

SPECIAL REPORT

The Availability of Hospitalised Road User Data in OECD Member Countries (2001)

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IRTAD Operational Committee

The Availability of Hospitalised Road User Data in OECD Member Countries (2001)

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1.0 Background

One of the principal mandates of the International Road Traffic and Accident Database (IRTAD) Operational Committee, when it first became operational in 1990, was to gather standardised traffic collision and exposure data among OECD member countries. This information was and continues to be used by program and policy makers to identify existing and emerging road safety problems and, if necessary, to help develop programs to curtail these problems.

In 1990, more than 154,000 road users were killed in traffic collisions in IRTAD member countries. Since that time, the level of safety has improved considerably. Road user fatalities have decreased by approximately 46% despite substantial increases in both vehicles in use (+25%) and population (+8%). The fatality rates in member countries have been more than halved on both a per registered vehicle and a per population basis. These changes were, in large part, the result of the development and implementation of road safety policies and programs in IRTAD member countries as well as improvements in vehicle design and roads infrastructure. Notwithstanding these positive trends, the rate of road safety improvements in many member countries has plateaued in recent years. Efforts to resume the pace of road safety improvements require enhanced knowledge of road safety problems. More complete or comprehensive traffic collision and exposure data are often prime sources of this expanded road safety knowledge.

In August 2000, a special seminar on data needs for the 21st century was held in Vienna, Austria. Two of the key findings that emanated from a panel discussion that took place at the seminar pertained specifically to the mandate of IRTAD⁽¹⁾. One focused on the relative lack of data available on hospitalised road users, while the other concerned the mechanisms IRTAD had in place to develop links with other databases. Ultimately, both issues related to improving the usefulness of the IRTAD database. Unquestionably, the database could be made more useful if member countries reported existing IRTAD data elements more completely or if the database were expanded to include additional information.

(1) The principal objectives surrounding the creation of the IRTAD database were to enhance international comparability of road collisions and traffic data; to enhance the quantity and quality of relevant data; to facilitate the international accessibility and dissemination of data; and to respond to the needs of researchers, governments, international organisations and private agencies. Axel Elsner, 'A Historical Overview of the International Road Traffic and Accident Database', International Seminar on Road Traffic Accident and Data Needs for the 21st Century, Vienna, Austria, August 2000.

2.0 Objectives

At the 23rd IRTAD Operational Committee meeting, which immediately followed the special seminar in Vienna, it was decided that efforts should be made to enhance the IRTAD database by exploring the issue of what is preventing or impeding member countries from reporting hospitalisation data.

As a result, in the spring of 2001, a brief questionnaire (see Appendix A) was sent to all national data providing institutes. The objectives of the questionnaire were:

- to determine the source and the type (census/sample) of information that is available in countries that currently provide hospitalised road user data to IRTAD;
- to determine how more consistent and comparable hospitalised victim data could be obtained from countries that currently provide this information to IRTAD;
- to determine the major impediments faced by member countries that currently do not provide hospitalised road user data to IRTAD; and
- to explore possibilities for increased reporting from countries that currently do not provide these data to IRTAD.

This report summarises the questionnaire responses and recommends actions that may lead to more complete reporting of such information in the future.

3.0 Survey Response

Of the 29 OECD member countries surveyed, responses were received from 19 national data providing institutes. Appendix B lists the countries and representatives that responded to the questionnaire. More detailed information on questions pertaining to hospitalised road user data in individual countries may be obtained by contacting the survey respondents at the e-mail addresses listed in the appendix.

4.0 Survey Results

Appendix C briefly presents, in table form, the answers received from the 19 respondents.

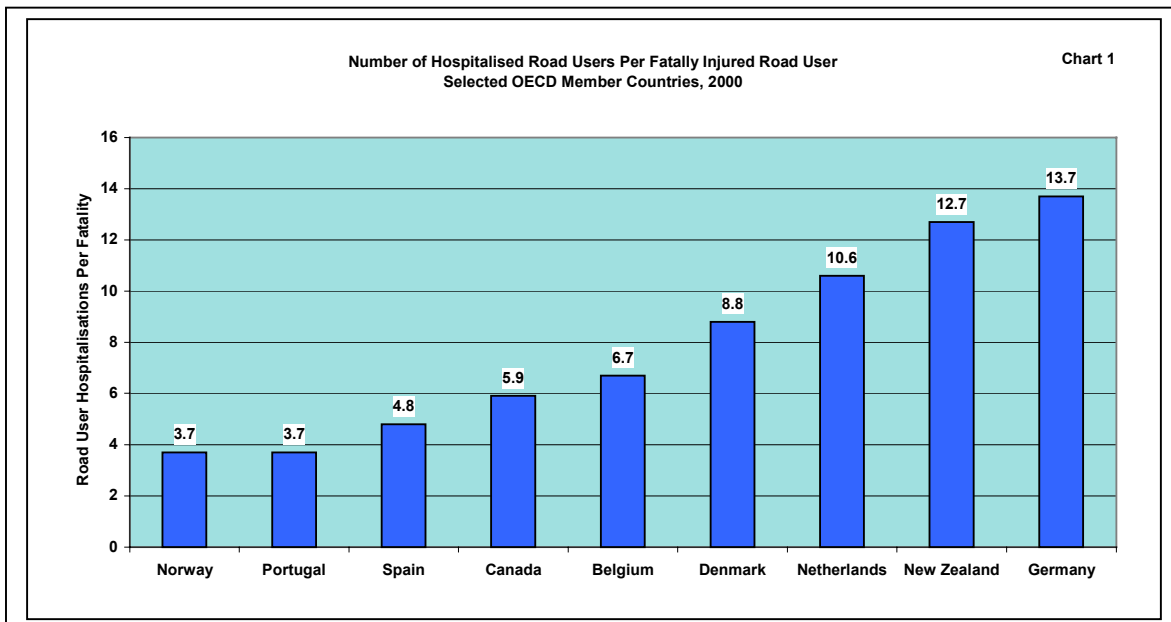
4.1 Countries that Provide Data

Seven of the 19 countries that responded to the questionnaire currently provide hospitalised victim data to the IRTAD database: Belgium, Canada, Denmark, Germany, the Netherlands, New Zealand and Spain. Two additional countries (Norway and Portugal), which did not respond to the questionnaire, also regularly provide data on hospitalised road users to the IRTAD database. In past years, Australia, Finland, Sweden and Luxembourg also provided hospitalised victim information to IRTAD.

4.1.1 Data Definitions

Two of the cornerstones of the IRTAD database are the consistency of the data definitions and the reliability of the information. According to the IRTAD Special Report on Definitions and Data Availability (BAST, Germany, 1998), hospitalised road users are ‘accident victims admitted to hospital as in-patients, excluding all killed’. For the most part, countries that provide hospitalised victim data to IRTAD provide data on injured victims who remain in hospital for a minimum of 24 hours (Belgium, Canada, Denmark, Germany, Norway, the Netherlands, New Zealand, and Spain). Portugal’s definition differs slightly from the other data providing nations – ‘victims of accidents that are hospitalised’.

In spite of the comparability of data definitions, Chart 1 shows that the ratios of hospitalised road users to fatally injured road users are considerably different among countries. These disparities are likely the result of incomplete reporting or different reporting criteria for hospitalised road users among member countries.



4.1.2 Data Sources

In all countries except New Zealand, police traffic collision records are used to generate hospitalised victim data. In New Zealand, hospital medical records are the source of this information.

4.1.3 Data Derivation Methods

The majority of countries (Belgium, Denmark, Germany, New Zealand and Spain) provide census hospitalised victim figures to IRTAD. However, it must be mentioned that, in Belgium, some under-reporting of this information does occur.

Canada's hospitalised victim data are estimates based on census figures from 12 of the country's 13 political jurisdictions. National totals are derived by applying the percentage distribution of hospitalised to total injured road users in the 12 provinces and territories where these figures are known to the one province that does not provide this information.

The Netherlands derives estimates of hospitalised victim data by linking common crash and hospitalised victim data elements (e.g. crash date, time, etc.). National estimates of hospitalised crash victims are then derived from three sets of victims: those found in both files, those found only in the crash data files and those found only in the hospital medical record files.

4.1.4 Definition Consistency

With the exception of Spain, the definition of a hospitalised road user has remained unchanged in all countries providing this information to IRTAD since collection of this data element began. In 1993, Spain revised its definition of a hospitalised victim to 'a minimum 24 hour stay in hospital'. Prior to that date, the type of injury sustained by the crash victim and not the length of stay in hospital was used.

4.2 Countries That Do Not Provide Data

4.2.1 Former Data Providers

As stated previously, Australia, Finland, Luxembourg and Sweden have provided hospitalised road user victim data to IRTAD in the past, but at present they do not.

Luxembourg did not respond to the questionnaire; consequently no explanation is available as to why it no longer provides this information.

Hospitalised road crash casualty data from Australia were based on police-reported collisions. Various data linkage exercises between police-reported records and hospital medical records revealed problems with data accuracy and under-reporting. As a result of these findings, one of Australia's states, which accounts for more than 30% of hospitalised crash victim records, stopped providing data on hospitalised road users in 1997, preventing aggregate Australian data from being available.

In Finland, hospitalised victim data were collected from 1990 until 1995, from some but not all hospitals, for special projects. Attempts to merge hospitalised medical records with crash data records were unsuccessful because of the inaccuracies in the hospital medical records.

Sweden determined that the quality of its hospitalised victim information varied considerably among regions of the country. Sweden also adopted a different hospitalised injury classification method in 1998, which caused additional data quality problems.

For the above-mentioned reasons, Australia, Finland and Sweden decided to discontinue providing hospitalised victim data to IRTAD until their data issues were resolved. All three countries are currently conducting specialised projects to address these data quality issues.

4.2.2 Impediments Facing Countries That Do Not Provide Data

The main factors that have impeded national reporting institutes from providing hospitalised victim data to IRTAD are incomplete reporting of hospitalised data (Czech Republic, Iceland, Ireland and Switzerland); the use of definitions that are inconsistent with the IRTAD definition (Austria and Hungary); traffic collision or hospital medical records report forms that do not contain data elements specifying the cause of injury (Korea and Poland); and responsibility for the collection of data resting with state or local governments rather than national agencies (the United States).

4.2.3 Strategies To Provide Data In The Future

Seven of the 11 OECD member countries that responded to the survey on the availability of hospitalised road data and that currently do not provide this information to IRTAD are taking or have already taken steps to facilitate the availability of this information.

Australia recently completed a country-wide project that considered a number of alternatives, including the use of unadjusted health system counts of hospital admissions; the use of unadjusted health system counts of hospital admissions of 48 hours or longer; the use of health system counts of 'patient days in hospital'; and the continued use of police counts. The desired outcome is a common approach to the reporting of hospitalised victim data among all of Australia's political jurisdictions.

The Czech Republic has not yet adopted any formal plan, but will study the experiences of other countries to develop a strategy.

Finland is undertaking a pilot project, based on the Göteborg action model, to determine how the model works in Finnish hospitals.

Hungary's traffic collision data report form was modified in January 2002 to include a new data element that identifies victims who have been hospitalised for 24 hours or longer.

Iceland recently developed a new accident registration system that is expected to capture all crash data. This system was expected to be fully operational in 2002.

In 2002, police in Ireland began collecting crash data on portable computers. This new data collection method is expected to include information on crash victims who are hospitalised. A complete data set on hospitalised road users is expected to be available from the 2002 data file.

In Sweden, research was recently carried out on victims who were hospitalised as in-patients due to traffic collisions. The results of this analysis are expected to enable reliable estimates of the number of hospitalised road crash victims to be made.

In Switzerland, a nation-wide project that involves the collection of all hospitalized victim data has been ongoing since 1998. Victims are categorized according to the ICD-10 classification system, which enables the identification of road user casualties. Once the National Bureau of Statistics compiles census data, efforts will be made to provide hospitalized victim data to IRTAD.

Among the survey respondents, only Austria, Korea, Poland and the United States do not currently have plans in place for the provision of national data on hospitalised road users.

4.2.4 Alternative Sources of Data

Some countries that currently do not provide census figures on hospitalised road users to IRTAD have indicated that they may be able to generate this information using alternative data sources. However, for the most part, these alternatives themselves are not problem-free.

Australia indicated that health system counts of hospital admissions could be used. These victim totals are 50% to 60% higher than the victim totals compiled from police records. However, poor data timeliness and quality have been cited as factors that would limit the usefulness of this information.

Austria indicated that figures on hospitalised road users might be available in the National Statistics of Hospital Discharge from Statistics Austria. However, a way must be found to separate road traffic crash statistics from crash data related to other modes of transportation.

As stated previously, revisions to the data collection process in both Hungary and Ireland should result in the availability of either census or estimated hospitalised victim information.

Poland is planning to implement a new national road safety program and may attempt to obtain data on hospitalised road user victims as part of this initiative.

As mentioned in the previous section, Sweden recently carried out research on hospitalised victims of traffic collisions. The results of this analysis should enable reliable estimates of the number of hospitalised road crash victims to be made.

4.3 Data Linking Initiatives

A number of countries, both providers and non-providers of hospitalised victim data to IRTAD, are currently developing initiatives to link police-reported and hospitalised victim data.

One Australian state regularly links police-reported hospitalised victim data and hospital medical records using victims' names. The linked file thus created then excludes any

personal identification information. Unfortunately, data confidentiality legislation prevents such linkages in most Australian jurisdictions.

The national road safety transportation agency in Australia is finalising a research project that aims to link a full year of police-reported data for the entire country with comparable health system data, with victim names excluded. The objective of the project is to successfully link the two databases by matching other personal identifiers, such as victim age, gender, road user class, jurisdiction, crash date and admission date. Preliminary results of the project indicated that fewer than 50% of police-reported cases could be linked to corresponding health system cases.

In 1990 and again in 1999, Austria's national data providing institute attempted to link police-reported crash records with comparable medical records using common demographic traits. Reliable matches were made for 30% of the victims in both databases. Considerably less reliable matches could be made for an additional 40% of police-reported victims. Record matches could not be made for the remaining 30% of police-reported victims.

Belgium is planning to establish a data warehouse to link hospital medical records with several other sources of information, including licensed driver, traffic and environmental data. It is anticipated that such a data warehouse will facilitate the availability of additional hospitalised victim information.

Canada is currently involved in a research project that aims to link police-reported data with hospital medical records. The study will compare crash and medical records from Canada's most populated province to examine the injury outcomes for specific crash configurations. Results of a pilot study showed that approximately 70% of police-reported and hospital medical records matched using a probabilistic record matching approach (e.g. victim age, and the month, day and time of the crash).

In Denmark, a limited number of hospitals register traffic crash information, but only one directly links hospital data with police-reported victim data. Discussions have taken place to expand data collection for the entire country.

Iceland's new crash data system, which became operational in 2002, links police-reported records with hospital medical records.

The Netherlands currently links data elements common to both police-reported crash records and hospital medical records (e.g. crash date, crash time, victim date of birth, gender) to estimate the number of hospitalised road users. Due to privacy issues, victims' names are not used to match records. The matching procedure identifies three groups of hospitalised victims: those found in both data sets; those found in only the police-reported database; and those found in only the hospital medical records database. Estimates are then derived of the number of persons that are not recorded in both databases. The data linking procedures are carried out approximately every five years. The results are used to derive annual estimates of hospitalised victims in the intervening years.

In New Zealand, a number of researchers have matched police traffic crash data with hospital medical records as part of specialised studies.

Sweden is currently involved in a promising ongoing pilot project aimed at linking police-reported and hospital data. The project has been operational in selected regions of Sweden since 1999, and is scheduled to be introduced in the whole country in 2003.

The U.S. federal government sponsors a program that provides funding to states to link motor vehicle crash data with medical outcome data. States use probabilistic matching techniques to link the data and are required to produce at least two years of linked data. They are encouraged to use these linked data both to support state traffic safety programs and to provide analyses to the federal government on important issues.

5.0 Discussion

The questionnaire on hospitalised road user data availability was designed to solicit information from all OECD member countries, regardless of their history of providing data to IRTAD. At present, nine of the 29 IRTAD member countries (31%) provide hospitalised road user victim data to the IRTAD database. Seven of these nine countries responded to the questionnaire.

Data quality and consistency are two of the main attributes of the IRTAD database. However, as shown in Chart 1, in section 4.1.1 of this report, large disparities exist among data providing countries in the ratios of hospitalised victims to fatally injured road users. These disparities range from less than four in Norway and Portugal to almost 14 in Germany. Explanations for these substantial differences (e.g. under-reporting of hospitalised victims) should be provided to ensure data integrity.

The countries that provide hospitalised victim data to IRTAD derive their information from various sources. Six of the seven responding countries that provide data to IRTAD derive this information from police-reported records (Belgium, Canada, Denmark, Germany, the Netherlands and Spain). The Netherlands derives this information from both police-reported figures and hospital medical records, while New Zealand derives it solely from hospital medical records. All countries except Canada and the Netherlands provide census figures; Canada and the Netherlands provide national estimates.

The key point here is the diverse nature of the information provided to IRTAD. Police-reported records and hospital medical records are used independently and in combination, depending on the jurisdiction, and both census and estimated figures are provided. Countries that cite incomplete reporting of police data or an inability to link police and hospital records may wish to consider adopting one of the information generating methods used by countries that currently do provide data.

Survey responses indicate that several more countries may be able to provide this information to IRTAD in the near future. Three countries (Hungary, Iceland and Ireland) said that recent or impending revisions to their police-reported traffic collision forms or

data collection techniques would likely enable them to produce hospitalised road user data.

Hungary indicated that its police traffic collision report form did not, in the past, contain a data element on hospitalised road users. However, continued lobbying regarding the importance of this data element eventually resulted in its addition to the form. Countries that cited the lack of a data element on hospitalised victims on police-reported forms (Korea) or injury causation on hospital medical record forms (Poland) as the main impediments to the provision of data to IRTAD may wish to consider changing their forms to include this information.

In 2002, Iceland introduced a completely new data collection system. This more comprehensive system should enable the collection of all data on hospitalised road users.

In Ireland, police now report details of traffic collisions using portable computers and have agreed to provide this information to the national transportation agency. It is anticipated that these data will contain information on hospitalised road user victims. Countries that intend to revise their traffic collision data collection system and that do not currently collect information on hospitalised road users may wish to consider including this data element in the new system.

Australia and Sweden, which provided hospitalised victim data to IRTAD in past years, are both involved in initiatives aimed at enabling them to resume providing this information.

Alternatives being examined in Australia include the use of unadjusted health system counts of hospital admissions; the use of unadjusted health system counts of hospital admissions of 48 hours or longer; the use of health counts of 'patient days in hospital'; and the continued use of police counts. In southern Sweden, an ongoing pilot project has been in place since 1999 that aims to link police-reported hospitalised victim records with hospitalised in-patient records. The outcomes of the research initiatives in both these countries may prove useful to countries interested in developing protocols that enable the provision of hospitalised victim data.

Another option available to countries that currently do not provide hospitalised victim data to IRTAD but that are interested in doing so in the future is to change their definition of hospitalised road users. Data definitions can be modified if the political willingness to do so exists. In 1993, Spain revised its definition of hospitalised road users to be consistent with the definition used by IRTAD. Since that time, Spain has provided data to IRTAD.

In a number of countries that do not currently provide hospitalised victim information to IRTAD, definitions of road users who are 'seriously injured' and 'hospitalised for a minimum of 24 hours' are used interchangeably. Countries whose definition of 'seriously injured' victims is reasonably close to the hospitalised definition used by IRTAD may

wish to consider using their seriously injured victim data as a surrogate measure to produce estimates of hospitalised victims.

Some countries have cited specialised studies that resulted in poor matching between police-reported and hospitalised medical records as the reason for not producing hospitalised road user victim information. At present, several IRTAD member countries are involved in police and hospital data linking initiatives. Countries involved in data linking studies may wish to consider sharing their findings with countries currently not able to produce hospitalised victim data.

At present, the majority of countries use police-reported crash records to generate their hospitalised victim figures. It is important for enforcement agencies to be aware of the role that data accuracy and completeness play in the road safety problem identification and program development process. National data providing institutes may therefore wish to develop closer working relationships with provincial, state or national police agencies.

National data providing institutes may also wish to develop closer working relationships with provincial, state or national health care agencies. Notwithstanding the success of a probabilistic approach for matching records from different data sets, data confidentiality regarding victim names remains the chief impediment to achieving high match rates in data linking studies. A more cooperative and collaborative relationship with health agencies, where the benefits gained by both agencies through greater data access are clearly identified, may help overcome data confidentiality issues and facilitate improved access to hospitalised medical records.

If current efforts to increase the number of countries providing hospitalisation data are unsuccessful, consideration may be given to the collection of seriously injured road user data for IRTAD. At present, this information is not included in the database. The findings of an IRTAD Special Report on Data Definitions (1998) showed that almost all IRTAD member countries collect data on seriously injured road users. However, a major hurdle that may prove difficult to overcome would be the achievement of a standardised definition of 'seriously injured' victims in all member countries.

It is clear that the impediments faced by several nations regarding the provision of hospitalised victim data could easily be overcome if the political will to implement the necessary changes existed. Perhaps a starting point for initiating this change would be the creation of a task force comprising IRTAD members. This group would be asked to develop communications material directed at program and policy makers in all IRTAD member countries. A communiqué could market road safety as a public health issue, point to the usefulness of hospitalised victim data in the development of road safety strategies, and raise awareness of the need for increased reporting of this information among IRTAD members.

6.0 Recommendations

- Countries that provide hospitalised road user data to IRTAD should revisit their injury data collection practices to confirm the reliability of their data and should provide explanations for the substantial differences in injury severity distributions, given that the definition of hospitalised road users is effectively identical in all data providing countries.
- Countries interested in producing hospitalised road user data should, where feasible, adopt data collection or estimation protocols used in countries that currently provide this information to IRTAD.
- Countries that successfully link police-reported and hospital medical records should share their data linking protocols with interested IRATD members.
- Countries whose definition of hospitalised road users differs from the accepted IRTAD definition should examine the feasibility of revising their definition to be consistent with the IRTAD definition.
- Countries that do not provide hospitalised road user data to IRTAD but do collect information on seriously injured road users should, where feasible, consider modifying their reporting criteria to enable them to use the data they collect to create estimates of hospitalised road users.
- The IRTAD Operational Committee should raise awareness of the usefulness of hospitalised road user victim data. A communiqué that outlines the usefulness of this information for identifying road safety problems and for enhancing existing or developing new road safety strategies or programs should be developed and submitted to national road safety program and policy makers.
- National program and policy makers should ‘market’ road safety as a public health issue. IRTAD member countries should consider incorporating reductions in the number of hospitalised road users into national road safety targets or action plans.
- National data providing institutes should develop closer working relationships with provincial, state or national police agencies.
- National data providing institutes should develop closer working relationships with provincial, state or national health care agencies.

Appendices

A. Survey form

B. List of respondents

C. Respondent summary results

APPENDIX A

IRTAD: HOSPITALISED ROAD USER DATA SURVEY FORM

Name of Respondent:

Agency:

Country:

1. Does your country provide hospitalised road user victim (hereafter *hospitalised victim*) data to IRTAD?

If **No**, please go to question 5.

If **Yes**, please describe the criteria used to define hospitalised victims.

2. What is the source of the hospitalised victim information (e.g. police traffic collision records, hospital medical records, etc.)?

3. Are the hospitalised victim data that are provided to IRTAD census figures or are they estimates based on a sample? Please describe the techniques used to derive the figures if they are based on a sample.

4. Has the definition of a hospitalised victim remained unchanged since your country began providing this information to IRTAD? If the definition has been revised, please describe the changes.

5. If your country has, in the past, provided hospitalised victim data to IRTAD, but currently does not, please explain why the information is no longer provided.

6. If your country has never provided hospitalised victim data to IRTAD, please describe the main impediments.

7. If your country does not currently provide hospitalised victim data to IRTAD, has it implemented or does it plan to implement any procedures or strategies that will enable it to provide this information in the future? If **yes**, what procedures are/will be implemented and when do you think hospitalised victim data might become available?

8. If census information on hospitalised road users is not available, would it be possible to provide reasonably accurate national estimates of hospitalised victim data using other sources (e.g. based on a sample of medical records of hospitalised road users or using a correction factor based on seriously injured road user data)? Please elaborate.

9. Is any work being undertaken in your country to link police-reported hospitalised victim data with hospital medical records? If yes, please describe the work and the expected results.

APPENDIX B

LIST OF RESPONDENTS

Country	Respondent	Agency	E-mail address
1. Australia	Thomas Roberts	Australia Transport Safety Bureau	Thomas.Roberts@dotrs.gov.au
2. Austria	Robert Esberger	Austrian Road Safety Board (KfV)	Robert.esberger@kfv.at
3. Belgium	Ward Vanlaar	Belgian Road Safety Institute (IBSR)	Ward.vanlaar@bivv.be
4. Canada	Paul Gutoskie	Transport Canada	gutoskp@tc.gc.ca
5. Czech Republic	Ladislav Skacal	Transport Research Centre (CDV)	skakal@cdv.cz
6. Denmark	Stig Hemdorff	Road Directorate	
7. Finland	Jussi Heino	Statistics Finland	Jussi.heino@stat.fi
8. Germany	Axel Elsner	Federal Highway Research Institute (BAST)	irtad@bast.de
9. Hungary	Peter Hollo	Institute for Transport Sciences Ltd.	hollo@kti.hu
10. Iceland	Orn Th. Thorvardarson	Umferdarrad – The Icelandic Traffic Council	
11. Ireland	Fergal Trace	National Roads Authority	ftrace@nra.ie
12. Korea	Won-Sang Eum	Road Traffic Safety Authority	Eumws58@hanmail.net
13. Netherlands	Harry Derriks	Ministry of Transport, Public Works and Water Management, Transport Research Centre	h.m.derriks@avv.rws.minvenw.nl
14. New Zealand	Bill Frith	Land Transport Safety Authority (LTSA)	Wjf.ltsa.govt.nz
15. Poland	Justyna Wacowska	Motor Transport Institute	justyna@its.waw.pl
16. Spain	Monica Colas Pozuelo	Dirección General de Tráfico	Monica.colas@dgt.es

17. Sweden	Thomas Lekander	Swedish National Road Administration	Thomas.lekander@vv.se
18. Switzerland	Roland Allenbach	Swiss Council for Accident Prevention (bfu)	R.Allenback@bfu.ch
19. United States	Dennis Utter	National Highway Traffic Safety Administration	Dennis.utter@nhtsa.dot.gov

APPENDIX C

HOSPITALISED ROAD USER DATA AVAILABILITY

	Australia	Austria	Belgium	Canada	Czech Republic
Hospitalised data provided to IRTAD?	No	No	Yes	Yes	No
Criteria used to define hospitalised	Not applicable	Not applicable	Hospitalised for at least 24 hours	Crash must occur on a public roadway; hospitalised for at least 24 hours	Not applicable
Source of hospitalised victim information	Not applicable	Not applicable	Police records	Police traffic collision records	Not applicable
Census or sample data	Not applicable	Not applicable	Census information; however some under-reporting does occur	Estimates	Not applicable
Method used to derive estimates	Not applicable	Not applicable	Not applicable	Census information is available in 12 of Canada's 13 political jurisdictions. The distribution of hospitalised victims to total injured victims in known jurisdictions is applied to the lone province that does not provide this information	Not applicable
Has hospitalised victim definition changed? If yes, please describe the change.	Not applicable	Not applicable	Unchanged	Unchanged	Not applicable

HOSPITALISED ROAD USER DATA AVAILABILITY

	Denmark	Finland	Germany	Hungary	Iceland
Hospitalised data provided to IRTAD?	Yes	No	Yes	No	No
Criteria used to define hospitalised	Hospitalised for at least 24 hours	Not applicable	Victims hospitalised for at least 24 hours and who do not die within 30 days of the crash	Not applicable	Not applicable
Source of hospitalised victim information	Police records	Not applicable	Police traffic collision records	Not applicable	Not applicable
Census or sample data	Census data	Not applicable	Census data	Not applicable	Not applicable
Method used to derive estimates based on sample data	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Has hospitalised victim definition changed? If yes, please describe the change.	Unchanged	Not applicable	Unchanged	Not applicable	Not applicable

HOSPITALISED ROAD USER DATA AVAILABILITY

	Ireland	Korea	Netherlands	New Zealand	Poland
Hospitalised data provided to IRTAD?	No	No	Yes	Yes	No
Criteria used to define hospitalised	Not applicable	Not applicable	Admitted to hospital for at least one day	Admitted to hospital for at least one night	Not applicable
Source of hospitalised victim information	Not applicable	Not applicable	Police traffic collision records	Hospital records	Not applicable
Census or sample data	Not applicable	Not applicable	Estimates	Census data	Not applicable
Method used to derive estimates based on sample data	Not applicable	Not applicable	Common crash and hospitalised victim data elements (e.g. crash date, time) are linked. Estimates of hospitalised persons are derived from three sets of victims: those in both files, those only in crash files and those only in hospital files.	Not applicable	Not applicable
Has hospitalised victim definition changed? If yes, please describe the change.	Not applicable	Not applicable	Unchanged	Unchanged	Not applicable

HOSPITALISED ROAD USER DATA AVAILABILITY

	Spain	Sweden	Switzerland	United States
Hospitalised data provided to IRTAD?	Yes	No	No	No
Criteria used to define hospitalised	Victims hospitalised for at least 24 hours	Not Applicable	Not Applicable	Not Applicable
Source of hospitalised victim information	Police traffic collision records	Not Applicable	Not Applicable	Not Applicable
Census or Sample Data	Census data	Not Applicable	Not Applicable	Not Applicable
Method used to derive estimates based on sample data	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Has hospitalised victim definition changed? If yes, please describe the change.	The definition of hospitalised victim changed to a minimum 24 hour stay in 1993. Prior to that date, the type of injury and not the length of stay determined the severity.	Not applicable	Not applicable	Not applicable

HOSPITALISED ROAD USER DATA AVAILABILITY

	Australia	Austria	Belgium	Canada	Czech Republic
If hospitalised victim data were provided to IRTAD previously but not currently, please explain.	Hospitalised victim data were provided in the past, based on police collision reports, but were subsequently felt to be too inaccurate. Comparisons made with road crash admissions derived from health records showed the police data were under-reported.	Not applicable	Not applicable	Not applicable	Not applicable
Description of the main impediments to providing hospitalisation data to IRTAD	Due to incomplete reporting of police data, which resulted in severe under-counting, one state, which comprises more than 30% of Australia's figures, stopped providing police counts of hospitalised crash casualties, resulting in incomplete figures.	Austria's definition of serious injury is considerably different from the definition used in other countries.	Not applicable	Not applicable	There is no link between police and hospitalisation statistics. Hospitalised victim data fall under the jurisdiction of the Health Ministry and are incomplete because the reasons for hospitalisation (e.g. traffic crashes) are not always recorded.

HOSPITALISED ROAD USER DATA AVAILABILITY

	Denmark	Finland	Germany	Hungary	Iceland
If hospitalised victim data were provided to IRTAD previously but not currently, please explain.	Not applicable	Data were collected for special projects and include information from some but not all hospitals.	Not applicable	Not applicable	Not applicable
Description of the main impediments to providing hospitalisation data to IRTAD	Not applicable	Attempts to merge hospital medical records with crash data records have proven futile because the hospital records are too inaccurate.	Not applicable	Hungary's definition of serious injury (8 days in hospital) is very different from the IRTAD definition. Several unsuccessful proposals were made to include a data element specifying a minimum 24 hour stay in hospital on the collision report form.	Only information reported by police on the scene is provided to the Icelandic Traffic Council. Information on hospitalised victims is provided for only the most severe crash victims.

HOSPITALISED ROAD USER DATA AVAILABILITY

	Ireland	Korea	Netherlands	New Zealand	Poland
If hospitalised victim data were provided to IRTAD previously but not currently, please explain.	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Description of the main impediments to providing hospitalisation data to IRTAD	Although the collision report form contains information relating to whether crash-involved persons are hospitalised, this information is not available for all involved victims and is therefore incomplete. Consequently, this information is not provided.	Korea's police collision report form does not contain a data element on whether the victim is hospitalised.	Not applicable	Not applicable	Poland's hospitalisation statistics do not provide information on the cause of the injury.

HOSPITALISED ROAD USER DATA AVAILABILITY

	Spain	Sweden	Switzerland	United States
If hospitalised victim data provided to IRTAD previously but not currently, please explain.	Not applicable	Not applicable	Not applicable	Not applicable
Description of the main impediments to providing hospitalisation data to IRTAD	Not Applicable	Problems exist with data quality and definitions. These issues must be examined and resolved before hospitalisation data can be provided.	There are no links between police and hospitalisation data. There are no national statistics for hospitalisation data. Each hospital collects its own data, but these figures are not aggregated to form a national data file.	Local and state governments, who are responsible for crash data collection do not capture this information and have no plans to do so. A sample of hospitalised victim data is collected for occupants of towed vehicles but national estimates are not made.

HOSPITALISED ROAD USER DATA AVAILABILITY

	Australia	Austria	Belgium	Canada	Czech Republic
Procedures or strategies to be implemented by non-reporting countries to enable them to provide hospitalisation data in the future	Alternatives being considered as part of a country-wide project include the use of unadjusted health system counts of hospital admissions, patient days in hospital, hospital stays of 48 hours or longer, and continued use of police counts.	No procedures or census surveys are currently being planned.	Not applicable	Not applicable	While plans have not yet been formed, the experiences of other countries in generating this type of information will be used to develop a strategy.
If census information on hospitalised road users is not available, can these data be generated from other sources, e.g. based on a sample of medical records of hospitalised road users or using a correction factor based on seriously injured road user data?	Health system counts of hospital admissions could be provided, but they are 50%-60% higher than police counts. Additionally, the data are not timely, multiple counting of admissions sometimes occurs and the coding of external cause is not always accurate.	This information may be available in the National Statistics of Hospital Discharge from Statistics Austria. However, a way must be found to separate road crash statistics from other kinds of transportation crash data (e.g. air, rail and marine).	Not applicable	Not applicable	No

HOSPITALISED ROAD USER DATA AVAILABILITY

	Denmark	Finland	Germany	Hungary	Iceland
Procedures or strategies to be implemented by non-reporting countries to enable them to provide hospitalisation data in the future	Not applicable	A pilot project based on the Göteborg action model is being developed. The objective of the project is to determine how this model works in Finnish hospitals.	Not applicable	The traffic collision report form is being modified to include a data element that indicates that a victim was hospitalised for 24 hours or longer. The new forms were introduced in January 2002, and hospitalisation data should be available by 2003.	A Complete Regional Accident Registration System (CRARS) was recently developed. All crash data will be captured using this system. It is anticipated that this system will be fully operational by 2002.
If census information on hospitalised road users is not available, can these data be generated from other sources, e.g. based on a sample of medical records of hospitalised road users or using a correction factor based on seriously injured road user data?	Not applicable	Finland does not collect data on seriously injured road users and therefore cannot provide national estimates of hospitalised road users. No other estimation method is currently available.	Not applicable	In principle, census data are available. These data are based on hospital records but have not been linked to police records. Efforts will be made in the near future to provide these data to IRTAD.	No

HOSPITALISED ROAD USER DATA AVAILABILITY

	Ireland	Korea	Netherlands	New Zealand	Poland
Procedures or strategies to be implemented by non-reporting countries to enable them to provide hospitalisation data in the future	Police will soon begin using PCs to capture collision information and will provide this information to the NRA. A complete year of hospitalised data should be available by 2002.	None planned	Not applicable	Not applicable	None planned
If census information on hospitalised road users is not available, can these data be generated from other sources, e.g. based on a sample of medical records of hospitalised road users or using a correction factor based on seriously injured road user data?	No such work has yet been undertaken. In the future, available data will be examined to determine if estimates of hospitalised road users are feasible.	Accurate estimates cannot be made.	Not applicable	Not applicable	It may be possible to estimate the number of hospitalised victims as part of a new national program aimed at improving road safety in Poland.

HOSPITALISED ROAD USER DATA AVAILABILITY

	Spain	Sweden	Switzerland	United States
Procedures or strategies to be implemented by non-reporting countries to enable them to provide hospitalisation data in the future	Not applicable	Although strategies were not discussed, the National Roads Administration feels that hospitalised data should be available in the near future.	Since 1998, each hospital, nation-wide, collects hospitalised victim information for all hospitalised road users (not only traffic injury victims) using ICD-10 reporting procedures. The data has been forwarded to the National Bureau of Statistics for compilation.	None planned
If census information on hospitalised road users is not available, can this data be generated from other sources, e.g. based on a sample of medical records of hospitalised road users or using a correction factor based on seriously injured road user data?	Not applicable	It is possible to make good estimates of hospitalised victims from existing data.	At present, census data are not available. But efforts will be made in the future to provide data generated from the above-mentioned study to IRTAD.	No. Collection of hospital data is a function of state governments and is sometimes incomplete and unreliable. There are currently no plans to develop a sample of hospitalised victims by source of injury.

HOSPITALISED ROAD USER DATA AVAILABILITY

	Australia	Austria	Belgium	Canada	Czech Republic
Is any work being done in your country to link police-reported victim hospitalisation data with hospital medical records? If yes, please describe the results.	One Australian state regularly links police and hospital medical records. The ATSB is finalising a research project that aims to link a full year of comparable police-reported and Australian health system data with victim name excluded.	Efforts were made in 1990 and 1999 to link police and medical records. The medical file is individual-based, while the police database is event-based. Matches were made on common demographic traits. But the results were disappointing – only 30% matched.	A data warehouse to link several databases including hospital, licensed driver and environmental data is being planned. While no time frame has yet been established for this plan, a data warehouse should provide more hospital information.	Transport Canada is currently involved in a research project that aims to link police-reported data with hospital medical records. The study will compare data from Canada's most populated province.	Not at this time

HOSPITALISED ROAD USER DATA AVAILABILITY

	Denmark	Finland	Germany	Hungary	Iceland
Is any work being done in your country to link police-reported victim hospitalisation data with hospital medical records? If yes, please describe the results.	Seven hospitals register traffic crashes. Only one directly links the data with police records. Discussions are under way to collect this information nationally. A major challenge is to include crash location information in the hospital data.	In 1998, a research study was undertaken that combined traffic crash and health care data. However, data quality was a major problem. Current efforts are focusing on the Göteborg action model pilot project.	No	Not at this time	Yes. The new crash data system being developed, called Complete Regional Accident Registration System (CRARS), links police information with hospital records. It is expected to be operational in 2002.

HOSPITALISED ROAD USER DATA AVAILABILITY

	Ireland	Korea	Netherlands	New Zealand	Poland
Is any work being done in your country to link police-reported victim hospitalisation data with hospital medical records? If yes, please describe the results.	No	No	Estimates of hospitalised road users are derived by linking hospital records with police-reported crash data using data elements common to both data sets (e.g. crash date, crash time, date of birth of hospitalised victims). Personal identifiers are excluded.	A number of researchers have matched police traffic crash reports with hospital records.	No

HOSPITALISED ROAD USER DATA AVAILABILITY

	Spain	Sweden	Switzerland	United States
<p>Is any work being done in your country to link police-reported hospitalisation victims data with hospital medical records? If yes, please describe the results.</p>	<p>No</p>	<p>An ongoing project aimed at linking police-reported and hospital data shows promise. The project has been operating since 1999 in southern Sweden. This system is scheduled to be introduced in the whole country in 2003.</p>	<p>No</p>	<p>Yes. NHTSA sponsors a program which encourages states to link road crash data with medical outcome data. The program funds states to develop linkage capabilities for at least two years of data, which are then used to support traffic safety programs.</p>