



**SUMMARY AND PUBLICATION OF BEST PRACTICES  
IN ROAD SAFETY IN THE MEMBER STATES**

**THEMATIC REPORT:  
REHABILITATION AND DIAGNOSTICS**

**THE FINAL REPORT OF SUPREME CONSISTS OF 14 PARTS:**

<b>PART A</b>	METHODOLOGY
<b>PART B</b>	LIST OF MEASURES COLLECTED AND ANALYSED
<b>PART C</b>	BEST PRACTICES IN ROAD SAFETY HANDBOOK FOR MEASURES AT THE COUNTRY LEVEL
<b>PART D</b>	BEST PRACTICES IN ROAD SAFETY HANDBOOK FOR MEASURES AT THE EUROPEAN LEVEL
<b>PART E</b>	REVIEW OF IMPLEMENTATION AT THE COUNTRY LEVEL
<b>PART F1</b>	THEMATIC REPORT: EDUCATION AND CAMPAIGNS
<b>PART F2</b>	THEMATIC REPORT: DRIVER EDUCATION, TRAINING & LICENSING
<b>PART F3</b>	<b>THEMATIC REPORT: REHABILITATION AND DIAGNOSTICS</b>
<b>PART F4</b>	THEMATIC REPORT: VEHICLES
<b>PART F5</b>	THEMATIC REPORT: INFRASTRUCTURE
<b>PART F6</b>	THEMATIC REPORT: ENFORCEMENT
<b>PART F7</b>	THEMATIC REPORT: STATISTICS & IN-DEPTH ANALYSIS
<b>PART F8</b>	THEMATIC REPORT: INSTITUTIONAL ORGANISATION OF ROAD SAFETY
<b>PART F9</b>	THEMATIC REPORT: POST ACCIDENT CARE

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 CDV	CDV Transport Research Centre	CZ	 DHV Group	DHV Group	NL
 DTF	DTF Danish Transport Research Institute	DK	 TØI Institute of Transport Economics	TØI Institute of Transport Economics	NO
 DVR	DVR Deutscher Verkehrssicherheitsrat e.V.	DE	 IBDIM Road and Bridge Research Institute	IBDIM Road and Bridge Research Institute	PL
 CERTH/HIT	CERTH/HIT Hellenic Institute of Transport	EL	 PRP Prevenção Rodoviária Portuguesa	PRP Prevenção Rodoviária Portuguesa	PT
 FITSA	FITSA Foundation Technological Institute for Automobile Safety	ES	 SPV Slovene Road Safety Council	SPV Slovene Road Safety Council	SI
 INRETS	INRETS Institut National de Recherche sur les Transports et leur Sécurité	FR	 Výskumný ústav dopravný	VÚD Transport Research Institute Inc.	SK
 NRA	NRA National Roads Authority	IE	 bfu Schweizerische Beratungsstelle für Unfallverhütung	bfu Schweizerische Beratungsstelle für Unfallverhütung	CH
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 TRRI	TRRI Transport and Road Research Institute	LT	 CIECA Commission Internationale des Examens de Conduite Automobile	CIECA Commission Internationale des Examens de Conduite Automobile	INT
 KTI	KTI Institute for Transport Sciences	HU	 European Transport Safety Council	ETSC European Transport Safety Council	INT
 WHO	WHO Europe World Health Organization - Regional Office for Europe				

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# Introduction

# 1 The SUPREME project

The objective of the SUPREME project is to collect, analyse, summarise and publish best practices in road safety in the Member States of the European Union as well as in Switzerland and Norway, with a view to implementation in as many partner states as possible. By making the study results available to a broad target audience across Europe – and thereby encouraging the take-up of successful strategies – the project wants to contribute to reaching the 50% reduction target of road fatalities, which the European Commission set in its White Paper "European transport policy for 2010: time to decide" (2001).

Analysis, synthesis and further selection of collected data were carried out along nine categories of measures and cover all areas of road safety work.

1. Education & Campaigns
2. Driver Education, Training & Licensing
3. Rehabilitation and Re-Licensing
4. Vehicles (incl. ITS)
5. Infrastructure (incl. ITS)
6. Enforcement
7. Statistics & In-depth Analysis
8. Institutional Organisation of Road Safety
9. Post Accident Care

In order to avoid overlapping between these categories, a detailed list of subcategories and – in some cases including even sub-subcategories - has been provided.

Accordingly, nine "Thematic Reports" (of which one is the volume in front of you) shall give a detailed description of best available practices for each of these categories, featuring basic characteristics such as target groups, quantitative and qualitative goals, key issues, duration of implementation and effects, coverage, costs, actors involved, implementation procedures as well as **key success factors** and potential **implementation barriers** in other countries or at the European level.

The crucial task of the project lies within the sound **identification of best practice** from the vast amount of available measures. In order to facilitate this process, a set of tools for collection, classification, selection and ranking of measures has been developed, along with guidelines for the assessment process at country level. As the common basis of all further activities, a list of eight best practice criteria was developed and transferred into a questionnaire. While the major part of this questionnaire consisted of a common set of core elements, some questions also addressed key features for each category.

On this basis, the SUPREME network of "Country Experts" has provided information from various stakeholders in cooperation with the respective Analysis Group members. Although 227 questionnaires have been completed, not all subcategories of road safety measures have been addressed. So this is the first step of data collection.

As an additional step a list of road safety measures, that had not been covered by questionnaires but were considered potential best practices by the SUPREME consortium, was compiled. Additional

information was gathered from available scientific literature and earlier European projects. This extended list of potential best practices was the starting point for the second step of selection and analysis within each of the nine Thematic Reports.

#### Further SUPREME activities

Based upon these findings, 27 country surveys will be produced. The current status of implementation of best practice measures as well as implementation barriers shall be addressed and necessary steps shall be outlined.

Further, two separate handbooks will be provided, one for the European level (European institutions, international organisations, global industries) and one for the Country level (Ministries, regions, local level: stakeholders, policy makers, practitioners and the interested public).

For more information about the SUPREME project and latest results, please visit the SUPREME website, which is [http://ec.europa.eu/transport/supreme/index\\_en.htm](http://ec.europa.eu/transport/supreme/index_en.htm).

## 2 Focus of this thematic report

Driving under the influence of alcohol, exceeding the speed limit and other dangerous violations of traffic regulations all represent considerable safety risks in road traffic. A reduction in the frequency of offences would reduce both the number and the consequences of road accidents.

The “rehabilitation and diagnostics” report investigates the question of how rehabilitative and diagnostic measures aimed at traffic offenders should be designed in order to increase road safety. The subject of the report is thus the sum total of measures intended to lead to the restitution of a driver’s fitness to drive in terms of character or to avoid repeat offences after traffic offences have been committed (driving under the influence of alcohol or drugs or other serious violations of traffic regulations).

Firstly, the study included *measures to identify* people at risk of committing traffic offences (e.g. self-declaration sheet when applying for a driving licence, compulsory diagnostic clarifications) and *measures to restore fitness to drive* after offences (e.g. warning letters, single- and several-day target-group-specific forms of intervention, group discussions, abstinence) and more *technical measures* (e.g. alcohol ignition interlock) aimed at preventing offences by means of specific modifications to vehicles. Naturally, all three different types of measures can be combined. In connection with measures designed to prevent offences, many countries are using preventive warning measures or penalties (e.g. suspending driving licenses for shorter or longer periods, fines or prison sentences). Legally prescribed sanctions such as driving licence suspensions or prison sentences may be shortened or even withdrawn in favour of rehabilitative measures.

In the literature, a distinction is generally made between two different types of offender groups: driving under the influence of alcohol or drugs (= driving while impaired) and other serious violations of traffic regulations (exceeding the speed limit, aggressive and dangerous driving).

Overall, it was clearly imperative that rehabilitation measures must be developed specific to target groups or offences in order to have a chance of success.<sup>1</sup>

### 3 Potential benefits of rehabilitation measures

Alongside the actual effect of the measure, the remediation potential of rehabilitative measures depends on other factors, these being the probability of identification and the intensity of treatment. How many people will be registered by the police for offending and how many of them will be subjected to the measure or can even be “treated” (compulsorily v. voluntarily)? Within the framework of a project for compiling the Swiss federal guidelines for a national road safety policy (VESIPO), for example, the authors have reached the conclusion that the introduction of a nationwide, compulsory driver improvement scheme for offenders in Switzerland would lead to a relatively low reduction in fatalities and severely injured people of around 0.5 % in each group.<sup>2</sup>

In connection with the discussion revolving around the sense or the remediation potential of rehabilitation measures for people driving under the influence of alcohol and/or drugs, attention should be paid to the fact that treatment can have an effect not just on road accidents where alcohol is involved. A reduction in dangerous levels of consumption also leads to a decline in the number of alcohol-related diseases and improves the quality of life of those affected. Treatment affects not only people’s fitness to drive in terms of character but also other areas. For example, programme participants learn strategies that will help them to cope better in emotionally-charged situations, keep their alcohol or drug consumption within healthy limits or even stop harmful consumption altogether. Seen in this light, rehabilitation measures, particularly for drink/drugs driving offenders, have an influence on public health.

In the “Public Health Perspective” by Anderson & Baumberg<sup>3</sup>, it is obvious that all measures leading to a reduction in alcohol consumption have a positive effect on public health since, in the EU as a whole, around one third of all fatal accidents are alcohol-related. The authors particularly emphasize the positive effects of low blood-alcohol concentrations (0.5 ‰, or 0.2 ‰ for new drivers; random breath testing), however they tend to have a sceptical view of driver improvement courses. They ascribe the greatest effect of those measures aimed at drink driving offenders to alcohol ignition interlock systems and short interventions in terms of basic medical care.

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<sup>1</sup> q.v. Bartl, G., Assailly, J.-P., Chatenet, F., Hatakka, M., Keskinen, E., & Willmes-Lenz, G. (2002). EU project “Andrea”: Analysis of driver rehabilitation programmes. Wien: Kuratorium für Verkehrssicherheit KfV.

<sup>2</sup> Schweizerische Beratungsstelle für Unfallverhütung bfu. (2002). Erarbeitung der Grundlagen für eine Strassenverkehrssicherheitspolitik des Bundes (VESIPO): Massnahmenbeschreibungen im Detail. Forschungsauftrag ASTRA 2000/447. Bern: Author.

<sup>3</sup> Anderson, P. & Baumberg, B. (2005). Alcohol in Europe: A public health perspective. London: Institute of Alcohol Studies. Retrieved October 4, 2006, from [http://www.dhs-intern.de/pdf/Alkohol\\_in\\_Europa.pdf](http://www.dhs-intern.de/pdf/Alkohol_in_Europa.pdf)

## 4 Potential benefits of diagnostics

The potential benefits of diagnostics primarily depend on the reliability with which serious risk-increasing behaviour can be predicted. Apart from this question that will be answered further on, consideration must be given to the fact that the outlay for the diagnostic clarification of all drivers or learner drivers is disproportionately high. On the other hand, the benefit of test diagnostics is limited in the case of driving offenders since intervention only takes place after the danger has already arisen (secondary prevention). Accordingly, no substantial contribution to the reduction in injuries and fatalities as the result of accidents can be anticipated from test diagnostics.

## 5 Procedure

The aim of the SUPREME project is to identify the best solutions in the various areas of road safety work. In the field of diagnostics and rehabilitation, some European countries have many years' experience in intervention that they have developed on a continuous basis. The countries participating in the SUPREME project were asked to describe possible BEST PRACTICE measures. These were assessed on the basis of the criteria (including accident-reducing effect) described in chapter 15.

All in all, the SUPREME partners submitted 11 measures in the domain of rehabilitation and diagnostics (q.v. Table 1). These measures were allocated to different sub/subcategories (q.v. Table 1: Rehabilitation and diagnostic measures

). However, the authors consider that the measures submitted represent a very small sample of all the measures that are applied in this field in the partner countries. Efforts have been undertaken in order to motivate some country-partners to describe further known best practice measures, but without great success. Only one measure could be added with the help of documentation sent by the Dutch colleague. Moreover, none of the few reported measures have been properly evaluated. All these measures are summarized and assessed in chapters 16 and 17.

No.	Sub-category	Country	Title of the measure
1	3.1.1	Belgium	Educational courses for young DUI offenders
2	3.1.2	Portugal	Rehabilitation of driving offenders
3	3.1.3	Austria	Mandatory Driver Improvement (DI) for drivers who drove under the influence of alcohol or drugs, drivers with severe violations
4	3.1.3	Switzerland	Training course for recidivist drunk drivers
5	3.2.1	Germany	Rehabilitation seminar for novice drivers (ASF)
6	3.2.2	Germany	Driver Improvement courses for drivers with offences (ASP)
7	3.2.3	Belgium	Speed awareness course
8	3.2.3	Latvia	Measures to improve driver's behaviour within penalty point system
9	3.3.1	Belgium	Fitness to drive assessment (for elderly drivers 65+)
10	3.3.3	Austria	Mandatory traffic-psychological assessment (VPU) of drivers who drove under the influence of alcohol
11	3.3.3	Belgium	Fitness to drive assessment (for people with special needs PSN)

Table 1: Rehabilitation and diagnostic measures

3.1 DUI rehabilitation programmes	
3.1.1 Intervention for young drivers	1
3.1.2 Interventions for experienced drivers	1
3.1.3 Mixed target groups	2
3.1.4 Other	
3.2 Rehabilitation programmes for non-DUI offenders	
3.2.1 Intervention for young drivers	1
3.2.2 Interventions for experienced drivers	1
3.2.3 Mixed target groups	2
3.2.4 Other	
3.3 Programmes mainly based on diagnostics	
3.3.1 Testing elderly drivers	1
3.3.2 Testing young drivers	
3.3.3 Testing conspicuous drivers	2
3.3.4 Other	
<b>Total</b>	<b>11</b>

Table 2: Distribution of the measures in the sub/subcategories

In addition, the results of scientific studies outside the EU were taken into account. The following details show that the European models, some of which were highly developed, were not very often the subject of comprehensive, methodically sufficient evaluations. A major share of the scientifically compiled experience originates from the US, where interventions are evaluated more regularly and meta-analyses have also been conducted. This empirical initial situation leads to the fact that, in this



report, the best-practice recommendations do not contain specific, existing measures. Instead, the report concludes with general recommendations, which, when taken into consideration, will ensure the effectiveness of interventions in the field of diagnostics and rehabilitation.

# **Rehabilitation measures and their effects on road safety**

## 6 Methodological demands of studies

### 6.1 Assessment of various outcome or success criteria

The formulation of “best-practice criteria” for the “rehabilitation and diagnostics” sector was based on scientific work on rehabilitation measures, which, alongside a description of the measure and its area and form of application, also contain information on the effects of the latter on road safety. The following takes a detailed look at which success criteria in the studies have been used and how their prognostic validity for enhancing road safety can be assessed. In addition, the basic demands of the study design are formulated and additional factors are discussed that might influence the validity of the studies.

In the evaluation studies included, the following criteria were used as the basis for evaluating success or effect:

- ◆ Accident figures
- ◆ Recidivism rates
- ◆ External assessment by instructors
- ◆ Change in attitude
- ◆ Increase in knowledge

Whereby several of these outcome variables were very frequently recorded parallel. In connection with the introduction of rehabilitation measures, the question is always raised as to how successfully a measure can be implemented at all. For this reason, criteria should also be recorded that tend to be of a process evaluative nature. For example, the following criteria can play a role within the framework of process evaluations:

- ◆ Participant rates in percent of the targeted group (voluntarily vs. compulsorily)
- ◆ Discontinuation rates
- ◆ Satisfaction of participants
- ◆ Willingness of official authorities to cooperate
- ◆ ...

Testing the influence of a measure on road safety in the sense of lowering accident rates must clearly be considered worth striving for since it is the hardest criterion for success. However, this is not always possible for various reasons. Based on the literature, it can be assumed that the prevention of the originally difficult behaviour has a positive effect on road safety since problematical or delinquent behaviour is directly connected to road safety.<sup>4</sup> It can also be proved that the self-reported

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<sup>4</sup> Elvik, R. & Vaa, T. (2004). The handbook of road safety measures. Amsterdam: Elsevier. Quotation p. 869.

tendency to break traffic laws is clearly connected statistically with a higher risk of accident.<sup>5</sup> According to the report by the European Traffic Safety Council<sup>6</sup>, greater compliance with the laws where alcohol and speed are concerned would also lead to a massive improvement in road safety. As regards driving under the influence of alcohol, clear-cut connections between dosage and effect have been proved: driving with a blood alcohol concentration (BAC) of more than 0.8 ‰ leads much more frequently to accidents than driving with a BAC of between 0.01 ‰ and 0.5 ‰.<sup>7</sup> The fact that accidents can be predicted more reliably on the basis of previous accidents rather than on earlier violations of traffic regulations<sup>8</sup> indicates a differential connection: the connection between traffic violations and accidents is more distinct in some sub-groups (defined by gender, socio-economic criteria and age) than in others.<sup>9</sup>

On the basis of a review of the literature on this subject, it can be stated in summary that an increase in road safety can be anticipated if the frequency of disregard for traffic regulations relevant to road safety can be successfully reduced (= probation). This thus only means that no offence over a certain level of serious violation was demonstrably proved over a specific period of time.<sup>10</sup> In the various studies, the period of observation and the number and type of offences taken into account vary (i.e. only recidivism that corresponds to the incident for the rehabilitation measure, e.g. driving again while under the influence of drugs, or other associated recidivism such as screening positive for drugs or drug possession without simultaneously driving under the influence of drugs).

Seen as a whole and where success criteria are concerned, various procedures have also become established in the various countries; the rehabilitation measures employed differ widely in the extent to which they are “psychologically invasive”. In countries where widely differing, therapeutically-inspired rehabilitation measures are used, with which however only low proportions of the target groups can be recorded not least due to the high level of therapeutic complexity, recidivism rates are frequently given as a success criterion (e.g. Austria, Germany, Great Britain, Switzerland). In parallel to this, the modes of action and changes in attitude and knowledge of those participating are also of interest in the studies from these countries.<sup>11</sup> In countries in which less complex therapeutic rehabilitation measures and technical devices (e.g. alcohol ignition interlock) are used with which a

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<sup>5</sup> Parker, D., Reason, J. T., Manstead, S. R. & Stradling Stephen, S. G. (1995). Driving errors, driving violations and accident involvement. *Ergonomics*, 38(5), 1036 – 1048.

<sup>6</sup> European Transport Safety Council ETSC. (1997). *Safety Monitor & ETSC's Newsletter on Transport Safety Policy Developments in the EU*. Brussels: European Transport Safety Council.

<sup>7</sup> Borkenstein, R. F. (1974). The role of the drinking driver in traffic accidents. *Blutalkohol*, 11(supplement 1), 1–132 (quotation p. 25).

Krüger, H. P. (1995). *Das Unfallrisiko unter Alkohol*. Stuttgart: Gustav Fischer Verlag.

<sup>8</sup> Chen, W., Cooper, P. & Pinili, M. (1995). Driver accident risk in relation to the penalty point System in British Columbia. *Journal of safety research*, 26(1), 9–18.

<sup>9</sup> Biecheler-Frétel, M. B. (1994). La place de l'infraction dans l'analyse du risque routier. In Institut national de recherche sur les transports et leur sécurité INRETS (Ed.), *Infractions routière et risque d'accident, l'évaluation du système réglementaire de prévention* (Actes INRETS no. 39) (p. 39–54). Arcueil Cedex, France: Editor.

<sup>10</sup> Schade, F.-D. (1999). Das Kriterium der Legalbewährung nach Daten des Verkehrszentralregisters. In F. Meyer-Gramcko (Ed.), *Verkehrspsychologie auf neuen Wegen: Herausforderungen von Strasse, Wasser, Luft und Schiene (I)*: 37. BDP-Kongress für Verkehrspsychologie (p. 256–264). Bonn: Deutscher Psychologen Verlag.

<sup>11</sup> Christ, R. (2001). Auf der Suche in der Wundertüte – Ergebnisse einer Evaluationsstudie zu Driver-Improvement und Nachschulungskursen für Fahranfänger. *Psychologie in Österreich*, 21(3), 212–217.

large number of offenders can be reached, the changes in accident figures are also used as success criteria (e.g. the US, Canada, Australia).

The following takes a critical look at the individual success criteria using examples from the literature.

Neither the accident criterion nor probation are in any way ideal dimensions since acquiring data on them is strongly influenced by factors beyond the control of the investigators, for example the exposure of risk of the drivers of interest, the density of checks and the willingness of authorities to impose penalties. The outlay involved in investigating these criteria is also considerable. In addition, the provision of data protection can hinder or even prevent access to the relevant data. These considerations apply equally both to the accident criterion as to the probation criterion.

As a supplement to exposure to risk, what must also be taken into account in connection with rehabilitation measures at all times is whether they have been imposed in connection with further penalties (e.g. licence suspension). This can lead to a risk exposure that is possibly not comparable between experimental group and control group.<sup>12</sup> Christ<sup>13</sup> is also of the opinion that the positive result of rehabilitation measures based on recidivism figures must be put into perspective since the chance of recidivism is heavily dependent on the extent of driving after completing the course since those undergoing rehabilitation are frequently not allowed on the roads at all due to longer periods of licence suspension.

It is extremely difficult to obtain figures on the density of checks and official willingness to impose penalties but these can be highly relevant, particularly when comparing various studies on the risk of recidivism after rehabilitation measures.<sup>14</sup> Moreover, the access of researchers to the relevant data on recidivism can be very difficult and is handled in different ways. In particular, there is also a risk that current proceedings not yet concluded from a legal standpoint will not be taken into account in a survey on recidivism rates.

Since changes in knowledge and attitude can be considered as preliminary stages in behavioural changes and since cognitive content can be surveyed relatively easily, the change in knowledge and attitude relevant for safety based on rehabilitation measures is also often surveyed. It is relatively easy to obtain data on these criteria. However, distortions are possible and can be expected in certain cases, particularly if the respondent can or must assume that his replies can have an influence on being allowed to drive again. On the other hand, claims of a particular change in attitude can be interpreted in the sense of excessive adjustment or concealment of attitude changes (in order to avoid damaging a person's self-worth in front of the group and course leaders). These are two contradictory and yet equally plausible behavioural strategies among participants that make an accurate forecast of the risk of recidivism difficult.<sup>15</sup> In contrast, recording the change in the level of

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<sup>12</sup> Jacobshagen, W. & Jansen, J. (2004). Kritische Anmerkungen zur Evaluationsstudie DRUGS sowie Erwiderung der Autoren. *Zeitschrift für Verkehrssicherheit*, 50(4), 199–203.

<sup>13</sup> See footnote 11, quotation p. 216.

<sup>14</sup> See footnote 11.

<sup>15</sup> See footnote 11.

knowledge relevant for safety is relatively easy, whereby the question arises of the relationship between safety-relevant knowledge and behaviour.

The evaluation study by Bächli-Biétry<sup>16</sup> indicated that the assessment of learning success among course participants by course leaders was clearly more valid than self-assessment. Correlations could be made between the learning success assessed by others and frequency of recidivism while this could not be determined between self-assessed learning success and the frequency of recidivism.

In view of the problems that the evaluation of rehabilitation measures incurs with the criterion of probation, the question arises as to whether the check on driving behaviour during drives accompanied by experts might be a possible alternative. However, this is not a satisfactory alternative since an accompanied drive is hardly representative of the (otherwise) typical driving behaviour of the driver being assessed and accompanied drives are limited to specific situational parameters and to an extremely modest timeframe.

One possibility of gaining a complete picture of the driving behaviour of the person concerned without having an observer along on drives would be the installation of an electronic trip recorder in the vehicle. In this way, technical data such as driving time, driving speed, etc. could be recorded.

In summary, the accident criterion remains the desirable success criterion for the proof of success with a rehabilitation measure, since this provides the clearest proof that road safety as a whole has been increased by the measure. However, when recording the accident criterion, attention must be paid to the fact that both the experimental and the control group were on the roads during the period of observation. The probation criterion can similarly be described as a very good criterion for success due to the clearly proven connection between offending behaviour and the threat of accident. Where exposure is concerned, the same considerations apply to this criterion as for accidents. In addition, where probation is concerned, particularly in connection with the comparison of studies in different regions or countries, the intensity of follow-up must be decisively taken into account. By comparison, changes in attitude and knowledge by means of rehabilitation measures represent weak success criteria. Nevertheless, it is meaningful to include these criteria in connection with offence and accident figures since pointers on the modes of action of the measures can be gained.

## 6.2 Demands on the study design

In order to maximize the validity of an evaluation study or to even guarantee it, certain criteria must be met which can be derived from the basic requirements of experiments (design of experimental and control groups). According to Biehl & Birnbaum<sup>17</sup>, a broad consensus has been reached in Germany in terms of the survey design of preference, namely “a probation study with a control group”. Basically, the demand is for measuring the variables of interest at least twice with the same

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<sup>16</sup> Bächli-Biétry, J. (2005). Evaluationsbericht des Modellversuchs: Lernprogramme als neue Interventionsform in der Strafjustiz. Retrieved September 27, 2006, from

[http://www.bj.admin.ch/etc/medialib/data/sicherheit/straf\\_und\\_massnahmen/modelversuch\\_abgeschlossen.Par.0022.File.tmp./schlussbericht\\_mv\\_lernprogramm-d.pdf](http://www.bj.admin.ch/etc/medialib/data/sicherheit/straf_und_massnahmen/modelversuch_abgeschlossen.Par.0022.File.tmp./schlussbericht_mv_lernprogramm-d.pdf)

<sup>17</sup> Biehl, B. & Birnbaum, D. (2004). Evaluation eines Rehabilitationskurses für drogenauffällige Kraftfahrer. Zeitschrift für Verkehrssicherheit, 50(1), 28–32 (quotation p. 28).

people at individual and not group level (longitudinal study). Cross-sectional studies do not meet the requirements of an evaluation study.

In order to be able to attribute an effect clearly to a specific independent variable, the treatment variable, it would be necessary for the control group and the experimental group to differ only in terms of this one variable. All other conditions would have to be comparable. Within the framework of investigating the effects of rehabilitation courses, the following variables can be important: socio-demographic features, attitudes as well as criteria for inclusion in and exclusion from a course. In particular, self-selection effects in voluntary course participation can decisively affect comparability between experimental and control group.

Christ<sup>18</sup> makes references to the connection between socio-demographic features as well as features connected with previous driving behaviour with the likelihood of recidivism among traffic offenders after retraining: "Course participants who attract attention as a result of clear resistance during the course will reoffend more frequently. People who leave the course optimistically will reoffend more frequently ('optimism bias'). The fact is also evident that course participants who improve in the 'can admit mistakes' attitude scale will reoffend more frequently."

Explicit mention of the allocation criteria is important when putting together a comparable group of people for a control group. In this connection, Gabor and Handels<sup>19</sup> express their dissatisfaction with the situation a few years ago by stating "that a scientific check of the pre-selection (of the study collective - author's note) is totally impossible under current conditions. Preselection is substantially influenced by whether and how social, commercial or criminal interests determine the situation in that location or region. The composition of the study collective in long-term rehabilitation is only co-determined in exceptional cases by professional indications that give sufficient consideration to alcohol and personality problems."

Exclusion criteria can also be used to supplement the allocation criteria. These can also be important when setting up a control group in parallel. The existence of drug or alcohol addiction or serious personality problems or a psychiatric clinical picture as well as insufficient intellectual capabilities or a lack of language skills in the course language are frequently used as exclusion criteria.

## 6.3 Conclusions for the inclusion of the studies in the analysis of the literature

It is difficult to provide proof of the positive effect of rehabilitation measures on road safety following traffic offences in the sense of avoiding road accidents. Since there is a connection between the frequency of accidents and the frequency of offending behaviour, recidivism rates offer a relatively hard success criterion for rehabilitation measures. In addition, use is made of psychologically softer criteria, such as a change in attitude, increase in knowledge and external

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<sup>18</sup> See footnote 11, quotation p. 216.

<sup>19</sup> Gabor, M. & Handels, V. (1998). Indikations-, Evaluations- und Marktprobleme der Langzeitrehabilitation/Verkehrstherapie alkoholauffälliger Kraftfahrer. Zeitschrift für Verkehrssicherheit, 44(3), 116–118 (quotation p. 117).

assessments of the participants by course leaders. The prognostic validity of these criteria must be assessed critically, however.

Where recording data on probation is concerned, studies must meet a range of criteria if they are to have a solid basis:

- ◆ Design of experimental and control groups
- ◆ Parallelism of experimental and control groups must be guaranteed (in terms of features relevant to the offence, inclusion and exclusion criteria)
- ◆ Exposure opportunities during the probationary period must be taken into account (duration of licence suspension, exposure opportunities)
- ◆ Intensity of follow-up must be taken into account

## 7 Evidence regarding selected examples of rehabilitation measures

This report takes into account all published evaluation studies that report on the success of rehabilitation measures in terms of the frequency of offence or accident. However, not all the studies meet all of the quality criteria required (e.g. parallelism of experimental and control group). More importance has thus been attached to results from methodically sound studies.

### 7.1 The classic “driver improvement” course

The classic “driver improvement courses”, which are mainly conducted in the German-speaking area (Germany, Austria, Switzerland) as well as in Canada, are group courses for traffic offenders (drink/drive offenders, drug offenders, points system offenders) developed on the basis of therapeutic considerations. The deficits that lead to misdemeanours are presumed to be primarily in the area of traffic-relevant knowledge and attitudes as well as personality. The purpose of these courses is for participants to learn to analyse their lifestyle or the accompanying errors, to acquire knowledge of the consequences of misconduct and to assume responsibility for their misconduct. The main aim of the intervention is to create personal avoidance strategies for future misconduct on the roads. In Germany, courses are offered that have a more behavioural psychological orientation (IFT) and those that focus on group dynamic processes (LEER).<sup>20</sup>

The classic driver improvement course is voluntary and attendance can lead to earlier licence reinstatement (cf. bfu’s alcohol course in Switzerland<sup>21</sup>, IRAK-S<sup>22</sup>). In this connection, it is also

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<sup>20</sup> Heinrich, H. Ch. & Porschen K. M. (1988). Die Wirksamkeit von Kursen für wiederholt alkoholauffällige Kraftfahrer. *Zeitschrift für Verkehrssicherheit*, 38(3), 129–130.

<sup>21</sup> Siegrist, S., Kägi, U. & Ammann, A. (1995). *Kurs für wiederholt alkoholauffällige Fahrzeuglenker: Ein Handbuch für Kursmoderatoren, Behörden und Fachleute*. Bern: Schweizerische Beratungsstelle für Unfallverhütung bfu.

Bächli-Biétry, J. (2003). *Evaluation der bfu-Nachschulungskurse für Alkoholauffällige im Rahmen der EU-Studie ANDREA (bfu-Report 52)*. Bern: Schweizerische Beratungsstelle für Unfallverhütung bfu.

important that an effort is made to exclude unsuitable people from these courses (i.e. alcoholics and similar). Plausibly, it is decisive for the success of the measure that suitable people are assigned. Alcoholics should be assigned to an individual measure.

The courses available address different target groups, for example first-time drink/drive offenders (IRAK-S), second-time drink/drive offenders (bfu's alcohol course), offenders with an intoxication of 1.2 ‰ or more (Austria), alcohol and drug offenders after a negative medical/psychological examination (MPU Germany, Amtsärztliche Untersuchung und Verkehrspsychologische Stellungnahme in Austria), as well as novice drivers during probation time (e.g. retraining courses for novice drivers within the two-year probationary period in Austria) and drivers with severe or multiple traffic violations (during probation or not, Austria).

Classic driver improvement courses designed for drink/drive offenders primarily aim at modifying offenders' drinking habits or even demand abstinence. In contrast, Rider, Kelley-Baker, Voas, Murphy, McKnight & Levings<sup>23</sup> describe an American programme in which the focus is not on controlling drinking habits but exclusively on controlling driving (PARC = Preventing Alcohol-Related Convictions). This programme comprises four 2.5-hour meetings and is intended to motivate participants to develop strategies for consistently separating drinking and driving in future. This programme is suitable for first-time DUI (driving under the influence) offenders who have no alcohol-dependency problems. The evaluation is still ongoing.

Classic driver improvement courses in German-speaking areas have been shown to result in a 50 % reduction in recidivism rates.<sup>24</sup> According to Bartl, Assailly, Chatenet, Hatakka, Keskinen & Willmes-Lenz<sup>25</sup>, it can be assumed on the basis of an analysis of the literature, which was carried out within the framework of the EU's "Andrea" study, that retraining courses reduce the risk of recidivism in comparison to an untreated control group if the following conditions are met:

- ◆ The programme must be oriented towards the target group.
- ◆ Course leaders must be highly qualified.
- ◆ The focus must be on participants' critical self-reflection.
- ◆ Course meetings must be conducted over a lengthier period or over several weeks.
- ◆ The group must be limited in number to 10 participants.

In the ALKO-EVA project (evaluation project for "Paragraph 70 courses" "IFT, IRAK and LEER"), the intensity of follow-up was taken into account (operationalised with the used test tubes for breath testing) in recording recidivism rates. Exposure was also operationalised accurately in this project and the recidivism rates were checked within 3, 5 and 10 years after the actual reinstatement of the

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<sup>22</sup> Birnbaum, D., Biehl, B. & Seehars, I. (2005). Die Wirksamkeit des Nachschulungsmodells IRAK-S für erstmals alkoholauffällige Kraftfahrer. Zeitschrift für Verkehrssicherheit, 51(4), 202–207.

<sup>23</sup> Rider, R., Kelley-Baker, T., Voas, R. B., Murphy, B., McKnight, A. J. & Levings, C. (2006). The impact of a novel educational curriculum for first-time DUI offenders on intermediate outcomes relevant to DUI recidivism. Accident Analysis and Prevention, 38(3), 482–489.

<sup>24</sup> cf. e.g. Michalke, H., Barglik-Chory, Ch. & Brandstätter, Ch. (1987). Driver-Improvement – Effizienzkontrolle von Gruppentrainingsmassnahmen für alkoholauffällige Kraftfahrer. Wien: Kuratorium für Verkehrssicherheit KfV, Institut für Verkehrspsychologie.

driving licence. This project established both a reduction in recidivism rates among programme participants as well as the long-term effect of the programme.

The BUSS programme (Beratung, Untersuchung und Schulung [Advice, examination and training])<sup>26</sup> represents a combination of training and diagnosis within the period of suspension. In order to grant those affected with as short a period of suspension as possible, the intervention (usually the LEER programme) should be completed as quickly as possible within this time. A condition of this programme is good cooperation between authorities and treatment centres. The comparison of “people treated conventionally” and recipients of intervention at an as early stage as possible results in lower recidivism rates among BUSS clients.

## 7.2 Traffic therapy

The IVT-Hö® programme<sup>27</sup> is a long-term rehabilitation concept, individually tailored to drivers who are problem drinkers and for whom the therapeutic process is only complete when the individual therapeutic goals have been achieved. This approach to treatment is based on the idea that drink driving is a psychopathological phenomenon (alcoholic neurotics) in which aspects of a neurotic adjustment disorder are foremost.<sup>28</sup> The evaluation shows very good results in terms of the reductions in relapse frequency following the successful completion of the programme.<sup>29</sup> As an explanation for the major success of this measure, it can be stated that this wide-ranging intervention is frequently used by particularly motivated people who have already failed before, the programme is open and individually psychological and thus can be ideally tailored to its clients.

According to Himmelreich<sup>30</sup>, 93.6 % of people completing the individual long-term treatment IVT-Hö® had not reoffended with drink driving in the five years after regaining their driving licence. The author emphasizes that an efficacy of this magnitude has never been achieved anywhere with the exception of the “IRAK-L” model by AFN (Gesellschaft für Ausbildung, Fortbildung und Nachschulung [Society for training, retraining and improvement courses, incorporated society]) in which a similar individual psychological lifestyle analysis is conducted in nine months and 104

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<sup>25</sup> See footnote 1.

<sup>26</sup> Jacobshagen, W. (1998). Nachschulungskurse für alkoholauffällige Fahranfänger nach dem Modell NAFA in Deutschland: Klientel, Kursdurchführung, Wirksamkeit und Akzeptanz. In Bundesanstalt für Straßenwesen BASt (Ed.), *Driver Improvement 6: Internationaler Workshop* (Heft M 93) (p. 261–274). Bergisch Gladbach: Editor.

<sup>27</sup> Höcher, G. (1992). Langzeitrehabilitation alkoholauffälliger Kraftfahrer (I) – Individualpsychologische Verkehrstherapie (IVT-Hö). *Blutalkohol*, 29(4), 265–275.

Höcher, G. (1994). Alkoholauffällige Kraftfahrer nach Abschluss einer Langzeitrehabilitation Modell IVT-Hö. *Blutalkohol*, 31(4), 201–221.

<sup>28</sup> Fiesel, P. (1998). Entwicklung von Qualitätskriterien für die Rehabilitation alkoholauffälliger Kraftfahrer am Beispiel der IVT-Hö®. *Zeitschrift für Verkehrssicherheit*, 44(3), 111–113.

<sup>29</sup> Echterhoff, W. (1998). Legalbewährung von alkoholauffälligen Kraftfahrerinnen und Kraftfahrern fünf Jahre nach Abschluss der Verkehrstherapie IVT-Hö® – Qualitätskontrolle einer Langzeitrehabilitation in Nordrhein-Westfalen. *Zeitschrift für Verkehrssicherheit*, 44(3), 113–116.

Echterhoff, W. (1999). Legalbewährung von alkoholauffälligen Kraftfahrerinnen und Kraftfahrern fünf Jahre nach Abschluss der Verkehrstherapie IVT-Hö®. In F. Meyer-Gramcko (Ed.), *Verkehrspsychologie auf neuen Wegen: Herausforderungen von Strasse, Wasser, Luft und Schiene (I) – 37: BDP-Kongress für Verkehrspsychologie* (p. 292–294). Bonn: Deutscher Psychologen Verlag GmbH.

<sup>30</sup> Himmelreich, A. (1998). Verkehrstherapie – kurz oder lang? In K. Himmelreich (Ed.), *Jahrbuch Verkehrsrecht 1998* (p. 175–217). Düsseldorf: Werner-Verlag.

hours. The author thus considers individual psychological (psychoanalytical) long-term therapy to be by far the most successful form of traffic therapy especially for the severest of problem cases.

Sohn & Meyer-Gramcko<sup>31</sup> also report on the success of individual traffic therapy in terms of relapse rates. The authors describe that the therapeutic approach is based on a careful individual diagnosis and thus no all-inclusive approach is therefore possible. Alongside the collection of relapse rates, the authors also describe as evaluation criteria the end of the measures, the results of the MPU (medical/psychological examination) and the successful catamnesis.

### 7.3 Driver improvement courses

In Austria, driver improvement courses are mainly used for new drivers who have committed offences during the probationary period.<sup>32</sup> This form of rehabilitation is mandatory. This thus leads to the problem that people who are not prepared to change also have to be included in the programme. Since this is a compulsory measure prescribed by legislation, formal criteria for the measure (size of groups, number of hours) are defined by legislators. As a rule, there is no room for methods of procedure tailored to the individual. As a result of these guidelines, it becomes possible to simply sit out the rehabilitation measure. These factors lead to the evaluation results of mandatory driver improvement courses for traffic offenders not being comparable to the results obtained from voluntary driver improvement courses.

In Austria, there are two different types of driver improvement models for new drivers who commit offences (A course, V course) with both models being conducted in groups of between 6 and 10 people by specially trained psychologists. The courses are held over a period of four to six weeks. Drink drivers and other traffic offenders are subjected to different course concepts, with a test drive being part of the course for traffic offenders.

With the introduction of probationary driving licences with driver retraining for offenders, there was the accompanying legal obligation to evaluate this model at the level of society as a whole, in other words at the level of accident figures. Within the framework of the evaluation study of this compulsory measure, data was collected on actual probation within the two years after completion of the course alongside participants' changes in attitude and external assessments of the effects of the courses by course leaders. In particular, an attempt was made in this study to show whether the concept of the A and V courses was comparable with the classic driver improvement courses in terms of preventing recidivism. The results indicate that the concept is promising although methodically there were obvious difficulties in comparing the different course models (heterogeneity of participant groups in terms of relapse risk, selection processes, likelihood of apprehension of different types of offence, etc.).<sup>33</sup>

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<sup>31</sup> Sohn, J.-M. & Meyer-Gramcko, F. (1998). Evaluation der Verkehrstherapie – Zwischenbilanz und Ausblick. Zeitschrift für Verkehrssicherheit, 44(4), 170–173.

<sup>32</sup> Christ, R. (1995). Die Evaluation psychologischer Massnahmen – behördlicher Auftrag oder berufsständische Pflicht? Die verkehrspsychologische Nachschulung als Fallbeispiel. Psychologie in Österreich, 15(2), 40–43.

<sup>33</sup> See footnote 11.

In Germany, within the framework of the law on provisional driving licences in 1986, mandatory driver improvement courses that went beyond the valid penalties were also introduced for new drivers who committed offences (NAFA). The core result of the evaluation study by Jacobshagen<sup>34</sup> is that the recidivism rate measured after a 3-year observation period was less than half of the recidivism rates of first-time drink driving offenders prior to the introduction of these courses.

#### **7.4 Combined measures (measures imposed by a court: Alcoholics Anonymous groups in combination with electronic monitoring)**

In the evaluation of the “New Jersey Alcohol Countermeasures Program”<sup>35</sup>, groups of people who completed the programme more or less quickly and thus had their licences reinstated sooner were compared with people who had not had any treatment and whose licences were suspended for the full term of the penalty (in this US state, this means 2-6 months for the first DUI conviction, 1 to 3 years for the second conviction and 5 years for the third conviction). Depending on the extent of the alcohol problem within the framework of an assessment, the programme comprised education or intervention. Treatment was not voluntary. The study covers a very large sample (more than 2,200 cases) and a long observation period (up to 8 years). The success variables investigated were drink driving, other offences and accidents. The programme had positive effects on the relevant relapses (drink driving) but not on other offences and accidents. One problem was that, in some instances, people were included in an inappropriate programme based on the assessment.

The DISP programme (DUI Intensive Supervision Program, Oregon, US) is a programme for repeat offenders of the DUI law. Since the majority of the offenders were still driving despite having had their licences suspended, the declared aim of the programme, alongside changing drinking habits, is to also prevent driving when licenses were suspended. Participation is voluntary and both the penalty and suspension time can be reduced. This leads to the significance of the study being affected by a self-selection bias. The programme comprises electronic surveillance, sale of the vehicle, weekly Alcoholics Anonymous (AA) meetings, discussions with a probation officer and polygraph tests. The study by Lapham, Ring Kapitula, C’de Baca & McMillan<sup>36</sup> shows a reduction in the recidivism rate of around 50 %, even though the experimental group of DISP participants spent less time in prison and thus had more opportunities for exposure to traffic.

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<sup>34</sup> See footnote 26.

<sup>35</sup> Green, R. E., French, J. F., Haberman, P. W. & Holland, P. W. (1991). The effects of combining sanctions and rehabilitation for driving under the influence: An evaluation of the New Jersey Alcohol Countermeasures Program. *Accident Analysis and Prevention*, 23(6), 543–555.

<sup>36</sup> Lapham, S. C., Ring Kapitula, L., C’de Baca, J. & McMillan, G. P. (2006). Impaired-driving recidivism among repeat offenders following an intensive court-based intervention. *Accident Analysis and Prevention*, 38(1), 162–169.

## 7.5 Measures imposed by the judicial system

“Under the limit” (UTL) is an 11-week programme imposed by the courts in Australia for drink driving offenders with the aim that participants learn to drink in a controlled way and to consistently separate drinking and driving. The programme was introduced in 1993 and has led to a marked reduction in recidivism rates among participants when compared with those who do not complete it and with a control group.<sup>37</sup>

In Switzerland, a trial model for cognitive-behaviourally oriented group training sessions as part of sentencing was conducted between 1999 and 2003 on behalf of the government (Federal Office of Justice).<sup>38</sup> This trial model comprised a range of offence-oriented learning programmes, including three for driving offenders (TAV, LAST: alcohol-related offences and START: serious traffic violations). The trial model was accompanied and evaluated.<sup>39</sup> The comparison of the experimental group with the untreated control group resulted in a demonstrable reduction in recidivism rates among the alcohol offenders, while the result was less positive among the serious traffic violators. Overall, however, it could be proved that people who had benefited well from the programme in the opinion of the course leader or completed the learning programme successfully also suffered fewer relapses. Within the framework of the evaluation, it could also be shown that participants’ cultural background should be specially taken into account when designing the programme.<sup>40</sup> The aspect of the cultural specificity of interventions was also emphasized by Dill & Wells-Parker<sup>41</sup> based on experience in the US with Hispanics and African-Americans.

According to Dill & Wells-Parker<sup>42</sup>, measures imposed by the judicial system for drink driving offences vary both in their intensity and their duration and range from brief meetings once or twice to programmes lasting several weeks or months with several components and follow-up care. Frequently, existing institutions, e.g. Alcoholics Anonymous, are also used as a means of treatment. As experience is gained, the measures imposed by the judicial system have developed from purely educational measures in a more therapeutic direction. Within the framework of an assessment, the offenders’ risk of relapse is noted and they are allocated to the programmes accordingly. Evaluation studies of measures imposed by the judicial system give a clear picture of their effect and their limitations.<sup>43</sup> A modest influence on the frequency of relapse and alcohol-related accidents is evident. The greater the differentiation made during allocation, however, and the better the offenders’ problems are recorded and treated, the greater the success. For example, it appears that a

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<sup>37</sup> Ferguson, M., Sheehan, M., Davey, J. & Watson, B. (1999). Drink Driving Rehabilitation: The present context. Queensland: Centre for Accident Research and Road Safety.

<sup>38</sup> Mayer, K. & Hollenweger, H. (2005). Lernprogramme als neue Interventionsform in der Strafjustiz: Schlussbericht zum Modellversuch 1999–2003. Retrieved September 25, 2006, from [www.justizvollzug.zh.ch/showpdf/docloader.php?search=498/](http://www.justizvollzug.zh.ch/showpdf/docloader.php?search=498/)

<sup>39</sup> See footnote 16.

<sup>40</sup> Bächli-Biétry, J. & Mayer, K. (2006). Sind Raser heilbar? In R. Schaffhauser (Ed.), *Jahrbuch zum Strassenverkehrsrecht 2005* (p. 11–40). St. Gallen: Schriftenreihe des Instituts für Rechtswissenschaft und Rechtspraxis.

<sup>41</sup> Dill, P. L. & Wells-Parker, E. (2006). Court-mandated treatment for convicted drinking drivers. *Alcohol Research and Health*, 29(1), 41–48.

<sup>42</sup> See footnote 41.

<sup>43</sup> See footnote 41.

supplementary and more personal intervention can encourage a change in behaviour particularly among drink drive offenders with depressive tendencies.<sup>44</sup>

In the US, there has been a range of programmes in existence largely since 2000 (the first programmes of this type go back to 1971) that are used in a judicial setting (DUI problem-solving courts), the main aim of which is to prevent relapses into criminal behaviour. Punishment of the criminals is combined with treatment. These programmes were originally designed for violent criminals and drug offenders. As is the procedure with drug offenders, there are also programmes for drink drive offenders imposed by the judicial system. Programmes of this type are also intended to prevent driving while the licence is suspended. The programmes have not been specially evaluated.<sup>45</sup>

Special courses for non-DUI offenders supported by the courts have existed in the US since 1930 (Court traffic violator schools). Finigan<sup>46</sup> reports on an experimental evaluation study (random allocation to experimental and control groups) relating to the success of special courses for offenders at a driving school. There were two different types of courses depending on the extent of the preceding offence. Data was collected in 1989 and 1990 and around 35,000 drivers were investigated. The study shows clear and positive effects of course attendance on relapse and accident frequency both when the course participants were compared with the control group as when the course participants were compared with people who had preferred to pay the fines instead of attending a course.

## 7.6 Warning letters (q.v. meta-analyses)

## 7.7 Short interventions

According to Anderson & Baumberg<sup>47</sup>, short interventions within the framework of basic medical care for alcohol consumption that is a risk and damaging to health have been proved to have a far-reaching effect on safety as a whole as well as on road safety since they lead to a reduction in alcohol consumption and the resultant alcohol-related disorders. If only 25 % of the population at risk (this also includes drink drivers) were reached, this would mean, seen for the EU as a whole, the avoidance of 408,000 years of disability and premature death (or put another way, EUR 740 bn).

Short medical interventions for addiction are usually based on cognitive-behavioural or motivational concepts.<sup>48</sup>

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<sup>44</sup> Wells-Parker, E. & Williams, M., 2002, quoted by Dill, P. L. & Wells-Parker, E. (2006), see footnote 41, quotation p. 45.

<sup>45</sup> Flango, V. E. (2004). *DWI Courts: The Newest Problem-Solving-Courts*. Williamsburg, VA, USA: National Center for State Courts.

<sup>46</sup> Finigan, M. (1995). *Traffic violator school research report*. Retrieved October 10, 2006, from <http://www.drivers.com/article/418/>

<sup>47</sup> See footnote 3.

<sup>48</sup> Reymann, G. (2003). Suchtmedizinische Kurzinterventionen in der Grundversorgung. *Suchttherapie, Supplement*, 1(4), 13–17.

Rist, Demmel, Hapke, Kremer & Rumpf<sup>49</sup> conducted research into the literature in the MEDLINE database of studies published since 1995 on the topic of short interventions. According to the authors, the term short intervention is frequently insufficiently defined or differentiated from other terms (early recognition, early intervention, motivational treatment, secondary prevention, damage-reducing strategies, etc.). A differentiation can be made between minimal (once-only intervention of up to five minutes), brief (a maximum of three sessions, each lasting up to 60 minutes), moderate (five to seven sessions) and intensive interventions (eight or more sessions). In the German-language literature, minimal and brief interventions are generally summarized as short interventions. Short interventions are mostly early interventions - a willingness to change or motivation to accept treatment should be promoted in early stages of dependency development or when dangerous or harmful usage is present - and are frequently conducted by general practitioners as part of basic medical care. Since the short interventions described in the literature differ considerably in terms of duration, context, procedure as well as in a range of other features, generalized conclusions are rarely possible in spite of the meta-analyses of randomised controlled studies that exist.<sup>50</sup> In addition, neither internal (compliance with the manual and adherence to the investigation protocol) nor external validity (practicability within the framework of the routine) of the relevant interventions are checked with any frequency. The important elements of successful short interventions are described using the acronym FRAMES<sup>51</sup>:

Feedback

Responsibility (self-responsibility)

Advice

Menu (offer of various treatment possibilities),

Empathy

Self-Efficacy

In this connection, it appears to be important that a confrontational approach is not adopted for short interventions since self-efficacy and willingness to change are being promoted and treatment goals are agreed on by mutual agreement. Factual, unbiased information on the diagnostic examination (or the assessment) promotes willingness to undergo treatment among those concerned.

The use of short interventions presupposes a good screening procedure that can give an estimate of the extent of problematical alcohol consumption (dependency, abuse, harmful or dangerous consumption. According to Rist et al.<sup>52</sup>, questionnaire methods based directly on statements made by participants have proved to be valid as a screening process although there is a danger of falsification.

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<sup>49</sup> Rist, F., Demmel, R., Hapke, U., Kremer, G. & Rumpf, H. J. (2004). Riskanter schädlicher und abhängiger Alkoholkonsum: Screening, Diagnostik, Kurzintervention. *Sucht*, 50(2), 102-112.

<sup>50</sup> See footnote 49.

<sup>51</sup> Miller, W. R. & Sanchez, V. C., 1994, quoted by Rist, F., Demmel, R., Hapke, U., Kremer, G. & Rumpf, H. J. (2004), see footnote 49.

<sup>52</sup> See footnote 49.

Although no success can be achieved among alcohol-dependent people with short interventions, it can be assumed that, as a result of the low outlay on measures and thus the wide distribution, a very good overall effect is possible with people who consume alcohol excessively. Success is demonstrable up to 48 months after a short intervention has been carried out.<sup>53</sup> Reymann<sup>54</sup> also adds that, as a result of short interventions, willingness to go on to further treatment can be promoted.

Dill, Wells-Parker & Soderstrom<sup>55</sup> report that there is a range of people who are involved in road accidents caused by alcohol and are then treated medically in emergency rooms and trauma centres but do not enter the criminal justice system. Short interventions (one or two sessions, within the framework of what is justifiable from a medical standpoint) are meaningful with these people. These short interventions are very individual in their focus and appear to have a positive effect on the relevant recidivism rates as well as on other self-endangering modes of behaviour. Once again, the cost effectiveness of these measures is given as an argument.

Dinh-Zarr, Goss, Heitman, Roberts & DiGiuseppi<sup>56</sup> found 17 studies that investigated, among other things, the influence of short medical interventions on injuries. In summary, these studies showed that the treatment of problematical drinking behaviour led to both a reduction in injuries and to a reduction of events that can result in injuries.

## 7.8 Licence suspension as a sole measure

The purely warning measure of licence suspension without additional rehabilitation measures is only beneficial for the actual period of licence suspension, and seen as a whole, it appears to be a very effective measure.<sup>57</sup> There are also references in the literature that licence suspension also has an effect on reducing offences if people still drive in spite of the suspension. They drive more carefully and try to avoid committing an offence.<sup>58</sup>

On the other hand, it is apparent that licence suspension when compared with a more comprehensive, 12-month therapeutic measure to prevent future drink driving is clearly more effective. Sadler, Perrine & Peck<sup>59</sup> were able to show that dispensing with the suspension of licences in favour of treatment in no way leads to an increase in road safety, since participants in these programmes had accidents far more often than people with suspended licences when compared in a 4-year evaluation phase. Only the alcohol-related offences are reduced in comparison to people whose licences have been suspended. The authors conclude that it is not meaningful to use the non-suspension of a licence as an incentive to participate in a measure.

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<sup>53</sup> See footnote 49.

<sup>54</sup> See footnote 48.

<sup>55</sup> Dill, P. L., Wells-Parker, E. & Soderstrom, C. A., 2004, quoted by Dill, P. L. & Wells-Parker, E. (2006), see footnote 41, quotation p. 45–46.

<sup>56</sup> Dinh-Zarr, T. Goss, C. Heitman, E. Roberts, I. & DiGiuseppi, C. (2006). Interventions for preventing injuries in problem drinkers. The Cochrane Database of Systematic reviews, 3.

<sup>57</sup> McKnight, A. J. & Voas, R. B., 1991, quoted by Anderson, P. & Baumberg, B. (2005), see footnote 3.

<sup>58</sup> Hagen, R. E., Williams, R. L. & McConnell, E. J., 1982, quoted by Masten S. V. & Peck, R. C. (2004). Problem driver mediation: A meta-analysis of the driver improvement literature. Journal of safety research, 35, 403–425 (quotation p. 413).

Overall, based on US studies, it is evident that it is not meaningful to dispense with suspending licences in favour of a measure, i.e. to pursue the “either/or” concept (either punishment or rehabilitation). The “both/and” (both punishment and rehabilitation) appears to be substantially more effective.<sup>60</sup>

## 7.9 Prison sentences

On their own, prison sentences and fines have little effect on recidivism rates. A reduction effect of 8 % was noted when prison sentences for drink driving offenders were combined with rehabilitation measures.<sup>61</sup>

## 7.10 Short courses in defensive driving

In many places, first-time offenders - which are usually reflected by an increase in their violation points - are ordered to undergo courses lasting one or several days that focus on the subject of defensive driving. These are generally school-type group courses with lecture-style presentation of the course contents, to some extent even combined with driving exercises.<sup>62</sup>

According to the evaluation study by Huguenin et al.<sup>63</sup>, the courses that are mainly effective or reduce the likelihood of recidivism are those in which individual care as part of the course content is provided by social workers in parallel. Courses dealing solely with traffic regulations or the assessment of traffic situations must be considered fairly ineffective in terms of the likelihood of recidivism.

## 7.11 Impounding vehicles or immobilizing vehicles

In order to control the increasing problem of people continuing to drive despite the suspension of their licences, models or laws have been drafted in the US that are designed to prevent this as reliably as possible (vehicle immobilization program in Franklin County (Columbus) and an analogue program in Cincinnati). This is done by impounding or immobilizing the vehicle of the offender with a suspended licence. Voas, Tippetts & Taylor<sup>64</sup> report on the success of this measure on offender recidivism. In the studies, groups of people were compared who had had nothing done to

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<sup>59</sup> Sadler, D. D., Perrine, M. W. & Peck, R. C. (1991). The long-term traffic safety impact of a pilot alcohol abuse treatment as an alternative to license suspensions. *Accident Analysis and Prevention*, 23(4), 203–224.

<sup>60</sup> See footnote 35.

<sup>61</sup> Wells-Parker, E., Bangert-Drowns, R., McMillen, R. & Williams, M., 1995, quoted by Anderson, P. & Baumberg, B. (2005), see footnote 3.

<sup>62</sup> Elvik, R. & Vaa, T. (2004), see footnote 4.

Huguenin, R. D., Engel, K. & Reichhardt, P. (1988). Evaluation von Kursen für auffällige Lenker in der Schweiz (bfu-Report 11). Bern: Schweizerische Beratungsstelle für Unfallverhütung bfu.

<sup>63</sup> Huguenin, R. D., Engel, K. & Reichhardt, P. (1988), see footnote 63.

<sup>64</sup> Voas, R. B., Tippetts, A. S. & Taylor, E. (1997). Temporary vehicle immobilization: Evaluation of a program in Ohio. *Accident Analysis and Prevention*, 29(5), 635–642.

Voas, R. B., Tippetts, A. S. & Taylor, E. (1998). Temporary vehicle impoundment in Ohio: A replication and confirmation. *Accident Analysis and Prevention*, 30(5), 651–655.

their vehicles with people whose vehicles had been immobilized. The evaluation period lasted two years and revealed that the people “treated” relapsed less both during the immobilization of their vehicles and afterwards. It is assumed that this measure has a high deterrent potential.

An attempt was also made in the US to prevent people driving with suspended licences by placing a striped sticker on the number plate of those whose licence was suspended for a drink driving offence. Voas, Tippetts & Lange<sup>65</sup> report on an evaluation study conducted in Washington and one in Oregon. While no effects with the sticker could be proved in Washington, positive effects were noted in Oregon on the level of drink driving and recidivism. The authors explain the contradictory results by the fact that monitoring intensity was lower in Washington and lower frequency of use.

## 7.12 Alcohol ignition interlock

Alcohol ignition interlock systems are used both in the US/Canada and in Sweden and Australia. All these country surveys on the effect of such systems, whereby a person who has been previously accused of drunk driving is prevented from driving away by a system installed in their vehicle when the breath alcohol concentration exceeds 0.0025 ‰ (US) or 0.04 ‰ (Canada). While driving, the driver is repeatedly requested to provide a breath sample, thus preventing the situation where a driver can start the vehicle with an insignificant breath alcohol concentration and then consume alcohol while the engine is running. In the US, an interlock system is installed under one of the following conditions:

- ◆ As a condition for re-licensing
- ◆ As a condition during the probationary phase

Voas, Blackman, Tippetts & Marques<sup>66</sup> report that the comparison between experimental and control groups (EG: interlock, CG1: prison sentence, CG 2: electronic tag) provides indications that people with the interlock system installed relapse less frequently. However, when the system was uninstalled, people reverted to their original drink driving patterns and recidivism was just as high by comparison. Overall, the effect on road safety in the US is limited because only approximately 5 % participated in this voluntary programme, which was also linked with incentives.

The effect of alcohol-interlock systems on the risk of recidivism or accident is thus present but is limited to the period of its actual use. So far, a sustained effect could not be proved.<sup>67</sup>

In contrast to the US, alcohol-interlock in Sweden is used both as a prevention strategy for professional drivers and as a treatment strategy for drink driving offenders in combination with

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<sup>65</sup> Voas, R. B., Tippetts, S. & Lange, J. E. (1997). Evaluation of a method for reducing unlicensed driving: The Washington and Oregon License Plate Sticker Laws. *Accident Analysis and Prevention*, 29, 627–634.

<sup>66</sup> Voas, R. B., Blackman, K. O., Tippetts, A. S. & Marques, P. R. (2002). Evaluation of a program to motivate impaired driving offenders to install ignition interlocks. *Accident, Analysis and Prevention*, 34(4), 449–445.

<sup>67</sup> Voas, R. B., Blackman, K. O., Tippetts, A. S. & Marques, P. R. (2002), see footnote 66.

Matthijssen, R. (2005). In *Alcohol Interlock Programs*. Ottawa: Traffic Injury Research Foundation.

Willis, C., Lybrand, S. & Bellamy, N. (2006). Alcohol ignition interlock programmes for reducing drink driving recidivism. *Cochrane Collaboration* (ISSN 1464-780X).

medical counselling.<sup>68</sup> Again, the author also talks of a distinct acceptance problem since only 11 % of the drink driving offenders undergo the programme. Apparently, the interlock as a primary prevention strategy is taken very seriously in Sweden since Bjerre<sup>69</sup> reports that the Swedish government has been discussing whether interlock systems should be installed in all buses and trucks by 2010 and whether all new cars should be equipped with one by 2012.

On behalf of the European Commission Directorate-General for Energy and Transport, Silverans, Alvarez, Assum, Drevet, Evers, Hagman & Mathijssen<sup>70</sup> compiled a report on the implementation of alcolock systems in Europe. In contrast to the US and Canada, the alcohol ignition interlock system is not widespread in Europe. According to Beirness & Marques 2004, quoted by Silverans et al.<sup>71</sup>, around 70,000 interlock systems are operational in North America alone. In Sweden, the figure is 7,000 for commercial vehicles and 1,500 for private vehicles. Several countries have taken part in an alcohol-interlock project: Germany, France, the Netherlands, Great Britain and Finland. In this project, alcohol-interlock systems were installed for five different types of drivers: bus and coach drivers, truck drivers, drink driving offenders and alcohol-dependent drivers. Each group had 30 drivers and was relatively small (the alcohol-dependent group was even smaller with only 7 drivers).

This project collected interview data (process-evaluative data) and alcohol figures were recorded that had to be provided by the participants. The authors come to the conclusion that acceptance of alcolock programmes is heavily dependent on the costs to be borne by participants. It should also be noted that, in particular, the system mainly achieves its full effect when installed and supported by the legal system.<sup>72</sup>

In the opinion of authors Silverans et al.<sup>73</sup>, the “ideal” alcolock programme for drink driving offenders should meet the following requirements:

- ◆ Mandatory condition for re-licensing
- ◆ Flexible duration of installation
- ◆ Mandated irrespective of the licence suspension period
- ◆ Administration by the authorities responsible
- ◆ Stated in driving licence
- ◆ Regularly monitored (particularly for alcohol-dependent drivers)
- ◆ Always in combination with a rehabilitation programme

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<sup>68</sup> Bjerre, B. (2005). Primary and secondary prevention of drink driving by the use of alcolock device and program: Swedish experiences. *Accident, Analysis and Prevention*, 37(6), 1145 – 1152.

<sup>69</sup> See footnote 68.

<sup>70</sup> Silverans, P., Alvarez, J., Assum, T., Drevet, M., Evers, C., Hagman, R. & Mathijssen, R. (2006). Alcolock implementation in the European Union: Final Draft (Deliverables D-2/D-3). Retrieved January 3, 2007, from [www.bivv.be/main/PublicatieMateriaal/research/catalogDetail.shtml?detail=718866192&language=nl/](http://www.bivv.be/main/PublicatieMateriaal/research/catalogDetail.shtml?detail=718866192&language=nl/)

<sup>71</sup> Beirness, D. J. & Marques, P., 2004, quoted by Silverans, P., Alvarez, J., Assum, T., Drevet, M., Evers, C., Hagman, R. & Mathijssen, R. (2006). Executive summary of the alcolock field trial: Alcolock implementation in the European Union: Final Draft (Deliverable D-3). Quotation p. 3. Retrieved January 3, 2007, from [www.bivv.be/main/PublicatieMateriaal/research/catalogDetail.shtml?detail=718866192&language=nl/](http://www.bivv.be/main/PublicatieMateriaal/research/catalogDetail.shtml?detail=718866192&language=nl/)

<sup>72</sup> See footnote 70.

<sup>73</sup> See footnote 70.

It is undeniable that alcohol programmes are considerably easier to implement in the commercial sector (truck, bus and coach drivers) than in the private sector. Interestingly, significantly more drivers in the commercial sector have tested positive for alcohol, which has however remained without legal consequences except for the temporary immobilization of the vehicles by the employer. It can be assumed that the system is seen as practical and easy to use and is thus relatively well accepted. Technical difficulties have mainly been encountered in the private sector. These minor difficulties may be connected with the fact that the commercial systems were much better maintained not least out of financial considerations.

## 7.13 Meta-analyses on the effect of rehabilitation programmes

### 7.13.1 *Struckman-Johnson, Lund, Williams & Osborne*<sup>74</sup>

This study was a meta-analysis of 19 experimental studies on rehabilitation measures for driving offenders with no alcohol involved, who can be divided into three groups:

- ◆ Indirect delivery: no direct contact between the authorities responsible and the offenders (warning letters, postal courses)
- ◆ Delivery in groups: group courses in a classroom
- ◆ Individual delivery: direct, individual contact between the authorities responsible and the offenders

In this study, practically no proof could be found that driver improvement measures lead to a reduction in recidivism or offence rates.

### 7.13.2 *Wells-Parker et al.*<sup>75</sup>

A very well-known and frequently quoted meta-analysis of rehabilitation programmes for DUI offenders is the study by Wells-Parker, Bangert-Drowns, McMillen & Williams.<sup>76</sup> This meta-analysis of evaluation studies largely originating in the US and published prior to 1990, essentially comes to the conclusion that rehabilitation programmes for DUI offenders have a positive effect on their knowledge, attitudes and opinions, alcohol consumption, state of health and risk of recidivism. Wells-Parker et al.<sup>77</sup> summarized that recidivism and accidents were 7 % to 9 % less likely among treated people compared with those who had merely been given the usual penalties (fines, licence suspension). In addition, the authors came to the conclusion that combined strategies were comparatively more efficient than single strategies. Another interesting result was that studies of better methodic quality (particularly in terms of the parallelism of experimental and control groups)

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<sup>74</sup> Struckman-Johnson, D. L., Lund, A. K., Williams, A. F. & Osborne, D. W. (1989). Comparative effects of driver improvement programs on crashes and violations. *Accident Analysis and Prevention*, 21, 203–215.

<sup>75</sup> 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.

<sup>76</sup> See footnote 75.

<sup>77</sup> See footnote 75.

tend to lead less to the effects of rehabilitation programmes being able to be proved to a major degree.

The meta-analysis by Wells-Parker et al.<sup>78</sup> is highly praised in scientific circles because it is carefully and comprehensively compiled and includes a large number (215) of studies (cf. Addiction<sup>79</sup>).

### 7.13.3 *Masten & Peck*<sup>80</sup>

In contrast to the meta-analysis by Wells-Parker et al.<sup>81</sup>, the meta-analysis by Masten & Peck<sup>82</sup> refers only to rehabilitation courses for road traffic offenders. Rehabilitation courses exclusively for DUI offenders are not included in this meta-analysis. It covers 19 studies of high quality in terms of method (experimental and control group design, quasi-experimental design). Accident and offence rates were accepted as outcome variables. A large part of the studies relate to California's "post-licensing control program", which has different stages (dependent on point count).

- ◆ Stage I: Soft advisory letter
- ◆ Stage II: Hard-threat warning letter
- ◆ Stage III: Short license suspension plus license probation
- ◆ Stage IV: Probation violator, license revocation

In addition and dependent on severity, there are driver counselling and re-examination programs.

The study outcome was a reduction in offences of around 6 % to 8 % after rehabilitation. The authors also presume that the success of the rehabilitation measures (however short they are) is assured by the level of penetration or obtrusiveness of the intervention in the short term. The authors further emphasize that licence suspension is by far the most effective measure of preventing accidents and offences and that the success of certain rehabilitation measures is linked to the fact that licenses were suspended.

The authors recommend the use of warning letters soon after the offences occurred. They assess the cost-benefit ratio of warning letters as very good. This not least for the reason that a large number of people can be reached with warning letters at only minimal cost.

The meta-analysis also provides far weaker links between rehabilitation measures (warning letters, group meetings, individual sessions and licence suspension) and accidents. No effects on accident figures could be proved for information brochures and contingent point reduction incentives.

Overall, it appears that measures imposed by licensing authorities (e.g. department of motor vehicles) are more effective than measures imposed by the courts.

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<sup>78</sup> See footnote 75.

<sup>79</sup> Comments on Wells-Parker et al.'s article "Final results from a meta-analysis of remedial interventions with drink/drive offenders". *Addiction*, 90, 1587–1602.

<sup>80</sup> Masten S. V. & Peck, R. C. (2004). Problem driver mediation: A meta-analysis of the driver improvement literature. *Journal of safety research*, 35, 403–425.

<sup>81</sup> See footnote 75.

<sup>82</sup> See footnote 80.

According to the study, license probation had a very positive effect both on figures for offences and for accidents.

#### 7.13.4 *Elvik & Vaa*<sup>83</sup>

The meta-analysis by Elvik & Vaa covers three types of intervention:

- ◆ Courses on defensive driving (4 x 2 lessons in a classroom)
- ◆ Group discussions (the facilitator attempts to motivate participants to change their behaviour)
- ◆ Warning letters, incentive letters and postal studies combined with incentives (reduction in penalty points)

In addition, the study then distinguishes between measures that involve no personal contact (e.g. warning letters), group contact or individual contact.

In summary, it appears that theoretical courses in defensive driving (without any practice in vehicles), irrespective of how provided (by letter, in groups or individually) leads to a reduction in accident frequency of around 6 % to 8 %. In contrast, discussions between offenders and representatives of the authorities appear not to have any effect on accident frequency. Warning letters (threat of licence suspension for further offences) and brochures on safe driving also appear to have no effect.

One important finding in this meta-analysis is that the demonstrable effects on accident figures are limited to the year after the intervention. No statements can be made about longer-lasting effects. No effects on offenders' mobility behaviour can be noted on the basis of the studies. Similarly, no cost-benefit analyses of the interventions were conducted in the studies. The considerations about Norway lead one to assume that rehabilitation programmes are cost-effective to all intents and purposes.<sup>84</sup>

#### 7.13.5 *Cochrane Collaboration*<sup>85</sup>

In the opinion of the authors, the meta-analysis of a range of US and one Swedish study on driver education courses provides clear evidence that rehabilitation measures do not make any contribution to increasing road safety or make no contribution to preventing accidents or offences.<sup>86</sup> The measures investigated covered, firstly the warning letters as they are called or correspondence education and, secondly, group meetings that did not include any individual treatment for participants and individual courses in which the assessment of traffic situations is trained. These interventions are clearly non-therapeutic in their orientation but are interventions that train driving skills (i.e. in particular, paying attention while driving), knowledge of the law and awareness of accident causes.

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<sup>83</sup> See footnote 4.

<sup>84</sup> See footnote 4, quotation p. 872.

<sup>85</sup> Ker, K., Roberts, I., Collier T., Beyer, F., Bunn, F. & Frost, C. (2006). Post-licence driver educations for the prevention of road traffic crashes. Cochrane Collaboration (ISSN 1464-780X).

<sup>86</sup> See footnote 85.

It is also important to note that, in this meta-analysis, no studies on interventions that lasted longer than one day were included.<sup>87</sup>

## 7.14 Conclusions

To summarize, the studies on the different types of rehabilitation methods cannot be categorized as uniform. This is undoubtedly attributable to the fact that, dependent on the relevant legal or administrative system, rehabilitation measures are frequently used in combination with legal penalties, with the result that the effects determined can only be conditionally attributed to the rehabilitation measures alone. In addition, the group of people undergoing rehabilitation measures must be described as extremely heterogeneous, and sub-dividing them into offenders with alcohol- and drug-related offences or offenders with severe violations of traffic regulations gives little consideration to this heterogeneity. Moreover, shortcomings in the methods used in the studies are very frequent due to the complexity of the topic, which leads to the outcome that highly differentiated studies - in which important factors are checked frequently - result in lower effect magnitudes for the rehabilitation measures.

Nevertheless, in summary, a range of elements can be compiled that are apparently connected with an enhanced effect of rehabilitation programmes:

- ◆ The combination of rehabilitation measures with licence suspension has a greater effect.
- ◆ Prior to any measures, a differentiated analysis of the client's problem should be conducted (personality, problems of addiction or abuse, etc.). Only in this way is proper allocation to the correct measure possible.
- ◆ The bigger the problem, the more intensive and individual the necessary rehabilitation measure should be.
- ◆ Unpleasant and threatening measures only work on people with an intact ability to check their own performance.
- ◆ An empathetic approach should be taken in direct contact with clients, confrontational behaviour should be avoided.
- ◆ Ignition interlocks are effective when in use. They are particularly meaningful for people who are highly sensitive to measures (people who are heavily dependent on their cars).
- ◆ Rehabilitation programmes that offer room for individual content and are headed by a facilitator are more successful.
- ◆ Findings are contradictory on the length of an intervention, whereby serious problems definitely require a longer (= several weeks) period of treatment. Short interventions are better suited to inducing a change in behaviour, which is then implemented independently. They are effective because they can be applied by general practitioners and thus at a relatively early stage in the alcohol problem.

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<sup>87</sup> See footnote 85, quotation p. 4–5.

- ◆ Driving with a suspended licence should be urgently stopped (avoidance of a negative learning process).
- ◆ Rehabilitation measures should be started as early as possible before negative behaviour becomes well-established (novice drivers!)

## 8 Modes of action for the various interventions

From a psychological learning standpoint, different influential strategies are applied in the various rehabilitation measures described above, which differ significantly from each other, firstly, in the extent to which they exert an influence on the lives of participants and, secondly, in terms of the motivation for change aimed at (extrinsic or intrinsic). In many of the measures described above, various influential strategies are combined.

- ◆ Blocking negative behaviour (e.g. alcohol ignition interlock)
- ◆ Punishment in the sense of a negative stimulus (e.g. prison sentence, licence suspension)
- ◆ Fear of punishment (e.g. threat of licence suspension)
- ◆ Hope of reward (e.g. bonus under specific conditions)
- ◆ Providing facts that are relevant for behaviour and safety (e.g. courses on assessing traffic situations) Mode of action: Promote insight into misconduct by means of facts, change in behaviour from insight.
- ◆ Promoting of a self-reflection process in terms of original misconduct and introducing an intrinsically motivated change in behaviour (e.g. group discussions, classic driver improvement course) Mode of action: Reflection on own misconduct - being able to name advantages and disadvantages - getting acquainted with strategies for change - developing and trying out own strategies - change in behaviour.

The results suggest a combination of these strategies, whereby little importance should be attached to the provision of facts and a great deal of importance to the promotion of the self-reflection process and practising behavioural alternatives.

# **Diagnostic interventions and their effects on road safety**

## 9 Relevant risk factors

The aim of this chapter is to discuss the effectiveness of diagnostic interventions performed within the framework of population screenings in order to detect the most severe forms of driver impairment and identify the individuals at risk whose the driving licence should be withdrawn. These diagnostic interventions give rise to several questions. What does “driver impairment” mean? Can a screening procedure make a good contribution to preventing accidents? And are there tests that can reliably establish if a person is fit to drive or not? What is the cost of such a procedure?

Driver impairment is regarded as a reduced ability to drive. The cause of such impairment may be either acute or chronic afflictions such as alcohol consumption, drug ingestion, fatigue, injury, physical handicap, disease, the natural ageing process or a combination of several factors. This chapter places the focus squarely on chronic impairment due to the natural ageing process, physical handicap or chronic disease.

Many studies have been conducted in order to establish the accident risk associated with various medical conditions. The EU project IMMORTAL (Impaired Motorists, Methods of Roadside Testing and Assessment for Licensing), for example, investigated “the influence of chronic and acute impairment in order to make a more accurate risk assessment to recommend criteria for high risk categories, and to provide key information to support EU Policy on licensing and roadside testing”.<sup>88</sup> Other studies focus on the older drivers, their medical condition and their driving competence. As a matter of fact, ageing is related to higher rates of diseases that have an impact on the fitness to drive. Arthritis, heart disease, arterial hypertension, diabetes and dementia are examples of age-related conditions that impact upon functional ability.<sup>89</sup> According to Ewert<sup>90</sup>, the most significant age-related losses of physical and cognitive skills in terms of road safety are associated with eyesight disorders, dementia, diabetes and the use of medication (e.g. sleeping tablets or sedatives).

Vaa<sup>91</sup> comes to the conclusion that a driver with a given medical condition has a 33 % higher risk of accident involvement than a driver without that given condition. This result was calculated on the basis of a meta-analysis of 62 reports, mainly case-control studies, and corresponds to the weighted average across all main categories of medical conditions mentioned in Annex III of the Council Directive on Driving Licences (CD 91/439/CEE) “Minimum standards of physical and mental fitness for driving a power-driven vehicle”. Medical conditions with the highest relative risks are alcoholism (2.00), neurological diseases (1.75), mental disorders (1.72), drugs and medicines (1.58) and diabetes

<sup>88</sup> Klemenjak, W., Braun, E., Álvarez, J., Bernhoft, I. M. & Fjerdings, L. (2005). Final programme report: IMMORTAL EU research project Deliverable A3.2. Retrieved October 20, 2006, from <http://www.immortal.or.at/deliverables.php>

<sup>89</sup> Middleton, H., Westwood, D., Robson, J. & Kok, D. (2005). Assessment and decision criteria for driving competence in the elderly. In G. Underwood (Ed.), *Traffic and Transport Psychology: Theory and Application: Proceedings of the ICTTP 2004* (p. 101–113). Amsterdam: Elsevier.

<sup>90</sup> Ewert, U. (2006). *Senioren als motorisierte Verkehrsteilnehmer (bfu-Pilotstudie R 0607)*. Bern: Schweizerische Beratungsstelle für Unfallverhütung bfu.

<sup>91</sup> Vaa, T. (2003). Impairments, diseases, age and their relative risk of accident involvement: Results from meta-analysis: IMMORTAL EU research project Deliverable R1.1. Retrieved October 20, 2006, from <http://www.immortal.or.at/deliverables.php>

mellitus (1.56). At the same time, Vaa<sup>92</sup> points out that age and gender play an even more important role: young male drivers (aged 16-19) have a relative risk of being involved in an injury accident which is about 7 times higher compared to the male group with the lowest risk (aged 45-54). The relative risk of accident involvement of young female drivers (aged 16-19) is about 3 times higher than that of the female group with the lowest risk (aged 35-54). The relative risk of drivers aged 75+ (male as well as female) is also about 3 times higher compared to the groups of males and females with the lowest accident risks. As demonstrated in different studies, the relative risk of older drivers can be explained by their particular frailty. Older drivers have a “greater vulnerability to injury, due especially to reductions in bone strength and fracture tolerance”.<sup>93</sup>

However, the fact that some medical conditions or advanced age (or youth!) are associated with a higher relative risk of accident involvement does not mean that every individual who has a given illness or is over 80 is not fit to drive. It depends, for example, on the stage of the illness contracted (e.g. dementia), on the diverse possible pathological evolutions of a given illness, on the side-effects of medication which can differ from one person to another, on the number of disorders a person is suffering from at the same time, or on the aptitude of the person to adopt specific compensation strategies or not. Concerning older drivers, it has been observed, for instance, that they tend to avoid driving in difficult conditions, such as darkness, slippery roads, peak hours, and other stress-inducing situations.<sup>94</sup>

## 10 Requirements for driving licences in different countries

At the present time in Europe, rules for the issuing or renewal of driving licences are defined in Annex III of the Council Directive on Driving Licences (CD 91/439/CEE). The implementation of this regulation varies from one member state to another. In Finland, the right to drive becomes conditional at the age of 45 years (every five years, the licence holder has to pass a medical review covering general health status and vision) and expires at the age of 70. Drivers who wish to continue driving have to pass a medical review and apply for a new licence, which is issued for periods of a maximum of five years. These periods mostly get shorter after the age of 80.<sup>95</sup> In Belgium, France or Sweden, no renewal procedures are implemented. In Spain, all non-professional drivers must undergo a medical-psychological test every 10 years up to 45, every 5 years between 46 and 70, and every 2 years from 70 if they want to renew their driving licence. The test intervals are even shorter

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<sup>92</sup> See footnote 91.

<sup>93</sup> Langford, J., Methorst, R. & Hakamies-Blomqvist, L. (2006). Older drivers do not have a high crash risk: A replication of low mileage bias. *Accident Analysis and Prevention*, 38(3), 574–578 (quotation p. 574).

<sup>94</sup> Hakamies-Blomqvist, L. (2004). Safety of Older Persons in Traffic. In *Transportation Research Board of the National Academies (Ed.), Conference Proceedings 27: Transportation in an Aging Society: A Decade of Experience* (p. 22–35). Washington D.C.: Editor. Retrieved October 20, 2006, from [http://onlinepubs.trb.org/onlinepubs/conf/reports/cp\\_27.pdf](http://onlinepubs.trb.org/onlinepubs/conf/reports/cp_27.pdf)

<sup>95</sup> Hakamies-Blomqvist, L. (1997). Validity of medical screening as a tool for selecting older drivers. *Theory and Application. Traffic & Transport Psychology*, 322, 445–448.

for professional drivers. Álvarez, Del Río, Fierro, Vicondoa & Ozcoidi<sup>96</sup> consider that “this approach to a systematic evaluation of all drivers can be understood as a screening, in the sense that those cases where the medical condition could impair fitness to drive are actively sought out”. People in Spain wishing to obtain or renew a licence must attend a Medical Driver Test Centre where their psycho-physical aptitudes are evaluated by an ophthalmologist, a psychologist and a medical doctor. The three of them decide upon the final results, which have three outcomes: “fit”, “fit with restrictions” and “unfit”. “Fit with restrictions” means, for example, that the driver needs mechanical adaptation of his car because of a physical problem or that the validity of the license must be shortened due to an illness, the development of which could have a negative impact on fitness to drive.

In a prospective study conducted by the above-mentioned authors<sup>97</sup>, 5,234 drivers who had attended the Medical Driver Test Centres agreed to take part in the study. Only about 2 % refused to participate. About 83 % were found “fit”, 17 % “fit with restrictions” and less than 1 % (34 persons), “unfit”. These 5,234 drivers were then contacted one year later in order to evaluate their involvement in accidents and traffic violations. Obviously, the drivers who had been considered as unfit were excluded at that point in the analysis. In the year following the medical examination, 5.4 % of the drivers had been involved in a traffic accident as a driver and 11.3 % admitted having been sanctioned. No statistically significant differences could be seen between drivers found “fit” and those who had been found “fit with restrictions”, either in the involvement in a traffic accident as a driver or in reference to traffic sanctions. In addition, accidents were more frequent among the youngest drivers. The authors mention that these results should be viewed with caution. (1) Data is based on the subjects themselves: forgetfulness and deceit cannot be ruled out. (2) The period covered is only one year; a longer period would probably allow more differentiated results to be observed that would be statistically significant. (3) A larger sample would be needed for such a study, since the number involved in accidents with injuries/fatalities (62 cases) was too low to allow an exhaustive analysis.

Moreover, it should be added that the study design contains severe flaws. Álvarez, Del Río, Fierro, Vicondoa & Ozcoidi<sup>98</sup> conducted a cohort study with two non-randomized and explicitly differing groups (diagnosed as with or without restrictions for motor-vehicle driving on the basis of a medico-psychological assessment). Only one of the groups is then exposed to a risk factor (“restriction”). Any difference in outcome (accidents or fines) can thus be caused either by the group differences or by the exposure or by a combination of both. Therefore, no valid conclusions can be drawn from this study regarding the effectiveness of medico-psychological screening in Spain.

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<sup>96</sup> Álvarez, J., Del Río, M. C., Fierro, I., Vicondoa, Á. & Ozcoidi, M. (2004). Medical condition and fitness to drive: IMMORTAL EU research project Deliverable R1.4. Quotation p. 9. Retrieved October 20, 2006, from <http://www.immortal.or.at>

<sup>97</sup> See footnote 96.

<sup>98</sup> See footnote 96.

## 11 Screening procedures

Seen from a theoretical viewpoint, a screening procedure is more effective if both the prevalence of a given impairment and the risk associated with this impairment are high.

However, if we take an “extreme” example based on some realistic figures concerning Switzerland (number of licence holders = 4,500,000 and number of road accidents per year = 70,000), we can see the impact on the percentage of accidents prevented and on the “number needed to treat” if the prevalence of a given impairment is 20 % and the risk (of road accident involvement) is 10-fold. In this calculation, it is assumed that the sensitivity and specificity of the given test are both 100 %. In this theoretical situation, 71 % of the accidents involving the elderly could be prevented and the number of persons needed to treat (or whose licence has to be withdrawn) to prevent one accident is 7. This means that, for 6 persons out of 7, licence withdrawal has no effect on road safety.

	Impaired	Not impaired	Accidents prevented (in %)
Accidents	3,111	1,244	71
No accidents	16,889	78,756	
<b>Total</b>	<b>20,000</b>	<b>80,000</b>	
Prevalence of impairment	20		
Number of accidents per year	70,000		
Licensed drivers (LD)	4,500,000		
Accidents per year per LD	0.016		
Accident risk	10		
Number needed to treat (NNT)	7		

Table 3: Accidents prevented and number needed to treat (example 1)

In reality, however, both the percentage of prevalence and the risk associated with impairment are most of the time much smaller. If we take the example of dementia, an estimation of the prevalence for older persons is available in the study by Ewert<sup>99</sup>: 9-11 % of persons over 70 years suffer from dementia. As we have already seen, the relative risk calculated by Vaa<sup>100</sup> for mental disorders is 1.72. With these figures, the percentage of accidents prevented is much lower (only 16 % of the accidents among the elderly) and the number of persons whose driving licence has to be withdrawn to prevent one accident is 89. This would only be true if all the people suffering from dementia were still active drivers, which, of course, is not the case in reality.

<sup>99</sup> See footnote 90.

<sup>100</sup> See footnote 91.

	Impaired	Not impaired	Accidents prevented (in %)
Accidents	268	1,400	16
No accidents	9,732	88,600	
<b>Total</b>	10,000	90,000	
Prevalence of impairment	10		
Number of accidents per year	70,000		
Licensed drivers (LD)	4,500,000		
Accidents per year per LD	0.016		
Accident risk	1.72		
Number needed to treat (NNT)	89		

Table 4: Accidents prevented and number needed to treat (example 2)

Moreover, Ewert<sup>101</sup> demonstrates that when there is a relatively low prevalence of impairment in the population, a serious risk exists that a false diagnosis (false positive) is made during screening – even with the use of good neuropsychological test procedures. In his example, he shows that, with a prevalence of dementia of 10 % among all drivers over 70 and if using one of the best screening tests available (e.g. the Mini Mental State-Test, MMST) with a sensitivity of 90 % (proportion of truly diseased persons who are so identified by the diagnostic test) and a specificity of 90 % (proportion of truly non-diseased persons who are so identified by the diagnostic test), 50 % of the persons diagnosed with dementia are in fact not ill with dementia (false positive).

False positive results can lead to distress, possible unnecessary treatment, the withdrawal of the driving licence, probable decrease of mobility and possible decrease of quality of life. False negative results (persons diagnosed healthy are in fact ill) can also occur – although to a much lesser degree – and lead to false reassurance by both patients and doctors on the one hand and to a general safety problem on the other. Besides the costs mentioned above, a screening procedure is also associated with cost of equipment, services, the time taken off work for people to attend the screening test, etc.

According to Staplin & Hunt<sup>102</sup>, “policy considerations demand an assessment approach that maximizes both sensitivity and specificity. If many drivers with significant impairment were missed, public health and safety would suffer unacceptably. If many individuals were restricted unnecessarily from driving or were compelled to spend large amounts of time or money to retain their driving privileges, a backlash would be expected against the entities performing the assessments and the administration that authorized them”.

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<sup>101</sup> See footnote 90.

<sup>102</sup> Staplin, L. & Hunt, L. (2004). Driver programs. In Transportation Research Board of the National Academies (Ed.), Conference Proceedings 27: Transportation in an aging society: A decade of experience (p. 69–94 (quotation p. 72)). Washington D.C.: Editor. Retrieved October 20, 2006, from [http://onlinepubs.trb.org/onlinepubs/conf/reports/cp\\_27.pdf](http://onlinepubs.trb.org/onlinepubs/conf/reports/cp_27.pdf)

In studies by organizations such as the WHO and OECD, scepticism is expressed about screening procedures for older drivers. In the chapter “Global impact” of the “World report on road traffic injury prevention”<sup>103</sup>, the following statement is made: “While it is accepted that certain groups of older drivers should not drive – such as those suffering from advanced forms of dementia – mandatory screening of drivers based on age is not recommended”. According to the OECD report “Ageing and transport: mobility needs and safety issues”<sup>104</sup>, “mandatory age-based testing targeting older drivers appears to be ineffective. A licence management alternative that targets only those drivers considered at higher risk is recommended. Thus, assessments can be more thorough and individually tailored. This will require a community-based referral system involving doctors and health professionals, police, community workers, friends and families of older drivers and older drivers themselves.”

The safety benefits of mandatory screenings based on age have not been proved yet.<sup>105</sup> Moreover, the system is expensive for society as well as for the individuals tested. Screening systems can also produce counter-productive results. According to a study conducted by Hakamies-Blomqvist, Johansson and Lundberg, in Finland where much stricter licensing legislation is enforced than in Sweden, no safety benefits among car drivers can be assessed, whereas an increased risk of fatal injuries is recorded among older, vulnerable road users.<sup>106</sup> In point of fact, elderly people have a greater risk of being fatally injured as a pedestrian or cyclist than as a car driver.

In addition, decisions on fitness to drive based on the diagnosis of a particular disease are rather hazardous. They should be based instead on an assessment of the functional abilities relevant for safe driving.

Finally, it should be pointed out that there are no tests of sensory and cognitive functions that are regarded as sufficiently sensitive and specific for measuring potential involvement in accidents that can be used as the sole criterion for decisions on fitness to drive.<sup>107</sup>

An important challenge will therefore be to develop a licensing model which takes into account these facts and succeeds in targeting those drivers who pose obvious risks to others. In the OECD study “Ageing and transport: Mobility Needs and Safety issues”, three licensing models are briefly described and presented as possible good examples to be followed. Several suggestions can be derived from these three models:

- ◆ Assessment practices should only target drivers with functional impairment relevant to safe driving.

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<sup>103</sup> World Health Organization WHO. (2004). World report on road traffic injury prevention. Geneva: World Health Organization. Quotation p. 47.

<sup>104</sup> Organisation for Economic Cooperation and Development OECD. (2001). Ageing and transport: mobility needs and safety issues. Paris: Organisation for Economic Cooperation and Development. Quotation p. 11.

<sup>105</sup> Langford, J., Fitzharris, M., Newstead, S. & Koppel, S. (2004). Some consequences of different older driver licensing procedures in Australia. *Accident Analysis and Prevention*, 36(6), 993–1001.

<sup>106</sup> Hakamies-Blomqvist, L., Johansson, K. & Lundberg, C. (1994). Limiting the older drivers’ right to drive: A fatal traffic safety measure. In Karolinska Institutet (Ed.), *Aging and driving: Effects of aging, diseases and drugs on sensory functions, perception and cognition, in relation to driving ability: Proceedings of the Symposium held in Stockholm, Sweden, September 24, 1994* (p. 133–138). Stockholm: Editor.

<sup>107</sup> See footnote 104.

- ◆ Multi-tiered assessment should be established. More elaborate and expensive tests should be reserved only for those drivers who show evidence of substantial impairment.
- ◆ Older drivers themselves should be active and informed participants, with the result that, in the case of corresponding impairment, they can accept the outcome better and are aware of mobility alternatives.
- ◆ Licensing authorities should not only deal with licensing procedures, but also provide advice and assistance on other transport options.

# **Recommendations**

## 12 Best-practice guidelines regarding rehabilitation

As we have seen, rehabilitation programs can be useful if they are complementary to other population oriented measures like campaigns, police controls or education.

Based on experience gained in Europe with rehabilitation measures and an analysis of the literature, a range of differentiated best-practice recommendations, which also include recommendations already in existence (e.g. Health Canada<sup>108</sup>, Bartl et al.<sup>109</sup>, Dill & Wells-Parker<sup>110</sup>) are listed below.

**Mandatory participation:** The completion of a rehabilitation programme should be a condition for re-licensing. Rehabilitation programmes should never replace licence suspension but always only supplement it.

**Allocation/target group orientation:** Based on standardised diagnostic clarifications, offenders should be allocated to an intervention tailored to their needs. For DUI offenders, a differentiation should be made between two levels adapted to current alcohol or drug consumption habits.

**Contents:** Rehabilitation programmes should contain both educational and therapeutic elements. Follow-ups to rehabilitation programmes should be compulsory. The focus should be on critical self-reflection for participants.

**Form:** The group size should not exceed 10 participants. Consideration should be given to participants' ethnic and cultural backgrounds.

**Time of intervention:** People who have only received a warning for legal reasons should also be offered the opportunity to participate in a rehabilitation programme. In any case, however, the measure should be conducted as soon as possible after the first serious offence and repeated for recidivists.

**Organization:** Rehabilitation programmes should not be organized and conducted by the authorities. The exchange of information between the authorities and rehabilitation programme organizers should be clearly defined (protection of participants).

**Costs:** Price for rehabilitation programmes should be monitored and at a uniform level. Financially weaker participants should be granted financial support.

**Evaluation:** Rehabilitation programmes should always be evaluated, with the cost of the evaluation being included in the programme budget. Cost-effectiveness should increasingly be a component of the evaluation.

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<sup>108</sup> Health Canada. (2004). Best practices: Treatment and rehabilitation for driving while impaired offenders. Retrieved September 27, 2006, from [http://www.hc-sc.gc.ca/ahc-asc/alt\\_formats/hecs-sesc/pdf/pubs/drugs-drogues/bp\\_treatment-mp\\_traitement/treatment\\_rehab\\_driving\\_impaired\\_practices.pdf](http://www.hc-sc.gc.ca/ahc-asc/alt_formats/hecs-sesc/pdf/pubs/drugs-drogues/bp_treatment-mp_traitement/treatment_rehab_driving_impaired_practices.pdf)

<sup>109</sup> See footnote 1.

<sup>110</sup> See footnote 41.

**Facilitators:** In terms of training and social skills, course leaders should be highly qualified. Health aspects should similarly be included for rehabilitation programmes involving DUI offenders.

**Duration:** Course meetings must be held over a longer period or several weeks. However, at an earlier stage, particularly for people with DUI problems, short interventions are also recommended outside of the legal system.

## 13 Best-practice guidelines regarding diagnostics

With respect to diagnostic interventions, the guidelines mentioned here are based on different studies (e.g. OECD<sup>111</sup> and Langford et al.<sup>112</sup>)

- ◆ A system of assessment only targeting drivers with functional impairment relevant to safe driving should be preferred to a system with mandatory assessment for all (older or impaired) drivers.
- ◆ A network of community notification sources such as doctors, health professionals, social workers, police, friends and family and older drivers themselves should be established. Only drivers suspected of having a high crash risk should be referred to the licensing authority for formal assessment.
- ◆ The notion of “high crash risk” should be defined and find international support.
- ◆ A multi-tiered assessment should be established. The more elaborate and expensive tests would be reserved for the most serious cases.
- ◆ More effective instruments for assessing fitness to drive should be developed
- ◆ More studies should be conducted in order to evaluate the different road safety jurisdictions.
- ◆ Older drivers should be informed at an early stage on procedures and mobility alternatives
- ◆ The role of the licensing authorities should not be limited to licensing procedures, but they should also give advice on different matters, such as car adaptations or mobility alternatives.

## 14 Best-practice guidelines regarding evaluation

Compared to other domains such as infrastructure or vehicles, rehabilitation and diagnostic measures are generally considered to be less effective. They concern high-risk groups and the effect of these measures on the number of accidents, fatalities or severe injuries is difficult to demonstrate. As substitutes, the indicators chosen to show the effectiveness of the measure are “accident-contributing risk factors” such as the recidivism rate, change in attitudes, gain of knowledge, satisfaction of the participants, proportion of voluntary participants, successful participation, etc. However, it is necessary to set criteria which decide on the quality of a evaluation study.

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<sup>111</sup> See footnote 104.

<sup>112</sup> See footnote 105.

From a public health point of view, severe or fatal injuries have to be chosen as the main success criteria whenever there is a large enough number of treated offenders. Within the framework of output evaluation of rehabilitation measures, the only alternative is recidivism rate, as severe offences have proved to be connected with accident risk. The next challenge is to define a case and a true control group and to make sure that the intervention is the only main difference between these groups. According to the best-practice guidelines, a good evaluation study should have:

- ◆ a measurement before and after the intervention in question
- ◆ a test group (that follows the intervention) and a control group (that does not)
- ◆ both groups should have similar background characteristics
- ◆ the sizes of these groups must be large enough to be able to show significant differences
- ◆ the test group should be representative of the rest of the offenders, so that the results can be extrapolated to apply to others in the same target group
- ◆ the measuring methods need to be precise and valid.

For judicial and practical reasons, experimental case-control studies are very rarely conducted. Therefore, the effects of measures introduced on a mandatory basis cannot be properly compared to a control group, because the whole target group has to follow the measure. Thus any other variables that may have influenced a change in the target group ('confounding factors') have to be taken into account and the statistics have to be adjusted accordingly. Measures introduced on a voluntary basis can be affected by the so-called 'self-selection bias', whereby motivated and safety-oriented persons take part in the course, so they should be expected to have 'better results' than the rest of the population. Offenders with a more severe problem and thus less chance for changing their behaviour are probably more likely not to participate. This problem can be overcome if the control group is selected from the group who wish to take part in the training.

Considerable 'statistical power' is needed to be able to identify significant effects of a training programme on accident rates. This is because accidents themselves are so rare. To ensure sufficient statistical power, sample sizes (of the test and control groups) need to be large and the time over which the measurements are taken needs to be long (often over a number of years). It is also important to know how much 'exposure' the drivers have had (i.e. mileage), something which official accident statistics generally do not contain. Therefore, questionnaires are often used to provide additional information and are completed by the members of the test and control groups.

If there are not enough resources or time available to invest in such an 'output' evaluation design, an evaluation can be carried out that is designed to check for changes in attitude or behaviour rather than actual accidents ('impact' evaluation). If a relationship is found between a change in behaviour and a particular feature of the measure when compared to a control group, one can conclude that the training has had some sort of effect. However, it is still not possible to conclude in such cases whether or not the change in attitude or behaviour will actually lead to reduced accident risk in reality.

# **Submitted measures**

## 15 SUPREME selection process

As for the other categories of measures in the SUPREME project (education and campaigns, driver training, vehicles, infrastructure, etc.), the country experts of the 27 participating countries were invited to submit a description of any rehabilitation and diagnostic measure they regarded as “best practice measure”. The basic selection criteria used for all categories were the following:

- ◆ The measure causes a sustained reduction of road accidents and accident victims, mainly fatalities and serious injuries.
- ◆ The effects of the measure are evidence-based (evaluation study/ies available) and/or
- ◆ The effects are expected due to the identification of risk factors, which will be positively influenced by the measure

A more detailed list of criteria has actually been developed in order to help the country experts to assess their measure as “best practice measure”<sup>113</sup>:

- ◆ The measure must be sustainably successful (minimum criterion: reduction in recidivist rates compared with untreated offenders - better, however, reduction in road accidents and reduction of road accident victims).
- ◆ The measure must be repeatable (precise definition or description)
- ◆ The measure must be applicable in a clearly defined (i.e. specific to a target-group) and sufficiently large sector.
- ◆ The measure must be easily transferable or not marked by regional peculiarities.
- ◆ The measure must be cost-efficient - in other words, costs and benefits must be in a meaningful ratio to each other.
- ◆ The measure must be accepted both by the authorities and by those affected.(cf. also Elvik, R., <http://www.kfv.at/supreme/internal/downloads>)

The description of the measure has been realised with the help of a questionnaire (see Annex 3). The body of the questionnaire was the same for all the categories, apart from some specific questions related to the theme of rehabilitation and diagnostics. As already mentioned in chapter 5 (Procedure), only a very small sample from all measures that are applied in this field has been described and none of the reported measures had been properly evaluated.

For that reason, the authors of this report don’t feel at ease in selecting any of them as best practice measure. In the following two chapters, the submitted measures are summed up and assessed with the help of the best-practice guidelines deriving from the literature analysis. In that way, the positive

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<sup>113</sup> Elvik, R. (2006?). Development of criteria for identifying best practice in road safety and collecting information on the use of best practice road safety measures. Retrieved September 27, 2006, from [http://www.kfv.at/supreme/international/downloads/input\\_tool/Input1\\_Elvik.doc](http://www.kfv.at/supreme/international/downloads/input_tool/Input1_Elvik.doc)

(and less positive) elements of the measures are highlighted and serve as examples for the best-practice guidelines.

## 16 Description and assessment of rehabilitation measures

Within the SUPREME project, 8 questionnaires in the domain of rehabilitation were submitted. The authors took the initiative to add one promising measure, i.e. the Educational Measure Alcohol and Traffic (EMA) from Netherlands. In this chapter, the 9 measures have been summarized, in principle with the wordings of each country expert. At the end of each measure, an assessment by the authors of the report is added (grey boxes).

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### Number of subcategory, title of the measure and country

3.1.1. Educational courses for young DUI offenders - Belgium

### Target group and allocation criteria of participation

The target group consists of people aged between 18 and 25 who were apprehended while driving under the influence of alcohol (<0.05 %) and/or illegal drugs. Alcohol offenders and drivers under the influence of other (illegal) drugs are treated separately. The programme is optional: offenders can choose not to participate but, in that case, their file will be transferred to a court.

### Main characteristics of the intervention

The intervention aims at (1) giving information about alcohol and legislation (2) countering certain unrealistic thoughts about driving and self-image and (3) increasing awareness of group-pressure and risks. The programme consists of group sessions (6 to 10 participants) of 20 hours and lasts 5 days (one Saturday and four evenings). The time lag between offence and course is between 3 and 12 months). The institution organising the courses is the Belgian Road Safety Institute (IBSR). The course leaders are social workers or psychologists with special training in group work and driving behaviour. The costs associated with the intervention are 280 € for each participant; they are paid by the federal government. The programme is not combined with other measures.

### Size of the road safety problem

8.5 % of all accidents with injuries are alcohol-related.

### Effects on safety (reduction of recidivism, reduction of risk factors)

No evaluation study is available. According to an internal study by the prosecutor, recidivism of DUI can be prevented. However, there is no information about the degree of contribution to accidents.

### Feasibility (acceptance, sustainability, transferability)

The measure is transferable if there is enough enforcement. No evaluation study is available on that subject.

### Why best practice?

The fact that the driver improvement courses are integrated in the judicial system seems to be unique.

**Assessment**

The proposed rehabilitation measure contains the following positive aspects complying with the best-practice guidelines: **separate courses** are proposed for DUI offenders depending on whether alcohol or illegal drugs are involved. In addition, the fact that the **participation fee** is paid by the federal government makes it possible for all persons, even for financially weaker potential participants, to take part in a rehabilitation programme. Moreover, the **group size** doesn't exceed 10 participants, the organising institution (Belgian Road Safety Institute – IBSR) is mandated by the authorities and the course leaders are qualified persons. On the other hand, this measure comprises some weaknesses: participation is **not mandatory**, and the rehabilitation programme has **not been evaluated**. Based on the information available, it is difficult to form an opinion about the content of the courses, which should include both **educational and therapeutic** elements and to judge the **time lag** between the offence and the course participation which can be rather short (3 months) but also reach 12 months. It is also not clear over which **period of time** the course meetings (one Saturday and four evenings) are held. Moreover, the measure is **not combined** with other measures.

→ This measure fulfils quite a good part of the requirements described in the best-practice guidelines.

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#### Number of subcategory, title of the measure and country

3.1.2. Rehabilitation of driving offenders - Portugal

#### Target group and allocation criteria of participation

The persons convicted for infractions (all) and crimes (mainly driving under the influence of alcohol, but also negligent homicide) committed when driving represent the target group of the intervention. Participation in the programme is optional in most cases.

#### Main characteristics of the intervention

The goals of the intervention are the promotion of an attitude of conformity with the law, an improvement in knowledge of the law and the prevention of recidivism. The psychological reasons of unsafe behaviour are analysed. The programme consists of group sessions (10 to 12 participants) of 12 to 15 hours and lasts 2 or 4 days. The program is combined with penal sanctions.

#### Size of the road safety problem

No useful information is available.

#### Effects on safety (reduction of recidivism, reduction of risk factors)

No evaluation study is available. According to studies carried out in other countries (U.K., Germany, Austria) and unpublished studies, an important decrease in sanctioned behaviour can be observed. However, there is no estimate of the decrease in the number of accidents, severe injuries and fatalities.

#### Feasibility (acceptance, sustainability, transferability)

Acceptance is considered good because the participation rate of convicted drivers is above 50 %. The measure is easily transferable since Portugal has imported it from other countries. However, some adaptations are necessary (legislation, culture).

#### Why best practice?

All measures with the aim of promoting “personal growing up” and responsibility have to be considered as best practice.

#### Assessment

Compared with the best-practice guidelines, the proposed measure contains several weak points or the description by the country expert fails to enclose the necessary information. First of all, participation in the course is **not mandatory** and it is not clear if the course is appropriately **tailored to the needs** of the offenders. In addition, no information is available concerning the **time lag** between the offence and course participation, the **institution** that organises the courses, the **participation fee** as well as the **qualifications** of the course leaders. Based on the information available, it is difficult to form an opinion about the effective **duration** of the whole programme which consists of courses of 2 or 4 days and about the content of the courses, which should include both **educational and therapeutic** elements. **No evaluation** related to the programme has been carried out. Fairly positive aspects of the measure are the **group size** of 10 to 12 participants (which should ideally not exceed 10 persons) and the fact that the measure is **combined** with penal sanctions.

→ Very few elements characterising the measure are in line with the best-practice guidelines.

3

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#### Number of subcategory, title of the measure and country

3.1.3. Mandatory Driver Improvement (DI) for drivers who drove under the influence of alcohol or drugs, drivers with severe violations - Austria

#### Target group and allocation criteria of participation

The target group of the intervention consists of drivers who drove under the influence of alcohol or drugs (more than 80 % of all participants) and drivers with severe violations. Separate courses are organised for offences with alcohol and other offences. Some institutions distinguish in addition novice drivers and more experienced drivers. Driver improvement (DI) is a road safety psychological-therapeutic measure and also represents an accompanying measure related to the revocation of the driving licence (only drivers on probation whose licence dates back no longer than 2 years are an exception: they may participate in a DI measure while having a licence). Participation in the programme is mandatory for reinstatement of the driving license.

#### Main characteristics of the intervention

Participants should be made aware of the relationship between wrong behaviour and personal attitude in order to finally elaborate future-oriented ways to correct both. Drinking and driving should be reliably separated in the future, drinking habits changed. Therefore, the knowledge gaps of the participant, e.g. about the effect of alcohol, should be filled and individually adjusted behaviour patterns should be developed, tested and rudimentarily stabilised. To avoid participants' relapse, self-control should be fostered by developing adequate behaviour patterns. Courses are held with a minimum of 6 and a maximum of 11 participants, one-to-one talks are only exceptions. A course consists of 15 units (of 50 minutes each) which are divided into five sessions. Sessions should be separated by an interval of at least two days. The intervention lasts at least 22 days. Successful participation (participation in all sessions, sufficient effort and cooperation in the course, soberness during the course, full payment of course fee) is documented with a participation confirmation. The time lag between the offence and the course participation depends on different factors like the severity of violation, the necessity for the offenders to undergo a traffic psychological assessment or the availability of the next course term. The traffic-psychological institutions, appointed by the Federal

Ministry of Transport, Innovation, and Technology (BMVIT), have to meet special standards defined in the licensing law. Course leaders have to fulfil certain prerequisites as well (§7 FSG-NV: psychologist, professional experience as traffic-psychologist, training in therapeutic intervention techniques, introduction to course agenda, class B licence holder, annual further training, ...), the suitability of the course agenda has to be proven. DI is combined with the revocation of the driving licence (exception: drivers on probation), in many cases also with a traffic-psychological assessment. Certain additional requirements make sense (partially disposed): e.g. periodical urinalyses of drivers who have driven under the influence of illicit drugs; periodical lab-parameter checks for drivers who have driven under the influence of alcohol. The participation fee is 525 € for first offenders and 630 € for repeated offenders.

### Size of the road safety problem

5.3 % of all fatal accidents in 2005 were allegedly mainly caused by alcohol, 35.9% of all fatal accidents in 2005 were allegedly mainly caused by speeding and 15.8% of all fatal accidents in 2005 were allegedly mainly caused by right-of-way violations.

### Effects on safety (reduction of recidivism, reduction of risk factors)

Within a timeframe of 2½ years, 30.6 % of DUI offenders who had not participated in a course had a relapse, compared to 15.8 % who had participated in DI. Many studies and evaluations have been carried out, for example the following:

- Michalke et al.: Effizienzkontrolle von Gruppentrainingsmaßnahmen für alkoholauffällige Lenker – Driver Improvement. Institut für Verkehrspsychologie, KfV, Vienna 1987.
- Christ, R.: Die Evaluation psychologischer Maßnahmen – behördlicher Auftrag oder berufsständische Pflicht. Die verkehrspsychologische Nachschulung als Fallbeispiel. Psychologie in Österreich 1995, 2, 40-43

### Feasibility (acceptance, sustainability, transferability)

The courses are received in a positive way: 89.2 % of the participants consider the DI courses as helpful in avoiding DUI in future. This result is cited in: Vergeiner, M: Neuerungen durch die Nachschulungsverordnung (FSG-NV). ZVR 2003, 29, 3, 102-108. Earlier studies have shown that DI reduces recidivism for DUI by 50 %. The measure is transferable if the adequate legal and administrative parameters are created.

### Why best practice?

The risk of individual recidivism is reduced because there is a psychological–therapeutic intervention at an early stage. Within this measure, on the basis of reflection, wrong attitudes and behaviour patterns can be corrected.

### Assessment

The Austrian measure described contains many positive elements that comply with the best-practice guidelines: participation in the course is **mandatory** for the reinstatement of a driving licence, the programme includes both **educational and therapeutic** elements and is **organised** by traffic-psychological institutions, appointed by the Federal Ministry of Transport, Innovation and Technology (BMVIT). Moreover, course leaders are **qualified**, the maximum **group size** is quite good (11) and it seems that **evaluations** of the programmes have been carried out. In addition, the course is **tailored to the needs** of the offenders, as separate courses are offered to drink driving offenders and to offenders having committed other types of violations. Besides, the measure is combined with the revocation of the driving licence, in many cases also with a traffic-psychological assessment. It is difficult to form an opinion about the **time lag** between the offence and course participation as it depends on different factors. The course meetings are held

over a **period of (at least) 3 weeks**, which is rather short but sufficient. The **participation fee** doesn't take into account the financial possibilities of the participants.

→ The measure has many interesting features and corresponds to a large extent with the best-practice guidelines.

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#### Number of subcategory, title of the measure and country

3.1.3. Training course for recidivist drunken drivers - Switzerland

#### Target group and allocation criteria of participation

The target group of the intervention consists of recidivist drivers with two convictions for drink-driving. Drivers addicted to alcohol are excluded. Participation in the programme is optional. A preliminary face-to-face interview is carried out in order to learn as much as possible about the individual case.

#### Main characteristics of the intervention

The aim of the measure is to support re-offending drivers in finding a way to separate drinking and driving. The programme provides information on the topic of alcohol and driving (legal and statistical aspects, as well as physical effects of alcohol). In addition, participants are supported in tackling their own drinking habits and get to know the reasons for their personal drinking behaviour. Finally, the participants are encouraged to define their personal solutions. Homework is an important means for achieving a change in behaviour. The full programme consists of six meetings of 2 hours each (group sessions with a maximum of 12 participants) and a 1-hour individual discussion. All in all, it lasts 8-12 weeks. The cost of participation is 350 €. The courses are conducted by specially trained facilitators, i.e. psychologists with a university degree, who have generally had additional therapeutic training. They are appointed by the cantonal authorities and trained by the Swiss Council for Accident Prevention (bfu). On average, it takes 6 months between the offence and course participation. The intervention is combined with earlier driver license reinstatement.

#### Size of the road safety problem

More than one in five fatalities on Swiss roads - or more than 100 fatalities annually – and 14 % of all severe injuries are caused by drunk drivers.

#### Effects on safety (reduction of recidivism, reduction of risk factors)

The effects of the measure in terms of reduced numbers of accidents are not known. However, in many studies, the recidivism rates were found to be reduced by about 50 % for drunk drivers who participated in a rehabilitation programme compared to drunk drivers without course participation over a two- to five-year observation period (Bartl, G., Assailly, J.-P., Chatenat, F., Hatakka, M., Keskinen, E. & Willmes-Lenz, G. (2002). EU project "Andrea", Analysis of Driver Rehabilitation Programmes. Vienna: Austrian Road Safety Board KfV). In addition, a process and impact evaluation showed good results (Bächli, 2003).

#### Feasibility (acceptance, sustainability, transferability)

The measure is well-established and accepted by the authorities as well as among the people participating in the training (but only those who can benefit from a reduction in the licence withdrawal period). Contributing factors for the transferability of the measure are a clear legal basis, competence of course leaders and participation incentives.

#### Why best practice?

The measure is quite cheap and the recidivism rate can be reduced by about 50 % after 3-5 years. The rehabilitation programme can also contribute towards solving or preventing a general alcohol problem.

#### Assessment

The proposed rehabilitation measure contains the following positive aspects: the course is **tailored to the needs** of the offenders who are clearly defined (recidivist drink drivers) and benefit from a 1-hour preliminary individual discussion, the programme includes both **educational and therapeutic** elements, the course leaders, **appointed** by the cantonal authorities, are **qualified** and the course meetings are held over a long **period of time** (8-12 weeks). The maximum **group size** is 12 persons. Moreover, the measure is **combined** with an early driver licence reinstatement. The **participation fee** per participant is mentioned (350 €); the financial possibilities of the participants are not taken into account. Participation in the course is **not mandatory** and **no output evaluation** of the programme has been carried out. The **time lag** between the offence and course participation is quite long (about 6 months).

→ The measure complies to a large extent with the best-practice guidelines.

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#### Number of subcategory, title of the measure and country

3.2.1. Rehabilitation seminar for novice drivers (ASF) - Germany

#### Target group and allocation criteria of participation

ASF is a measure for novice drivers in the probation period who have committed an offence against traffic regulations. The course is mandatory.

#### Main characteristics of the intervention

The aim of the measure is to avoid repeat offences by influencing participants in their risk awareness on the roads and by motivating them to behave more safely and with more regard for others. The intervention comprises the following elements: self reflection (self evaluation), change of behaviour and attitudes and building up new strategies (see levels 3 and 4 of the GDE matrix). The intervention also comprises a drive with other participants, which results in peer-to-peer-feedback. The course comprises 675 minutes (= 15 sessions of 45 minutes) and takes a total of five days. The cost of participation is between 200 and 350 € per participant. The cost of training a seminar leader is between 600 and 800 €, the administration costs are between 30 and 40€ per participant. The measure is combined with the probationary period.

#### Size of the road safety problem

The share of novice drivers with driver licence in the probation period (18 - 25 years by killed person in traffic is 20%.

#### Effects on safety (reduction of recidivism, reduction of risk factors)

No output evaluation study is available. The studies mentioned refer to the provisional driving licence (q.v. Fahranfänger im Straßenverkehr, Heft 70 (1989) BAST; Gefühlswelten junger Fahrer, Heft 84 (1991) BAST; Führerschein auf Probe, Heft 87 (1992), BAST EU DAN project EU ANDREA project).

#### Feasibility (acceptance, sustainability, transferability)

The intervention is well-accepted in society. It would appear that a complementary measure such as a probationary period would be necessary for the measure to be transferable.

### Why best practice?

It is a tested measure for conspicuous, novice drivers and is oriented at level 3 and 4 of the GDE matrix to build up self-reflection (self-evaluation).

#### Assessment

The described measure complies with some important elements pointed out in the best-practice guidelines, at the same time some useful information is lacking. The course seems to be **tailored to the needs** of offenders who are clearly defined (novice drivers in the probationary period who have committed an offence against traffic regulations). It is **mandatory** and includes both **educational and some therapeutic** elements; the **participation fee** per participant is mentioned (between 200 and 350 €) but it is not clear if the financial possibilities of the participants are taken into account. On the other hand, the course meetings are not held over a sufficient long **period of time** (15 hours with 45 minutes during only 5 days) and it seems that no **output evaluation** of the rehabilitation programme has been carried out. No information is available, the **time lag** between the offence and course participation, the **group size**, the **institution** that organises the courses as well as the **qualifications** of the course leaders.

→ Several elements characterising the measure are in line with the best-practice guidelines, though a lot of information is lacking.

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### Number of subcategory, title of the measure and country

3.2.2. Driver Improvement courses for drivers with offences (ASP) - Germany

#### Target group and allocation criteria of participation

The target group consists of drivers with more than one offence. In Germany, all drivers with traffic offences with a fine of at least € 40.- or with a driving ban are registered by the Federal Motor Transport Authority (Kraftfahrt-Bundesamt) in the Central Register of Traffic Offenders (VZR). The punishable acts recorded in the VZR vary according to their type and gravity between 5 and 7 points, traffic offences between 1 and 4 points. If offenders have 14 or more points, the course is mandatory; with less than 14 points, it is voluntary.

#### Main characteristics of the intervention

The Driver Improvement Course ASP aims at building up more self-reflection, increasing offenders' risk awareness on the roads and behaving more safely and with more regard for others. The intervention also comprises a drive with other participants, which results in peer-to-peer-feedback. The course comprises 675 minutes (= 15 sessions of 45 minutes) and takes a total of five days. The cost structure is similar to the ASF course. The measure is combined with a demerit point system.

#### Size of the road safety problem

No useful information is available.

#### Effects on safety (reduction of recidivism, reduction of risk factors)

Information on this subject can be found in following publication: Evaluation der Kurse für mehrfach auffällige Kraftfahrer, Heft 53 (1985), BAST Wirkung der Aufbau-seminare für Punktauffällige, BAST 2005 (not published).

### Feasibility (acceptance, sustainability, transferability)

Similar courses exist, for example for drivers with alcohol offences or in other countries. An important factor that contributes to the transferability of the measure is an efficient system of recording offences.

### Why best practice?

Long-term experience of this measure so that self-reflection effects with alcohol offenders can be evaluated (q.v. EU ANDREA project).

#### Assessment

Compared with the best-practice guidelines, the proposed measure contains some weak points and a serious lack of information. It seems that the course is not **tailored to the needs** of offenders, as the target group is not clearly defined. In addition, participation in the course is **mandatory only** if the offenders have 14 or more points registered in the Central Register of Traffic Offenders (VZR), the course meetings are not held over a sufficient long **period of time** (15 hours with 45 minutes during only 5 days) and the intervention includes more **educational rather than therapeutic** elements. No information is available concerning the **time lag** between the offence and course participation, the **group size**, the **institution** that organises the courses as well as the **qualifications** of the course leaders. On the other hand, an **evaluation** of the programme seems to have been carried out, but the results were not revealed in the questionnaire submitted. Moreover, the intervention is combined with the demerit point system. In addition, the **participation fee** per participant is mentioned (between 200 and 350 €), but it is not clear if the financial possibilities of the participants are taken into account.

→ The measure corresponds moderately well to the best-practice guidelines. A fairly important part of the information is lacking.

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### Number of subcategory, title of the measure and country

3.2.3. Speed awareness course - Belgium

#### Target group and allocation criteria of participation

The target group consists of speeding car drivers. Participation is optional. The prosecutor invites the offender to participate in a course before going to court. The judge can then take these efforts into consideration when pronouncing his punishment.

#### Main characteristics of the intervention

The goal of the intervention is to give the participants theoretical and practical information so that they become more aware of the consequences of speeding. The course comprises 15 hours and lasts a total of 3 days (one afternoon – one whole day – one evening). The time lag between the offence and the course participation is 3 to 9 months. The organisation which organises the courses is the Belgian Road Safety Institute (IBSR) in collaboration with the Jesco Driving School. The course leaders are social workers or psychologists with special training in combination with a driver trainer. Each participant has to pay 350 €; this covers the cost of the course, which is given in small groups. Participation can lead to a reduction of the fine and the period of withdrawal of the driver license.

#### Size of the road safety problem

Speeding is involved in 27 % of all casualties and 50 % of all fatal accidents.

**Effects on safety (reduction of recidivism, reduction of risk factors)**

No information is available.

**Feasibility (acceptance, sustainability, transferability)**

It is transferable to every country and into every judicial system. Comparable judicial systems contribute to the transferability of the measure.

**Why best practice?**

The course is a unique combination of psychological elements and driving practice. At the same time, it is implemented within the judicial system: voluntary course with legal consequences.

**Assessment**

The described measure complies with the best-practice guidelines concerning only few elements: the course seems to be **tailored to the needs** of offenders, who are clearly defined (speeding car drivers) and it can be assumed that the **group size** does not exceed the recommended number of 10 participants as it is specified that the course is given in small groups. The **institutions organising** the courses are not part of the authorities and the **course leaders** are qualified. On the other hand, the course is not **mandatory** and includes **educational rather than therapeutic** elements. The **participation fee** per participant is mentioned (350 €) but it is not clear if the financial possibilities of the participants are taken into account. It seems that no **evaluation** of the programme has been carried out. The **time lag** between the offence and the course participation can be rather short (3 months) but also long (9 months). No information is available concerning the **duration** of the whole programme which consists of 15 hours distributed over three days (one afternoon, a whole day and an evening).

→ Several elements characterising the measure are not in line with the best-practice guidelines.

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**Number of subcategory, title of the measure and country**

3.2.3. Measures to improve drivers' behaviour within penalty point system - Latvia

**Target group and allocation criteria of participation**

The target group consists of persons whose driving behaviour is unsafe (under the influence of alcohol or drugs or other regular offenders). Besides the fines and penalty points, the intervention also includes measures to improve drivers' behaviour depending on the severity of the offence and the corresponding penalty points. The maximum permitted blood alcohol content for novice drivers is reduced to 0.2 mg/ml; 6 penalty points are given for driving under the influence of alcohol (between 0.2 mg/ml and 0.5 mg/ml) for novice drivers. In the case of 4 penalty points, a written notification suggesting driving more carefully is sent.

If the number of received penalty points have come to 8 penalty points – a notification about the amount of received penalty points and the obligation to attend courses of instruction about road traffic safety "Driver's skills improvement courses" is sent to the dwelling-place address of the driver. 1,7 % of all drivers received over 8 points in 2005 [A. Adovics, A. Lama. Drivers in road traffic, violations, penalty points, accidents. – Road Traffic Safety Directorate, 2006, 25p.] 95% of them are drivers punished for driving under the influence of alcohol therefore the target group of "Driver's skills improvement course" mainly are drivers punished for driving under the influence of alcohol. These drivers besides fines must pass extra medical testing performed by a commission of doctors.

For novice drivers with 10 penalty points, the consequence is one year's disqualification and, on expiry of the term of prohibition, the driver must pass theoretical and driving tests in accordance with established procedures and may receive a new driving license. The driver is considered to be a novice driver for one more year after the expiry of the term of prohibition.

In the case of 12 penalty points, a mandatory theoretical test is conducted: 2 points are written off if the test is passed, 2 points added if the test is failed or if the driver ignores it.

In the case of experienced drivers with 16 penalty points, the consequence is one year's disqualification. On expiry of the term of prohibition, the driver must pass theoretical and driving tests in accordance with established procedures and may receive a new driving license.

On 14 October, 2005, the first amendments of the penalty point system came into force - if a driver is under the influence of alcohol or repeatedly drives without a driving license, the penalty is administrative arrest for 5 to 15 days together with a heavy fine.

### **Main characteristics of the intervention**

The aim of the penalty point system is to separate the "malicious" and regular violators from those who are driving according to the road traffic rules. The penalty point system besides punishment includes also information, rehabilitation and re-licensing.. The drivers' skills improvement course lasts the whole day on a Saturday and is split into two parts and each part is a three-hour lecture: firstly, "Behaviour of road traffic participants and factors that can have an impact on it" and, secondly, "Assured behaviour of a driver in different road traffic situations". Attending the course provides the possibility of writing off 2 points. The "Driver's skills improvement course" is organized by the Road Traffic Safety Directorate. The violator has to enter for the "Driver's skills improvement course" not later than two months and to attend them not later than four months after having received notification. The course leaders are persons with higher education who have at least three years experience of teaching and are approved by a special commission (at the moment these lectures are given by lecturers from Riga Technical University). The price of the "Driver's skills improvement course" is about 28 € which has to be paid by the violator.

### **Size of the road safety problem**

In 25.6 % of all fatalities registered in 2005, speeding was the cause of the accident; in 21.7 % of the fatalities registered, drivers were under the influence of alcohol.

### **Effects on safety (reduction of recidivism, reduction of risk factors)**

On 14 October, 2005, the first amendments of penalty point system came into force - if a driver is under the influence of alcohol or repeatedly drives without a driving license, the penalty is administrative arrest for 5 to 15 days together with a heavy fine. This decision has resulted in the following provisional achievements - comparing 14.10.2004.-01.05.2005 and 14.10.2005.-01.05.2006: - the number of drivers under the influence of alcohol apprehended by the police decreased 2.5 times; - the number of accidents involving injuries caused by drivers under the influence of alcohol decreased 1.9 times. The source of this information is: Aldis Lama, Road Traffic Research, Ltd. Penalty point system in Latvia. – Unpublished article which was sent to the European Transport Safety Council for publishing.

### **Feasibility (acceptance, sustainability, transferability)**

The measures to improve drivers' behaviour within the penalty point system are not directly transferable to other countries. Regulations would have to be changed to adapt this measure to the legislative system of each country. The measure can only be expected to be effective if it is combined with enforcement

### **Why best practice?**

The measures to improve drivers' behaviour within the penalty point system should be included in the list of best-practice guidelines because (1) they change the attitude of drivers and, in consequence, reduce the number of violations of road traffic rules and decrease the number of accidents and (2) they are mandatory measures, compelling offenders to further study the legislative system of road safety and aspects of road safety.

### Assessment

Compared with the best-practice guidelines, the proposed measure contains some important weak points. First of all, it includes **educational rather than therapeutic** elements and the driver's skills improvement course meetings are not held over a sufficiently long **period of time** (only one day). In addition, the **institution** organising the courses is not independent. Besides, no information is available concerning the **group size**. On the other hand, the driver's skills improvement course is **mandatory**, the **time lag** between the offence and course participation is rather short (maximum 4 months), the **participation fee** is low and the course leaders are **qualified**. As 95% of the drivers who received at least 8 points in 2005 were punished for driving under the influence of alcohol, it can be assumed that the course is rather **tailored to the needs** of offenders. Moreover, an **evaluation** related to the programme has been carried out about the development over one year of the number of persons driving under the influence of alcohol (DUI) apprehended by the police and the development of the number of accidents involving injuries caused by DUI, although the survey is not published. Actually, the drivers' skills improvement course is embedded in the penalty point system where other measures are applied (licence withdrawal, theoretical and driving tests).

→ The measure corresponds moderately well to the best-practice guidelines. However, our evaluation concentrates first of all on the driver's skills improvement course which is only a part of the described measure.

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### Number of subcategory, title of the measure and country

3.1.3. Educational Measure Alcohol and traffic (EMA) - Netherlands

### Target group and allocation criteria of participation

The target group consist of (a) drivers who have been apprehended once with a blood-alcohol concentration of between 1.3 and 1.8 per mille, (b) drivers who had a blood alcohol level above 1.8 (and previously had to participate in a medical test), (c) recidivists who have been apprehended twice with a blood-alcohol concentration higher than 0.8 per mille within a period of 5 years and (d) persons who have refused the breath-analysis. The EMA is imposed within the framework of administrative law. The legal procedure starts with the assumption that a holder of a driving license does not meet the standards of driving anymore. Generally, this information is gained by police officers, because they observe traffic behaviour. The police inform the Minister of Transport (actually it is the Dutch Driving Test Organisation CBR because the Minister has delegated this task to the CBR). Based on this assumption and depending on the criteria, a decision will be made. Either a person has to take a medical test or attend a rehabilitation programme. The measure has to be concluded in twelve weeks after the day drunk driving was detected.

### Main characteristics of the intervention

The EMA programme aims at increasing the relevant knowledge regarding the risks of alcohol in road traffic, creating an insight into and awareness of the causes of drunk driving and learning alternative behavioural strategies to diminish the chance of drunk driving in the future. The EMA programme is partly based on the theory of Fischbein and Azjen reasoned action model and on the "circle of change" of Prochaska and DiClemente. The EMA course takes three course days (group sessions) spread over a three-week period. An individual interview, performed by the course leader, precedes the course. It has the character of an admission interview and is meant to motivate the participants to take part in a

constructive way and to reduce their resistance to the EMA course and the course leader. The EMA courses are held with a maximum of 12 participants. The cost of the EMA amounting to approximately 665 Euro has to be paid by the participants themselves. Part of the cost of implementing the intervention is borne by the State. The courses are organised by didactically skilled workers in the Centres for Alcohol and Drugs. The course leaders are usually group-workers or health education workers and specially trained in working with people who have a problem with alcohol. Qualification criteria for course leaders are: degree in behavioural sciences such as psychology, andragogy, education and health education or specially trained in health and social studies. The measure is combined with criminal sanctions (in particular withdrawal of the driving licence). EMA is embedded in a legal procedure that, in the end, can lead to an invalidation of the driving licence. Refusal to pay the course-fee or to participate in EMA leads to the permanent withdrawal of the driver's licence. Only on sufficient conclusion of the measure, the driver's licence is returned.

Since the year 2003 a quality system is in practice for the EMA. In this system the quality of the course program and the performance by the course leaders is monitored on a continuous basis (van der Houwen & Vissers, 2002; Nagele & Vissers, 2003; Vissers & van Beekum, 2004).

### **Size of the road safety problem**

About 15 % of the serious traffic accidents are directly linked to drink driving.

### **Effects on safety (reduction of recidivism, reduction of risk factors)**

An evaluation study (quasi-experimental design) was carried out in 2000 by the investigation bureau called Traffic Test. Due to the recent implementation of the measure (1996), only a short-term and medium-term evaluation could be carried out. Besides the "shock effects" of the legal procedure, the EMA on its own brings about several positive changes, such as an increase of knowledge concerning drinking and driving, a positive influence towards the use of the social environment to control the drinking and driving behaviour of course participants as well as a stimulation of alternative means of transport after drinking. In certain aspects, the EMA is not effective: no improvement can be observed concerning problem awareness, awareness of guilt, sense of responsibility. The EMA seems to have no influence on the perceived chance of being caught again for driving under the influence. In addition, the EMA has not yet led to a significant reduction in recidivism.

In the past the course that preceded the EMA (the Alcohol Traffic Education Program) has been evaluated on its effects on recidivism. In this study [Bovens, R.H.L.M. (1991) *Rijders onder invloed beïnvloed*. Groningen, Wolters-Noordhoff BV] was concluded that the recidivism rate of course participants was decreased by approximately 30%.

### **Feasibility (acceptance, sustainability, transferability)**

The acceptance of the EMA can be qualified as good. Out of 9,500 drivers on which an EMA was imposed, 8,000 drivers followed the EMA course. So the participation rate of convicted drivers is approximately 85%.

In 2004 [Kuiken, M.J. & Oostlander, I.L. (2004) *Evaluatie vorderingsprocedure*. Eindrapport. Rotterdam, Adviesdienst Verkeer en Vervoer] the administrative legal procedure within which the EMA is imposed has been evaluated. In this study an estimation was made of the safety effects of the EMA. Using statistical data it was calculated that by implementing the EMA approximately 4 casualties (out of a possible 55 casualties to be saved in the target group) are saved on a yearly basis.

### **Why best practice?**

The EMA program has a strong theoretical basis and makes use of recent knowledge in the field of behaviour change of drunk drivers. There is a strong emphasis on giving participants insight and awareness in the causes of drink driving as well as on the learning of alternative behavioural strategies to diminish drink driving in the future.

The quality of the EMA program is monitored on a continuous basis. If necessary, each year the contents of the program are changed on the basis of the information of this quality and course leaders receive additional training.

### Assessment

The Dutch measure described contains many positive elements that comply with the best-practice guidelines: The course seems to be **tailored to the needs** of the offenders: an individual interview, performed by the course leader, precedes the course and, in some cases, a person has to take a medical test. However, the target group described is rather heterogeneous with BAC levels between 0.8 and above 1.8 per mille. There are probably many alcoholics in the group. The course is **mandatory** and includes both **educational and therapeutic** elements. The meetings are held over a **period of 3 weeks**, which is still rather short but sufficient. The maximum **group size** is 12 persons. In addition, it is stipulated that the measure has **to be concluded within twelve weeks** after the day drunk driving was detected. The Minister of Transport **has delegated** the task to the Dutch Driving Test Organisation CBR and the courses are organised by **didactically skilled course leaders** in the Centres for Alcohol and Drugs. An **evaluation** of the programme has been carried out. In addition, the measure is combined with criminal sanctions (in particular withdrawal of the driving license). On the other hand, the **participation fee** per participant (665 €) seems quite high; it is not clear if the financial possibilities of the participants are taken into account.

→ The measure has many interesting features and corresponds to a fairly good extent with the best-practice guidelines.

## 17 Description and assessment of diagnostic measures

Within the SUPREME project, 3 questionnaires in the domain of diagnostics were submitted. As in the previous chapter, these 3 measures have been summarized, in principle with the wordings of the country experts and an assessment of the authors of the report has been added (grey boxes).

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### Number of subcategory, title of the measure and country

3.3.1. Fitness to drive assessment (for elderly drivers 65+) - Belgium

### Target group and allocation criteria of participation

Elderly drivers, commonly defined as 65+, form the target group of the measure. Several reasons might trigger the beginning of the process. The most common reason is the referral by an MD, but insurance companies can also refer them. A minority of elderly people have themselves checked on their own initiative, or the initiative of relatives. In both these latter cases, this is of their own free will and hence not obligatory.

### Main characteristics of the intervention

An evaluation based upon 3 expert fields (medical, neuropsychological and practical fitness to drive) is carried out in order to assess cognitive functions known to be related to fitness to drive. On the basis of the provided medical information (self declaration form) it is decided which class of tests will be necessary: medical and/or psychological. A practical driving test is always required. A negative fitness to drive assessment results in the issue of a negative fitness to drive attestation to the 'candidate driver'. After this has been issued, it is required by law that this person returns the driving licence to

the authorities who originally issued it. After a negative attestation, the original driving licence is no longer valid. The fitness to drive assessment is carried out by CARA, which was appointed by Royal Decree as the only fitness to drive assessment centre in Belgium. On average, it costs about 490 EURO. In most cases, the state government bears the cost of the measure (except expert advice and assessment ordered by court). The EC has set minimum standards on being declared fit to drive (directive CD 91/439/EEC, annex III). All member states need to translate this into their national legislation. This is the responsibility of national governments. In Belgium, this was effected by Royal Decree, annex 6, on 23/03/1998).

### Size of the road safety problem

In 2002 107 65+ killed in accident (total of 807) in personal car as driver or passenger. The proportion of elderly in the total population is increasing and will do so for a long time. The same can be stated for the proportion of elderly drivers (elderly people with a driving licence) and of elderly people needing and wanting to continue driving. 20 % (731/3742) of all fitness to drive assessments performed at CARA in 2005 were for people aged 65 years and above. More and more elderly people are referred for fitness to drive assessment at CARA: 649 in 2003, 723 in 2004, 731 in 2005.

### Effects on safety (reduction of recidivism, reduction of risk factors)

Common sense tells us that some medical conditions lead to unfitness to drive. Most official criteria are based upon expert opinion and have not really been evaluated. Hence empirical evidence for most standards is lacking. However, some criteria have been evaluated. Evidence related to standards specific for the elderly is unavailable. One of the reasons is that there are no specific criteria for the elderly. The criteria are based upon evaluations of driving-related functions such as attention, vision, etc. By assuring fitness to drive in this (or any) population, it is believed that the risk of traffic accidents can be lowered by preventing accidents from happening that could be avoided because some medical problems or pathologies are likely to negatively affect the road safety of the driver.

### Feasibility (acceptance, sustainability, transferability)

46 % of elderly people accept the fitness to drive assessment of the elderly. 33 % are totally against such an assessment (the source of this information is the internal CARA database and an unpublished thesis). Most EU member states perform fitness to drive assessments. However, the content of the assessments varies. Some EU projects are aimed at standardisation of assessments.

### Why best practice?

A fitness to drive assessment should be uniform across all member states of the EU. The assessment should be multidisciplinary based on medical, neuropsychological and practical fitness to drive evaluations. The driving licence should not be an all-or-nothing decision: limited driving licences, also partly based upon the personal situation, should be possible.

#### Assessment

The proposed Belgian measure contains the following positive aspects complying with the best-practice guidelines regarding diagnostics: the intervention only concerns drivers over 65 years who have been **referred by** an MD or an insurance company. In a few cases, elderly people have been checked on their own initiative, or the initiative of relatives. **Cognitive functions** known to be related to fitness to drive are assessed. Moreover, the **tests are comprehensive**, including not only medical aspects, but also neuropsychological aspects as well as a practical fitness to drive. The assessment is **multi-tiered**: on the basis of the provided medical information (self declaration form) it is decided which class of tests will be necessary. On the other hand, in the case of a negative decision, **few advice** seem to be given to the impaired driver; this could be one explanation why so few persons decide to have themselves checked on their own initiative. It seems that older drivers are not specifically **informed** about procedure and mobility alternatives.

No description is available concerning the **role of the licensing authorities**, which should ideally be larger than only the licensing procedure.

→ The approach encompasses several interesting elements and should be considered as fairly good.

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#### Number of subcategory, title of the measure and country

3.3.3. Mandatory traffic-psychological assessment (VPU) of drivers who drove under the influence of alcohol - Austria

#### Target group and allocation criteria of participation

If a driver is detected driving at an alcohol level of 0.16 % BAC or more or if he refuses the breath test (or investigation by a health officer or blood sample), he is required by law to undergo a traffic-psychological assessment. The participation at the program is mandatory.

#### Main characteristics of the intervention

Two areas are tested: the driving capability and his willingness regarding traffic adaptation (both defined in the licensing law). The traffic-psychological assessment consists of three parts: performance testing, personality testing and a personal interview. Before a person has to undergo the traffic psychological assessment there is a medical investigation by a public health officer (Amtsarzt). The goal of the traffic-psychological assessment of DUI offenders is to assess the individual recidivism risk, i.e. to make a prognosis of the probability of future driving under the influence of alcohol. The diagnostic measure has consequences: the driver can be found to be “not capable at the moment”, “conditionally capable”, and “capable”. The traffic psychological investigation takes a total of about 3 to 4 hours (for the client). Afterwards, the results are studied by the psychologist; an expert opinion including the synopsis is written. The driver has to pay for the assessment fee of the VPU. The cost of police detection, administration, etc. is covered by government.

Before testing, there is a check of visual capabilities, a short questionnaire (physical and psychological orientation, medication), alco-test and check of speech capabilities (if necessary). If the person consumed alcohol (q.v. alco-test), or needs eyeglasses, does not feel well, or if there is a lack of speech capabilities, and so on ... the assessment is postponed.

The synopsis of all the results (performance test, personality test, exploratory data) forms the assessment. If the overall assessment is negative, the licence remains revoked until sufficient driving capability and/or sufficient willingness to adapt to traffic are restored. This serves as a basis for further measures (Driver Improvement, alcohol abstention, alcohol abstinence, etc.) This measure is combined by law with a licence revocation (of at least four months), a fine, and participation in a driver improvement course.

#### Size of the road safety problem

5.3 % of all fatal accidents in 2005 were allegedly mainly caused by alcohol. Empirical study Christ (1999): Accident involvement of drivers with high BAC was 20 % in this study.

#### Effects on safety (reduction of recidivism, reduction of risk factors)

Thanks to the assessment of the individual recidivism risk, the drivers who display a lack of willingness to improve road behaviour as well as deficits in driving skills and capabilities are selected. In case of inaptitude, a (prolonged) revocation of the driving licence follows until aptitude is re-established. Hence, the drivers in question do not participate in road traffic during this time span. Since 1990, the number of DUI accidents has dropped somewhat (2,860 accidents in 1991 to 2,746 in 2005). The number of people injured and fatalities has been greatly reduced: 1991: 4,192 people injured to 2005: 3,825 and 1991: 103 fatalities to 2005: 57). The decrease of DUI accident numbers can be attributed to multiple measures.

### Feasibility (acceptance, sustainability, transferability)

For transferability, it is important that the appropriate legal and administrative framework is established.

The following elements contribute to the transferability of the measure: trained police who enforce with the appropriate screening equipment, central licence registry (guaranteed equality), legal framework (processing, assessment institutions, [advanced] training of psychologists, supervision, price scaling, etc.) as well as quality management (expert commission).

### Why best practice?

The measure comprises many promising elements: decrease of individual recidivism risk for high-risk drivers, assessment/evaluation of the individual case, therefore targeted implementation of further measures is possible. Most of the cases show problematic drinking patterns (alcohol abuse) and, on an individual basis, specific support can be recommended to change attitude and behaviour. Only a few persons are identified as addicted to alcohol (alcoholism). On the basis of the expert opinion, efficient measures can also be initiated for this group.

#### Assessment

Compared with the best-practice guidelines, the proposed measure contains several positive elements. First of all, the assessment is **targeting only drivers** who have been detected driving with an alcohol level of at least 0.16 % BAC. According to the many experts in the field, a person driving with a level of 0.16 % BAC and more may be alcohol addicted. Consequently, this intervention assesses **cognitive functions** known to be related to fitness to drive. Moreover, the measure is **tailored to the needs** of the impaired person, depending on the results of the tests. On the other hand, the assessment seems **not to be multi-tiered** as the assessment includes three parts (performance testing, personality testing and a personal interview) for everybody. There seems to be no optional supplementary tests depending on the case.

→ The approach is in line to a large extent to the best-practice guidelines regarding diagnostics and is to be considered as good.

3

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### Number of subcategory, title of the measure and country

3.3.3. Fitness to drive assessment (for people with special needs - PSN) - Belgium

### Target group and allocation criteria of participation

The target group consists of people with special needs (PSN), defined as people with a medical condition that has or may have an effect on their fitness to drive. These medical conditions include problems of a purely physiological, motor, psychological or pure medical nature. Several reasons might trigger the beginning of the process. The most common reason is the referral by an MD (mostly after the change in medical condition), but also insurance companies can refer people. In some cases, these people have themselves checked because at the same time they can also get advice on the possible adaptations to the car (e.g. to compensate motor problems).

### Main characteristics of the intervention

An evaluation based upon 3 expert fields (medical, neuropsychological and practical fitness to drive) is carried out in order to assess cognitive functions known to be related to fitness to drive. A negative fitness to drive assessment results in the issue of a negative fitness to drive attestation to the 'candidate driver'. After this has been issued, it is required by law that this person returns the drivers licence at the authority that originally issued it. After a negative attestation, the original driving licence is no

longer valid. The fitness to drive assessment is carried out by CARA, which was appointed by Royal Decree as the only fitness to drive assessment centre in Belgium. It costs about on average 490 EURO. In most cases, the state government bears the cost of the measure (except expert advice and assessment ordered by court). If the vehicle needs adaptations, this is at the driver's expense. The EC has set minimum standards to be declared fit to drive (directive CD 91/439/EEC, annex III). All member states need to translate this into their national legislation. This is the responsibility of national governments. In Belgium, this was effected by Royal Decree, annex 6, on 23/03/1998).

### Size of the road safety problem

In 2004, about 135,700 driving licences were issued (all categories). About 114,500 were for category B (normal car). At CARA in 2004, about 3,400 fitness to drive evaluations were performed. This is about 3 % of all new driving licences (category B). More and more PSN are referred for a fitness to drive assessment at CARA: 2,704 in 2001, 2,907 in 2002, 3,077 in 2003, 3,402 in 2004 and 3,742 in 2005

### Effects on safety (reduction of recidivism, reduction of risk factors)

Common sense tells us that some medical conditions lead to unfitness to drive. Most official criteria are based upon expert opinion and have not really been evaluated. Hence empirical evidence for most standards is lacking. However, some criteria have been evaluated e.g. criteria related to vision and to epilepsy. By assuring fitness to drive in this (or any) population, it is believed that the risk of traffic accidents can be lowered by preventing accidents to happen which could be avoided because some medical problems or pathologies are likely to negatively affect the road safety of the driver.

### Feasibility (acceptance, sustainability, transferability)

Most EU member states perform fitness to drive assessments. However, the content of the assessments varies. Some EU projects are aimed at standardisation of assessments.

### Why best practice?

A fitness to drive assessment should be uniform across all member states of the EU. The assessment should be multidisciplinary based on medical, neuropsychological and practical fitness to drive evaluations. The driving licence should not be an all-or-nothing decision: limited driving licences, also partly based upon the personal situation, should be possible.

#### Assessment

The proposed measure contains the following positive aspects complying with the best-practice guidelines regarding diagnostics: the intervention concerns only drivers with special needs (PSN), who have been **referred by** an MD or an insurance company. In a few cases, persons have themselves checked on their own initiative. **Cognitive functions** known to be related to fitness to drive are assessed. Moreover, the **tests are comprehensive**, including not only medical aspects, but also neuropsychological aspects as well as practical fitness to drive. The CARA centre, which was appointed to assess the fitness to drive, gives **advice not only** concerning the licensing procedure, but also on possible adaptations to the car. In addition, the assessment seems to be **multi-tiered** or at least adopts some aspects of it: a fitness to drive specialist decides whether a neuropsychological assessment (assessment of cognitive functions known to be related to fitness to drive) will be necessary.

→ The approach complies in many different ways with the best-practice guidelines and should be considered as good.

# **Conclusion and summary**

## 18 Rehabilitation measures

The literature review made it clear that rehabilitation measures can amplify the effect of the sanction system. Taking into account the fact that highly differentiated studies result in lower effect magnitudes than studies with methodological shortcomings, driver rehabilitation measures are clearly not an outstanding traffic safety measure. However, they represent a complementary high-risk-group intervention that not only reduces relapse rates (and thus improves traffic safety) but also improves quality of life for many of the participants. The main causes of many traffic offences are not restricted to the abilities of driving a car. Attitudes, major personal or social problems, lifestyle or personality are much more important factors. Therefore a change in behaviour is not easy to achieve but, if it is successful, it often also results in an improvement of the private and professional situation in general. Moreover, in countries where driver rehabilitation activities have a longer tradition, these measures are soundly aligned with the sanction and re-licensing system. Systems that combine repression and individual support in a meaningful way are probably better accepted by the public compared to systems that do not offer driver rehabilitation measures or that do not combine these measures systematically with sanctions (e.g. measures are not offered in all regions).

Although the quality of the evaluation studies is quite heterogeneous, some best practice guidelines could be drawn from them (q.v. chapter 14). They refer to the following points:

- ◆ early intervention (after first serious offence)
- ◆ mandatory participation
- ◆ specific courses for different target groups
- ◆ allocation to courses based on diagnostics
- ◆ contents of intervention focused on self-reflection and change in behaviour
- ◆ educational and therapeutic methods of intervention
- ◆ consideration given to the cultural and ethnic background of offenders
- ◆ highly-qualified course leaders, who are independent of authorities
- ◆ several course meetings during several weeks, follow-up

In Europe, the German-speaking countries have played a major role in developing and deploying driver rehabilitation courses. Although the legal framework differs between these countries (e.g. penalty point system in Germany), they have improved their system by

- ◆ offering separate courses for different target groups (mainly according to number and nature of offences)
- ◆ offering individual therapeutic interventions for those who need it (e.g. when addicted to alcohol)
- ◆ applying psychologically sound methods that encourage changes in attitudes and behaviour
- ◆ selecting and training highly-qualified course leaders

- ◆ conducting process- impact- and output-evaluation studies
- ◆ exchanging their experiences on a regular basis.<sup>114</sup>

The Austrian and German system is more differentiated compared to the Swiss one. The main difference is that Austria and Germany offer more course models and that diagnostic tests are applied more systematically as a means of assigning the offender to the appropriate intervention and as a condition for licence reinstatement. Although the experience of the German-speaking countries has rarely been the subject of scientific articles in peer-reviewed journals, there are some methodologically sound evaluation studies<sup>115</sup>, which prove that these initiatives are effective in reducing recidivism.

Additionally, there are some further countries which have developed - and gained some experience with - rehabilitation courses. One remarkable attempt is the Dutch EMA-course for drivers apprehended while driving under the influence of alcohol. The intervention is linked with several best practice criteria. Due to the fact that the information and studies available do not permit a comparison in this report of the possible European best-practice measures in terms of the SUPREME criteria in detail, the real-life measures are described according to the information provided by the country experts and assessed by the authors of this report. The main conclusion of this report is given in the general recommendations (chapter 14), which, when taken into consideration, will ensure the effectiveness of interventions in the field of rehabilitation.

## 19 Diagnostics

The analyses within the SUPREME project put the focus on population screening that aims to detect drivers who are not fit to drive due to chronic impairment provoked by the aging process, physical handicap or chronic disease.

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<sup>114</sup> Zuzan, W. (1979). Driver Improvement: Erster Internationaler Workshop (Conference Proceedings). Wien, Bergisch Gladbach, Bern: Kuratorium für Verkehrssicherheit KfV, Bundesanstalt für Straßenwesen BASt, Schweizerische Beratungsstelle für Unfallverhütung bfu.

Huguenin, R. D. & Hess, E. (1982). Driver Improvement: Rahmenbedingungen und Methoden der Verhaltensbeeinflussung in der Ausbildung, Weiterausbildung und Nachschulung von Fahrzeuglenkern (Bericht über den zweiten Workshop in Gwatt) (bfu-Report 5). Bern: Beratungsstelle für Unfallverhütung bfu.

Bundesanstalt für Straßenwesen BASt (Ed.). (1985). Unfall- und Sicherheitsforschung im Strassenverkehr: Dritter Internationaler Workshop: Driver Improvement (Heft 50). Bergisch Gladbach: Editor.

Zuzan, W. & Michalke, H. (1989). 4. Internationaler Workshop: Driver Improvement. Wien, Bergisch Gladbach, Bern: Kuratorium für Verkehrssicherheit KfV, Bundesanstalt für Straßenwesen BASt, Schweizerische Beratungsstelle für Unfallverhütung bfu.

Siegrist, S. (1994). 5. Internationaler Workshop Driver Improvement (DI) in Locarno 1993 (bfu-Report 23). Bern: Schweizerische Beratungsstelle für Unfallverhütung bfu.

Bundesanstalt für Straßenwesen BASt (Ed.). (1998). Driver Improvement: 6. Internationaler Workshop (Heft M 93). Bergisch Gladbach: Editor.

Panosch, E. (2002). Driver Improvement: 7. Internationaler Workshop (Conference Proceedings). Wien: Kuratorium für Verkehrssicherheit KfV.

<sup>115</sup> e.g. Winkler, W., Jakobshagen, W. & Nickel, W.-R. (1991). Rückfälligkeit von Teilnehmern an Kursen für wiederholt alkoholauffällige Kraftfahrer nach fünf Jahren. Bergisch-Gladbach: Bundesanstalt für Straßenwesen BASt, Bereich Unfallforschung (Forschungsbericht Nr. 224).

Jacobshagen, W. (1998), see footnote 26.

Theoretical reflections pointed out the limited safety benefit of screening procedures: even under unrealistically “good” conditions (high prevalence of impairment, high risk associated with impairment, test specificity and sensitivity of 100 %) in six out of seven drivers the licence withdrawal would not have any effect on road safety. More realistic examples showed that the results would be even worse, as many false positive results would be produced. Also, the real-life experience in Finland showed that population screening for elderly drivers might even have negative effects. No safety benefits among car drivers could be assessed, whereas the risk of fatal injuries among the older, vulnerable road users increased.

The analysis of literature and real-life experience in several countries does not highlight any best-practice examples. Instead, the conclusion focuses on the need to develop licensing models which succeed in targeting those drivers who pose evident risks to others and tests that are based on a judgement of the functional abilities relevant for safe driving. Nevertheless, a few general recommendations could be made:

- ◆ assessment practices targeting drivers with functional impairment relevant to safe driving
- ◆ multi-tiered assessment
- ◆ information given to older drivers in a early stage (on procedure and mobility alternatives)
- ◆ expansion of the role of licensing authorities (not limited to the licensing procedure)

# **Annex**

## 20 Annex 1:

### Questions for country surveys

With regard to rehabilitation and diagnostics, which of the following guidelines are followed in your country? How could rehabilitation and diagnostic procedures be improved, considering your country's socio-political culture and traditions?

<b>Rehabilitation programs</b>	
Existence of rehabilitation programs	<b>Do you offer rehabilitation programs for traffic offenders? If yes, please describe them shortly. If no, indicate the barriers your country encounters in implementing such programs.</b>
Contents of rehabilitation programs	<b>Do your rehabilitation programs support the psychological process which is necessary for changing behaviour? Which psychological elements are included and how are they integrated in the program?</b>
Target groups and diagnostics	<b>How do you assess the specific problem of each offender in order to send him to an intervention tailored to his needs?</b>
Success criteria	<b>Which well known success criteria do you apply and how? [Examples for well known success criteria are condition of attendance (mandatory, combined with license suspension and possibly other restrictions), time of intervention (soon after first serious offence), form of intervention (group size up to 10, ethnic background) and level of qualification of course leaders (highly qualified)]</b>
Quality assurance and Evaluation	<b>How do you monitor the process and evaluate the effects on safety indicators?</b>
<b>Diagnostics (screening)</b>	
Trigger of diagnostics	<b>Do your diagnostic activities target only those drivers who pose evident risk to others or do they target a larger group?</b>
Best practice criteria	<b>Which good practice elements are taken into account in your system: valid test procedures, a reliable announcement system, a defined threshold for intervention, other elements?</b>
Quality assurance and Evaluation	<b>How do you monitor the process and evaluate the effects on safety indicators?</b>

## 21 Annex 2:

### List of rehabilitation and diagnostic measures

No	Sub-category	Country	Title
<b>Rehabilitation measures</b>			
1	3.1.1	Belgium	Educational courses for young DUI offenders
2	3.1.2	Portugal	Rehabilitation of driving offenders
3	3.1.3	Austria	Mandatory Driver Improvement (DI) for drivers who drove under the influence of alcohol or drugs, drivers with severe violations
4	3.1.3	Switzerland	Training course for recidivist drunken drivers
5	3.2.1	Germany	Rehabilitation seminar for beginner drivers (ASF)
6	3.2.2	Germany	Driver Improvement courses for drivers with offences (ASP)
7	3.2.3	Belgium	Speed awareness course
8	3.2.3	Latvia	Measures to improve driver's behaviour within penalty point system.
<b>Additional rehabilitation measure</b>			
9	3.1.3	Netherlands	Educational Measure Alcohol and traffic (EMA).
<b>Diagnostic measures</b>			
1	3.3.1	Belgium	Fitness to drive assessment (for elderly drivers 65+)
2	3.3.3	Austria	Mandatory traffic-psychological assessment (VPU) of drivers who drove under the influence of alcohol
3	3.3.3	Belgium	Fitness to drive assessment (for people with special needs – PSN)

## 22 Annex 3: Questionnaire form

### SUPREME: Best Practice Questionnaire Category “Rehabilitation and Diagnostics”

⇒ *bfu, Stefan Siegrist*

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## INTRODUCTION AND INSTRUCTIONS

### STEP 1: SELECTION OF MEASURE

Please select road safety measures from your country that are examples for very good - and possibly best - practice in road safety in Europe. **Best practice** refers to a road safety policy that is successful. A successful road safety measure is one that brings about a sustained **reduction in the number of road accidents and accident victims**, in particular fatalities and serious injuries.

Evaluation of measures and selection of best practice will be based on a list of criteria. Each measure you select will be assessed with an individual questionnaire, i.e. you fill out one questionnaire for each measure.

As different measures require different criteria, the questionnaire you fill out depends on the type of measure. At the end of this chapter you will find an overview of **categories** of safety measures, with examples of measures included in each of the categories. To open a questionnaire, please select the category for the measure you want to assess, and click on the link provided in the overview. There are two types of criteria: General description criteria (to be assessed for all measures, except for those in the categories “Statistics and In-depth analysis” and “Institutional Organization of Road Safety”), and specific description criteria (specific for measures in each category).

The questionnaire is organised as follows:

**Part 1:** The first part of each questionnaire contains questions on **background** information about the selected measure.

**Part 2: General description criteria** are assessed in the second part of the questionnaire. This part is identical for all measures in all categories. In some cases, not all criteria are applicable. In these cases, the criteria are marked “not relevant”, or may be marked as such by the respondent. General description criteria are:

- **Focus of the measure:** A clearly defined **road safety problem** that the measure is intended to solve.
- **Size of the road safety problem:** Quantitative assessment of the number of accidents, fatalities and severe injuries that the measure is expected to influence.
- **Expected effects on safety:** Quantitative assessment of the likely impact of the measure on accidents or accident-contributing risk factors.
- **Evaluation of effects:** Actual impact of the measure on accidents or accident-contributing risk factors.
- **Costs and benefits:** Assessment and comparison to alternative measures.
- **Acceptance:** Public, policy maker, and user / driver acceptance.
- **Sustainable effects:** Commitment to the continued use of the measure, long-term effects.
- **Transferability:** Applicability on a wider scale, within and across countries.

**Part 3: Specific description criteria** are assessed in part 3 of the questionnaire. This part is specific for each category, you will find more detailed information in the questionnaires.

**Resume:** Summary of why the measure is proposed as Best Practice.

#### CATEGORIES

⇒ Here, the **table with categories, subcategories, examples, exclusion examples and criteria** will be provided. Each category is linked to the respective questionnaire.

## STEP 2: QUESTIONNAIRE

### PART 1: GENERAL BACKGROUND INFORMATION (ALL CATEGORIES)

#### NAME OF THE MEASURE

- Please give the name of the measure as it is called in your country, and a common English name of the measure:

#### CLASSIFICATION OF THE MEASURE

- This measure has been classified as:

*[the classification (selected in the first step) will be repeated here to make sure that the correct questionnaire is being filled out; the answer boxes for "OK" and "not OK" will be linked to the rest of the questionnaire and the classification grid, respectively]*

- This is:                      OK (continue questionnaire):

Not OK (return to classification grid):

#### DESCRIPTION OF THE MEASURE

- Please give a short description of the measure.

#### CAN OR SHOULD THE MEASURE BE COMBINED WITH OTHER MEASURES TO OPTIMISE THE IMPACT?

##### WHICH MEASURES ARE THESE?



**INFORMATION SOURCE AND CONTACTS**

- Please give relevant references to the measure, e.g. web-sites or reports.

....

- Please give information about the institution / organization that is responsible for the measure, and contact information (name of the institution, e-mail, telephone number):

....

**IMPLEMENTATION OF THE MEASURE**

- **When** was the measure implemented?

....

- **Status of implementation:** What is the current status (e.g. fully implemented, partly implemented, implementation under progress)?

....

- **Duration of the measure:** Is the measure implemented permanently / once or for periods / in intervals / as a pilot scheme / ...?

....

- **Level and density of implementation:** At what level and in which density is the measure implemented (e.g. number of units on national / regional / local / ... level)?

....

- How long does it **take to implement** the measure (e.g. may be implemented immediately, in 5 years, long term)?

....

- When can (90% of the) effects be expected (e.g. immediately, in 5 years, long term)?

....

**IN WHICH OTHER EUROPEAN COUNTRIES IS THE MEASURE CURRENTLY IN USE OR AVAILABLE?**

- Please give information, if available.

....

**WHO IS RESPONSIBLE FOR THE MEASURE?**

- Responsibility refers to implementation, enforcement, incentives to use the measure, and activities related to the measure.

*E.g.: Legal form of implementing body/bodies, international organisation, authority, industry, NGOs, others.*

#### WHAT IS THE LEGAL BACKGROUND FOR IMPLEMENTATION OF THE MEASURE?

- Legal background includes laws, directives, norms, certificates, incentives, voluntary measures.

## PART 2: GENERAL DESCRIPTION CRITERIA

In this part of the questionnaire, the safety measure will be assessed by 8 general description criteria. This part is identical for all categories.

If a criterion is not applicable to your measure, please answer "not relevant", and give a short explanation why the criterion is not applicable.

### Focus of the measure

The focus of a safety measure is the **road safety problem** the measure is intended to solve. It may be a specific type of accident, a type or group of road users, or a type of accident location. Some measures may be more general.

#### WHAT IS THE FOCUS OF THE MEASURE?

Please specify the focus of the measure in terms of **at least one** of the following aspects.

If the focus is a **combination** of factors (e.g. group of road users with specific type of accident), you can describe the focus under both aspects, or under the aspect that seems most important. (*If you are uncertain, it may be helpful to look at question "2. Size of the road safety problem"*).

- **Accident types**, specified by type of collision, condition under which the accident occurs, or type of vehicle involved in the accident:

*E.g.: Single accidents, side collisions, animal collisions, head-on-collisions, night time-accidents, accidents on wet roads, accidents involving heavy trucks, accidents in working zones.*

- **Road users**, specified by personal or demographic characteristics (e.g. age, sex, length of licence ownership, car- or truck driver) or by certain types of behaviour (e.g. speeding, driving under influence, traffic violations):

*E.g.: Children, inexperienced drivers, old people, drunk drivers, drivers not using seat belts, speeding drivers.*



- **Accident locations:** Specified by road category, type of intersection, driving conditions, or other characteristics of accident locations.

*E.g.: highways, acceleration lanes, rural roads, urban areas, roundabouts, pedestrian crossings, roads or location with specific characteristics, slippery roads.*

.....

- **Vehicles:** Specified by adaptations to vehicles, prevention of unsafe participation in traffic, other modes/vehicle category, etc.

*E.g. adaptations to (the use of) heavy vehicles, passenger cars, mopeds, bicycles.*

.....

- **Unspecified / all accidents:** If a specific focus cannot be defined, please give a short explanation.

.....

#### HOW DOES THE MEASURE AFFECT ACCIDENTS?

- Please describe the **mechanism** by which the measure has an impact on the specified focus. If available, please refer to relevant **theoretical background** or empirical **studies**.

*E.g.: Avoidance of skidding due to improvement of vehicle dynamics, reduction of exposure, improvement of skills, change of attitudes, decrease of impact (air bag).*

.....

- **Source/s:** Please make clear whether the information is based on: empirical evidence (published / unpublished), expert opinion, own considerations etc. In case of published studies, please give full reference.

.....

#### Size of the road safety problem

In a first step we would like to know how large the focus of the measure is. In a second step we would like you to describe the risk of accidents, fatalities, and severe injuries within the focus of the measure.

#### HOW LARGE IS THE FOCUS OF THE MEASURE?

Please give your assessment according to the specified focus of the measure. If a quantitative assessment is not possible, please give an estimation and explain the rationale.

- **Accidents:** If a type of accident is the focus of the measure, what is the **proportion** of the specified type of accident, relative to all accidents?

*E.g.: "X% of all accidents are head-on-collisions."*

*E.g.: "X% of accidents occur on slippery roads."*



....

- **Source/s** (Accidents): Please make clear whether the information is based on: empirical evidence (published / unpublished), expert opinion, own considerations etc. In case of published studies, please give full reference.

....

- **Road users:** If a type or group of road users is the focus of the measure, what is the **proportion** of the specified type of road users, relative to all road users. If possible, also include **exposure** data in your answer.

*E.g.: "X% of all driving license holders are over Y years old."*

*E.g.: "X% of all vehicle kilometres travelled (VKT) are driven by professional drivers of trucks over 20t."*

*E.g. "X% of road users do not use seat belts, exceed speed limits, are fined more than twice a year...."*

....

- **Source/s** (Road users): Please make clear whether the information is based on: empirical evidence (published / unpublished), expert opinion, own considerations etc. In case of published studies, please give full reference.

....

- **Locations:** If a type or group of accident location is the focus of the measure, what is the **proportion** of this type of location relative to the whole road net (in terms of km or vehicle kilometres travelled), or relative to other variants of this type of location.

*E.g.: "X% of all roads in this country are rural roads."*

*E.g.: "X% of all VKT are travelled on rural roads."*

*E.g.: "X% of all motorway crossings are designed as cloverleaves."*

....

- **Source/s** (Locations): Please make clear whether the information is based on: empirical evidence (published / unpublished), expert opinion, own considerations etc. In case of published studies, please give full reference.

....

- **Vehicles:** If the measure focuses on a specific group of vehicles (or how these vehicles are used), what is the proportion of the specified type of vehicle, relative to all vehicles. If possible, also include exposure data in your answer.

*E.g.: "in X% of all accidents, a heavy vehicle is involved."*

*E.g. "the share of moped kilometres is X% of all kilometres travelled, while the share of moped accidents with fatalities/injuries is Y%"*

*E.g. "X% of heavy vehicles is not equipped with blind spot mirror."*

....

- **Source/s** (Vehicles): Please make clear whether the information is based on: empirical evidence (published / unpublished), expert opinion, own considerations etc. In case of published studies, please give full reference.

....

- **Unspecified focus / all accidents as focus of the measure:**

....

- **Source/s** (Unspecified focus): Please make clear whether the information is based on: empirical evidence (published / unpublished), expert opinion, own considerations etc. In case of published studies, please give full reference.

....

#### WHAT IS THE ACCIDENT RISK WITHIN THE FOCUS OF THE MEASURE?

The definition of accident risk varies, depending on the specified **focus**:

- **Accidents:** If a specific type of accidents is the focus of the measure, please give information about

the probability of the accident being **fatal**

the probability of the accident having **serious injuries** as a consequence.

If possible, relate these risks to **other** types of accidents.

*E.g.: "X% of all side-collisions are fatal, Y% of all side-collisions result in serious injuries. The risk of being fatal is Z times higher for side-collisions than it is for frontal collisions."*

*E.g.: "Night-time accidents have X times higher risk of being fatal than daytime accidents."*

....

- **Source/s** (Accidents): Please make clear whether the information is based on: empirical evidence (published / unpublished), expert opinion, own considerations etc. In case of published studies, please give full reference.

....

- **Road users:** If a group of road users is the focus of the measure, please give information about

the probability of an **accident** within this group of road users,

the probability of a **fatal** accident within this group of road users,

the probability of a **severe injury** accident within this group of road users.

If possible, relate these risks to **other** groups of road users.

*E.g.: "The risk of being involved in a fatal accident for inexperienced drivers is X."*

*E.g.: "Young and inexperienced drivers have X times higher risk of being involved in an accident than experienced drivers, who are aged over 20 and have minimum 2 years unrestricted driving licence."*

*E.g.: "Professional drivers have X times higher risk of being involved in an accident due to sleepiness than non-professional drivers."*

*E.g.: "Drivers not using hands free mobile phones have X times higher risk of being involved in an accident than drivers using hands free mobile phone."*



....

- **Source/s** (Road users): Please make clear whether the information is based on: empirical evidence (published / unpublished), expert opinion, own considerations etc. In case of published studies, please give full reference.

....

- **Locations:** If a specific type accident location is the focus of the measure, please give information about

- the probability of an **accident** at this type of accident location,
- the probability of a **fatal** accident at this type of accident location,
- the probability of a **severe injury** accident at this type of accident location.

If possible, relate these risks to **other** types of accident location.

*E.g.: "On ramps of grade-separated junctions without an acceleration lane, the accident risk is X accidents per million vehicle km travelled. The risk of a fatal accident is Y, and the risk of a severe injury accident is Z accidents per million vehicle km travelled."*

*E.g.: "X% of all fatal accidents happen on rural roads in areas with low population density."*

....

- **Source/s** (Locations): Please make clear whether the information is based on: empirical evidence (published / unpublished), expert opinion, own considerations etc. In case of published studies, please give full reference.

....

- **Vehicles:** If a group of vehicles is the focus of the measure, please give information about

- the probability of an **accident** for this group of vehicles,
- the probability of a **fatal** accident for this group of vehicles,
- the probability of a **severe injury** accident for this group of vehicles.

If possible, relate these risks to **other** groups of vehicles.

*E.g.: "The risk of being involved in a fatal accident for trucks is X."*

*E.g.: "The risk of being involved in accidents is X times higher for moped riders than for cyclists."*

....

- **Source/s** (Vehicles): Please make clear whether the information is based on: empirical evidence (published / unpublished), expert opinion, own considerations etc. In case of published studies, please give full reference.

....

- **Unspecified focus / all accidents as focus of the measure:**

....

- **Source/s** (Unspecified focus): Please make clear whether the information is based on: empirical evidence (published / unpublished), expert opinion, own considerations etc. In case of published studies, please give full reference.

## Expected effects

### WERE THE EFFECTS OF THE MEASURE ESTIMATED BEFORE IT WAS IMPLEMENTED?

- Yes or No? If yes, how and by whom where the effects estimated?

- **If yes**, what were the expected effects?

- **Source/s**: Please make clear whether the information is based on: empirical evidence (published / unpublished), expert opinion, own considerations etc. In case of published studies, please give full reference.

- If effects were estimated, was this assessment **taken into account in decisions** concerning the measure?

## Evaluation of effects

Evaluation of effects refers to the effects on numbers, types or proportions of **accidents, fatalities or severe injuries**, on **risk factors** that are known to contribute to accidents, and on **side effects** of the measure.

### HOW DOES THE MEASURE AFFECT ACCIDENTS IN TERMS OF REDUCED NUMBERS OF ACCIDENTS, FATALITIES OR SEVERE INJURIES?

- Please give information about the effects of the measure, preferably from **empirical studies**. If a quantitative assessment is not possible, please give an estimation and explain the rationale or the source of the estimation.

- Please give **background information** about the evaluation of effects of the measure on accidents, fatalities, and severe injuries. The summary should include

a description of how the effect has been **calculated** (e.g. accident counts, indirect measure),

information about the **type of study** (e.g. accident analysis, accident statistics, observational studies, survey)



information about the **design of the study** (e.g. control group, duration of before and after periods),

If the measure is a **part of a larger measure**, if road safety effects were evaluated separately.

Please also make a short comment on the **quality** of the study, especially about possible confounding factors.

*E.g.: "Study X estimated a reduction of the total number of accidents in urban areas by Y%"*

*E.g.: "Based on the evaluation, X% of all accident fatalities are expected to be avoided by the measure. Y% of all fatal accidents will not be avoided but have less serious consequences (severe or light injuries), due to (...)"*

....

- **Source/s:** Please make clear whether the information is based on: empirical evidence (published / unpublished), expert opinion, own considerations etc. In case of published studies, please give full reference.

....

**HOW DOES THE MEASURE AFFECT ACCIDENTS IN TERMS OF REDUCED ACCIDENT-CONTRIBUTING RISK-FACTORS?**

- Please give information about effects of the measure on accident-contributing factors (e.g. changes in behaviour or attitudes, traffic offences, exposure, traffic conditions), preferably from **empirical studies**. The summary should include information about

the type of **contributing factor**, and why, how, and to what degree it contributes to accidents,

the **design** of the study (e.g. control group) and how the effect has been calculated, and a comment on the **quality** of the study, especially about possible confounding factors.

....

- **Source/s:** Please make clear whether the information is based on: empirical evidence (published / unpublished), expert opinion, own considerations etc. In case of published studies, please give full reference.

....

**ARE ANY POSITIVE OR NEGATIVE SIDE EFFECTS OF THE MEASURE EXPECTED OR WITNESSED?**

- Side-effects can be expected or unintended. Unintended side effects include positive and negative effects on accidents or behaviour which are not specifically within the focus of the measure. Side effects also include those not directly related to traffic safety (i.e. health, environment). Please describe the side-effects and whether they were expected or not.

....

- **Source/s:** Please make clear whether the information is based on: empirical evidence (published / unpublished), expert opinion, own considerations etc. In case of published studies, please give full reference.

....

## Costs and benefits

Please give a summary of the costs and benefits of the measure in your country.

The analysis may be based on empirical results or on estimations. If a quantitative assessment is not possible, please give an estimation and explain the rationale or the source of the estimation.

Please describe precisely, what types of costs / benefits you are referring to, how they are related to the measure, and how they have been computed.

### WHAT COST ARE ASSOCIATED WITH THE MEASURE?

- Costs in **financial** terms: e.g. investments, maintenance costs, enforcement costs, reward systems, administration costs, long-term costs (ecological or social costs). Please specify **type** and **amount** of financial costs associated with the measure.

....

- Source/s:** Please make clear whether the information is based on: empirical evidence (published / unpublished), expert opinion, own considerations etc. In case of published studies, please give full reference.

....

- Who** bears the financial costs of the measure (e.g. user group, state government)?

....

- What **other types of costs** are there, for example ecological or social consequences, mobility, etc.?

....

- Source/s:** Please make clear whether the information is based on: empirical evidence (published / unpublished), expert opinion, own considerations etc. In case of published studies, please give full reference.

....

### WHAT BENEFITS ARE ASSOCIATED WITH THE MEASURE?

- Benefits in **financial** terms, e.g. cost savings. Benefits include financial effects of reduced accident costs. Please specify **type** and **amount** of financial benefits, and specify the exact figures used in the analysis (e.g. the economic value attached to a saved live).

....

- Source/s:** Please make clear whether the information is based on: empirical evidence (published / unpublished), expert opinion, own considerations etc. In case of published studies, please give full reference.



....

- What **other types of benefits** are there, for example environmental or social effects, and traffic performance?

....

- **Source/s:** Please make clear whether the information is based on: empirical evidence (published / unpublished), expert opinion, own considerations etc. In case of published studies, please give full reference.

....

**WHAT IS THE BENEFIT-COST-RATIO FOR THE MEASURE IN YOUR COUNTRY?**

- What **benefit-cost ratio** is associated with the measure? Please specify if the computed ratio is a benefit-cost-ratio or a cost- benefit-ratio.

....

- How has the benefit-cost ratio been **calculated:** Based on which types of costs, types of benefits, relevant actors, timeframe etc. has it been computed?

....

- At which **stage of the implementation** of the measure has the benefit-cost analysis been conducted (before, during or after implementation)?

....

- How do you judge the **quality** of the benefit-cost analysis (e.g. if the effect is likely to be over- or underestimated, consideration of confounding factors)?

....

- **Source/s:** Please make clear whether the information is based on: empirical evidence (published / unpublished), expert opinion, own considerations etc. In case of published studies, please give full reference.

....

**HAS THE BENEFIT-COST-RATIO OF THIS MEASURE BEEN COMPARED TO THE BENEFIT-COST-RATIO FOR OTHER MEASURES AIMING AT REDUCING ACCIDENTS WITHIN THE SAME FOCUS?**

- If so, please give the benefit-cost-ratio for these measures.

....

- **Source/s:** Please make clear whether the information is based on: empirical evidence (published / unpublished), expert opinion, own considerations etc. In case of published studies, please give full reference.

....



## Acceptance

Acceptance of the measure includes **public acceptance, acceptance by road users, policy makers, and other stakeholders (e.g. automotive industry)**. It is related to attitudes and behavioural consequences of the measure, especially to willingness to apply the measure, or to comply. Other relevant issues can be political, legal, financial, technical and administrative aspects.

### TO WHAT DEGREE IS THERE ACCEPTANCE FOR THE MEASURE?

- If possible refer to empirical quantitative or qualitative **studies**. Information about public acceptance may be based on surveys, media, consumer and / or behaviour studies, decision-making processes (e.g. in parliament). Please include information about the type and design of the study. In the absence of such a study, what is the perceived level of acceptance of the measure?

....

- **Source/s:** Please make clear whether the information is based on: empirical evidence (published / unpublished), expert opinion, own considerations etc. In case of published studies, please give full reference.

....

### HAS ACCEPTANCE BEEN TAKEN INTO ACCOUNT IN THE PLANNING AND IMPLEMENTATION PROCESS?

- At which stages of implementation (before, during or after) has acceptance been measured? Has there been public participation in the planning / implementation process?

....

## Sustainability

Sustainability includes **long-term effects** and **changes of effects** over time. Effects are considered to be sustainable when the effect is permanent and does not decrease over time.

### TO WHAT DEGREE ARE THE EFFECTS OF THE MEASURE EXPECTED TO BE SUSTAINABLE?

- The assessment can be quantitative or stated in qualitative terms. It can be based on
  - a **study** of earlier similar measures: if so, please provide a short description and source,
  - a scientific **analysis**: if so, please provide a short description of the scientific basis, or
  - an assessment of **contributing factors** (factors necessary to achieve and maintain the effectiveness) to its effectiveness (e.g. commitment to make use of the measure, requirement of police enforcement, skill improvement, risk compensation, exposure effects, public support, quality assurance, continuous monitoring).



....

- **Source/s:** Please make clear whether the information is based on: empirical evidence (published / unpublished), expert opinion, own considerations etc. In case of published studies, please give full reference.

....

## Transferability

Transferability includes prospects for using the measure successfully in other **countries** or **regions**, or on a **larger scale**.

### TO WHAT DEGREE IS THE MEASURE TRANSFERABLE?

- If available, refer to studies of the measure in other countries, explicit comparison with other countries, and publications about the measure in other countries.

....

- **Source/s:** Please make clear whether the information is based on: empirical evidence (published / unpublished), expert opinion, own considerations etc. In case of published studies, please give full reference.

....

### WHICH FACTORS CONTRIBUTE TO THE TRANSFERABILITY OF THE MEASURE?

- Contributing factors include **conditions for the effectiveness** of the measure in other countries or regions, or on a larger scale, and **specific requirements** necessary which may be difficult to fulfil elsewhere.

*E.g.: "The measure can only be expected to be effective if it is combined with enforcement"*

*E.g.: "The effects of the measure within the focus are expected to be larger if measure Y is also implemented"*

....

- **Source/s:** Please make clear whether the information is based on: empirical evidence (published / unpublished), expert opinion, own considerations etc. In case of published studies, please give full reference.

....

### WHICH FACTORS LIMIT THE TRANSFERABILITY OF THE MEASURE?

- Limiting factors include potential **obstacles** for the effectiveness of the measure in other countries or regions, or on a larger scale.

....



- **Source/s:** Please make clear whether the information is based on: empirical evidence (published / unpublished), expert opinion, own considerations etc. In case of published studies, please give full reference.

....

**TO WHAT DEGREE CAN THE MEASURE BE EFFECTIVE FOR TYPES OF ACCIDENTS, GROUPS OF ROAD USERS, OR ACCIDENT LOCATIONS, OTHER THAN THOSE SPECIFIED AS THE FOCUS OF THE MEASURE?**

....

- **Source/s:** Please make clear whether the information is based on: empirical evidence (published / unpublished), expert opinion, own considerations etc. In case of published studies, please give full reference.

....

### PART 3: SPECIFIC PART (REHABILITATION AND DIAGNOSTICS)

#### Questions related to rehabilitation programs

HOW MANY INTERVENTION HOURS DOES THE PROGRAM CONSIST OF?

HOW MANY DAYS DOES THE WHOLE PROGRAM LAST?

IS PARTICIPATION IN THE PROGRAM MANDATORY OR OPTIONAL?

IS YOUR PROGRAM COMBINED WITH OTHER MEASURES?

- If yes, please describe the measure(s) as precisely as possible.

*E.g.: licensing management system like 2-phase-model of driver training or demerit point system*

*E.g.: incentives like early driver license restoration*

*E.g.: restriction like alcohol ignition interlock*

*E.g. sanctions like license revocation, imprisonment*

WHAT IS THE MAIN ELEMENT OF YOUR PROGRAM?

*E.g.: restriction (e.g. alcohol ignition interlock), training driving skills, training behavioural skills, analysis of psychological reasons for unsafe behaviour, medical treatment.*

WHAT ADDITIONAL ELEMENTS DOES YOUR PROGRAM INCLUDE?

*E.g.: restriction (e.g. alcohol ignition interlock), training driving skills, training behavioural skills, analysis of psychological reasons for unsafe behaviour, medical treatment.*

ARE ANY TESTS APPLIED DURING THE PROGRAM?

- Please specify the kind(s) of tests, e.g.: psychological tests, medical tests, knowledge tests) and the consequence of a negative result.



....

**IS THE PROGRAM ASSOCIATED WITH TESTING?**

- If so, is it applied before the program starts, during the program or at the end of the program?

....

**Questions related to programs based on diagnostics mainly**

**WHAT EVENT TRIGGERS YOUR PROGRAM FOR AN INDIVIDUAL DRIVER?**

*E.g.: age, driving history (offence or accident), report of medical doctors.*

....

**WHAT KIND OF TEST DO YOU APPLY?**

....

**IF YOUR TEST HAS BEEN TESTED FOR VALIDITY, WHAT WAS THE...**

- validity value:

....

- validity criterion:

....

**WHAT IS THE CONSEQUENCE OF A NEGATIVE TEST RESULT?**

....



## RESUME

### WHY SHOULD THE MEASURE BE INCLUDED IN THE LIST OF BEST-PRACTICE ROAD SAFETY MEASURES IN EUROPE?

- Please give a short statement about what qualifies the measure as “Best Practice” in Europe.