IRTAD SPECIAL REPORT

UNDERREPORTING OF ROAD TRAFFIC CASUALTIES

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The International Transport Forum

The International Transport Forum was created in 2007 by transforming the European Conference of Ministers of Transport (ECMT) into a global body with new mandates and a broader scope.

The Forum involves representatives of government and politics, business and industry, research and education. It is a broad forum of debate and discussion —the world-wide meeting point on transport, logistics and mobility. The highlight of the International Transport Forum's activities is its annual Meeting, where Ministers meet with key figures from industry and civil society to debate on a single topic of world-wide strategic importance

The founding Members of the Forum consist of 51 countries1, which were involved in ECMT as Full or Associate Members. Morocco is an Observer country. Other countries, such as China, India and Brazil.

The Joint Transport Research Centre

The Joint Transport Research Centre of the OECD and the International Transport Forum (previously the ECMT) was established on 1 January 2004. Its mandate is to promote economic development and contribute to structural improvements of OECD and ECMT economies, through co-operative transport research programmes addressing all modes of inland transport and their intermodal linkages in a wider economic, social, environmental and institutional context.

The main strategic themes of the JTRC are:

- Transport infrastructure
- Transport operations
- Transport safety and security
- Environmental costs and sustainability
- Globalisation, trade and spatial effects of transport.

The IRTAD Group and the IRTAD database

The International Traffic Safety Data and Analysis Group (IRTAD) is a permanent working group of the Joint Transport Research Centre. Its main objectives are 1) to manage the IRTAD database on international road traffic and accident data and 2) to undertake analysis of road safety data on a wide range of topics.

The IRTAD database is an aggregated database on road traffic and accident. It contains around 500 variables (on fatalities, injury accidents provides researchers and policymakers data, aggregated by country and year, on on traffic and accident and offers the opportunity to compare various international road safety data, such as casualties, and other related information, such as seatbelt or helmet wearing rates.

[1] The 51 founding members of the Forum are: Albania, Armenia, Australia, Austria, Azerbaijan, Belarus, Belgium, Bosnia Herzegovina, Bulgaria, Canada, Croatia, Czech Republic, Denmark, Estonia, Finland, France , FYR Macedonia, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Italy , Japan, Korea, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Mexico, Moldova, Montenegro , Netherlands, New Zealand, Norway, Poland , Portugal, Romania , Russia, Serbia, Slovakia, Slovenia, Spain , Sweden, Switzerland, Turkey, Ukraine , United Kingdom , United States.

FOREWORD

Because reporting rates in the various countries are not equal, comparison safety data between countries can be difficult. Underreporting has been an acknowledged problem for many years, as described in an IRTAD special report written by Mr. H. Hvoslef for IRTAD in 1994. In spite of this report – and several other studies done on the same subject – most countries continue to record only the number of *reported* casualties.

In the IRTAD 2005-06 Programme of Work, it was decided that a new special report should be written on underreporting, elaborating on Mr Hvoslef's original conclusions. The report is defined in the work programme as follows:

> *"The new report intends to look at the problem from a different angle: it is necessary to have a better assessment of the real number of road crash casualties to make international comparisons on road traffic safety more accurate and to assess the costs involved. In this way, road traffic safety can receive the political attention it deserves."*

Part of the study was based on responses to a questionnaire sent to all IRTAD members. The aim of the questionnaire was to collect information on this subject in each country.

The report should help to encourage IRTAD members and other road administrators to make progress in estimating the real volume of traffic casualties. This can help to prioritise road traffic safety on a national and international scale.

This report was prepared by Mr Harry Derriks (AVV, Netherlands), Dutch Member of the IRTAD Group, and Mr Peter Mak (AVV, Netherlands). It was presented at the 3rd IRTAD Conference held in November 2006 in Brno (Czech Republic).

ABSTRACT

This report on *Underreporting of Road Traffic Casualties* is a follow-up of the 1994 IRTAD Special Report on "Underreporting of road traffic accidents reported by the police at the international level".

The report highlights the need to assess the real magnitude of the road safety issues, which requires having a better understanding of the real volumes of road traffic casualties.

Based on a questionnaire sent to all IRTAD members, this report reviews the known causes of underreporting and the experience of the 22 responding countries to assess the magnitude of underreporting and suggests a method to estimate the rate of underreporting. Finally it provides a set of recommendations to improve the data reporting mechanism.

This paper is intended to create a larger awareness of underreporting, and to generate a greater understanding of the opportunities available to gain more insight into the actual volumes involved

1. Introduction

In most countries road traffic accidents are recorded. A record system is vital in the understanding of road "unsafety" and development of effective countermeasures. The accident databases are based mostly on information from police accident reports. By means of these databases, each country can gain more insight into the circumstances and causes of accidents. Another advantage of their use is the insight provided on the number of accidents and casualties. It is known, however, that in many countries accident reporting is not complete and so the real number of casualties cannot be calculated.

This need not be an issue if we have sufficient knowledge about the underreporting. Ignoring it is not an option. If underreporting goes unrecognized, the magnitude of any road traffic safety problems are not known, or are seriously underestimated. This could lead to incorrect prioritising, or to less efficient or inappropriate countermeasures.

The issue of underestimation, in spite of being known about for many years, does not receive enough attention. This paper is intended to create a larger awareness of underreporting, and to generate a greater understanding of the opportunities available to gain more insight into the actual volumes involved.

With this paper we hope that, within a few years, real data on fatalities and, at the very least, the number of hospitalised persons (instead of the number of reported accidents) will be made public and available to all road administrators for the largest number of countries.

For estimations of the real volumes it is not necessary to have all accidents reported by the police. By using other sources, such as cause of death statistics and medical and insurance databases, it is possible to get a more accurate assessment. These additional databases can also provide supplementary information on accidents or the outcome of an accident, including the types and severity of injuries.

1.2. Objectives of this report

In 1994, the IRTAD report "Underreporting of road traffic accidents reported by the police at the international level" was presented to IRTAD members. At the 29th meeting of the IRTAD working group in Warsaw, in August 2003, the Underreporting was one of the items discussed within the framework of the IRTAD Working Programme for 2004-06, as part of "the strategies to improve the use of the database".

In the IRTAD special report "The availability of hospitalised Road User Data in OECD Member countries" (IRTAD, 2003) it was recommended that estimation protocols should be designed via the number of hospitalised, and that knowledge should be shared on how to produce these estimates.

The report presented here is follow-up of the 1994 report. It indicates the necessity of constant policy attention to road safety throughout the world based on the real magnitude of the problem.

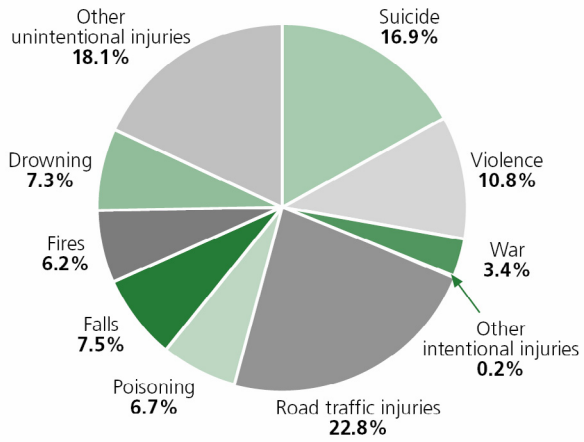
1.1 World scope and the magnitude of the road safety problem

The World Health Organisation (WHO) has emphasised the importance of international attention to road safety. The number of traffic fatalities worldwide is estimated to be around 1.2 million per year, and the number of people injured in traffic accidents at around 50 million (WHO, 2004).

Because of the apparent under-registration of traffic accidents globally, these estimates need to be improved. In addition, the figures on fatalities, hospital injuries, slight injuries and material damage require extra attention, since no sufficient worldwide estimation is available.

Road safety is a major public health problem. Each year, around 1.2 million people die in the road traffic system (around 3 000 per day) and more than 50 million are injured worldwide. About 2% of all deaths are related to traffic injuries and about 23% of all injury deaths are caused by traffic accidents (WHO, 2004, chapter 2). Globally, there is a factor of around 40 between the number of injuries and the number of fatalities. This figure can differ significantly from one country to another. In Czech Republic it is 25 and in the Netherlands, one of the safest countries in Europe, the factor is about 110. It seems quite likely, therefore, that in some countries the number of injured is an underestimation of the actual figure.

Figure 1. Distribution of global injury mortality by cause



Source: WHO (2004)

In 1990, road traffic fatalities (expressed in *disability adjusted life years* – DALYs) were the ninth cause of the global burden disease. Due to the predominantly young age and high number of traffic victims, the years lost through premature death are huge.

In spite of a decrease in fatality numbers in high income countries, the forecast is that road traffic injuries will rank third in DALYs by the year 2020 (Road Safety is No Accident; brochure for World health day 2004).

Table 1. Change in rank order of DALYs for the 10 leading causes of the global burden of disease

	1990		2020
Rank	Disease or injury	Rank	Disease or injury
1	Lower respiratory infections	1	Ischaemic heart disease
2	Diarrhoeal diseases	2	Unipolar major depression
3	Perinatal conditions	3	Road traffic injuries
4	Unipolar major depression	4	Cerebrovascular disease
5	Ischaemic heart disease	5	Chronic obstructive pulmonary disease
6	Cerebrovascular disease	6	Lower respiratory infections
7	Tuberculosis	7	Tuberculosis
8	Measles	8	War
9	Road traffic injuries	9	Diarrhoeal diseases
10	Congenital abnormalities	10	HIV

DALY: Disability-adjusted life year. A health-gap measure that combines information on the number of years lost from premature death with the loss of health from disability.

Source: WHO (2004), Chapter 1

The European Council of Ministers of Transport (ECMT) in Bucharest in 2002 unanimously adopted a common quantitative target for all member countries to reduce the 2000 road fatality level by 50% by 2012. Similarly, the European Commission agreed on a target of 50% reduction in the number of road fatalities by the year 2010, compared to 2001. As well, as shown in Table 2, many countries give high priority to road traffic safety, with ambitious targets set for the upcoming years.

Table 2.National targets in OECD/ECMT member countries

Country	National Target
Australia	-40% in fatals/100k popn by 2010 compared to 1999
Austria	-50% in fatal by 2010 compared to 1998-2000 -20% in inj by 2010 compared to 1998-2000
Canada	-30% in fatal/serious inj by 2010 + many sub targets
Denmark	- 40% in fatals by 2012 compared to 1998 -40% injured persons by 2012 compared to 1998
Finland	Less than 250 fatalities by 2010 Less than 100 fatalities by 2025
Great Britain	-40 % in fatal/serious inj by 2010 + many sub targets
Hungary	- 30% in fatal/injuries by 2010 -50% in fatal/injuries by 2015
Ireland	-25% in fatals by 2006 compared to 1998-2003
Japan	- 40% in fatals by 2012 compared to 2002
Korea	-35% in fatals by 2006 compared to 2002
Malta	-50% in fatals by 2014 compared to 2004 -50% in injury accidents by 2014 compared to 2004
Mexico	-27% in fatalities by 2015 compared to 2002
Netherlands	Less than 580 fatalities by 2020 (-28% compared to 2004)
New Zealand	- 33% in fatalities by 2010 + sub targets
Norway	-30% killed and seriously injured by 2015 compared to 2004
Romania	-20% by 2008 compared to 2002
Spain	-40% in fatalities by 2008 compared to 2003
Sweden	-50% in fatalities by 2007 compared to 1996
Switzerland	-50% in both fatalities and serious injuries by 2010 compared to 2000
United States	-40% in fatals/billion VKT by 2008

Source : OECD (to be published)

The social costs of all these road crashes and personal harms costs the society about US$ 518 billion every year (see table 1.3). For this reason the UN and the World Health Organisation (WHO) pleads for effective and sustainable road traffic safety policies.

Table 3. Road crash costs by region

Road crash costs by region

Region[a]	GNP, 1997 (US$ billion)	Estimated annual crash costs	
		As percentage of GNP	Costs (US$ billion)
Africa	370	1	3.7
Asia	2 454	1	24.5
Latin America and Caribbean	1 890	1	18.9
Middle East	495	1.5	7.4
Central and Eastern Europe	659	1.5	9.9
Subtotal	5 615		64.5
Highly-motorized countries[b]	22 665	2	453.3
Total			517.8

GNP: gross national product.

[a] Data are displayed according to the regional classifications of the TRL Ltd, United Kingdom.

[b] Australia, Japan, New Zealand, North America, and the western European countries.

Source: WHO (2004), Chapter 2

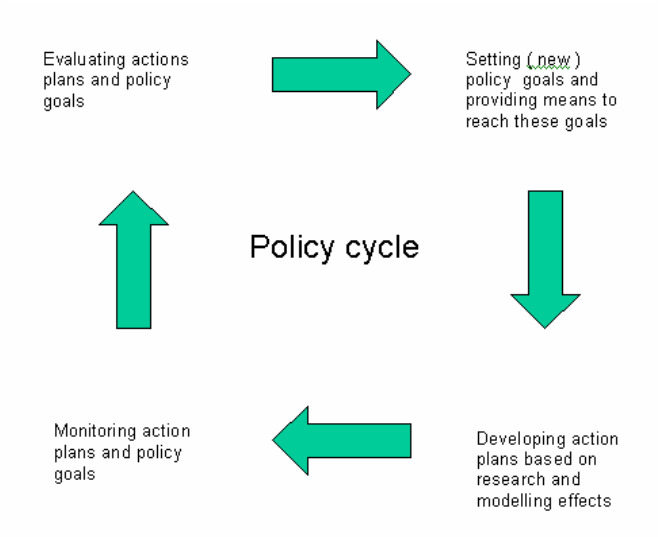
2. Why are Real Accident and Casualty Numbers Important?

2.1. The need for real numbers for proper measures

As in many other countries, the Netherlands contributes an ample amount of money to keeping road traffic safe. Policies are set by politicians who must be fed by policy-makers and the Road Authorities using real road accident figures. Measures to monitor the progress or decline of effectiveness, are considered every year, or at least at every change of government.

This requires a so-called “policy circle” approach.

Figure 2. Policy cycle to monitor the progress of road safety programmes



Thus, every year the latest figures are presented to policymakers and politicians to help adjust, if necessary, measures to fight effectively the still too-high number of casualties in road traffic.

"Target setting" or setting goals is a crucial step in the policy cycle. It is understood that setting a goal makes it easier to achieve a target, and the policy cycle is successful in its consecutive steps towards road safety. Reports from SWOV in the Netherlands indicate that "target setting is effective for realising road safety measures".

STEP 1: After setting the policy goals, it is necessary to develop action plans based on the means provided by the government and interest organizations (the providing of means is sometimes presented as an independent step in this policy cycle).

STEP 2: Following the development of such action plans is the carrying out of various projects, activities, campaigns, etc. This requires organisations employing skilled people with the tools and experience.

STEP 3: Monitoring of the output of these organizations is the next step in the policy cycle, in which detailed information is gathered, for example on the number of injured people, the number of road accidents on rural roads and (crucial to the next step) the direct effect of certain actions in everyday practice.

STEP 4: In the last step of the policy cycle – called evaluation – action plans in practice are confronted with the effects and the goals set by the policy makers. Once results are evaluated in quality and quantity, policy makers then have to decide whether or not they are satisfied with these results.

Accident data collection plays an important role in several phases of the policy-cycle. First in the problem identification, secondly in the research phase, digging into underlying accident causes, third in the phase of forecasting effects of possible countermeasures, fourth in the monitoring phase and finally in the evaluation phase. Specific information is needed in all these phases. For example, during research information, all three phases are required: pre-crash, crash and post-crash aspects.

2.2 Road safety: a qualitative or quantitative problem?

It is clear that the more data in respect of certain problems are available, the more likely your analysis will be correct. As a result, action plans to improve road safety will be more effective. But there is an optimum between the amount of research and analysis invested and the effects of the action plan harvested.

In order to reach the goals set by the policy makers to improve road safety, it is important to have a clear insight into the different aspects of road safety: Which roads are safe and which roads are not? Which people need what facilities on what roads to drive safely? Which age categories are more at risk than others, and why? From this angle, road safety is very much a qualitative problem.

There are other qualitative aspects. For example, errors made during registration. Reporting the wrong "end result" of an accident might lead to underestimation of hospitalised casualties or – if the wrong "means of transport" has been recorded – to wrong priorities in measures.

However, in order to compare the political urgency of road safety to other policy themes (e.g. environmental problems, poverty, social development, health care, sports and cultural development) it is important to know the size and extent of the road safety problem. To draw political attention to a problem requires insight into the real volume of the problem. Looking at the road safety issue this way, it is also a quantitative problem.

2.3 Insight into the real volumes of traffic casualties.

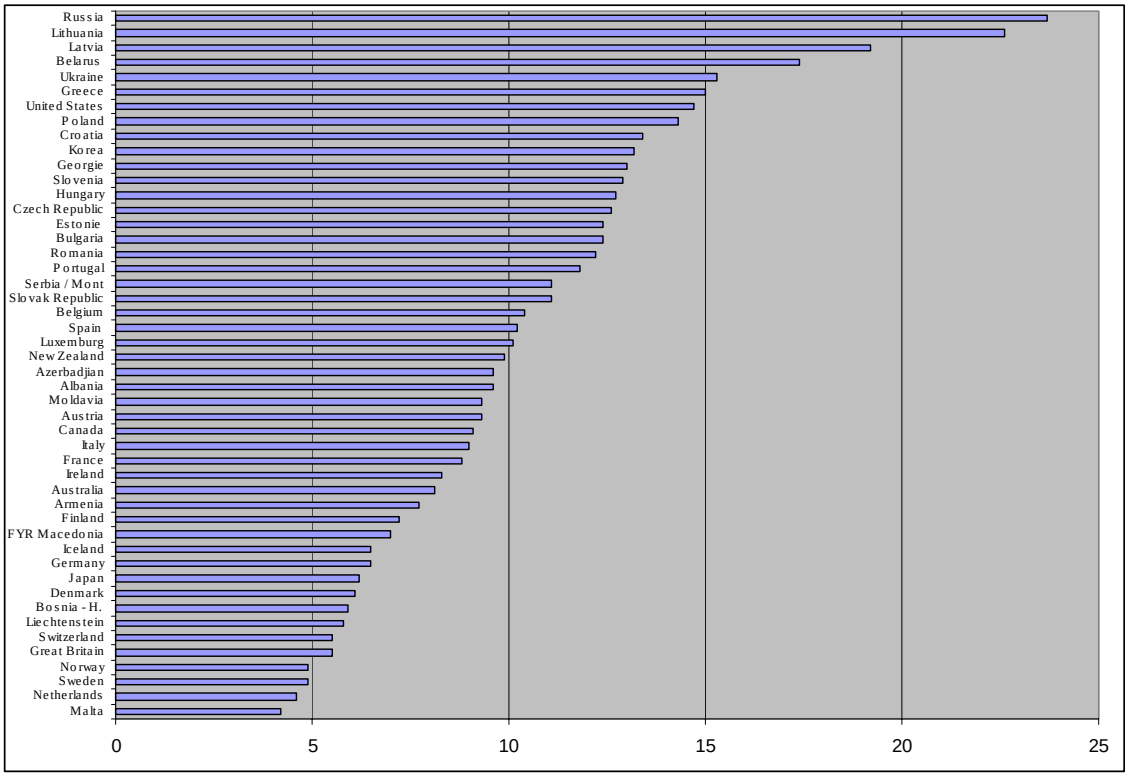
A real insight into the number of fatalities, injuries and accidents is needed in order to assess the actual magnitude of the road safety problem and to give it the correct national priority. Road safety is also a health problem. Therefore the number of people who have died or been injured in traffic should be comparable with other death and injury causes. To make this comparison in relation to other causes of death possible, the real numbers are essential.

The influence of road safety on the quality of life as well as the material damage caused by accidents, leads to societal costs. To estimate the societal costs, the real volume of victims and accidents are required. (If the societal costs are underestimated, the cost benefit ratios of measurements will also be higher and investing in road safety will appear less cost-effective).

Traffic accident data are often compared between countries and between regions. These comparisons are done in numbers of casualties, but also in relation to the number of inhabitants (a measure of national health risk), the number of vehicle kilometres driven (a measure of the transport risk) as well as the number of cars in a country, etc. For a reliable comparison the real volumes should be used (rather than recorded numbers with different recording rates).

For a monitoring purpose, it not always necessary to have the real volumes if the registered numbers are stable and representative in time. However, this is not always the case. For instance, some types of road users (bicyclists, pedestrians) are less likely to be recorded when hospitalised than other road users. This can lead to wrong priorities (for example, not enough attention to vulnerable road users because this type underreporting is higher than the average underreporting). Also time series are influenced by yearly registration degree. For that reason evaluation studies on specific topics are not always possible because of unstable registration and the bias in the registration.

Figure 3. Fatalities per 100 000 population in OECD and ECMT countries



Source: OECD/IRTAD and ECMT

3. Known Causes of Underreporting

3.1 Reporting Systems

It is useful to monitor the process for each phase in the policy cycle. A comparison of numbers and types of measures – either planned or in operation – is quite easy. In the end, the most important indicator is the number of lives saved or accidents prevented

These policy processes take place not only at national level, but also at regional and local levels.

To monitor all these interrelated processes require objective figures as well as address data sources. In most OECD countries police reports and accident-related data sources are used in addition to other data sources. This aspect will be discussed later in the report.

a) Police registration

In more than 90% of the countries, accident registration is based on police registration. In general, the advantages of police registration are:

- Nationwide uniform registration

Every accident is registered in a uniform way. In general every country maintains one standardised registration form. Each country harmonises the interpretation of the pre-crash, crash and post-crash phase for its own situation, taking into account the responses from questionnaires.

- Independent judgement by the police

  The interpretation of the incident (perhaps an accident) is impartial. The only framework on this matter is the law. The information on the registration forms the basis for the judicial judgement on the question of guilt.

- Continuity means stability

  The continuity of the police reporting accidents is an advantage both in a qualitative and a quantitative way.

Registration by the police certainly has some other inclinations:

- Police attention to road safety

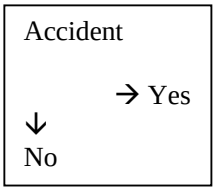
  Road safety within the Police organisation draws attention again towards policy levels rather than on the operational levels. This can vary a lot in different countries. The Police organisation as a whole contributes road safety a high priority and helps to reach stated goals. But on the operational level, specifically regarding the registration aspect, police officers on the streets do not always realize the importance of data collection with road accidents. Quite often data collection is associated with the burden of paperwork, administration, with fining someone, work for insurance companies etc.

- Stability of police registration

  No doubt changes in the registration process will occur. As well as the effect of such changes in the registration process (often very few changes occur), the reliability of the data changes too.

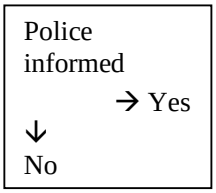
b) Registration process in detail

In order to come to a valid evaluation a closer look is needed at the registration process and the consecutive steps that may occur:

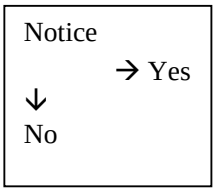


- There is an accident

  The first problem concerns the definition of a road accident? Road safety experts know exactly what the definition of a road accident is. However, the average traffic participant may not know, in fact not care, about this definition. A person involved in a road accident only knows that he needs the assistance of the Police or a paramedic.



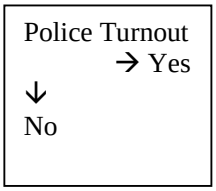
- An accident occurs and, depending on the severity of the accident, the police and/or emergency services are called. So, in some cases the police may not be informed.



- Reporting of the accident by persons involved.

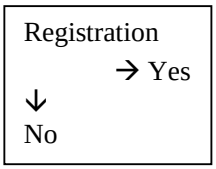
  If the police are informed, they will fill in a standardised form (if available).

  Second problem: though some countries have made reporting accidents a mandatory police task, underreporting is the case in most countries. (See: "Underreporting of road traffic accidents reported by the police at the international level", Norway 1994, with extensive background information on the actual process on incidents by police).



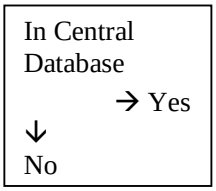
- Turnout by the Police

  Third problem: when an accident occurs, the police do not always come to the scene. Availability of police officers depends on other priorities demanding the instant attention of the police. Reporting of mandatory accidents plays a significant role. In The Netherlands, it is commonly accepted that the police is present at around 25% of all accidents (i.e. only 300 000 out of around 1 200 000 accidents). It was noticed, that in Sweden the distance between a police station and the accident site is of importance for the reporting rate, especially in the more northern areas.



- Registration at accident location

  Fourth problem: Police arrival at the scene is not necessarily followed by formal registration. The persons involved may state that they will coordinate the accident themselves and so administrative follow-up is left to them. They fill out an Insurance Accident Statement (EU-standard) to at least make sure that at least the financial aspects of an accident are covered. It may be that, due to lack of interest, the police will not record all the details of the accident, for example the cause of the accident or the specifics of the accident location.



- From registration to a central database

  Fifth problem: if and when an accident is finally registered on a form, it still needs to be processed into a database. This requires that the document is transmitted to the central database organisation. In general, each data entry involves (un)forced errors. Here, there are two important aspects:

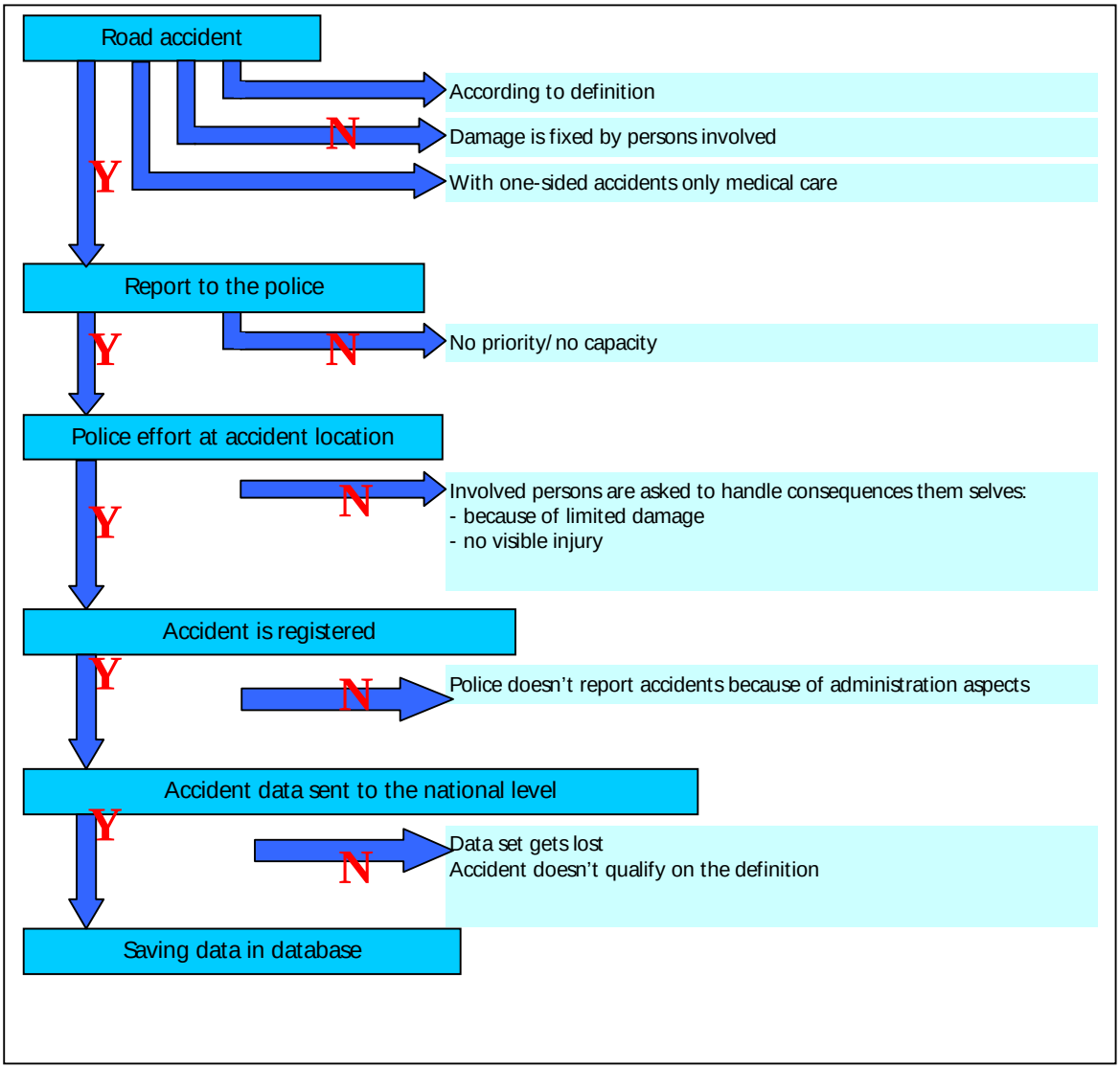
1. The accuracy of the police officer.
2. The fact that the person who fills out a form at the scene is not the same person who enters the data into a data base.

- From decentralised location to central location

  Sixth problem: accident data organised regionally needs to be re-organised at a central level and added from there to national information. This is no sinecure, especially in larger or multiform organised countries.

Figure 4 summarises the process below.

Figure 4. Registration process of an accident



c) Influencing political processes

It is important to recognise that this process is quite autonomous. At their level, police, participants in traffic, insurance companies, data processing organisations, etc cannot change this process drastically. Therefore the main target group for information on underreporting is the politicians and society. Increasingly, political considerations and decisions are based on cost/benefit studies. In any case, politicians and society are only interested in real volumes. When cost benefit-reports are based upon underreported numbers, cost benefit-rates are too low and consequently decisions tend to be faulty or ineffective. Some indication of underreporting should, in theory, be presented in such reports. A section of the IRTAD questionnaire on Underreporting refers to this aspect.

If we are to improve road safety, political attention needs to be focused on this matter. Costs-benefit studies are becoming more prevalent in political decisions. Societal costs, especially, deserve attention as, potentially, a great deal of these costs could be prevented.

Road safety and its consequences can also be expressed in costs. The societal costs of road safety are split by numbers of casualties, leading to an average cost per casualty. Similar exercises are carried out in many countries, with the application of this process varying widely and producing disparate costs.

For politicians and society, this method enables comparison between different countries, as well as between regions within a country. However it remains necessary to evaluate and improve these methods. So, benefits will occur in different dimensions of policy and its activities. For instance, an effective road safety policy will lead to lower medical and rehabilitation costs, less labour capacity loss and less insurance company costs. Taken together, this leads to a decreasing in future insurance premiums.

3.2. The essence of reporting on road safety

Obviously, the most important component in the calculation of these costs is the number of accidents, and even more importantly the numbers of casualties. To make computations possible, good information on the numbers of casualties and the societal costs of road safety is required. It is therefore important to know the differences in calculation methods used by the various countries. Using simply the methods of other countries is inappropriate do. Umbrella organisations in the medical industry, in the insurance industry, the automotive industry, the damage restore industry as well as population surveys could supply interesting data on road traffic safety costs. It is becoming increasingly relevant to compare these data sources in order to get a better result.

4. What do we know about underreporting within IRTAD member countries?

4.1. IRTAD Questionnaires 2004-2006

In 2004 and 2006 a two-fold questionnaire was forwarded to IRTAD members. In all, 22 countries responded. In the next sections we will focus on the results of the questionnaire.

General analysis of the responses to the questionnaires 2004-2006 sent to IRTAD members

All responding countries have a national road safety plan, some relatively new and others adopted many years ago. The long-term scope reaches towards 2025 and, not surprisingly, the main issues are the three E's (Engineering, Enforcement and Education), next to improvement of vehicles and infrastructure via technology and information and communication technology (ICT), as well as improvement of legislation.

A number of targets have been set up either at international level or national level. For example, the European Council of Ministers of Transport (ECMT) in Bucharest in 2002 unanimously adopted a common quantitative target for all member countries. The Council agreed to reduce the 2000 road fatality level by 50% by 2012. Similarly, the European Commission agreed on a target of 50% reduction in the number of road fatalities by the year 2010, compared to 2001. Targets can focus on a decrease in the number of fatalities and also on the number of injury accidents, hospitalised, etc.

The national societal costs of road accidents are well known to politicians throughout the OECD-countries. These societal costs are common in all countries though ways of calculating differ quite a lot.

One clear conclusion from the responses to the questionnaire is that there is a 50%-split between countries in terms of using police-reports for these computations. Other sources are mentioned in two-third of countries, which precedes the need for "more detailed insight" into the problem of underreporting of accidents in general.

Options are widely available for improving the use of both police records as well as other sources for examining the issue of underreporting (death statistics, hospital databases; etc.). Some three-quarters of all countries carry out studies on these elements. It has been shown that a minority of countries can actually define and describe the quality of their accident numbers, especially when discussing types of accidents and severity.

Legislation (in 4 countries) and formal procedures (in almost all others) are used to ensure the calculation processes remain stable over the years. Severe accidents (killed and hospitalised/ seriously injured) are commonly treated as more important than minor accidents, and highlighted in more detailed accident records in more than half of the countries. More than two-third of all countries think underreporting occurs during the process of recording road traffic accidents.

As previously stated, almost all countries rely on police-records for accident information. Some countries obtain their information directly from national police records, whilst others "add things up" themselves. Guarantees on the source of accident records are by means of Service Level Agreements(10-15%), Memoranda of Understanding (20-25%) and Gentlemen's Agreements (30+%), leaving some 50% for judicial means (law, etc.). Most countries have arranged a "no fee" agreement with their source(s) of accident data. Where any fee is agreed, it is usually a small sum.

Data on accidents comes in many different formats: both digital files (60+%) and paper sheets (some 25%) are widely found in the responding countries. Delivery periods are commonly set to once

a year (60+ %), although some countries are in “semi-real-time” (daily/weekly basis) in obtaining police accident records. General terms of delivery are not known, though file transfer via internet in a form of encryption, as well as “delivery at the end of each month” are mentioned in responses.

Only in one-fifth of the countries does the organisation in charge of road safety figures have a voice in defining the actual content of police records on road accidents, as well as in the process description of accident registration.

When asked to score their national road safety processes the responders scored 6.5 (in a scale from 1 to 10), whilst only one-quarter scored 8 or higher.

Comparisons through linkage of other data sources are done in 50% of countries, with the other 50% sticking to police-numbers only. In those countries actually comparing most data, one third name Death Statistics (Statistics on Causation of Death) and Hospital Records as main alternatives. These sources are usually freely available and their presence for future use is arranged through Service Level Agreements or Memoranda of Understanding and utilised annually (in more than half of the cases), or on a monthly basis (30% of the one-third of the countries that do compare data). Improvements are quite likely to be found in defining processes of linkage to reach higher accuracy and validity: better quality

In the second questionnaire, we asked for documentation on the process of linkage/estimation in use within the various countries/organisations. The scope of this report is not to elaborate on these documents, but interesting statistical methods have been forwarded to the authors. From these documents it also becomes clear that the average “frequency” for reviewing the statistical methods is four years.

It was clear from the responses to the questionnaire that most countries are quite confident in their actual numbers for fatal and serious accidents, although almost all countries are less confident on numbers for minor injuries and damage only accidents. It should be noted here that the latter group is of lesser importance to politics and road authorities alike, resulting in police officers “in the streets” insufficiently recording these types of accidents.

Table 4. Reporting rate mentioned by IRTAD members

Country	Killed	Hospitalised	Severely injured	Slightly injured	Damage only accidents	Remarks
Australia	**100**	**90**	Hospital patients only	Hospital patients only	Not registered	Number of kiilled and hospitalised counted monthly.
Austria	No data on reporting rates	No data on reporting rates	No data on reporting rates	No data on reporting rates	No data on reporting rates	Await SafetyNet-outcome
Belgium	No data on reporting rates	No data on reporting rates	No data on reporting rates	No data on reporting rates	No data on reporting rates	
Canada	No data on reporting rates	No data on reporting rates	No data on reporting rates	No data on reporting rates	No data on reporting rates	
Czech Rep.	No data on reporting rates	No data on reporting rates	No data on reporting rates	No data on reporting rates	No data on reporting rates	
Finland	**100**	No data on reporting rates	No data on reporting rates	No data on reporting rates	No data on reporting rates	
France	Close to 100%	No data on reporting rates	No data on reporting rates	Depends on users	No data on reporting rates	
Germany	**95**	No data on reporting rates	**68**	**64**	No data on reporting rates	In research
Ireland	No data on reporting rates	No data on reporting rates	No data on reporting rates	No data on reporting rates	No data on reporting rates	
Island	**100**	No data on reporting rates	No data on reporting rates	No data on reporting rates	No data on reporting rates	Number of killed counted annually.
Netherlands	**94**	**60**	**14**	**5**	**30**	Number of killed: counted annually. Number of hospitalised and injured: assessed every year. Slightly injured: assessed biannually
New Zealand	**100**	**100**	**67**	No data on reporting rates	**3**	Number of killed, hospitalised and severely injured: counted annually.
Norway	**100**	No data on reporting rates	No data on reporting rates	No data on reporting rates	No data on reporting rates	
Poland	No data on reporting rates	No data on reporting rates	No data on reporting rates	No data on reporting rates	No data on reporting rates	
Portugal	No data on reporting rates	No data on reporting rates	No data on reporting rates	No data on reporting rates	No data on reporting rates	
Slovak Rep.	**100**	**100**	**100**	**100**	**100**	Number of killed, seriously injured and slightly injured counted annually.
Slovenia	**100**	No data on reporting rates	**94**	**82**	**49**	Number of killed: counter annually. Number of hospitalised, seriously and slightly injured: assessed annually.
Spain	**97**	No data on reporting rates	**67**	No data on reporting rates	No data on reporting rates	Number of killed and seriously injured counted regularly.
Sweden	**100**	**90**	**50**	**20**		Number of killed counted annually. Number of hospitalised, seriously and slightly injured assessed annually.
Switzerland	**98**	No data on reporting rates	**77**	**25**	No data on reporting rates	Number of killed counted annually. Number of hospitalised, seriously and slightly injured assessed every year.
US	**100**	No data on reporting rates	**95**	**75**	**50**	Number of killed counted annually. Number of hospitalised, seriously and slightly injured assessed every year.

Most countries responded that the reporting rate was unknown. Perhaps they are aware of underreporting but can't quantify it. These countries belong for instance to the target group of this report.

5. Estimation of the real volume of casualties

5.1 Estimation methods

As seen in the previous section, insight into the real volume of traffic casualties is important. There are several ways to get a better sense of actual number of fatalities or injured persons (hospitalised, taken to emergency department, or slightly injured).

In this section we describe general, as well aggregated methods, as methods based on matching on record level. Each method uses different databases. The basis of these methods is firstly the accident database and secondly commonly used databases such as Death Cause Statistics and Hospital databases on persons admitted to hospital. Sometimes the latter also includes data on people that visited the A&E (Accident and Emergency) department of the hospital. Other useful databases are those of car insurance companies. A completely different way to get insight into real volumes is done through inquiries.

The methods described in this chapter can be used for different levels of severity (killed, hospitalised, slight and material damage only)

5.2 Investigations of the real volumes by surveys

One of the simplest ways to get a better idea of the number of injured persons is through surveys.

In the Netherlands, the Dutch Consumer Safety Institute carries out a continuous survey, called OBIN[2], in which 10 000 residents are interviewed by telephone each year regarding the prevalence of accidents (not only traffic). Based on this investigation it was concluded that, in the Netherlands, about 260 000 persons were medically treated (in a hospital, an A&E department or by a general practitioner) due to a traffic accident in 2000. Respondents in the survey are asked whether they suffered injuries during the focus period as a result of an accident in that period, or from injuries from a past accident (Dutch Consumer Safety Institue, .

The Dutch Ministry of Transport combines the National Traffic Survey with an additional bi-annual investigation into people injured or involved in an accident. This extra survey was launched in 2005.

Types of questions found are: number of accidents people were involved in, type of vehicle, injury and hospital-admittance, type of road, time of day, amount of damage and, crucially, whether a police report was drawn. Results on this are not yet available for publication.

5.3. Registration rate

It is assumed in many countries that the rate of registration of fatalities is high. In the Netherlands approximately 92%[3] of all fatalities are recorded. Another way to reivew is to calculate the ratio of persons killed in relation to the numbers of persons hospitalised. In the IRTAD report of 2003 (IRTAD, 2003), Paul Gutoskie concluded that, in spite of data definitions, the ratio of hospitalised road users to fatally injured road users differed not only between countries, but also within regions (see figure below).

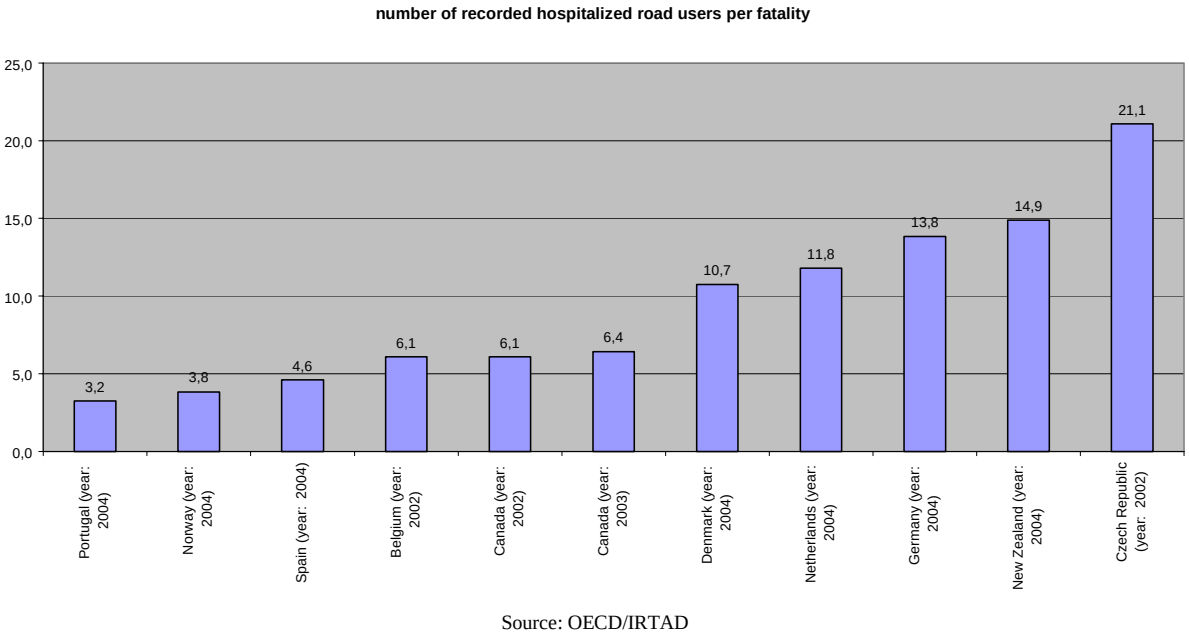
This disparity can be caused by differences in, for example, countries with more vulnerable road users. In the countries compared here, it suggests differences in the recording or definition of hospitalised persons.

2. http://www.veiligheid.nl/csi/websiteveiligheid.nsf/wwwAssets/BC98FB7723BF0EABC12570BB0033C07B/$file/Brochure%20Obin%202002-2003.pdf.
3. Based on merging the National Death Causes Statistics and the Accidents Database.

These differences become apparent when we compare not only recorded numbers but also real numbers.

For the Netherlands, the ratio of the estimated number of fatalities and hospitalised persons for the year 2000 is 15.7 (18 300 hospitalised road users divided by 1 166 fatalities) while the ratio of recorded numbers is 11.8.

Figure 4. Number of recorded hospitalised road users per fatality



Source: OECD/IRTAD

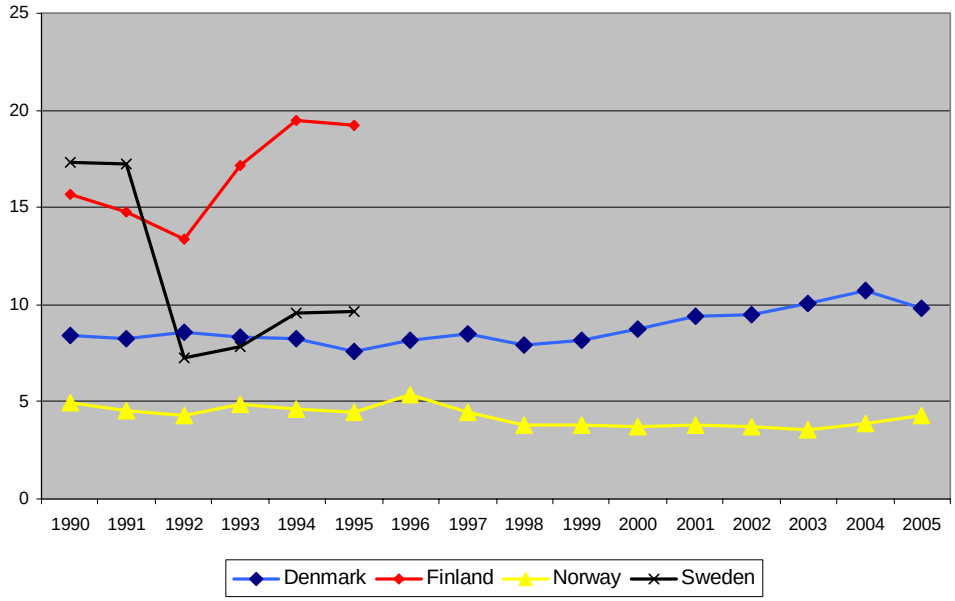
The reporting rate is defined as the number of casualties (injured) recorded by police, divided by the number of injured from hospital records. Using "recorded by police" figures can lead to mistakes due to recording failures. Studies show that the police sometimes mistakes the severity of the injury. So although a casualty may be recorded, the severity may be incorrectly registered. This can lead to different interpretations of the reporting rate.

Thus ***gross rate*** is the number of hospitalised persons recorded in an accident database divided by the real number of hospitalised persons. ***Nett Rate*** is the *real* (corrected for recording errors) number of hospitalised people recorded in the accident database, divided by the real number of hospitalised people.

The reporting rates mentioned in this report are mostly gross rates. In a more sophisticated database the recording mistakes are corrected by matching with the hospital database, in which case gross and net rates are equal. In Sweden (Strada) and Denmark (POL-SAS), systematic matching procedures with the hospital data repair such errors (*source*: Lammar, 2003).

In the figure below the ratios are presented for the Nordic countries for which data was available in the IRTAD database. It can be noted that even in these comparable countries the ratios differs very much. Special attention should be given to the drop of the ratio for Sweden in 1992.

Figure 4. Evolution in the number of hospitalised persons per fatality in the Nordic countries



Source: IRTAD

Conclusion

The ratios between fatalities and hospitalised persons differ significantly between countries. Assuming that the numbers of fatalities are reported on the same level, the ratios convey the impression that the number of hospitalised road users reported by the countries are not the complete number of hospitalised persons.

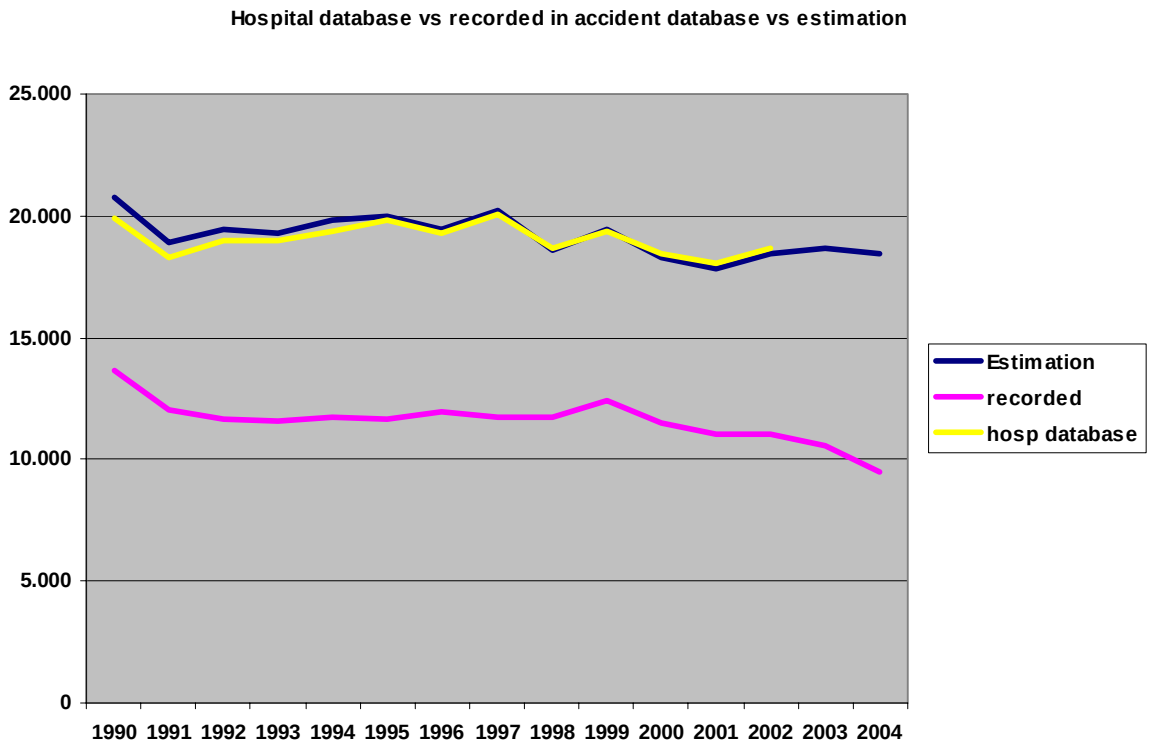
Countries can compare the rates between fatalities and hospitalised road users with the surrounding countries to determine if there is possible underreporting. This can also be done within regions of countries when there is enough data.

5.4 Use of different databases

Another method is based on the comparison of several databases within a country. Some examples of the application of this method are discussed below. Databases used for this purpose are hospital databases, but also insurance databases.

In the Netherlands, a comparison is done between the hospital database LMR and the accident database. The Department of Transport (DFT, England) made a comparison between the accident database Stats19 and the Hospital Episode Statistics. In 2002, Schweizerische Beratungsstelle für Unfallverhütung (BFU, Switzerland) estimated injuries based on data from insurance companies.

Figure 5. Comparisons of the number of recorded accidents with the number of accidents included in the hospitalised database and with estimation
Netherlands



In Figure 5, the results of the estimate of the real volume of hospitalised persons for the Netherlands (Ecodes: E810 – E819 and E 826 – E 829) are compared with the "raw" hospital data and the number of hospitalised persons in the accident database (see paragraph on "matching").

It can be concluded that the "raw" hospital data is a better estimator for the real numbers than the data from the accident registration.

Figure 6. Number of overnight admissions in a Hospital in the HES database (Hospital Episode Statistics), compared with serious injured persons in the accident database Stats19 England

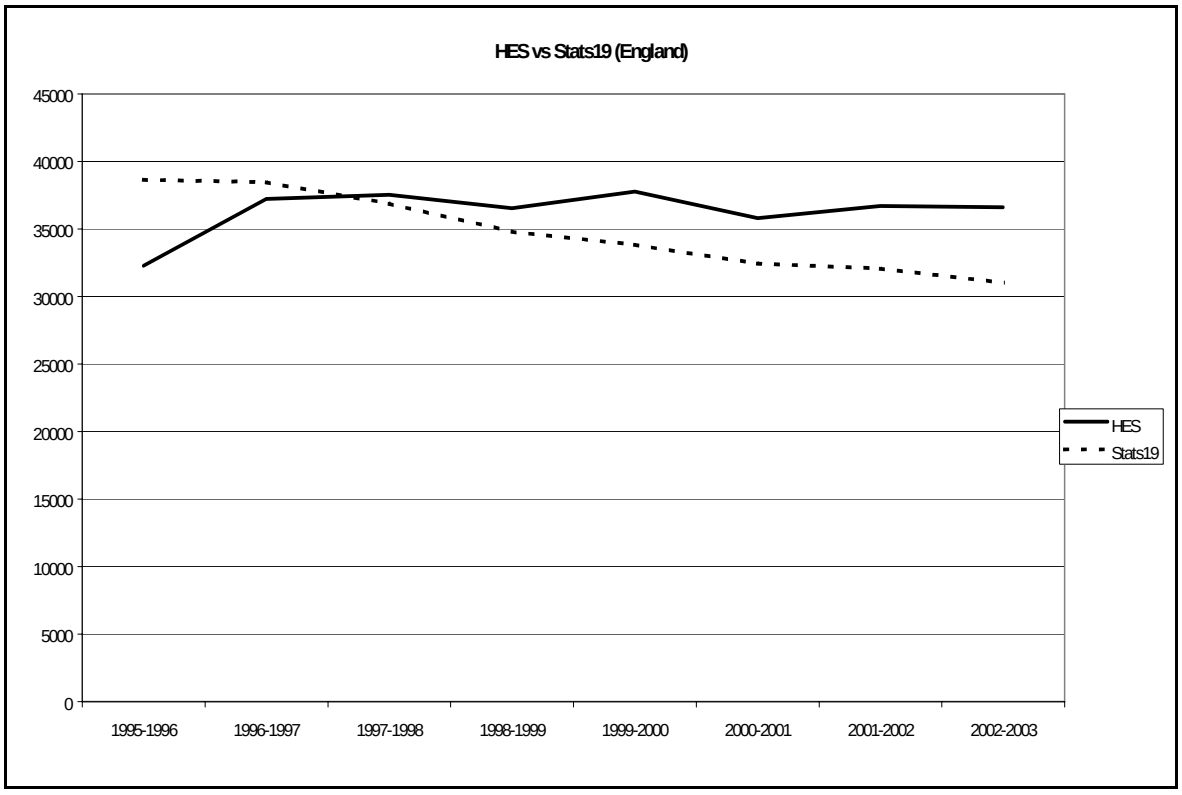


Figure 6 shows the number of overnight admissions in a Hospital in the HES database (Hospital Episode Statistics), compared with serious injured persons in the accident database Stats19 (DFT) [4]

The figure indicates that the number of hospitalised persons in both databases is of a similar order of magnitude. Nevertheless there is a more marked decrease in the recorded numbers of Stats19 than in HES.

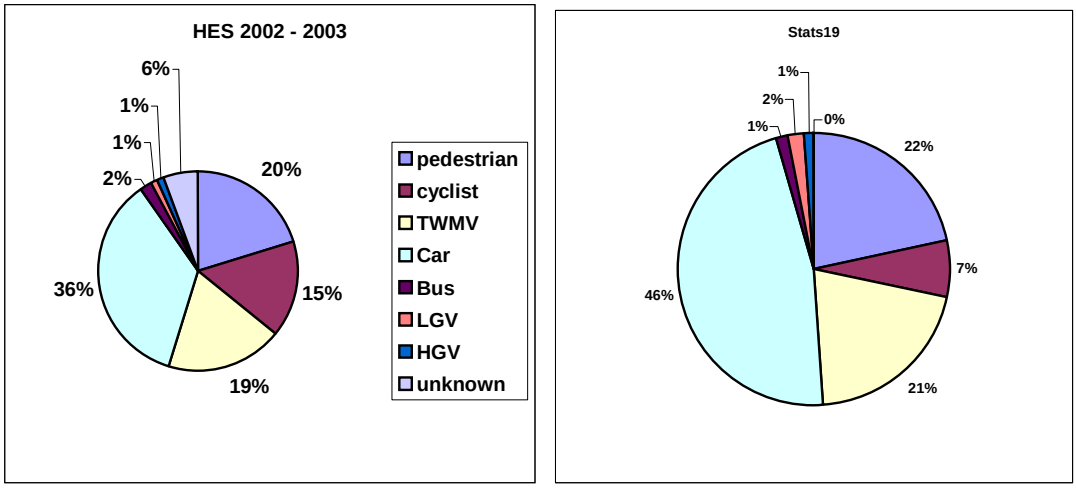
We should emphasise here that the selection of seriously injured persons in Stats19 consists of a broad range of injuries — from life-threatening to minor —therefore one would expect that the number of casualties in Stats19 would be much higher than those in HES.

Another conclusion is that it can be difficult for police officers to distinguish the severity of traffic victims at the accident spot. Studies in Great Britain showed the police are more likely to under-estimate the severity of injuries (Giles, 2000[5] ; DFT; Umeå, 2004[6]).

The comparison by DFT was also done by mode of transport of the injured. See figure 7.

4. Road Accident Casualties: A comparison of STATS19 Data with Hospital Episode Statistics. See: http://www.dft.gov.uk
5. Primary and secondary data sources for the study of Road Crashes in Australia
6. Fordonsrelaterade skadefall som behandlats virr Norrlands Universitetssjukhus under ar 2004, rapport nr 127

Figure 7. Comparison of data in the hospital database and the accident database Great Britain



A more detailed analysis of road user groups shows larger differences for the underlying groups of road users.

Table 5. Number of road users injured in the hospital (HES) and accident (STATS19) databases Great Britain

	Pedestrian	Cyclist	Motorcyclist	Car occupants	Bus	LGV	HGV	Unknown
HES	7 457	5 661	6 885	1 3041	669	451	403	2 044
STATS19	6 665	2 068	6 336	1 4358	443	568	373	

The differences in the type of road users can be the consequence of, or mistakes in, the recording process, or by underreporting (bearing in mind that the Stats also include slight injuries). In the case of Stats19 and HES, it is possible to compare several cross sections.

The DFT report concluded that HES data can be an alternative measure for the number of seriously injured casualties

Bfu estimated the number of injuries based on data from insurance companies and accident data. There was no estimation of the underreporting of hospitalised persons (Bfu R 0009; non-occupational accidents in Switzerland – the full extent in 1997). It was concluded that only one third of all injured casualties was recorded, and that the rate differed greatly, depending on the age of the victim and transport mean (between 11% for cyclists in the age group 17-64 and 75% for the elderly (> 65 years)).

When comparing the hospital database and the police recorded accidents in Sweden (, it was found that about one third of all hospitalised persons are recorded by the police Larsson 2005[7]; Brüde 2005[8]). It

7. Trafikskador 1988-2002 enligt patientstatistik, Jörgen Larsson, VTI notat 21-2005, www.vti.se/publikationer.
8. Basic statistics for accidents and traffic and other background variables in Sweden, VTI notat 27A-2005.

was also apparent that there is a difference in the recording rate for the different means of transport. As can be seen from the table below, cyclists[9] have the lowest rate.

Table 5. Ratio between casualties recorded in the hospital database and casualties reported by the police Sweden

way of transport	1998	1999	2000	2001	2002
motorist/driver	1,7	1,86	1,88	2,03	1,81
moped/motorcyclists	3,96	3,74	3,75	3,65	3,29
cyclist	6,33	7,47	7,83	8,23	8,47
pedestrian	2,2	2,45	2,39	2,71	2,27
others	40,28	35,92	52,25	33,2	31,5
Total	2,9	3,17	3,18	3,29	2,98

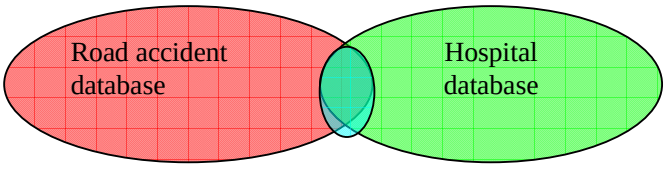
Conclusion

It is useful to compare databases to get more insight into the real volumes using several aggregated databases. It is not really possible to estimate the real numbers, since we do not know the volume of the intersection of both databases. A judgment on which database delivers the best estimator for the number of injuries cannot be given. However, if we know the processes of registrations in greater detail we can draw conclusions about the quality, or reliability, of the data in several databases which be used to help find the best estimator. In the Dutch situation, the hospital data is a better indicator of the number of hospitalised persons. In Great Britain, it is more difficult to make a comparable conclusion because the contents of the hospital and police databases (in terms of injury severity) differ.

A matching of the databases, as well as a good knowledge of the registration process of databases, may provide a better understanding of the reporting rate.

5.6 Matching databases

As shown in the previous section, it is not possible to estimate the number of fatalities,or injured road users by comparison of databases. By using linking procedures it is possible to get a more precise picture of the part of the data present in only one of the databases. In the linking procedure the records which are comparable in both the accident database and in the hospital database are matched. Records will then remain in the accident database that cannot be found in the hospital database (accident in the accident database only). There will, of course, also be accidents that are in the hospital databases which are not recorded in the accident database (hospital database only). (see figure below).



One part still missing is those victims that are not recorded in either the accident database or in the hospital database.

9. Others concern only a small group smaller than 1% it not presented as lowest rate.

The part missing in both databases (the blue cell in the matrix) can be estimated by dividing the product of the numbers in only one of the databases by the number in both databases. In this calculation, we assume that the opportunity to be recorded in the databases is independent. It is, however, reasonable to suppose that there is a great correlation, based on the fact that the more severely injured are better recorded. This means the number missing in both databases is underestimated.

		accident database		
		yes	no	total
hospital database	yes	*both*	*only hosp*	
	no	*only acc db*	*both not*	
	total			

The real volume can then be calculated by the sum of the four quadrants.

Example:
Assuming, there are 220 000 hospitalised persons recorded in the accident database, and 300 000 hospitalised persons in the hospital database, and that there are 200 000 common records, we can estimate the number of cases which are missed in both databases:

The number of non reported hospitalized persons can be estimated as follow:

(20 000 x 100 000) / 200 000 = 10 000

And the real volume of hospitalized persons is 330 000

		accident database		Total
		Yes	**no**	
hospital database	**yes**	200 000	100 000	300 000
	no	20 000	10 000	
Total		220 000		330 000

Problems, which can be met in the linking procedures, come with laws on personal data protection in several countries. Some countries allow institutes to link databases on personal identification codes. In such cases a linkage method can be applied rather easily, under the assumption that the identification codes are perfect in both records.

Other countries do not allow the use of personal identification codes in the databases. See, for example, the Dutch Data Protection Authority[10] information. For this reason, the linking procedures used by SWOV in the Netherlands involves common values (time and date of the accident, date of birth, sex and hospital) in both databases, a stochastic linking procedure. The selection of records from the hospital databases is broader than the standard selection of E codes E810-E819 and E826 – E829, to take into account that there may be some miscoding in the hospital database. Similarly, all injured road users – and not only the persons recorded as hospitalised – are selected from the accident database.

10. http://www.justitie.nl/english/images/handleidingwbpuk_tcm75-28677.pdf?refer=true

The SWOV used a so-called *distance function*, dependent on the common values in both the records of the accident database and the records of the hospital database. The distance between records from the matched databases are zero if they are exactly the same for the common values ànd recorded as hospitalised in the accident database and the E code in the hospital database was E 810 – E819 or E 826 – E829. If the match was not perfect, the distance was based on the differences between the unequal values. For instance the longer the distance between date of the accident in the accident database and the date in the hospital database, the longer the distance between the two records. For each record from both databases, the nearest and the next nearest neighbour was checked against the other database. Based on selectivity criteria and a maximum distance the best match could thus be found. Therefore doing three clusters (in only one of the databases or in the intersection) could be possible. These three values, combined with the estimate of the forth cluster (not in both databases), produced the estimate of the number of hospitalised road users in the Netherlands.

Matching procedures are applied, for example, in Sweden (Umeå, 2004), Great Britain (TRL, 1984[11]DFt, 2006[12]), Austria (Deliverable: WP1 Task 5 National Report for Austria Stefan Hoeglinger (KfV) under preparation) and the Netherlands (SWOV, R 2000-26 and SWOV 2006 not yet published).

Depending on the information in the underlying databases, it is possible to make more detailed estimates (for example by mode of transport, age, region, etc.).

In the case of matching procedures, it is also possible to improve and enrich the accident database. This is only feasible when databases are linked by means of unique identification codes. In the accident database, for instance, there is no detailed information on the injury severity and the type of injury of hospitalised persons. By adding this information to the accident database we can get more insight into possible decreasing injury severities. Conversely, the severity recorded by the police can be altered if we know (from the hospital database) that a victim was hospitalised. Finally, it is possible to add the injuries from the hospital databases to the accident database. In this situation we should emphasise that such details as accident location and crash information are not available. It is advisable in these circumstances to assign a code to each record in order to locate the source of that record (police or another database).

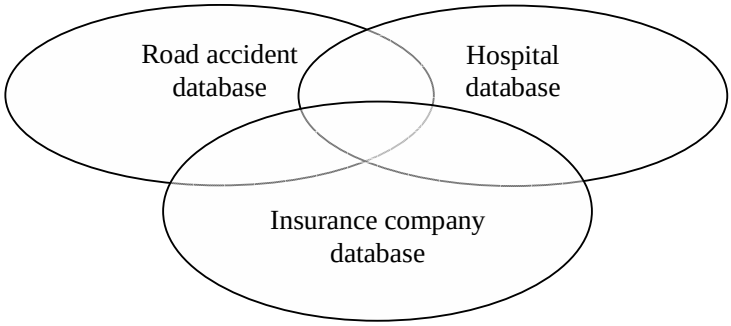
Figure 5 also presents the results of the linkage procedure for the Netherlands are presented.

The three data sources shown in Figure 9 are combined to estimate real numbers on road accidents. Each database has its own omissions, there being no such thing as the perfect database for all applications. Therefore it will be very difficult to assign more confidence to a special database. Reliability will also depend on the process of registration and the purpose of the databases. The purpose of the hospital database is based on medical procedures whilst the purpose of the accident database relies on the description of an accident. Obviously the data in the accident database related to for instance the type of vehicle are more reliable in the accident database. In the hospital database the medical information will be more trustworthy. Using more databases will help find the truth.

11. TRL 1984, R.D. Stone Computer linkage of transport and health data

12. DfT (2006). Under-reporting of Road Casualties Phase 1.

Figure 9. Three data sources



The survey showed that, amongst IRTAD members, a majority states a reporting rate for hospitalised and fatalities of about 100%. Studies show, however, there are several reasons to assume accident recordings are incomplete for fatalities and hospitalised road users. DFt concludes “studies have shown that it is insufficient to rely solely on Stats19 data, or on any other data source" for an assessment on trends in serious injury. The fact that different databases are showing different parts of the picture is useful and it is recommended that greater use will be made of all sources”.

5.6 Conclusions

By matching databases it is possible to find an acceptable estimator for the real volumes of victims.

It would be preferable to match databases on personal identification codes.

If there are restrictions on this kind of linking procedures, it is possible to match the databases on a stochastic way.

If databases are matched by id codes it is possible to add hospital information (severity ICD-codes etc) to the accident database.

Useful databases for matching with the accident database are:

- Death cause statistics for the real number of fatalities,
- Hospital databases for the real number of hospitalised persons,
- A&E databases for the number of road users rendered first aid at an A&E department,
- Databases of insurance companies for the real number of accidents.

One should always be aware, however, of the differences in the definitions between the databases used in the comparison. For example, when looking at death statistics for a country the death of residents are recorded, and in the accident databases, the fatalities within a country. So there are differences caused by foreigners who die in an accident, and for residents who die in an accident abroad. In the accident database there is a restriction in the 30-days period that will not be in the death statistics.

6. Recommendations

Looking at the various answers given by the 22 responding countries, some recommendations are quite obvious. Others come from analysis of those answers and state-of-art knowledge of Road Safety Experts.

- All member countries should work seriously on estimating the real volumes of fatalities and seriously injured road users. If they believe they have an almost complete dataset, they should be able to describe the process by which the database is guaranteed to have almost 100% of the seriously injured and killed in it.
- All member countries should validate there fatalities with the death cause statistics.
- The IRTAD Group should start a programme in which knowledge is exchanged on best practices for estimation methods (on surveys, comparison of databases, matching/linking methods)
- A protocol should be given to select traffic accidents from inpatient hospital databases
- All member countries should provide IRTAD with the number of in- patients of the hospital database in their country if available and accessible.
- As it is becomings much more important to find new policy measures, discussion is needed on the new structure and content of the accident database for the future.
- We should always speak about *recorded* accidents or casualties in the cases where we report data from an accident database that is not complete. When we refer to the complete set of data, we would refer to the number of fatalities, hospitalised etc., without precising it is "real data".
- Hospital data on road traffic injuries (both short-term and long-term consequences) must be used much more in the future.
- It is necessary to start a discussion on use of data from forensic institutes in order to get better information on causes of death based on autopsy data in order to identify persons who have died from a sudden decease and not from crash forces.

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ANNEXES

1st IRTAD QUESTIONNAIRE dd. September 2004

Country		
Q-ID	**Question**	**Answer**
1A	Does your country have a national road safety plan?	
1A1	If so since when is it active?	
1A2	Which are the main issues in this plan?	
1A3	Are there any political targets to reduce the number of road accident injuries in your country? If so, please complete:	
1A4	Completion #1	
1A5	Completion #2	
1A6	Completion #3	
1B	Is the government aware of the road accident's costs to society?	
1B1	If so, are any political decisions made on this awareness?	
1B2	Can you give some examples?	
1C	Are these costs to society somehow calculated in your country?	
1C1	If so, what is the annual amount of the societal costs?	
1C2	In these calculations accident and casualty numbers are necessary. Do these numbers come from official statistics, based on police reports?	
2A	Is this possibility taken into account in your country?	
2A2	* fatalities	
2A3	* hospitalised persons	
2A4	* slightly injured persons	
2A5	* only damage accidents	

2B	No matter how you answered the previous question, is there any desire or attempt to better understand underreporting in your country?	
2C	Are there any intentions or plans to improve the reporting system in your country in order to reach a higher level of accident reporting?	
2C1	Please indicate how	
3A	Are there any studies or surveys carried out in your country in order to build a more complete picture of numbers of road accidents and casualties?	
3A1	If so, are these studies carried out periodically or only once in a while?	
3B	Is there any information about the completeness of the database on reported road accidents and casualties?	
	REPORTING RATE	**Please explain how you know of these percentages**
3B1	*killed	
3B2	*hospitalised	
3B3	*severely injured	
3B4	*slightly injured	
3B5	*damage only accidents	
	Definitions:	
3B6	Killed =	
3B7	Hospitalised =	
3B8	Severely injured =	
3B9	Slightly injured =	
	Differences between reporting rates of specific types of accidents can occur (other than the accident severity, see question 3b).	
3C1	Are such differences known in your country?	
	Is it possible to quantify these reporting rate differences, such as:	
3C3	Among road user types	
3C4	Among regional subdivisions	

3C5	Among age categories	
3C6	Other	
	If any calculations or estimates of real volumes of casualties are made in your country, please indicate which features of these road casualties are known	
4A1	Age	
4A2	Sex	
4A3	Vehicle / means of transport	
4A4	Collision partner	
4A5	Municipality	
4A6	Accident month	
4A7	Accident day	
4A8	Accident hour	
4A9	Road type	
4A10	Speed limit	
4A11	Rural/urban area	
4A12	Other: Hospital Autonomous Community	

2nd IRTAD Survey on Underreporting July 2006

Dear addressee,

"Why real accident figures are so important" was the question we set ourselves to answer in the Autumn of 2005. You'll remember the quite extensive questionnaire on this matter. Some 20 countries took the trouble to answer the list.

If you were amongst those you'll find your answers listed in the next pages.
Please check them carefully since we've added some questions based upon your answers.
Also do feel free to add extra information, adjust data or remark your previous entry.

Due to all kinds of delay we had to abort activities on the report but now we feel the obligation to speed things up again. Looking back on the questions and the answers received we had to conclude some aspects on underreporting and the real figures on road traffic casualties we're left out entirely or underexposed to say the least.

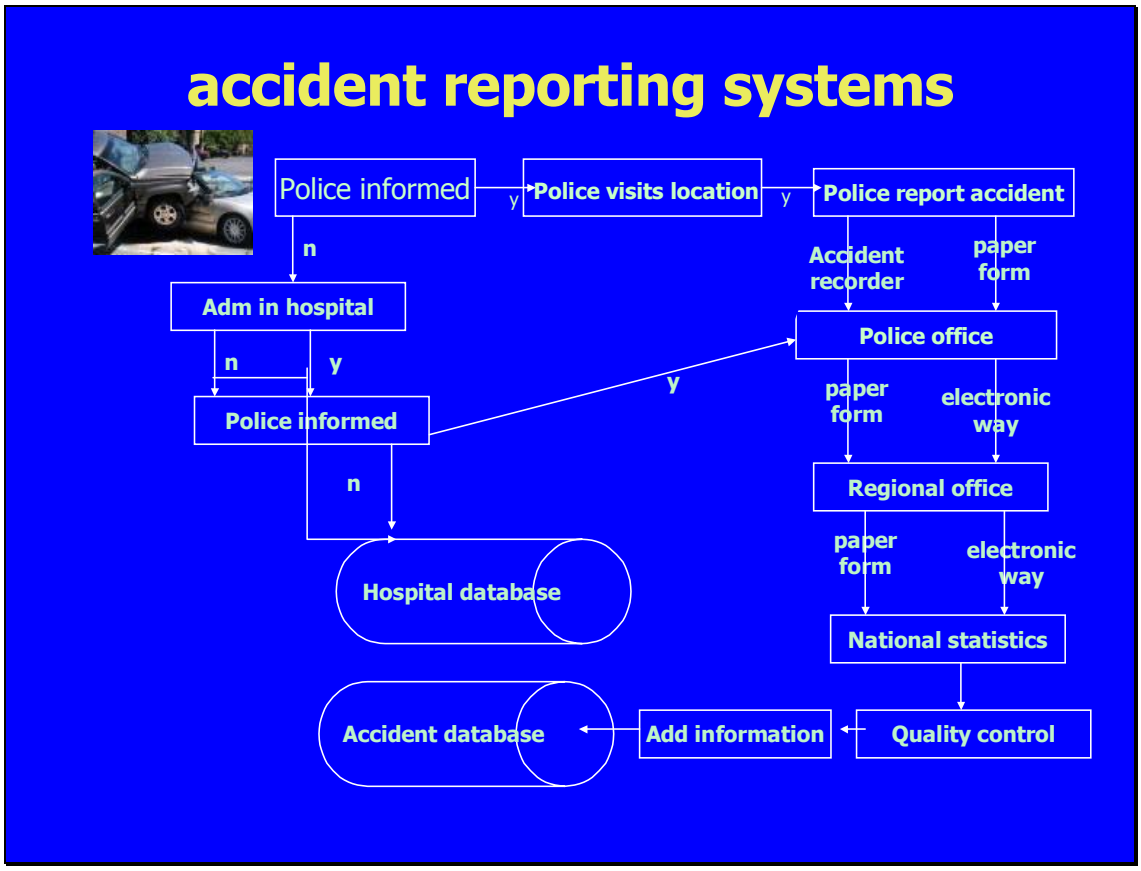
We hope to find is a picture of how the different IRTAD members cope with the need – amongst others by politicians and road authorities – for real figures on accidents, killed and seriously injured road users within their countries. Do they use statistical means linking various relevant data sources to obtain general but no detailed data or do they order e.g. police to attend every single accident taking place and write down all possible aspects? Most likely it will be some sort of mix of both. But what is the situation in your country?

These next set of questions therefore all focus on the processes and procedures used within your respective countries and intend to clarify the real "size" of traffic (un)safety. In the end this will offer opportunities

for benchmarking by means of weights (indicators) linked to numbers of fatalities and injured next to directions for implementations of methods found.

We kindly ask you to sent your replies by Email as soon as possible but ultimately within 4 weeks from postmark/receipt. The Email-adress is:<Email>
We'll use your answers to these questions in the report/memo we're writing on behalf of the International Safety Data and Analysis group of IRTAD.

Please use this figure as guidance when answering the questions. You'll recognise it from the presentation by Mr. Harry Derriks in March 2004.



In the previous questionnaire we already asked for indications as to national programs for estimating the actual – real world – road accident figures and improvement plans for registration of accidents. If you already filled out this first questionnaire a copy of your answers is attached. If and when needed a remarks or additional question on our behalf can be found in the "remarks" column. If so, please answer those items as well.

The following questions elaborate some more on these issues. Please use your "answers copy" for reference.

For administrative reasons we'll use sequential numbering of the question relating them to the previous set.

Q-ID	**Question**	**Answer**
5A	If you've arranged for registration of road accidents by other organisations then yourselves, what organisation is that?	❑ National police ❑ Regional Police ❑ National Road Authority ❑ Regional Road Authorities ❑ Local Road Authorities ❑ Insurance Companies ❑ Automobile clubs/Road Guard ❑ Other, nl.: *Please tick the appropriate box(es)*
5A1	How is this registration arranged and controlled in terms of liability, guarantees?	❑ Contract ❑ Service Level Agreement ❑ Gentleman's Agreement ❑ Memorandum of Understanding ❑ Other, nl.: *Please tick the appropriate box(es)*
5A2	Is any payment / fee involved?	❑ Yes Please provide the approximate annual amount involved (in EURO) [ ] ❑ No
5A3	In what form do you receive registration?	❑ Filled Paper-sheet(s) ❑ Handwritten report(s) ❑ Digital file(s) ❑ Other, nl.: *Please tick the appropriate box(es)*
5A4	What is the delivery period?	❑ Daily ❑ Weekly ❑ Monthly ❑ Quarterly ❑ Biannually ❑ Annually ❑ Other, nl.: *Please tick the appropriate box(es)*
5A5	Are there any terms of delivery?	❑ Yes, *please elaborate* ❑ No
5A6	Are you in charge of defining the actual content of the registration?	❑ Yes, *please elaborate*

		❑ No
5A7	Please indicate (scale 1 – 10) your satisfaction on these arrangements	[ ]

	ON DATA EXCHANGE and VALIDATION								
6A	Do you compare your road accidents data to other sources?	❑ Yes ❑ No, please proceed to 6B1							
6A1	If YES to 6A: What other sources are used in comparison? *For the Dutch Road Accidents data is e.q. compared from Dutch Statistics on Causation of Death and Hospital Records*	1. [ ] 2. [ ] 3. [ ] 4. [ ] 5. [ ] 6. [ ] 7. [ ] 8. [ ]							
	Sometimes one has to pay for use of data sources other than your own. If so we'd like to know of those payments.								
6A2	Is any payment / fee involved? Please fill for all sources mentioned and provide the approximate annual amount involved (use EURO currency)	1	2	3	4	5	6	7	8
		❑Y❑N	❑Y❑N	❑Y❑N	❑Y❑N	❑Y❑N	❑Y❑N	❑Y❑N	❑Y❑N
6A3	If YES to 6A: Please indicate the frequency of these comparisons	❑ Monthly ❑ Quarterly ❑ Biannually ❑ Annually ❑ Every [ ] years							

6A4	If YES to 6A: How are sources guaranteed for future use. Please fill for every source mentioned previously. C = Contract S = Service Level Agreement G = Gentleman's Agreement M = Memorandum of Understanding O = Other	(see table below)
6B1	If NO to 6A: Please explain why ?	
6C1	Do you link your road accidents data to other sources to improve validity?	❏ Yes ❏ No, please proceed to 6D1

1	2	3	4	5	6	7	8
❏ C ❏ S ❏ G ❏ M ❏ O: ____ ____ ____	❏ C ❏ S ❏ G ❏ M ❏ O: ____ ____ ____	❏ C ❏ S ❏ G ❏ M ❏ O: ____ ____ ____	❏ C ❏ S ❏ G ❏ M ❏ O: ____ ____ ____	❏ C ❏ S ❏ G ❏ M ❏ O: ____ ____ ____	❏ C ❏ S ❏ G ❏ M ❏ O: ____ ____ ____	❏ C ❏ S ❏ G ❏ M ❏ O: ____ ____ ____	❏ C ❏ S ❏ G ❏ M ❏ O: ____ ____ ____

	Some respondents have stated they used statistical methods for estimates on the real road accidents / casualties figures. These questions focus on these methods.	
7A	Do you use statistics / modelling techniques for estimations on road accidents / casualties?	❑ Yes ❑ No
	If these methods are documented and available in English please sent them to: ***AVV Postal mail adress***	
7A1	If YES to 7A: How often are those statistical means evaluated?	❑ Never ❑ Every now and then ❑ Each year ❑ Every 2 – 4 years
7A2	If NO to 7A: What apparent other means do you use to come to actual figures	

This is the end of the secondary stage of the questionnaire on Underreporting.

Please check your answers thoroughly since we will not be able to consult you in a later stage.
All answers found in will be used “as is” in the report at hand during the next few months.