Traffic Authority of New South Wales, May 1994.

HINDMARCH I, ALFORD C., BARWELL F and KERR J.S., “Measuring the side effects of psychotropics : the behavioural toxicity of antidepressants”, *Journal of Psychopharmacology*, 6, 1992, pp. 198-203,.

JONAS C., “La prescription de médicaments susceptibles d’entraîner des troubles de la vigilance: principes juridiques du devoir d’information et recommandations juridiques du devoir d’information et recommandations pratiques”, *La tribune juridique du médecin généraliste*, January 1998.

JOHNSON L.C., CHERNIK D.A., “Sedative hypnotics and human performance”, Psychopharcology, 76, 1982, pp. 101-113.

KRUGER H.P., SCHULZ E., MAGERL H., The German roadside survey 1992-1994; Saliva analyses from an unselected driver population: licit and illicit drugs, 13th Conference on Alcohol, Drugs and Traffic Safety, Adelaide, Proceedings, Volume1, August 1995, pp.55-62.

KUITUNEN T., MERIRINNE E., SEPPÄLÄ T. “Correlation between blood Diazepam concentrations and performance on the clinical test for drunkenness in acute and chronic Diazepam users”, *Journal of Traffic Medicine*, Volume 22, Number 3, 1994, pp. 105-111.

J., DALIGAUX S., “De l’influence néfaste des médicaments sur la conduite automobile”, *Act. Pharm* 270, 1989, pp. 75-78.

LAFONT R., “Un exemple d’enjeu de la vigilance: la circulation sur autoroute”, in Vallet M, *Le maintien de la vigilance dans les transports*, journée d’études INRETS, Paradigne éd. Collection Transports et communication, 1990, pp. 23-29.

LAGIER G., FACY G., GIRRE C., DE CREMOUX P., DALLY S., Rapport d’étude sur le rôle des tranquillisants et hypnotiques de type benzodiazépines dans la survenue d’accidents de la route, National survey carried out in 1989-1990 on 3147 drivers involved in accidents. Road Safety and Traffic Directorate, Ministry of Transport, 1990.

LAGIER G., “L’influence des médicaments et psychotropes sur la conduite automobile”, Revue d’études et d’informations de la gendarmerie, 1993 ; no. 169, pp. 55-7.

LAGIER G., “Aspects techniques et scientifiques”, in Lagier G. (Ed.) *Conduite automobile, vigilance et medicaments*, Paris, Sejourne-Robert, 1997, pp. 27-100.

LARCAN A., PAILLE F., ROYER-MORROT M.J., LAMBERT H., ROYER R., Médicaments psychotropes, alcoolémie et accidents : études de 341 sujets accidentés. Bull. Acad. Natle. Méd. 5, 1987, pp- 507-516.

LAURELL H., “Benzodiazepines and road accidents”, Documents of the 3rd Conference on Vigilance and Psychomotor Performance, Annecy, France, 10-19 April 1991, CERMT Ed. Annecy, 1991, pp. 26-29..

LECHAT P., “Fatigue, médicaments et conduite automobile”, *Bull. Acad. Nat. Med,* 186 (6), 1982, pp. 773-777..

MATTILA M.J., Interactions of benzodiazepines on psychomotor skills. *British Journal of Clinical Pharmacology*, 18, 21S-26S, 1984.

MERCIER-GUYON C., “Médicaments, drogues et comportement au volant”, *Bull Acad Natl. Med*, 178, 1994, pp. 1111-1122.

MERCIER-GUYON C., Tests in sedation and tests in risk taking, their interest and their limits in evaluation of side effects of psychotropic drugs applied to driving”, Proceedings of the 12th International Conference on Alcohol, Drugs and Traffic Safety; 28 Sep-2 Oct 1992; Cologne, Germany, 1992, pp. 725-733.

MERCIER-GUYON C., “Methodological aspects in evaluation of the effects of psychotropic drugs and driving”, International workshop on drugs and driving; 29 Oct-1 Nov 1991, University of Padua, Italy, ARFI Ed; 1991, pp. 73-75.

MERCIER-GUYON C., ICADTS Working Group on the standardisation of administrative rules in the marketing of psychotropic drugs: results of the French working group preparing a draft law, 13th International Conference on Alcohol, Drugs and Traffic Safety, Adelaïde, Proceedings, Volume 2, August 1995, pp. 667-670.

MOSKOWITZ H., “Attention tasks as skills performance measures of drug effects”, *British Journal of Clinical Pharmacology*, 18, 1984, 51S-61S.

NELEMANS F.A., DE GIER J.J., “Government information requirements for regulating drug use by drivers”, in: *Drugs and Driving*, O’Hanlon J.F. and De Gier J.J. (Eds.), Taylor & Francis, London, 1986, pp 349-354.

NEUTEL C.I., “Risk of traffic accident injury after a prescription for a benzodiazepine”, *Annals of Epidemiology*, 5, 1995, pp. 239-244.

O’HANLON J.F., BROOKHUIS K.A., LOUWERENS J.W., VOLKERTS E.R., “Performance testing as part of drug registration”, in: O’Hanlon J.F. and De Gier J.J. (Eds), *Drugs & Driving*, Taylor & Francis, London, 1986, pp 311-330.

O’HANLON J.F., “Experimental methods of determining the influence of drugs on driving. Solutions in search of the problem”, in P.C. Noordzij and R. Roszbach (Eds), *Alcohol, Drugs and Traffic Safety*, T-86, Excerpta Medica, Amsterdam, 1987.

-PICARD M., FRANC B., ESCOUSSE A. et al, “Imprégnation médicamenteuse par les psychotropes dans les accidents de la voie publique”, Bull. HCEIA, No. 1, 1985, pp. 25-36.

RIEDEL W.J., VERMEEREN A., VAN BOXTEL M.P.J., VUURMAN E.F.P.M., VERHEY F.R.J., JOLLES J. and RAMAEKERS J.G., "Mechanisms of Drug-Induced Driving Impairment: A Dimensional Approach", Experimental Psychopharmacology Unit, (formerly Institute for Human Psychopharmacology), Brain and Behaviour Institute, Maastricht University, The Netherlands. Human Psychopharmacology. Hum. Psychopharmacol. Clin. Exp 13, 1998), S49-S63.

SABEY B. "The drugs (medicines) driving situation in the UK", *Int. Clin. Psychopharmacol*., 3 (Supp. 1), 1988, pp.1-12.

SANDERS A.F., "Drugs, driving and the measurment of human performance", in O'Hanlon J.F. and Gier J.Jd (Eds), *Drugs & Driving*, Taylor and Francis, London, 1986, pp 3-16.

SEPPÄLÄ T., "Benzodiazepines and traffic safety", *Journal of Traffic Medicine*, Volume 19, Number 1, 1991, pp.1-2.

SKEGG D.C.G., RICHARDS S.M. and DOLL R., *Minor tranquillisers and road accidents.*

SODERSTROM C.A., DISCHINGER P.C. and KERNS M.S., "Medicinal drug involvement among drivers admitted to a regional trauma center", Session 182A, 75th annual meeting, Transportation Research Board, Washington DC, January 1996.

STEENTOFT A. "Other drugs than alcohol in Danish traffic cases, requested by the police", Proceeding of the 14th Conference on Alcohol, Drugs and Traffic Safety; Annecy, France, 21-26 Sept 1997; CERMT Ed. Annecy, 1997, pp. 1345-9.

SWEEDLER B., "Alcohol and other drug use in the railroad, aviation, marine and trucking industries – Progress has been made", 12th Conference on Alcohol, Drugs and Traffic Safety, Cologne, Proceedings, Volume 2, 1992, pp. 912-917.

TERHUNE K.W., IPPOLITO C.A., HENDRICKS D.L., MICHALOVIC J.G., BOGEMA S.C., SANTINGA P., BLOMBERG R. and PREUSSER D.F., "The incidence and role of drugs in fatally injured drivers", National Highway Traffic Safety Administration (DOT HS 808 065), October 1992

VALLET M., KHARDI S., *Vigilance et transports. Aspects fondamentaux, dégradation et prevention*, Presse Universitaire de Lyon, Lyon, France, 1995, p. 424.

VERMEEREN A., DE GIER J.J. and O'HANLON J.F., "Methodological guidelines for experimental research on medicinal drugs affecting driving performance", Institute for Human Psychopharmacology (U. Limburg, Maastricht, NL) Tech Rep IHP 93-27, 1993.

VERMEEREN A., DE GIER J.J., O'HANLON J.F and LAURELL H., "An expert survey on methodology of experimental research in drugs and driving", in Utzelmann H..D. Berghaus G. and Kroj G. (Eds), *Alcohol, Drugs and Traffic Safety*, Cologne, 28 September–2 October 1992, Verlag TUV Rheinland, Cologne, 1993, pp. 795- 803.

WITTENBORN J.R., ”The effects of Benzodiazepines on psychomotor performance”, *British Journal of Clinical Pharmacology*, 7, 1979, 61S-67S.

WOLSCHRIJN H., DE GIER J.J. and DE SMET P.A.G.M., *Drugs and Driving: a new categorization system for drugs affecting psychomotor performance*, Maastricht : Institute for Drugs, Safety and Behaviour, University of Limburg, 1991.

WORKING GROUP T’92 ICADTS: “Quality assurance and standardization concerning empirical trials on drugs and driving”. Results of the workshop on the occasion of ICADTS – T’92, in: Utzelmann H.D., Berghaus G.and Kroj G. (Eds), *Alcohol, Drugs and Traffic Safety,* T’92, TÜV Rheinland, Cologne, 1993, pp 804-806.

Methadone detections in blood samples from apprehended drugged drivers

by A.S. Christophersen, Å. Ripel, T. Øgaard, J. Mørland (Norway)

Keywords
Methadone, drugged driving, multi-drug use

Abstract
Norwegian patients in methadone assisted treatment programmes (MATP) are allowed to drive after taking an unchanged daily dose for at least 6 months. Since 1997, the number of patients in MATP has increased more than ten-fold. By using the nationwide database from the National Institute of Forensic Toxicology on blood concentrations measured in suspected drugged drivers during 1997-2002, all methadone positive cases were identified. These cases were subject to blood alcohol and drug screening, as well as the confirmation and quantification of methadone and the presence of other drugs. These results were used in the present study.

During the period studied, the number of suspected drugged driving cases was approximately 3000-5000 per year, while methadone positive cases increased steadily from three in 1997 to 102 in 2002. In the majority of the cases from 2000-2002, the measured blood methadone concentrations were compatible with a daily dosage up to 150 mg, i.e. within the therapeutic range. In 97% of the cases, additional drugs were detected. Flunitrazepam was present in 72% of the samples, often in high concentrations, and other benzodiazepines were abundant such as tetrahydrocannabinol and amphetamine. Recent heroin use could be stated (6-monoacetyl-morphine positive) in 17% of the cases, and it was suspected in an additional 18% of the cases, as well. On average, between two and three additional drugs were found in methadone positive samples.

Drivers on methadone, suspected of drugged driving, had a more frequent use of additional drugs than had been reported from MATP with urine drug control. This, therefore, could suggest that those on methadone who also use additional drugs are more likely to become impaired and, thus, drive in a manner that calls the attention from the police.

Introduction

Methadone intake can lead to impaired performance in various psychomotor tests under controlled conditions (1,2). Some dose-effect relations have already been demonstrated (1). It has been found, though, that these acute effects of methadone will be less pronounced when patients have been using the same daily dose for weeks or months (1,2). As a result of these findings, however, Norwegian patients in methadone assisted treatment programmes (MATP) are allowed to drive after being on a stable daily dosage for approximately 6 months. Until 1997, approximately only 100 patients were enrolled in MATP. This figure has since then increased to 1074 in 2000 and 1984 in 2002. The sale of methadone in Norway closely parallels this increase. We wanted to test whether this increasing enrolment into MATP over the later years was reflected in more frequent methadone detections among people suspected of drugged driving by the police. If that was the case, among those given methadone in MATP, we wanted to determine whether the suspected subjects represented cases with higher blood methadone concentrations.

This could be done since the Norwegian police for years have demonstrated a rather high detection rate of correctly suspected drugged driving. This was based on close observation of signs and symptoms of impairment followed by forensic toxicological analysis of the suspect's blood sample. Most of the cases that have caught the attention of the police have done so because of accidents, reckless and dangerous driving or other deviating driving patterns.

Our hypothesis was that increased numbers of methadone cases among drugged drivers would reflect an increased enrolment of patients in MATP, in spite of careful precautions that permitted driving unless stable dosing was achieved, since real traffic could be more demanding than simple laboratory tests. Furthermore, high methadone concentrations would be overrepresented in this material because of limited tolerance to high doses of methadone.

Methods

All blood samples from drivers suspected by the Norwegian police for drugged driving are routinely sent to the Norwegian Institute of Public Health, Division of Forensic Toxicology and Drugs Abuse, for analysis and interpretation. These samples are subject to alcohol and drug screening with confirmation and quantification of methadone and other drugs by chromatographic methods. For the majority of drugs, mass spectrometric detection (GC/MS, LC/MS) is utilized. The samples are accompanied by both a drug history of the subject and the results from a 23 item clinical test of drunkenness (CTD), which is routinely performed by a police physician at the time of blood sampling. Taking this background information into account, the analytical results are interpreted individually for each suspected driver. The results are stored in a database at the Institute. By using this nationwide database, all methadone positive cases were identified and the results were used for the present study.

Results

The number of blood samples from suspected drugged drivers, in which one or more non-alcoholic drug of any type was detected, increased from 2927 in 1997 to 4590 in 2002 (table 1). During the same period, samples containing methadone increased from three in 1997 to 22 in 2000 and to 102 in 2002.

Table 1: Blood samples from suspected drugged drivers

	1997	1998	1999	2000	2001	2002
Number positive for one or more non-alcohol drugs	2927	3314	3456	3535	4029	4590
Number positive for methadone	3	7	17	22	69	102

From 2000 and onwards, we routinely analysed our samples for approximately 25 non-alcoholic drugs, including all major illegal drugs and medicinal drugs of particular importance for traffic safety. Blood samples containing methadone (104 samples) that were collected from 2000 to 1 March 2002 were subject to further study.
We found that in three out of 104 cases, methadone was the only drug detected. In the other 101 cases, one or more drugs were found in addition to methadone. In accordance to table 2, it can be distinguished that most samples contained two or three drugs in addition to methadone. Depending on the number of additional drugs that were found, the table also demonstrates that there was not a significant difference between methadone levels in drivers. The measured methadone levels were at a magnitude that was expected to be found in patients participating in MATP (0.3-2.8 micromol/L).

Table 2: Methadone positive samples from suspected drugged drivers

Number of additional drugs taken:	0	1	2	3	4	5	6	Total
Number of samples	3	16	35	30	15	4	1	104
Methadone conc. (micromol/L)								
Median	1.1	1.0	1.0	0.9	1.0	1.1	0.7	1.0
Range	0.9-1.4	0.4-1.8	0.3-2.8	0.3-2.2	0.5-2.1	0.3-1.6		0.3-2.8

Several drugs were found in the 101 blood samples that contained drugs other than methadone. Drugs of abuse were represented by morphine (n=36, median conc. 0.26, range 0.03-1.0 micromol/L). In 18 samples with morphine detection, where urine was available for analysis, 6-monoacetylmorphine (6-MAM) was found which unequivocally demonstrated the intake of heroin. Other drugs of abuse were tetrahydrocannabinol (THC) (n=32, median conc. 0.003, range 0.001-0.018 micromol/L), amphetamine (n=26, median conc. 0.9, range 0.3-5.0 micromol/L), methamphetamine (n=4, median conc. 2.1, range 0.5-7.3 micromol/L) and the cocaine metabolite benzoylecgonine (n=2, range 0.9-2.4 micromol/L).

Ethanol was found in 15 samples (median conc. 0.092, range 0.001-0.218 per cent).

The most abundant drug group that was found together with methadone were benzodiazepines. The two most frequent were flunitrazepam (n=75, median conc. 0.048, range 0.006-0.53 micromol/L) and diazepam (n=31, median conc. 0.8, range 0.2-3.6 micromol/L). In addition, other benzodiazepines were found in 31 blood samples.

Discussion

As expected, we found that the number of suspected drugged driving cases with methadone increased noticeably during the years 1997 to 2002. Moreover, this was during a period when the number of patients enrolled in MATP increased more than ten-fold.

Originally, we had expected that the subjects driving in a manner that would call the suspicion from the police were from a user group with particularly high blood methadone concentrations, but this was not the case. Instead, in most cases from 2000 to 1 March 2002 (n=104), the measured blood methadone concentrations were compatible with daily doses up to 150 mg, i.e. with doses which had been used in therapeutic settings (3).

In 97 per cent of the cases, however, other drugs were present in the blood samples. Almost all of these drugs, themselves, could perhaps impair driving. This finding strongly indicated that drivers on methadone, who also used additional drugs, were more likely to become impaired and consequently drive in a manner calling the attention from the police. Other studies have also revealed that people who combined methadone with other drugs represented a greater risk than those who used only methadone (4,5).

In our study, this group of suspected drugged drivers who mixed methadone with other drugs did so more frequently than had been reported from MATP with urine drug control (3). Even though abstinence from all drugs besides methadone is the principle guideline, the Norwegian MATP programs might allow some drug use in combination with methadone without the institution of strong sanctions. When it comes to driving, though, no drugs in addition to methadone are allowed.

Accordingly, 97 per cent of our cases had violated this rule. There are other points, however, which can be determined from our results that indicate that these drivers were from a group that was difficult to control. First, illegal drugs were frequently used: opiates in 35 per cent of the cases, cannabis in 31 per cent and amphetamine in 25 per cent. For the 35 per cent, heroin use was most likely the reason for the morphine positive samples. This is evident by the 6-MAM detection in urine (when available) in 17 per cent of the total material. Second, the presence of THC and morphine as well as high concentrations of other drugs in blood indicated recent drug use, which most likely occurred during the last 12 hours before driving. Flunitrazepam was found in 72 per cent of the samples taken from suspected drivers. The median flunitrazepam concentration (0.048 micromol/L) indicated the use of 4-5 mg or more within the period before driving. The highest recommended dose at bedtime is 2 mg. However, the use of high-dose flunitrazepam is not uncommon in drug abuse. We also noticed the presence of alcohol in 14 per cent of the samples, with a median concentration of 0.092‰, which indicated a substantial intake of ethanol with respect to driving.

The collected Norwegian material of suspected drugged drivers with methadone detection appeared to represent a group that was not following the given advice during treatment. It is important to stress that mixing other drugs with methadone is not compatible with driving. The presence of only three subjects with only methadone among suspected drugged drivers could be interpreted in several ways, but one possibility is that most of those following the basic principle of not combining other drugs with methadone were able to drive in a way that did not attract the attention of the police. Those who did, however, did not have a substantially high methadone blood concentration, thus demonstrating the potential deteriorating effects of this drug in roadside traffic.

References

1. Rothenberg S, Schottenfeld S, Meyer RE, Kraus K. Performance differences between addicts and non-addicts. Psychopharmacology 1977; 52:299-306.

2. Zacny JP. A review of the effects of opioids on psychomotor and cognitive functioning in humans. Exp Clin Psychopharmacol 1995; 3:432-66.

3. Barnett PG, Rodgers JH, Bloch DA. A meta-analysis comparing buprenorphine to methadone for treatment of opiate dependence. Addiction 2001; 96:683-90.

4. Hauri-Bionda R, Bär W, Friedrich-Koch A. Traffic-related performance of drivers on medically supervised methadone programmes. Schweiz Med Wochenschr 1998; 128:1538-47.

5. Musshoff F, Banaschak S, Madea B. Road users under the influence of methadone - a report on the current state of affairs. Blutalkohol 2001; 38:325-35.

Substitution therapy of heroin addicts and driving licence – the situation in Germany

by Jürgen Brenner-Hartmann (Germany)

According to a nationwide consumption study in the Federal Republic of Germany, there are approximately 100.000 current opiate consumers in the age group from 18 to 39 years (consumption within the last 12 months).[42] Looking at the lifetime prevalence, we have 350.000 adults conceding to be or have been opiate-users. In comparison to the year 1990 in the western states of Germany a slight slowdown is evident (from 1,7% to 1,4%). In contrast, we find a dramatic increase from nearly no consumers (0,1%) up to the western level (1,4%) in the five new eastern states.

Since about 1990, substitution programmes have been legally permitted. By now, the number of participants in substitution therapy has been rising constantly from 1.000, in the beginning, up to 46.300 therapy places in 175 specialized institutions.[43] According to the report of Leune (2001), methadone or levomethadone is primarily prescribed for the substitution therapy (42.100 cases), followed by dihydrocodein (3.700 cases). In a small number of cases, only 1% of all in the year 2000, buprenorphine (Subutex ®) is given to addicts, whereas this agent enjoys increasing popularity according to our observations during the last two years.

In contrast to this high amount of substitution places, we have only 5.000 full stationary therapy places in hospitals for all kinds of drug-addicts, and only 1.500 places for detoxication combined with an additional motivation therapy. When substitution therapies started, the ambition was to help the very severe addicts to survive and save their health. Substitution therapy was an exception only allowed in well-controlled programmes. Meanwhile, an increasing number of general practitioners are prescribing dihydrocodein, methadone and/or buprenorphine, and substitution seems to have become the standard therapy for opiate-users. Substitution practice by the GP is not integrated well in the traditional abstinence-orientated addict-care system. The danger is that substitution therapy becomes a substitute of therapy.

Seeing as the substitution therapy of heroin addicts should finally support the social rehabilitation, the question of possibly acquiring the driving licence in order to improve the rehabilitation chances arises rapidly.
In this report, the fundamental demands for the granting of a driving licence in Germany are described first. After that, I would like to explain under which conditions substitution treatment would be possible for a heroin addict.

[42] Kraus, L., Augustin, R. und Müller-Kalthoff, Th. (2001) Konsumtrends illegaler Drogen bei Erwachsenen 1990 bis 2000. In: Jahrbuch Sucht 2002, Geesthacht: Neuland Verlagsgesellschaft

[43] Leune, J. (2001) Zahlen, Fakten und Trends im Hilfssystem. In: Jahrbuch Sucht 2002, Geesthacht: Neuland Verlagsgesellschaft

Driving suitability as a precondition for the driving licence

The German traffic legislation was far-reaching and it was amended in the year 1998. Since this amendment, the Road Traffic Act (Straßenverkehrsgesetz, StVG) requires as an explicit condition for participation in public traffic that the applicant is not only qualified ("befähigt") for driving motor vehicles as shown in the driving test, but also "geeignet" (suitable, fit or capable) to participate in public road traffic (§2 Abs. 2 StVG). In view of the fact that there is no exact translation for this term, I will therefore use the term "suitability" to emphasize the contrast from "qualification" and "ability." According to the details of the act, a person is suitable "who fulfils the necessary physical and mental demands and has not substantially offended legal traffic rules" (§2 Abs. 4 StVG). These demands aim at applicants and at holders of a driving licence in the same manner. It is stated in the additional Driving Licence Regulation (Fahrerlaubnisverordnung, FeV) that in the case of "dependency on narcotics listed in the Narcotics Act (BtMG) and on other psychoactive substances," the driving ability is not specified as a given rule. According to Appendix 4 of this regulation, the driving suitability is considered to be re-established "after detoxification and withdrawal with a one-year period of abstinence."

The Driving Licence Regulation, a demand of the Council Directive of July 29th in 1991 (91 / 439 / EEC), was put into action which states:

"Drugs and medical products

15. Abuse

Driving licences, in whatever category of licence is requested, shall not be issued to, or renewed for, applicants or drivers who are *dependent on psychotropic substances,* or who are not dependent on such substances but *regularly abuse them*.

Regular use:

15.1 Driving licences shall not be issued to, or renewed for, applicants or drivers who *regularly use psychotropic substances*, in whatever form, *which can hamper the ability to drive* safely when the quantities consumed are such that they have an adverse effect on driving. This shall apply to all other medical products, or combination of medical products, which affect the ability to drive."

Without any doubt, a participant in a regularly conducted substitution therapy programme is addicted to opiates because addiction is one condition for the coverage of the costs by the health insurance (BUB-Directive of 28.10.2002).[44] Although drug-abstinence has to be the aim of regular substitution therapy, we have to consider that abstinence is not reached during therapy. The conditions of appendix 4 of the Driving Licence Regulation are not fulfilled and could be formally stated as follows:

As a rule, a person in a substitution treatment is not suitable for driving.

However, there is an exception to every rule. It is worthwhile to take a look at the individual cases, while leaving the perspectives of justice and administration. Let us see what the medical and psychological Experts-Guidelines reveal.

[44] BUB means „**B**ewertung ärztlicher **U**ntersuchungs- und **B**ehandlungsmethoden" (validation of medical examination and treatment)

The Experts-Guidelines for Driving Suitability

The short regulations in appendix 4 of the FeV are explained in detail in the "Experts-Guidelines (Begutachtungs-Leitlinien)[45]" which were prepared by a group of experts and edited by the Traffic and Health Ministry of the German government. In the fundamental appraisal indications, if "according to the individual physical and mental (psychic) state, in cases of driving a motor-vehicle, traffic endangerment is to be expected," it is said that an applicant is not suitable to drive safely.
Therefore, this can be assumed,

- if the requirements on driving a motor vehicle, including *a stable performance level* and the control of stress situations, can no longer be mastered,
- if it has to be expected that *a sudden breakdown* of the driver's abilities will occur in a foreseeable space of time,
- or if, due to *hazardous attitudes, lack of insight or personality faults*, there is no warrantee that the driver will behave according to the traffic rules and security demands.

These premises show that there are different reasons for a missing suitability of an addict. First, it is possible that after a long time of drug abuse the psycho-physical performance level is lowered and becomes insufficient for car-driving (a). Secondly, the effects of drug consumption can furthermore be unexpected or actually atypical and could lead to a sudden breakdown of the performance level (b). Thirdly, the personality of the narcotic-user might be problematic, either caused by addiction or as a former reason for becoming an addict (c). Moreover, the chance of driving a car under the influence of an illicit drug has to be calculated in any case.

Driver fitness and reliability in empirical studies

How is the situation concerning methadone? Can we assume that the permanent use of this opiate does not lead to an impairment of the performance level? Different empirical studies have checked up on this question, such as the study by Prof. Battista that was presented at the "Road Traffic and Drugs" seminar in 1999,[46] here in Strasbourg. He found that 22 of 34 tested methadone-patients had had a psycho-physical performance level high enough to be fit for traffic participation. A number of other studies have proven that regular attendants of methadone programs do not necessarily have a loss of relevant functional abilities, although a relevant individual fluctuation was observed.[47] Thus, a stable performance level can be given despite the

---

45 Bundesanstalt für Straßenwesen (Hrsg.).(2000). Begutachtungs-Leitlinien zur Kraftfahrereignung. Heft M 115, Bergisch-Gladbach: MV Wirtschaftsverlag

46 Battista, H.-J. (1999) Substitution programme (methadone) and driving ability. In: Road traffic and drugs –2000. Strasbourg: Council of Europe Publishing

47 e.g.: Gastpar, M.. (1995) Methadon und Verkehrssicherheit. In: Berichte der Bundesanstalt für Straßenwesen, Heft M 41, S. 65-71. Bremerhaven: Wirtschaftsverlag NV
Berghaus, G., Shibata, J. und Friedel, B. (1997) Erweiterung der Kölner Studie zur Methadon-Substitution und Fahrtüchtigkeit. In: Kongressbericht der deutschen Gesellschaft für Verkehrsmedizin. Berichte der BASt, Heft M 92, S. 279-283. Bremerhaven: Wirtschaftsverlag NV

permanent intake of methadone. The “ideal substitution patient” could be capable for a driving licence, but is the “real substitution patient” also as capable? Can we expect that he will have the necessary reliability to give the reason for an exception from the rule of law? The driving ability, however, can be recommended only if an additional use of other drugs can be expelled, and if a sufficient social adaptability is present which allows the expectation that a safety-orientated attitude exists while leading a motor vehicle.

A detailed view on studies with methadone-patients always shows considerable problems of obtaining a proper sample. There often is a high dropout rate which is caused by an additional use of other psychotropic substances and the unreliable behaviour of the study-subjects. Above all, the high rate of additional use of heroin, cocaine, cannabis and other drugs is an important argument against the acceptance of driving suitability as a rule. Seeing that it is obviously difficult to find addicts who consequently refrain from additional use under the controlled conditions of an empirical study, I have no reason to expect things of being better in the reality of traffic participation.

In this context, a study of Musshoff et al. (2001)[48] is very interesting. He analysed the methadone-positive blood samples from the Institute of Forensic Medicine of the University of Bonn for other drugs and found that 96% of these blood samples had one or up to five other psychoactive substances, in addition to methadone. Above all, benzodiazepine derivates (58%) and morphine (42%) were verified.

Let us have a second look at the study by Battista. Five years later, among the 34 primarily investigated subjects, only 14,7% had brought the programme to an end, while 44,1% still took methadone. The remaining subjects had either irregularly broken the programme or died. Thirteen persons took part in a follow-up study and out of them only one person, who had been tested five years ago for being fit to drive, was still able to pass the tests with sufficient results. Only four out of the thirteen were found without additional use of drugs and who had not developed a confirmed alcohol problem.

Granting the licence to methadone patients

Nevertheless, there is the possibility that in individual cases an assessment by medical and psychological experts can determine the possibility of re-granting the driving licence. The Experts-Guidelines (Begutachtungs-Leitlinien), which are relevant for the medical and psychological experts, designate that only in well-justified exceptions are the conditions for safe driving given.

Therefore, the following items must be fulfilled above all:

- the substitution with methadone has to take place for more than one year
- the person concerned is psychosocially solidly integrated

Kubitzki, J. (1997). Charakteristische Merkmale der Kraftfahrtauglichkeit von Methadonpatienten. Berichte der BASt, Heft M 76. Bremerhaven: Wirtschaftsverlag NV

[48] Musshoff, F., Banaschak, S. und Madea, B. (2001). Verkehrsteilnehmer unter dem Einfluss von Methadon – Ein aktueller Zustandsbericht. Blutalkohol, 38, S. 325-335

- suitable urine or hair analyses prove the abstinence of the additional use of other psychoactive substances for at least one year (including alcohol)
- personal responsibility and therapy-compliance are present
- no personality disturbance is present (also disturbances which are not caused by the drug but were already present before or parallel to the drug consumed)

It must be emphasised that the substitution has to be controlled according to the BUB-directives, and it has to also be embedded in a therapy-concept that leads to social integration and finally to drug abstinence. Substitution that is only guided and controlled by the compassion of a general practitioner will not fulfil the demands.

Not explicitly mentioned, but nevertheless important, is the check of motivation for joining the methadone programme. If an addict will abstain from all psychotropic substances, he needs a reflection and analysis of the personal and emotional reasons that led to the development of the addiction. It cannot be accepted, that due to a pharmaceutical covering of the addiction, the need of psychotherapeutic help is denied. To reach a content life without alcohol and drugs, the addict has to make up for the neglected personal and social development during the years of heroin use.

However, another critical stage is not mentioned in the Experts-Guidelines: the withdrawal of the substitution substance. In this period when the pharmacological protection of an addicted person against the craving for heroin is taken away, a high relapse risk has to be calculated. Also, renewed alcohol consumption can have a negative influence on the possibility of relapse, and it can bring the danger of an addiction-shift to alcohol. Therefore, the granting of the driving licence to a substitution patient must always be connected with suitable conditions in order to control further development.

As a conclusion finally, I can say:

As a rule, a person in a substitution treatment is not suitable for driving. In well assessed special cases, though, an exception of the rule is possible and can be accepted due to positive personal conditions and social circumstances.

CONCLUSIONS AND RECOMMENDATIONS OF THE SEMINAR

General conclusions

Rapporteur – Robert Tunbridge (United-Kingdom)

- Drugs and driving is an issue of fundamental importance for all member states. This second seminar on Road Traffic and Psychoactive Substances has allowed expert representatives on behalf of member States to contribute and update knowledge since the first seminar in 1999. It is a logical assumption that in three years time developments will be such that another seminar on road traffic and drugs will be necessary.

- In this important field, it is of primary importance that any political decisions that are made are both practical and based on sound scientific evidence.

- In this respect, the Pompidou Group provides a crucial role in providing a multidisciplinary forum for all aspects of the legal, enforcement, judicial and scientific issues surrounding drugs and driving. It is in a unique position to ensure a full debate on the ethical and human rights issues concerning drugs and driving and to stimulate a productive synergy between interested groups.

- There is little doubt that up until now insufficient attention has been given to the issue of drugs and driving and this needs to be remedied.

- It is essential that in addressing these deficiencies, effective evaluation criteria are both developed and applied.

- The whole area of drugs and driving is still in a state of rapid development with researchers, enforcement agencies and policy makers seeking to develop these evaluation criteria and to ensure that they are effectively applied.

- In the enforcement field, the goal of producing a valid, reliable, convenient and inexpensive roadside testing devices for drugs is still paramount and not yet achieved. Also, there is still considerable debate as to the relevant benefits and deficiencies of *zero-tolerance* and the requirement to demonstrate impairment.

- Since the last road traffic seminar, the Pompidou Group has achieved a great deal in moving from an almost exclusive focus on illicit drugs to a more interlinked, multidisciplinary approach which recognises the importance of the risk from medicinal drugs in road traffic. The whole issue of *impairment* whether from illicit or medicinal drugs is now seen as being paramount.

- In terms of priority for illicit drugs, cannabis is still seen as the drug of major concern. Despite debate on the impairing effects of cannabis when taken in doses commonly used, it is the most commonly found illicit drug and there is growing evidence of increased accident risk at high dose.

- The CERTIFIED study provisionally showed benzodiazepines as representing the major risk for medicinal drugs and much work has been done trying to establish risk ratios and to relate impairment levels to blood concentration.

- The whole issue of methadone and substitution therapy has been a major development since the last seminar and with around half of member States having no assessment for drivers, remains a major issue.

- The importance of carefully defined prevention measures was underlined by all participants. There is substantial knowledge about efficient prevention issues. The main problem is the lack of sufficient funding. Furthermore, international co-operation in this field should be intensified

- Across the international boundaries represented by the Pompidou Group, there are key initiatives which can be seen as priorities for establishment or continued development.

  - Routine testing of drivers in fatalities;
  - Continued multidisciplinary initiatives for roadside testing;
  - Police training in drug recognition and impairment testing.

For medicinal drugs in particular:

- improved measures for assessing prevalence and risk

- guidelines to Doctors and pharmacists for sensible prescribing

- standardised labelling based on sound scientific evidence and a firmer consensus on relative risk.

Group A – Legal aspects

Rapporteur – Claude Gillard (Belgium)

The working group looking at legal aspects had a large number of participants, all of whom made a very active contribution.

Seven presentations were given: the first six outlined national experiences (France, Belgium, Finland, Sweden, Slovenia and Ireland). The seventh summarised a comparative law study by the European Monitoring Centre for Drugs and Drug Addiction.

In addition to the exchange of information and ideas following these presentations, there were a number of conclusions relating specifically to legal aspects:

1) The law enforcement and judicial authorities should have clear legislative and regulatory provisions, in line with which they can prosecute and convict individuals driving a vehicle whilst under the influence of psychoactive substances.

2) Road safety objectives should not be confused with the general policy concerning drug use.

3) Scientific studies should back up legislation ("we need to combine science and law"). However, the reliability of statistics should be viewed with caution.

4) National legislation could, where necessary, deal with individual substances differently, depending on the influence they have on driving. For example, it could be decided that the zero-tolerance approach followed in respect of a psychoactive substance covered by the United Nations conventions might not be followed for medicines or other psychoactive substances.

5) Where a zero-tolerance approach is not followed, it can sometimes be difficult to provide proof of the influence a substance has on driving ability.

6) Consideration should be given to the question of aggravating circumstances in cases of driving under the combined influence of several psychoactive substances, legal or illegal.

7) The testing approach adopted (random, targeted or only in accident situations) should be clearly specified in relation to the objectives pursued. Close attention must be paid to whether there is a need to provide a legal framework for the circumstances in which the police may take action.

8) It is essential to set up evaluation mechanisms in order to amend legislation to overcome any problems of implementation encountered In general terms, there is a need for reliable information on the application of the laws in question by the judicial authorities.

Group B – Prevalence, risk assessment, pharmaco-epidemiology

Rapporteur –Johan J. De Gier (The Netherlands)

The aim of this session was to discuss new developments in assessing prevalence of drug-driving and risk of being involved in (injurious or fatal) traffic accidents after using psychotropic substances in order to present new information for discussing and developing new legislation. In the first paper Prof Egberts (Netherlands) presented an introduction in pharmacoepidemiology as a powerful approach in the field of medicinal drugs and driving. Very basically he introduced the principles of epidemiology as they are applied in risk assessment for investigating the association of drug use and the detection of a drug's side effects (including sedation). For investigating causation, the link between drug use and impairment, experimental research is still needed as an complementary approach in drugs and driving research.

In pharmacoepidemiology one looks at the exposure of patients to medication in very-day practice. By linking medication records as can be obtained under controlled conditions (regarding privacy) from community pharmacies or insurance companies to accident data for the same patient groups, some very relevant studies have been conducted in Canada, the United Kingdom and the Netherlands. These studies show an elevated risk for many medicinal drugs groups, especially the benzodiazepines. Although this approach is relatively simple, and inexpensive, some weaknesses have to be accepted. First of all the actual drug intake at the day of the accident cannot be derived from medication records where the dispensing dates of the drugs have been recorded. But, it is possible to investigate drug use patterns in the population by a separate study in order to know the impact of these patterns on the outcomes of the study. For example for benzodiazepines it is well known that dependence can exist and therefore the actual use will probably be reflected by medication records. Another weakness is the lack of information on alcohol use at the time of accidents in the cases and in the control group. The need to conduct studies of this type, however, is growing and it was recommended to focus on those countries where possibilities for pharmacoepidemiological studies exist and to collaborate in order to obtain large sample sizes by combining data sets in those countries.

Clinical impairment of benzodiazepines as assessed by forensic physicians related to blood concentrations in DUI (driving under the influence) cases for drugs other than alcohol was presented by Dr Bramness (Norway). Interestingly it was made clear that a relationship exists between benzodiazepine blood concentrations and clinical impairment in apprehended drivers in Norway, as good as for alcohol. Drivers with therapeutic blood concentrations of benzodiazepines, and no other psychoactive substances in their system, are frequently (>70%) identified as being impaired. It was discussed that for future strategies looking into practice will lead to better understanding of impairment. In those countries in which impairment of apprehended drivers has been documented and blood samples are taken studies like the Norwegian one will contribute to gathering more information.

In the presentation of Prof Berghaus (Germany) focus was on determinants of a benzodiazepine (side)-effect derived from meta-analysis in combining all relevant studies. Determinants such as for example first-time use, dosage, blood concentration, half-life, metabolites, chronic use are indicated to play a significant role in determining impairment in experimental studies. However, it is still unclear how this knowledge can be used for developing new legislation. Therefore it was suggested to improve the provision of information on the various aspects pertaining to the determinants to health care professionals and the public.

Dr Brault (Quebec, Canada) presented the provisional results of the so-called 'Quebec Study'.

This roadside study was developed for case/control comparisons in (at this moment) 600 fatally injured drivers. In the second part of the study responsibility analysis will be performed comparing responsible drivers (for causing the accident) with non-responsible drivers as controls. The results so far show that alcohol, cannabis, and benzodiazepines are the most frequently detected psychoactive substances. The major risk was detected for the combination of cannabis and alcohol.

Responsibility analyses are complex as was made clear by the presentation of Dr Biecheler-Fretel (France) and sometimes less sensitive than expected. In the earlier studies it was not always possible to detect the active substances (for example with THC) and results based on non-active metabolites are less valuable. It was discussed that new knowledge exists on testing for the right substances and also new technology for screening blood and urine samples. Therefore it might be possible that new studies as intended to be conducted in France, as reported by Dr Martineau, will have some added value. Interpretation of results will remain a major issue. It was stated by one participant that 'it is a risk if scientists start communicating to politicians'. The message normally is about the design of the study, whether or not this was properly done so that sensitivity is acceptable and validated outcomes are to be expected, which is not what politicians normally want to hear. They want clear answers and not too many 'but's and if's'. But more problems can be expected if the use of drugs as such is illegal, and statements are provided by scientists that a given amount of a drug is safe for drivers. This dilemma is enormous and only very clear messages about the context and applicability of the study results should be delivered to politicians, and the public.

Dr Rob Tunbridge (UK) presented a double blind, cross-over placebo controlled study to show the impairing effects of cannabis using the TRL driving simulator. The need for the study was well described as the outcomes from two surveys in the UK in the periods 1985-1989 and 1996-2000 indicated a significant increase in illicit drug use in fatal casualties (3% and 17%, respectively). In the drug positive samples the cannabis use increased from 2.6% to 12%. The results of the simulator study showed that cannabis causes drivers to drive more slowly, with more distance to the car in front of them and with an increase in the weaving index. With increasing dose level the tracking ability of the subjects decreased. Within the sample of drivers, the effect of alcohol (at a dose just more than half of the UK legal limit) and cannabis together were slightly greater than with cannabis alone. A larger sample would be needed to determine whether this is likely to apply to the population as a whole. It was also judged that the general medical examination and standardised impairment testing applied by the police surgeons were generally effective in determining impairment.

Finally two prevalence studies were presented by Dr Leavy (Ireland), and Prof Maravelias (Greece). It was made clear that investigating the prevalence of drugs other than alcohol in DUI cases offers an opportunity to monitor trends in drug use among the driving population in a particular country, provided that procedures for selecting and analysing the samples are kept the same over time. It was also mentioned that in looking at DUI cases the need to know the prevalence of drugs other than alcohol in the general driving population is growing. However, most legislations in Europe prevent random roadside testing, and this will also prevent risk assessment studies based on DUI cases or (fatally) injured drivers. It was also concluded that standardized procedures are needed for comparisons between countries.

The overall conclusions of the discussions in group B are summarized as follows:

- Medicinal drugs are on the agenda! Benzodiazepines are most frequently detected in epidemiological studies showing an association with increased accident risk and evidence derived from practice that a relationship between blood concentrations and clinical impairment exists among drivers apprehended for DUI is available.
- For these reasons it is clear that discussion on implications of new results for developing legislation is about to start with benzodiazepines.

- There is a need to know what is happening in every day practice, in descriptive and analytical epidemiology, based on case-control studies and opportunities to link data bases with information on medication use and accident involvement for increasing the sample sizes to investigate specific medicinal drugs and drug groups.
- Clear messages are needed to explain at what level we can observe increasing risk of being involved in accidents (compared to legal limit of alcohol) if psychoactive substances are used (therapeutically, as well as recreationally). It was suggested that high concentrations of benzodiazepines should be declared as non-compatible with safe driving.

Group C – Practical aspects

Rapporteur –Alain Verstraete (Belgium)

Eight presentations were given in this session on the practical aspects of the enforcement of the legislation on drugs and driving. The session focussed more on the recognition of impaired driving by police officers, in complement to the presentation on roadside testing for drugs in urine, oral fluid (saliva) or sweat, which was given in the plenary session. Three presentations were made by scientists, and five by police officers.

In the first presentation Dr. John Oliver from Glasgow University described the legislation in the United Kingdom, where a person who, when driving, attempting to drive, or in charge of a mechanically propelled vehicle on a road or other public place is unfit to drive through drinks or drugs, is guilty of an offence. A subject suspect to be unfit to drive based on drink or drugs is first asked to provide a breath test. If this test is negative and impairment is still suspected, he is examined by a police surgeon. If the police surgeon considers him impaired, he is charged and a blood sample is taken. In Scotland, the number of drivers suspected of driving while impaired through drinks or drugs has remained constant. The drugs that are found are (in decreasing order of frequency) diazepam, temazepam, cannabis, morphine, methadone, cocaine, dihydrocodeine and MDMA. Eighty-seven % of the samples are positive when alcohol is included, 72% when alcohol is excluded. To tackle the problem of the relatively low percentage of positives, roadside impairment testing was introduced. The field impairment tests consist of pupil size, Romberg test, walk-and-turn, one-leg-stand and finger-to-nose. When the field impairment test was added to the roadside protocol, drugs were found in 94-97% of the cases. Polydrug use was prevalent and represented 76% of the drug positive cases.

Ms Frances Huessy from the Addiction Research Institute in the USA gave an overview of the recent developments in the U.S. drug evaluation and classification program. This system was developed in Los Angeles in the late 1970s. Today, 37 of the 50 states are participating in the program. She described the Drug Evaluation and Classification program, which includes a standard breath alcohol test, an interview with the driver, clinical tests of the eyes, vital signs, muscle tone, blood and urine assays. So far, there does not seem to have been a successful legal challenge to the admissibility of a drug recognition expert (DRE) officer's testimony. In 2002, a drug recognition training module for school administrators and nurses has been added. It is expected that this will reduce the number of drug-using students.

Mr. Robert Sušanj, from the Road Traffic Section of the Slovenian police, gave an overview of the protocol used in Slovenia. There has been a constant increase in the number of cases where an examination of a driver by a medical professional was requested by the police, both in traffic accidents or because of a traffic violation. In these cases, the most frequently detected drugs were cannabis, opiates, methadone, benzodiazepines and amphetamines.
The Slovenian protocol is based on the American DRE programme and developed in cooperation with Germany. The procedure starts with a breath test for alcohol and consists of an examination of the eye (horizontal and vertical nystagmus, convergence and pupil size). A rapid drug test may be added, when reliable tests will be available. The training of the police officers is presently under way.

Prof. Möller explained the German legislation, where there is an administrative offence (if certain drugs are found in blood) and a criminal offence (if unfitness to drive can be proven). The analytical cut-offs are established by the Grenzwertkommission, a multidisciplinary group of experts. In November, most of the cut-offs were reduced by half. Drugs are found in 95-97% of the cases that are referred by the police officers.

Mr. Paul Deblaere of the Belgian Police described the procedure that is used in Belgium. It consists of a standardised battery of tests (consisting of many items, e.g. observation of the pupils, trembling etc, and divided attention tests like the Romberg test, walk-and-turn, one-leg-stand and finger-to-nose), which if positive is followed by a roadside urine test, which if positive is followed by venepuncture and analysis of the plasma in a certified lab. Many police officers have already been trained. The training programme consists of two days of theoretical lessons and 8 hours of practical work. The legal framework, the organisation of the controls and the practical performance of the tests, including urine sampling are taught. In an evaluation of 896 cases where blood was analysed, drugs were found above the legal analytical limits in 85 % of the cases. In the remaining 15 % some explanations for the impairment were found like drugs present below the cut-offs, sometimes in combination with alcohol or medicinal drugs. The main problems observed in Belgium are the lack of training, sensibilisation of the judges, the duration and complexity of the procedure (lasting 1h tot 1h30), the possibility of adulteration and the fact that some products (e.g. LSD, mushrooms) are not covered by the *per se* law.

Mr. Hans-Jürgen Maurer of the Saarland police described the procedure in Germany. In Saarland, the police officers are very well trained. The heart of the training programme is the checklist. Frequent controls are carried out during weekend nights on roads leading to or from discotheques. The German police is now collaborating with the Polish police and recently a training course was given in Poland.

Mr. Inge Frydenlund of the Oslo police described the procedure that is used in Norway. If the police officer has enough suspicion that the driver is under the influence of drugs, the driver is examined by a physician, who performs the clinical test for impairment. Often, drivers are apprehended after a call from the public who signals erratic driving. The training course takes three days.

Mr. Ad Hellemons of TISPOL presented his organisation, which is a network of European traffic police forces. It has members form 13 EU member states, 3 candidate states, Switzerland and Norway. TISPOL aims to improve conditions for co-operation, develop a common EU police strategy on road safety tasks, improve the police profile at the European level and collect and provide European police expertise and experience. TISPOL organizes meetings, has put a network into place and information and know-how can be disseminated over Europe. TISPOL also supports international enforcement operations and exchange of good practice. He reiterated the need for good drug screening devices and stated that we are far away from an efficient control system. One of the aims of TISPOL is the development of European standard user requirements for roadside drug tests.

Based on these presentations, the presentations in the plenary session and the discussions during the seminar, the following **conclusions** can be drawn:

Driving under the influence of drugs (DUID) is a complex matter and it requires multidisciplinary work: police officers, physicians, toxicologists, judges, psychologists, politicians,... The experience in several countries has shown that such collaborative work between different professionals is beneficial and rewarding for all involved.

The procedures for the enforcement of DUID legislation are cumbersome and take too long (60-90 minutes per case). Some solutions should be found: reliable and fast drug screening tests are available for urine but not for oral fluid or sweat. The development of on-site oral fluid tests has not been as quick as hoped for. Ten different tests or prototypes are available, but the sensitivity for the active cannabis compound THC is still insufficient. A new evaluation will take place, in cooperation with the United States in Rosita-2

The availability of roadside drug tests will simplify the procedure, but will never completely replace the judgment of a trained and experienced police officer. More research is needed on the field sobriety tests, to determine which tests are the most sensitive, in order to simplify and shorten the procedure.

Training of police officers is extremely important and there have been several bilateral cooperation initiatives. Training of police officers is an important investment (a course lasts between 3 and 5 days), but experience shows that police officers are positive about it and that it increases their confidence in being able to reliably detect drug-impaired drivers. After selection of the drivers by the police officers, a large majority (85-97%) turn out to be positive (drugs present in the blood or expert opinion that the driver is impaired). The percentages increase if the police officers are well trained. In some countries there should be more feedback on the outcome of the cases to the police officers. The exchange of information between police officers of different countries is important, but there are some problems like lack of funds and travel restrictions. TISPOL provides a forum for exchanges between traffic police forces.

Countries with a *per* se legislation have seen a spectacular increase in prosecuted cases. In countries with *per* se legislation, the analytical cut-offs are not mentioned in the law, so the values can be easily adapted based on new evidence, e.g. of improved laboratory performance or finding a significant percentage of values under the legal cut-off. In Germany the expert commission has recently lowered the analytical cut-offs.

There is concern about the hardcore multi-recidivist driver who continues to drive and to be caught driving under the influence and without license.

Group D1 – Prevention, Rehabilitation, Regranting

Rapporteur – Hans Peter Krüger (Germany)

This section was mainly dealing with issues of prevention. Two of the papers dealt with classical preventive activities, and the other two with preventing driving under the influence of medicaments through providing better information for patients. A. Siebers, Y. Koerner & Ch. Meindorfner's paper from Germany referred to the stocktaking review of preventive activities in 17 European countries written by Prof Krueger and colleagues. The result of this review was in someway disillusioning. Despite the fact that all experts are convinced that prevention is necessary and have to accompany measures of repression and rehabilitation, in the field of illegal drugs and medicaments only a few substantial activities could actually be found. There has however been progress in legislation and in all police activities, but the actual prevention stagnates at a low level. A. Siebers et al. discussed in their paper, whether for the different substance classes alcohol, illegal drugs, and medicaments, different prevention strategies are necessary. Based on a review of the literature they concluded that the prevention messages have to be adapted to the respective consumer groups. They proposed the following messages (a) concerning alcohol: « don't drink and drive », (b) concerning illegal « drugs: drug driving is more dangerous than you believe », and (c) concerning medicaments: « keep yourself informed about the restrictions on driving ».

Sylvie Delcourt (Belgium) reported from an extended campaign aimed against drugged driving. The main intention was to inform the target group about the risks of driving under the influence of drugs and also about the legal consequences of being caught driving under such influences. The content of the campaign, and the distribution of the brochures and information material were all planned very carefully. However, despite the great effort involved in designing and conducting the campaign, there was no budget to finance the evaluation of the programme.

In the second section of Group D1, Prof Alvarez and C. del Rio (Spain) reported the Spanish experiences involving categorizing medicaments and the efforts that they had undertaken in order to inform physicians and pharmacists as well as the public at large about the risks linked with driving under the influence of psychoactive substances. The authors proposed a multi-leg procedure, which was mostly based upon providing written material. The first target group is the general public who should be informed about how medicaments can impair driving fitness. The second method is directed at patients imparting the message that if they are ever to have any doubts they should always consult their doctor or pharmacist. Thirdly, the country's health professionals must be provided with the relevant information about medicament effects. Subsequently all medicaments sold in Spain with a warning sign, were classified into a three-tier warning system. This system was proposed in the CPMP and the three tiers were as follows: "I – presumed to be safe or unlikely to produce an effect", "II = likely to produce minor or moderate adverse effects" and "III = likely to produce severe effects or presumed to be potentially dangerous". The result of this categorization was published and distributed to all of the health professionals in the country. The paper concluded with an appeal to reach a common procedure in the whole of Europe instead of simply developing national solutions.

Dr Mercier-Guyon (France) referred to the classification scheme used in Spain and Belgium, however he stressed that not only should the pharmacological properties of the substances be taken into account but also their therapeutic indications, which can also be a source of driving impairments. This implies that the classification of a medicament as dangerous can vary according to the underlying illness. In addition, he proposed that there should be a discrimination between driving licenses for "heavy" and "light" vehicles, the former consisting of trucks, taxis, and professional drivers. Through applying this classification, four classes resulted: III = not compatible with driving, II = no heavy vehicles to be driven, only light ones, I = patients have to be informed but there are no restrictions on driving, 0 = no adverse effects known.

The discussion within the working group revealed that all participants fully accepted that there is a fundamental need for information both for health professionals and patients. It was also agreed upon that the actual information about the impact a substance has on driving safety is not sufficient. All information needs to be collected and sorted by experts and then distributed to the relevant persons. The substantial result of these efforts will be a revised warning system. Unfortunately, as the development in France shows, a common European system is missing and gradually we are starting to devise national solutions. Problems could therefore consequently arise in the future with respect to integrating these national solutions. It was proposed that materials which have been developed in the different countries should be published on the internet, with the intention of beginning an extended scientific discussion.

Some important questions were also mentioned in the discussion: Why does the development of a common warning system progress so slowly? Who is not interested in a classification system? Why are patients so patient? Are patients really interested in information which could consequently lead to restrictions on driving? In the case of driving under the influence of medicaments, is deterrence necessary? Are people more interested in avoiding punishment than in behaving responsibly?

The following recommendations were given:

1. The experts from all the countries involved are unanimously convinced that prevention of driving under the influence of psychoactive substances is an urgent need. Prevention has to be adapted to the consumer and therefore has to be different for alcohol, illegal drugs and medicaments.

2. Looking at the period of time between the seminar in 1999 and today, there has been a substantial lack of prevention programmes. Progress only can be made if funding is provided. This holds especially true for the evaluation of new programmes.

3. There is a need for international cooperation
   – in the research of prevention messages regarding alcohol, illegal drugs and medicaments,
   – in the research on the most effective preventive measures,
   – as to whether it is possible to develop prevention measures which can be used in different countries
   – as to whether or not it is possible to create a common database for all the different types of materials, which are to be used in prevention.

Group D2 – Substitution treatment and driving

Rapporteur – Jørg Mørland (Norway)

Three presentations were given: ”Methadone and driving” by Johan De Gier, ”Methadone detections in blood samples from apprehended drugged drivers” by Asbjørg Christophersen, and ”Substitution therapy of heroin addicts and driving licence – The situation in Germany” by Jürgen Brenner-Hartmann. All presentations covered the problems linked to long-term substitution treatment and rehabilitation. The presentations gave a very illustrating picture of the situation in various European countries as it stands per 2003. The reader is referred to the full texts of these three papers for further reference. A striking phenomenon was the lack of clear policies and guidelines in many countries.

The following points represented the main conclusions which were drawn:

- Our knowledge about the impact of these drugs to influence driving is limited, and it is only for methadone that sufficient evidence is available for some conclusions to be drawn.

- It has been conducted more than 20 experimental studies, but rather few epidemiological studies on methadone.

- The experimental studies have shown that methadone intake has detrimental effects on several functions which might be critical to safe driving.

- These effects are far less pronounced in subjects who use opioids (e.g. methadone) regularly.

- Long-term methadone users will usually show reduced performance in tests thought to be critical for safe driving, but it appears to be substantial interindividual variation in this respect.

- Very few experimental studies have measured blood methadone concentrations, and accordingly the importance of any possible variation in concentration to the variation in impairment, is presently unknown.

- Several causes could explain the impaired performance of long-term methadone treated patients in addition to methadone effects as: Previous use of other drugs, personality differences and other pre-drug use differences between patients and controls.

- If methadone is used together with other psychoactive drugs, the negative impact on performance is increased.

- There are almost no controlled driving studies with methadone treated patients.

- Descriptive epidemiological studies among DUI suspected drivers have revealed that approximately 1-5 % of these will have methadone in their blood samples.

- A majority of these drivers (over 90 %) will also have other psychoactive drugs present in their blood.

- Based on available evidence it appears that methadone might impair functions of importance to safe driving. Considerable variation observed among subjects included in the studies prevent the generalization of these studies' outcomes. The present data do not allow us to conclude that patients who use methadone as recommended as their only drug would be safe drivers. On the other hand they do not appear to represent a major traffic risk.

- It should be considered whether patients who have been stable (no use of other drugs and no variation in methadone dose) for a long period (6-12- months) can be regranted their driving licence. A prerequisite for this is complete abstention from use of other psychoactive drugs.

- Criteria for regranting of driving licence should be developed based on the critical evaluation of existing criteria in some countries and knowledge about how methadone patients normally are able to comply with criteria.

- Further research on the effects of substitution opioids with respect to driving capability should be supported. This would specially apply for studies with blood drug concentration measurements and real driving.

- More epidemiological research of both descriptive and analytical types (cohort studies) should be encouraged.

- Research is needed on driving specific performance of opiate dependent persons included in substitution programmes in order to look for better opportunities to develop a screening test for assessing driving fitness.

Programme of the seminar

Wednesday 18 June 2003, 14h30 – 17h45

Opening address by Mr Claude GILLARD (Belgium)
Chairman of the seminar

Welcome address by Mr Christopher LUCKETT
Executive secretary of the Pompidou Group

Dr Johan J. DE GIER, (The Netherlands)
Presentation of the revised report on "Problems raised by the use/abuse of psychoactive substances by drivers"

Prof. Jørg MØRLAND (Norway)
"Drugs and driving in Norway, an example of "best practice"

Prof. Hans-Peter KRÜGER (Germany)
Presentation of the report on "Approaches in preventing driving under the influence of drugs"

Prof. Alain VERSTRAETE (Belgium)
“Results of the CERTIFIED and ROSITA projects”

Ms Inger Marie BERNHOFT (Denmark)
“The IMMORTAL project”

Mr Patrick NORROY (European Commission)
“Drugs, medicines and road safety : which role for the EU” ?

18h00 Reception for all participants (« Restaurant Bleu », Council of Europe)

Thursday 19 June 2003, 9h15 – 12h45
Group A : Legal Aspects
Rapporteur : Mr Claude GILLARD (Belgium)

Presentations on recent and planned legislation

Prof. Claude GOT (France)
Mr Claude GILLARD (Belgium)
Mr Matti JÄRVINEN (Finland)
Dr Majda ZOREC-KARLOVSEK (Slovenia)
Mr Hans LAURELL (Sweden)
Prof. Denis A. CUSACK (Ireland)

Mr Brendan HUGHES (EMCDDA)
« Administrative sanctions against drug law offenders » and « Drugs and Driving »

Thursday 19 June 2003, 9h15-12h45Room 10
Group B : Prevalence, risk assessment, pharmaco-epidemiology
Rapporteur : Dr Johan J. DE GIER (The Netherlands)

Prof. Antoine EGBERTS (The Netherlands)
"Pharmaco-epidemiology in drugs and driving : an introduction"

Mr Maxime BRAULT (Canada)
"The Quebec survey"

Mr Jørgen G. BRAMNESS (Norway)
"Clinical impairment of benzodiazepines – relation between benzodiazepine concentration and impairment in apprehended drivers"

Prof. Günter BERGHAUS (Germany)
"Experimental research on benzodiazepines and driving: determinants of impairment intensity"

Ms Marie-Berthe BIECHELER-FRETEL (France)
"Use of cannabis and accident risk – analysis of scientific data at international level (as presented in the collective INSERM survey) "

Dr Rob TUNBRIDGE (United Kingdom)
"Alcohol and cannabis and their impact on driving »

Ms Pauline LEAVY (Ireland)
"Psychoactives substances and driving in Ireland"

Ms Hélène MARTINEAU (France)
"The setting up of a national study in France on drug use in the context of fatal traffic accidents"

Prof. Constantine MARAVELIAS (Greece)
"The use of alcohol and other psychoactive substances by victims of traffic accidents in Greece (1995-2002)"

Thursday 19 June 2003, 14h15 – 17h45Room 7
Group C : Practical aspects
Rapporteur : Prof Alain VERSTRAETE (Belgium)

Dr John OLIVER (United Kingdom)
"DRE/training : what's new in the United Kingdom ?"

Ms Frances HUESSY/ Prof Bud Perrine (USA)
"Recent American developments in the detection of drug-impaired drivers and the implications for further DRE/DEC adaptation in Europe"

Mr Robert SUSANJ (Slovenia)
"DRE/Training in Slovenia"

Prof Manfred R. MÖLLER (Germany)
"Where does discussion on blood drug levels stand now in Germany?"

Mr Paul DEBLAERE (Belgium)
"Drugs and traffic safety – driving under influence: the Belgian approach"

Mr Hans-Jürgen MAURER (Germany)
"DRE – The Saar experience"

Mr Inge FRYDENLUND (Norway)
"Norwegian traffic police routines when apprehending drugged drivers"

Mr Ad HELLEMONS (TISPOL)
"EU developments in police enforcement of drink/drug driving"

Thursday 19 June 2003, 14h15-17h45Room 10
Group D1 : Prevention / Rehabilitation / Regranting
Rapporteur D1 : Prof. Hans-Peter KRÜGER (Germany)

Ms Anke SIEBERS/Yvonne KOERNER/Ms Charlotte MEINDORFNER (Germany)
« Driving under the influence of alcohol, illegal drugs and medication : is it necessary to differenciate between these categories in the prevention message ?»

Ms Sylvie DELCOURT (Belgium)
« The Belgian prevention campaign « Drugs and driving » »

Prof. F. Javier ALVAREZ (Spain)
« Medicinal drugs and driving : the Spanish experience »

Dr Charles MERCIER-GUYON (France)
« Categorisation of medicines and groups of ability for driving licenses »

followed by
Group D2 : Substitution treatment and driving
Rapporteur D2 : Prof. Jørg MØRLAND (Norway

Dr Johan J DE GIER (The Netherlands)
Presentation of the report « Methadone and driving »

Prof. Asbjørg S. CHRISTOPHERSEN (Norway)
« Impaired driving and methadone maintenance treatment »

Mr Jürgen BRENNER- HARTMANN (Germany)
« Substitution Therapy of Heroin Addicts and Driving Licence – The Situation in Germany »

Friday 20 June 2003, 9h30 – 13h00Room 7Plenary session

Presentations by the rapporteurs of the working groups
General debate
Closing address by Mr Christopher LUCKETT, Executive Secretary of the Pompidou Group
Closing address by Mr Claude GILLARD, Chairman of the seminar

List of participants of the seminar

AUSTRIA
Dr Johanna SCHOPPER
(Psychoactive Substances)
Federal Ministry of Health and Women

Prof. Dr Rainer SCHMID
General Hospital Vienna

BELGIUM
M. Claude GILLARD
Direction générale de la Législation pénale et des Droits de l'Homme
Ministère de la Justice

M. Paul DEBLAERE
Police Fédérale

Prof Dr Alain VERSTRAETE
University Hospital Gent

Mme Martine BANTUELLE
Prévention des traumatismes et de promotion de la sécurité en Communauté française en Belgique

Mme Sylvie DELCOURT
Institut Belge pour la Sécurité Routière

CANADA
Mr Maxime BRAULT
Société de l'assurance automobile du Québec
Direction générale de la planification et de la coordination

CROATIA
Ms Lidija VUGRINEC

Ms Zrinka RADNIC

DENMARK
Ms Inger Marie BERNHOFT
Danish Transport Research Institute

FINLAND
Mr Veli-Matti RISKU
Ministry of Social Affairs and Health

Mr Matti JÄRVINEN
Managing Director

FRANCE
Prof. Claude GOT
Président du Conseil Scientifique de l'OFDT

Mme Hélène MARTINEAU
Observatoire Français des Drogues et des Toxicomanies (OFDT)

Dr Charles MERCIER-GUYON
Conseil Medical de la Prévention Routière
Centre d'Etudes et de Recherches
en Médecine du Trafic (CERMT)

Dr Michèle MUHLMANN-WEILL
Chargée de Mission Sécurité Routière

Mr Patrick SANSOY
Mission Interministérielle de lutte
contre la drogue et la toxicomanie

Mme Marie-Berthe BIECHELER-FRETEL
INRETS

GERMANY
Prof. Dr Hans-Peter KRÜGER
University of Würzburg
Center for Traffic Sciences

Mrs Yvonne KÖRNER
University of Würzburg
Center for Traffic Sciences

Mrs Charlotte MEINDORFNER
University of Würzburg
Center for Traffic Sciences

Mrs Anke SIEBERS
University of Würzburg
Center for Traffic Sciences

Mr Jürgen BRENNER-HARTMANN
Leiter Kompetenz - Center Fachwissen
TÜV Med. – Psych. Institut GmbH

Prof Dr. Manfred MÖLLER
Chairman of Department of Toxicology
Institute of Legal Medicine

Mr Hans-Jürgen MAURER
Polizeihauptkommissar
Beauftragter für Drogenerkennung

Prof., Dr Günter BERGHAUS
Institute for Forensic Medicine
University of Cologne

GREECE
Mr Spyros LASKOS
First Lieutenant
Police Traffic Road of Koridalles

Mr Constantine MARAVELIAS
Director of Drug Analysis
University of Athens - Medical School
Department of Forensic Medicine-Toxicology

HUNGARY
Dr Zoltán FÜLÖP, MD.
Forensic Medical Expert
Health Service of the Police
National Police Headquarters

IRELAND
Mr Declan O'BRIEN
Garda Siochana Headquarters

Ms Pauline LEAVY
Medical Bureau of Road Safety
Department of Forensic Medecine
University College Dublin

Prof. Dr Denis A. CUSACK
Medical Bureau of Road Safety
Department of Forensic Medecine
University College Dublin

ITALY
Mr Mauro PAPI
Presidenza del Consiglio del Ministri
Ufficio del Commissario straordinario per il coordinamento delle politiche antidroga

Dr Carmelo FURNARI
President of the scientific committee of the Italian Monitoring Center for Drug and drug addiction
Public Health Department

LITHUANIA
Ms Ona GRIMALAUSKIENE
Ministry of Health
Public Health Department

LUXEMBOURG
M. Alain ORIGER
Coordinateur national « drogues »
Ministère de la Santé

NETHERLANDS
Dr Johan J. DE GIER
Consultancy BV

Prof. Antoine EGBERTS
Department of Pharmacoepidemiology
and Pharmacotherapy

Drs Beitske E. SMINK
Forensic Scientist Toxicology
Ministry of Justice
Netherlands Forensic Institute

NORWAY
Prof Jørg MØRLAND
Norwegian Institute of Public Health,
Division of Forensic Toxicology and Drug Abuse

Prof Asbørg Solberg CHRISTOPHERSEN, PHD.
Department Director
Norwegian Institute of Public Health,
Division of Forensic Toxicology and Drug Abuse

Mr Jørgen Gustav BRAMNESS
Specialist of Psychiatry/Research follow
Norwegian Institute of Public Health
Division of Forensic Toxicology and Drug Abuse

Mr Inge FRYDENLUND
Police Traffic Force
Oslo PoliceDistrict - Traffic Department

POLAND
Dr Arthur MALCZEWSKI
Centre d'Information des Drogues et de la Toxicomanie

Dr Wojciech KLOSINSKI, M.D.
Head of Psychiatry Health Care
Ministry of Health

Mr Marcin FLIEGER
Road Traffic Department
General Police Headquarter

PORTUGAL
Ms Helena TEIXEIRA
Laboratory of Forensic Toxicology
National Institute of Legal Medicine

SLOVAK REPUBLIC
Mgr. Tania KUPKOVICOVA
National Anti-Drug Unit
Police Force HQs

Mr Lubomir DURINA
Presidium of the Police Force
Traffic Police Division

Mr Jiri FRANCIK
Office of the Government - General Secretariat
National Monitoring Centre for Drugs

SLOVENIA
Mr Robert SUŠANJ
Control and Traffic Accidents Division - General Police Directorate - Road Traffic Section
Ministry of Interior Affairs

Dr Majda ZOREC-KARLOVSEC
Institute for Forensic Medicine

SPAIN
Prof. F. Javier ALVAREZ
Institute for Alcohol and Drug Studies
Faculty of Medicine - University of Valladolid

Ms Monica COLAS-POZVELO
Direccion General de Trafico

Dr Juan Carlos GONZALEZ LUQUE
Direccion General de Trafico

SWEDEN
Mr Hans LAURELL
National expert on alcohol, drugs and traffic safety
Swedish National Road Administration

UNITED KINGDOM
Dr Rob TUNBRIDGE
Transport Research Laboratory

Dr John OLIVER
Forensic Medicine & Sciences

Dr Lily READ
Department of Transport

Mr Robert DAVIES
Road Safety Division
Department of Transport

UNITED STRATES OF AMERICA
Ms Frances B. HUESSY
Addiction Research Institute

Prof. M. W. Bud PERRINE
Addiction Research Institute

COMMISSION EUROPÉENNE
M. Patrick NORROY
DG TREN

EMCDDA/OEDT
Mr Brendan HUGHES

WHO GENEVA
Mr Isidore S. OBOT
Department of Mental Health and Substance Dependence

European Traffic Police Network TISPOL
Mr HELLEMONS
Director of the European Affairs of the Dutch National Agency

POMPIDOU GROUP SECRETARIAT

Mr Chris K. LUCKETT, Head of Department
M. Klaus FUCHS, Principal Administrator, Secretary of the seminar
Ms Kheyra MOKEDDEM, Assistant
Ms Julia WHITHAM, Assistant