

A COMPARATIVE ANALYSIS OF THE POTENTIAL OF INTERNATIONAL ROAD ACCIDENT DATA FILES

Dr. George Yannis, Dr. John Golias and Dr. George Kanellaidisⁱ

Abstract

An important work effort has been dedicated over the last decades on the development of international road accident data files in Europe. Today, there exist at least eight international data files at European level offering various series of road accident data. The objectives and scopes of these data files differ among the various data providers making them to function in complementarity in most of the cases. However, the objectives of the international road accident data analysis are far from being reached. A number of actions, such as data harmonisation and better quality control, provision of integrated output services and use of more performant systems are required in order to face the structural problems which prevent international road accident statistics providers to cope satisfactorily with the demand for international road accident data.

Key-words: Road safety, road accident analysis, data bases, road safety information systems

ⁱ Dr. G.Yannis is Research Associate, Dr. J.Golias and Dr. G.Kanellaidis are Associate Professors in the National Technical University of Athens, Department of Transportation Planning & Engineering, 5, Iroon Polytechniou str., GR-15773 Zografou, Athens, GREECE
tel. +30.1.7721326, fax. +30.1.7721327, e-mail: geyannis@central.ntua.gr

1. Introduction

An important work effort has been dedicated over the last decades in road accident analysis at national level which led to numerous interesting results explaining better the road accident phenomenon and were used for the development and implementation of road safety policies at national and local level. Efforts for road accident analysis at European level are lacking far behind equivalent efforts at national level due not only to the lack of a concrete European road safety policy but also to the difficulties arising from the incompatibilities of the national data and the related insufficiencies of most of the international data files with road accident data at European level.

Recent developments in the European society (integration of the European Community internal market, opening up of the eastern European markets) gave also a more international character to road safety problems and initiatives for international cooperation in the field of road safety are intensified¹. Approaches for dealing with the road accident phenomenon at European level are gaining more ground and the European Union has already set the basis for a European road safety policy^{2, 3}. In parallel, efforts are intensified in order to cope better with the existing deficiencies in the provision and availability of the international road accident data which are necessary to support European level initiatives. These efforts are mainly coordinated by the various international organisations; among them the group of experts of CARE⁴ (European Commission) and of IRTAD⁵ (OECD) can show already some interesting results.

The objective of this research is to produce a comparative analysis of the current and future potential of all major International Data Files (IDF) for road accident statistics. It aims to provide useful information about the current and future situation concerning the supply of international road accident data at European level⁶.

The results of this comparative analysis provide the tools to identify which are the appropriate IDF to be used in each case of international comparison and analysis of road accidents. These results are beneficial for the end-user of international statistics as, by being informed about which information can be found in which IDF, his data search workload is reduced. In parallel, these research results are also useful for the international data providers, as by having extended information about what is offered today, they will not only focus on the complementarity of IDF services avoiding overlapping but also adopt best practices used by other IDFs.

2. Methodology

In the early stages of the research all major files containing road accident data for several countries were identified. The scope of the research focused on Europe with special attention to the EU member states. Some world-wide cases were also treated occasionally. The international data files considered were the following eight:

- CARE (European Commission, Brussels and Luxembourg)
- IRTAD (Organisation for Economic Cooperation & Development/BASt, Bergisch-Gladbach)
- ECMT (European Conference of Ministers of Transport, Paris)
- UN/ECE (United Nations - ECE, Geneva)
- EUROSTAT (European Commission, Luxembourg)
- RSQI (European Commission, Brussels)
- WHO (World Health Organisation, Geneva)
- IRF (International Road Federation, Geneva)

In addition to these eight files, some other possible international statistics providers have been contacted (IRU⁷, ERSF, etc.) but none of them collect data; they simply compile or use road accident data from various international sources for their publications. They act more as statistics users than statistics providers. A very interesting national file, the USA Federal Accident Reporting System (FARS), has also been considered because its characteristics are very much similar to an international file.

After the choice of the international data files, preliminary information has been collected through extensive bibliography research. On the basis of this preliminary information a questionnaire was developed in order to assist the information collection during interviews with the persons responsible for the files. During these interviews very useful information was collected concerning the technical (data collection and processing techniques, system specifications, etc.) and operational (aims, users, publications and other output services, etc.) characteristics of each system. Furthermore, the opinion of those interviewed on the existing situation in the field of international road accident statistics was also proved to be a valuable input.

All information collected was put together and analysed in a uniform way allowing extraction of comparative results. Quantitative and qualitative comparative Tables have been prepared allowing the formulation of general and specific conclusions as well as recommendations for the improvement of the current situation in the field of the international road accident statistics. Special attention has been paid to the analysis, matching user needs to the current and future potential of international data files. During this procedure, additional information was asked by the persons responsible for the international data files, when necessary.

3. Summary description

Among the eight international road accident data files considered, two data files contain disaggregate data (CARE and WHO) and six data files contain aggregate statistics (IRTAD, ECMT, UN/ECE, EUROSTAT, RSQI, IRF). Data files with disaggregate data are those containing detailed information for every accident recorded (e.g. the exact time and date of the accident as well as the exact age of all the persons involved), whereas data files with aggregate data are those containing only summary total statistics (e.g. the number of persons killed by age group and by type of road network). It is also noted that aggregate data can always be derived from the aggregation of disaggregate data.

The European Commission (EC) of the European Union is in charge of three road accident data files including data from the fifteen member states of the European Union: the CARE

file with disaggregate data, the Eurostat file with aggregate statistics and the Road Safety Quick Indicator with very recent trends.

CARE is a huge data base containing all national files with disaggregate road accident data from the 15 EU member states since 1991⁸. The total number of variables contained in CARE file exceeds 300 (with more than 3.000 values) but the currently common-label variables are about 30 (with about 600 values). Today, only administrations from the EU member states have access to each other data under the reciprocity principle and can produce via on-line queries (24h/day) aggregate reports (reports containing aggregate statistics)⁹ combining every variable and value in multi-dimension Tables. There is no official publication of CARE except some test reports produced occasionally. The pilot operation phase of CARE is not yet completed as a number of quality issues, inherent to the available national data, as well as the related exploitation plans of the output services are under development. CARE presents a great potential and intends to evolve towards an integrated information system offering a wide range of road accident analysis services¹⁰.

The EC-Eurostat issues annually a transport statistics publication¹¹ containing also information about road accidents (6 Tables containing 5 variables and 22 values) which is available at a low price (20 ECU). Technical problems of the last years have been solved and the 1996 publication containing data from 1988 to 1994 is available. In the future, this publication will be introduced in the electronic services of the Eurostat for on-line and off-line consultation of the pre-defined Tables.

The Road Safety Quick Indicator (RSQI) is an initiative of the Directorate General for Transport of the European Commission aiming to provide very recent trends on basic road accident numbers (number of accidents, persons killed and injured) based on provisional data. An eight-page publication is distributed only to the fifteen national administrations. This data file concerns trends only, overpassing thus data incomparability problems. On average, complete trends for the fifteen member states are available within five months after the end of the period concerned.

The IRTAD data base is a project of the Organisation for Economic Cooperation and Development (OECD) which is run by BASt, the Federal research institute of Germany¹². This data file contains the most interesting international road accident statistics with 3 road safety units and 17 indices concerning 6 variables containing a total of 44 values for 27 countries (21 European countries). This information is available only to its members (currently more than 30) which are obliged to pay about 4.200 ECU as annual subscription (1.300 ECU for additional members). Apart from the two-page summary statistics publication¹³ available to everybody free of charge, IRTAD members receive twice per year updated statistics in off-line electronic form (disks) and have all year long on-line access to all statistics Tables.

The European Conference of Ministers of Transport (ECMT) maintains a European road accident data file mainly for supporting political decisions within the framework of its activities¹⁴. An annual publication¹⁵ with few but very interesting road accident statistics (2 variables containing 9 values in 18 Tables) concerning 34 European countries is issued by the ECMT. This publication is available to everybody at a low price (about 15 ECU). No electronic form is currently available, but it may be possible in the future.

The Economic Commission for Europe of the United Nations (UN-ECE) issues an annual publication¹⁶ with an important number of road accident statistics (11 variables containing 57 values in 6 Tables) concerning 53 European countries. This publication is available to everybody at a low price (about 20 ECU). No electronic form is available today, but it may be possible in the future, through the UN page in the www.

The World Health Organisation (WHO) maintains a huge disaggregate data base on persons killed throughout the world (192 countries of which 50 in Europe) in which the cause (primary and secondary) of death is mentioned. One of the death cause categories is the road accident; disaggregate information for 5 variables containing more than 300 values is available. A large number of values (more than 150) concerns the road accident type^{17, 18}. Information about every person killed in road accidents is correct but not always as detailed as supposed to be. The WHO issues an annual publication¹⁹ which is available to everybody at a price of about 65 ECU. Pre-defined aggregate parts of the data base are available free of charge via Internet. For some special cases, access to disaggregate data is permitted under specific conditions.

The International Road Federation (IRF) is a non-governmental organisation issuing an annual publication²⁰ on road transport statistics comprising also road accident statistics (2 variables containing 4 values in 1 Table) concerning 132 countries (36 European countries). This publication is available to everybody at a price of about 135 ECU. No electronic form is currently available, but it may be possible in the near future, through the IRF page in the www.

FARS, the federal disaggregate data base on fatal accidents of the United States of America²¹ is operational since 1975 and contains very interesting data leading to very useful statistics [more than 100 variables containing more than 3200 values (1200 concern car makes)]. FARS data present a high degree of homogeneity as a result of long efforts of data harmonisation between road accident data collected at State level. This high degree of data homogeneity is also due to the availability of an important annual budget (exceeding 4 MECU) devoted to suitable data transformations in each State, as well as to a strong negotiation power of the federal administration towards the States' governments, which undergo financial penalties if they don't use common data definitions. FARS output services comprise an annual report²², some fact sheets, a CD-ROM version containing reports and original data²³, and on-line access to the fact sheets and other information via Internet. Among the near future intentions of FARS is the provision of the complete FARS file with disaggregate data for on-line queries and possibly original data downloading via Internet.

4. Analysis of the contents

All road accident variables, units and indices used in the various international road accident data files are listed in the following Tables 1 - 3 allowing for a direct comparison of the contents of the files.

Table 1. List of variables used in each international road accident data file

| ROAD ACCIDENT VARIABLES | CARE | IRTAD | ECMT | UNECE | EUROSTAT | RSQI | WHO | IRF | Total | FARS |
|-------------------------------------|------|-------|------|-------|----------|------|-----|-----|-------|------|
| Road user type | ● | ● | ● | ● | ● | | ● | | 6 | ● |
| Age group | ● | ● | | ● | ● | | ● | | 5 | ● |
| Sex | ● | | | | ● | | ● | | 3 | ● |
| Alcohol influence | ● | | | ● | | | | | 2 | ● |
| Lighting conditions | ● | | | ● | | | | ● | 3 | ● |
| Road condition | ● | | | ● | | | | | 2 | ● |
| I/O Built-up areas | ● | ● | | ● | ● | | | ● | 5 | ● |
| Road class | ● | ● | ● | ● | | | | | 4 | ● |
| Vehicle Type | ● | ● | | ● | ● | | ● | | 5 | ● |
| Accident type | ● | | | ● | | | ● | | 3 | ● |
| Month | ● | ● | | ● | | | | | 3 | ● |
| Day | ● | | | ● | | | | | 2 | ● |
| Total | 12 | 6 | 2 | 11 | 5 | | 5 | 2 | | 12 |
| <i>Combinations of variables</i> | | | | | | | | | | |
| Road user type - Age group | ● | ● | | ● | ● | | ● | | 5 | ● |
| Road user type - Sex | ● | | | | ● | | ● | | 3 | ● |
| Road user type - Age group - Sex | ● | | | | ● | | ● | | 3 | ● |
| Road user type - Alcohol influence | ● | | | ● | | | | | 2 | ● |
| Road user type - I/O Built-up areas | ● | | | ● | | | | | 2 | ● |
| Road user type - Accident type | ● | | | | | | ● | | 2 | ● |
| Age group - Sex | ● | | | | ● | | ● | | 3 | ● |
| I/O Built-up areas - Accident type | ● | | | ● | | | | | 2 | ● |
| Vehicle type - Vehicle type | ● | | | | ● | | ● | | 3 | ● |

The variables and units presented in Tables 1 and 2 were found in the description of the contents of each data base (questionnaire, etc.). The list of variables is exhaustive only for the files with aggregate road accident data; the files with disaggregate data (CARE, FARS) contain much more variables which are not listed in Table 1. It is noted that FARS contents do not refer to international data and consequently, they are not included in the Table totals. However, as they refer to a number of States they are shown in a separate column.

Table 1 shows that only 12 variables and 9 combinations of them are used in the eight international road accident data files. These variables concern the road user (road user type, age, sex, alcohol influence), the road environment (lighting conditions, road condition, inside/outside built-up areas, road class), the vehicle (vehicle type), the accident (accident type) as well as general information of the accident (month, day). Furthermore, it is obvious that the road accident variables that are mostly used in the international data files are those concerning the type of the person involved (pedestrian, passenger, driver of various types of vehicles, etc.), his/her age, the type of the network where the accident occurred (inside/outside built-up area, road class, etc.) and the type of the vehicle involved.

It is noted that Table 1 provides mainly quantitative information as it shows only the number of variables included in each data file. Information on data homogeneity and availability of values within each variable is not included in this file. For example, values included in the six IRTAD variables are comparable to a higher degree than the values included in the fourteen UN/ECE variables.

Table 2. List of basic units used in each international road accident data file

| UNITS | CARE | IRTAD | ECMT | UNECE | EUROSTAT | RSQI | WHO | IRF | Total | FARS |
|-------------------------|----------------|----------------|------|-------|----------|------|-----|-----|-------|----------------|
| Casualty road accidents | ● | ● | ● | ● | ● | ● | | ● | 7 | ● ¹ |
| Killed persons | ● | ● | ● | ● | ● | ● | ● | ● | 8 | ● |
| Injured persons | ● ² | ● ³ | ● | ● | ● | ● | | ● | 7 | ● |
| Vehicles involved | ● | | | | | | | | 1 | ● |
| Total | 4 | 3 | 3 | 3 | 3 | 3 | 1 | 3 | | 4 |

¹ Fatal accident only

² CARE distinguishes between slightly and seriously injured persons

³ IRTAD contains hospitalised persons (in-patients) separately

As far as road accident units are concerned, it is obvious from Table 2 that apart from the WHO data file which is not oriented to road accidents, all other data files include the three basic units: injury road accidents, killed and injured persons. Definitions used for injured persons and related injury accidents vary considerably both among countries of each data file and among data files for some countries, whereas definitions of persons killed present smaller differences. IRTAD is the only data file using the unit hospitalised persons (in-patients) which is considered as a more easily rather comparable unit.

Table 3. List of indices used in each international road accident data file

| INDICES | CARE | IRTAD | ECMT | UNECE | EUROSTAT | RSQI | WHO | IRF | Total | FARS |
|---|------|-------|------|-------|----------|------|-----|-----|-------|------|
| Accidents/inhabitants | | ● | | | | | | | 1 | |
| Accidents/Veh*Km | | ● | | | | | | ● | 2 | |
| Accidents/Veh*Km I/O build-up areas | | ● | | | | | | | 1 | |
| Accidents/Veh*Km by road class | | ● | | | | | | | 1 | |
| Killed/inhabitants | | ● | ● | | ● | | ● | | 4 | ● |
| Killed/inhabitants by age group | | ● | | | ● | | ● | | 3 | ● |
| Killed/inhabitants by age group & sex | | | | | ● | | ● | | 2 | ● |
| Killed/licensed drivers | | | | | | | | | 0 | ● |
| Killed/mil vehicles | | | ● | | | | | | 1 | ● |
| Killed/mil road users by road user type | | | ● | | | | | | 1 | |
| Killed/Veh*Km | | ● | | | | | | ● | 2 | ● |
| Killed/Veh*Km I/O build-up areas | | ● | | | | | | | 1 | |
| Killed/Veh*Km by road class | | ● | | | | | | | 1 | |
| Injured/inhabitants | | ● | | | ● | | | | 2 | ● |
| Injured/inhabitants by age group | | ● | | | ● | | | | 2 | ● |
| Injured/inhabitants by age group & sex | | | | | ● | | | | 1 | ● |
| Injured/licensed drivers | | | | | | | | | 0 | ● |
| Injured/mil vehicles | | | | | | | | | 0 | ● |
| Injured/Veh*km | | ● | | | | | | ● | 2 | |
| Injured/Veh*Km I/O build-up areas | | ● | | | | | | | 1 | |
| Injured/Veh*Km by road class | | ● | | | | | | | 1 | |
| Total | 0 | 14 | 3 | 0 | 6 | 0 | 3 | 3 | | 11 |

The indices presented in Table 3 were found either in the description of the contents of the data bases or in the relevant publications. In some cases more indices can be produced using data contained in the data bases but only those given in the data bases or in the publications were retained (e.g. in the IRF file it is also possible to calculate indices per inhabitants and

per vehicles which are not included in Table 3, as they are not presented as such in the publication).

Table 3 shows that five out of the eight international road accident data files contain indices (IRTAD, ECMT, EUROSTAT, WHO, IRF). These indices relate accident data mainly with population data but also with vehicle fleets and vehicle mileage. The most frequently used indices are those relating number of persons killed or injured with population data, mainly because the latter are easier to find. Indices relating accident data with mileage are the most interesting for the purposes of road accident analysis²⁴ and are provided only by IRTAD and IRF. However, incomparability of traffic data seem to indicate that these indices should be used with great attention. IRTAD produces fourteen indices by distinguishing among various age groups and sex of the population and among mileage in the various types of road network.

5. Data comparison

Within the framework of this research all recent statistics publications issued by the various international data files have been collected. These publications contain data and analyses, the comparison of which can demonstrate the current situation in the provision of international road accident data in Europe.

Therefore, a comparison of the basic road accident data available was attempted. All available data concerning the number of accidents, killed and injured persons, for the years 1989 - 1994 for each one of the fifteen country members of the European Union have been placed in an comparative Table not included in this paper, allowing their direct comparison. Additionally, for the year 1991 only, data from national sources, the national road accident statistics publication²⁵, were also available and have also been incorporated in the comparative Table. Data contained in the comparative Table, were put together in order to compare data referring to the same country and year from different sources. The analysis of this comparative Table revealed a number of interesting remarks concerning similarities and differences of the data supplied by the various international road accident data files. The most interesting remarks are summarised below.

As far as the number of persons killed is concerned, ECMT and IRTAD use correction coefficients for the transformation of all figures to the common definition (death within 30 days). IRTAD and IRF files provide a note concerning the definition used by the country concerned. From Table 4, showing the various correction coefficients used, it is obvious that the transformation to the common definition is not the same for all files. Furthermore, further calculations showed that even if the same coefficients were used some figures would continue to differ.

Table 4. Definition of killed persons: correction coefficients and notes

| | Correction coefficients | | Notes | |
|----------|-------------------------|----------|----------|----------|
| | ECMT | IRTAD | IRTAD | IRF |
| Austria | 1,085 | 1,12* | 3 days | 3 days |
| Spain | 1,3 | 1,3** | 24 hours | 24 hours |
| France | 1,09 | 1,057*** | 6 days | 6 days |
| Greece | 1,12 | 1,15 | 3 days | n.a. |
| Italy | 1,07 | 1,08 | 7 days | 7 days |
| Portugal | 1,3 | 1,3 | 24 hours | 24 hours |

* up to 1991 ** up to 1993 *** 1,09 was used up to 1992

WHO fatalities data present, in general, differences from the equivalent data of the other data files. WHO data are not always higher than those of the other data files as expected (WHO data source are the hospitals which obviously record in general more road accident fatalities than the police). This may be explained by the fact that the correction coefficients used by the other data files reflect mean values over long previous periods and do not coincide with the real values per year.

RSQI data series do not match with data series from any other source because only provisional data, which are never updated with the final figures, are contained in the data file. Surprisingly, sometimes provisional fatalities figures are higher than the final contained in the other data files. This may be explained by the fact that sometimes provisional data may contain estimation of fatalities. Comparison of IRF data to data of the other files shows relatively more important differences than those between the other data files. These differences refer mainly to the total number of accidents. IRF total number of accidents for most of the countries is relatively lower than the equivalent data of the other files. Comparison of ECMT data with data from the other files shows that the total number of accidents and killed persons for some countries is relatively higher than the equivalent data of the other files.

Figures referring to road accidents present less problems than the equivalent figures for persons killed. This is mainly due to the elaboration of the figures concerning killed persons so that they become comparable.

Some countries present very small differences in the total number of accidents and casualties in the various data files whereas some other countries present more important differences. It is believed that data differences among the various data files are mainly due to the fact that each international data file uses a different national data source, and that for some countries these different sources do not provide the same figures.

Comparison of the accident and casualties data published by the national authorities with those contained in the international data files shows that these national data are consistent with the data provided by the majority of the international data files.

The general conclusion from the above data comparison is that today, even basic figures such as the number of accidents that occur every year in the roads of the European Union and the number of persons killed or injured are not recorded accurately. A user should consult more than one international data sources and read carefully the related explanatory notes before

proceeding to the use of a certain figure. The situation is worse when more detailed data are used.

6. Overall comparison

On the basis of all information collected and the subsequent analysis, the following summary comparison Table 5 was prepared, presenting a comparative description of basic characteristics of all nine road accident data files considered. Additionally, the further analysis of the various international road accident data files produced a number of interesting remarks on the existing potential in this field. More precisely, the assessment of the current situation for the supply of international road accident statistics is summarised below.

There exist two international road accident data files with disaggregate data (CARE, WHO), five files with aggregate data and one with provisional aggregate data (RSQI).

An important variation of numbers published by the various international data files and referring to the same cases was observed. Even basic numbers, like the total number of accidents, presented significant differences among the various files. In some cases (certain countries for certain years), total numbers were different in all eight files.

The number of data variables and values as well as their quality (incompatibility, under-reporting, etc.) varies considerably among the various international road accident data files. Under-reporting is a very important problem and according to research carried out the last decade, police collects a very high percentage (~ 85%) of accidents with killed persons but a rather poor percentage (~ 40 - 60%) of accidents involving only injured persons²⁶. These percentages vary from country to country and even from region to region. It is noted that the effect of these data quality problems to accident analysis is less important for the data files with aggregate data than for those with disaggregate data because aggregate statistics are destined for general macro analysis (quality problems influence in a lower degree the general trends), whereas disaggregate data files are destined for specific detailed analysis (data quality problems can easily lead to unreliable results).

The elaboration of output statistics varies also considerably among the various international data files. Tables with accident rates and indices are more useful but only a few indices are provided by the various files. The IRTAD data base provides by far the highest quality of output Tables containing 17 accident indices. ECMT, Eurostat, WHO and IRF produce also a number of accident indices.

Data quality varies according to the country. For example, data for Eastern European countries are usually unreliable and very often missing.

Use of correction factors in order to make national data comparable at international level is adopted today in only two files (IRTAD, ECMT) and is under preparation in a third (CARE). Correction factors for the first two files refer mainly to the definition of a killed person, while for CARE they will concern more concepts.

Table 5. Comparative description of basic characteristics of international data files

| GENERAL INFORMATION | | | | | | | | | | |
|------------------------------------|--|----------------------|----------------------|----------------|----------------|----------------|-----------------------|----------------|-------------------------|---------------------|
| 1 | Name | CARE | IRTAD | ECMT | UN-ECE | EUROSTAT | RSQI | WHO | IRF | FARS |
| 2 | Owner organisation | EC-DGVII | OECD/BAST | ECMT | UN-ECE | EC-Eurostat | EC-DGVII | WHO | IRF | NHTSA |
| 3 | Type of organisation | Inter-gov/ntal | Inter-gov/ntal | Inter-gov/ntal | Inter-gov/ntal | Inter-gov/ntal | Inter-gov/ntal | Inter-gov/ntal | Non-gov/ntal | National |
| 4 | City | Brussels, Lux. | Bergish-Gladbach | Paris | Geneva | Luxembourg | Brussels | Geneva | Geneva | Washington |
| 5 | Starting decade | 80s | 80s | 60s | 60s | 70s | 80s | 50s | 50s | 70s |
| DATA INPUT & PROCESSING | | | | | | | | | | |
| 6 | Type of data collection | file transfer | custom questionnaire | questionnaire | questionnaire | questionnaire | questionnaire | file transfer | quest./ftp/mai/www/disk | electronic transfer |
| 7 | Number of sources per country | 1 | 1 - 3 | 1 | 1 | 1 | 1 | 1 | 1 - 3 | several |
| 8 | Accident data | disaggregate | aggregate | aggregate | aggregate | aggregate | provisional aggregate | disaggregate | aggregate | disaggregate |
| 9 | Other data ¹ | No | aggregate | aggregate | aggregate | aggregate | No | No | aggregate | aggregate |
| 10 | Available time series | 1991 - | 1965, 1970- | 1960 - | 1950 - | 1960 - | 1988 - | 1950 - | 1955 - | 1975- |
| 11 | Number of European countries | 15 | 21 | 34 | 53 | 15 | 15 | 50 | 36 | 0 |
| 12 | Number of all countries | 15 | 27 | 34 | 185 | 15 | 15 | 192 | 132 | 1 |
| 13 | Number of accident variables used ² | ~ 30 | 6 | 2 | 11 | 5 | 0 | 5 | 2 | ~100 |
| 14 | Number of accident values used ² | ~ 600 | 44 | 9 | 57 | 22 | 0 | ~ 300 | 4 | ~3200 |
| 15 | Number of units used ³ | 4 | 3 | 3 | 3 | 3 | 3 | 1 | 3 | 4 |
| 16 | Number of indices used | 0 | 17 | 3 | 0 | 6 | 1 | 3 | 3 | 11 |
| 17 | Use of correction factors | Yes | Yes | Yes | No | No | No | No | No | No |
| 18 | Hardware used | Main frame | Main frame / PC | PC | Main frame/PC | PC | PC | Main frame | PC | PC |
| OUTPUT SERVICES | | | | | | | | | | |
| 19 | Access | National admin. only | Members only | Everybody | Everybody | Everybody | National admin. only | Everybody | Everybody | Everybody |
| 20 | Publication | Test reports | Summary statistics | Annual | Annual | Annual | Quarterly | Annual | Annual | Annual |
| 21 | Issued after X months of the reference year | - | 14 | 15 | 15 | 20 | 5 | 12 | 11 | 10 |
| 22 | Price (in ECU) | - | Free of charge | 15 | 20 | 20 | Free of charge | 65 | 135 | n. a. |
| 23 | Total number of pages ⁴ | - | 2 | 66 | 88 (115) | 17 (250) | 8 | 280 (440) | 20 (300) | 165 (190) |
| 24 | Number of tables | - | 6 | 18 | 6 | 6 | 4 | 1 | 1 | 117 |
| 25 | Notes on road safety | - | No | Yes | Yes | No | No | No | Yes | Yes |
| 26 | Definitions | - | No | Yes | Yes | No | No | No | Yes | No |
| 27 | Languages | - | Eng, D | Eng, Fr | Eng, Fr, Rus | Eleven | Eng, Fr | Eng, Fr | Eng | Eng |
| 28 | Off-line electronic form (disks) | No | Yes | No | No | No | No | Yes | Yes | Yes |
| 29 | On-line electronic form | Yes | Yes | No | No | No | No | No | Yes | Yes |
| 30 | Electronic form in the future | Yes | Yes | Yes | Yes | Yes | No | Yes | Yes | Yes |
| 31 | World Wide Web page (www) | europa.eu.int | oecd.org | oecd.org/cem | un.org/unece | europa.eu.int | europa.eu.int | who.org | web.eunet.ch/irf | nhtsa.dot.gov |
| 32 | Accident data available on the www | No | No | No | No | No | No | No | No | Yes |

¹ : Other data refer to additional data used in accident rates (vehicles, vehicle-kilometrs, etc.)

² : With common label for all countries considered in the data file

³ : As units the number of accidents, the number of killed persons, the number of injured persons and the number of vehicles involved are considered

⁴ : Number in parentheses refer to the whole publication containing not only accident related statistics but also other transport related statistics

n.a.: information not available

-: non-relevant

The geographic coverage of each file is different, varying from 15 EU countries of the EC files to more than 130 of the UN, WHO and IRF files. This variation in geographic coverage justifies to some extent the co-existence of several files containing international road accident data.

Disaggregate data files (CARE and WHO) use a file transfer procedure for the collection of national data while all other files use standard questionnaires, with the exception of IRTAD which uses questionnaires customised to the particularities of each country's data. The Eurostat, the ECMT and the UN files use a common basic questionnaire to which they can optionally add any other question.

For all files the data provider in each country is one competent service of the national administration. However, IRTAD and IRF after having checked all data received, ask their members to verify the data validity; if any data errors occur, the figures are revised in close cooperation with the data providing administrations.

Four files are based on PC applications (Eurostat, RSQI, ECMT, IRF), two files are based on main frames (CARE, WHO), the UN files is currently switching from the main frame version to the PC version and the IRTAD is available in both PC and main frame versions.

Five data files allow everybody to access their data through their paper publications, in a cost varying from 15 ECU to 135 ECU. The CARE and RSQI are available free of charge only to competent services of the national administrations. IRTAD data are available only to its members; IRTAD summary statistics are available free of charge to everybody.

All international data files allow access to the data providers with the exception of IRTAD file, which requires membership.

Five files issue an annual publication (Eurostat, ECMT, UN, WHO, IRF). This publication concerns exclusively road accident statistics (ECMT, UN) or includes them in a transport statistics context (Eurostat), or in a road transport statistics context (IRF) or in the context of deaths by all causes (WHO).

Only two publications (ECMT, UN) contain notes on road safety as well as the definitions of road accident concepts included in the publication.

As far as the electronic output services are concerned, there exist several different arrangements:

- on-line queries on disaggregate data (CARE)
- on-line queries on aggregate data (IRTAD)
- on-line consultation of aggregate Tables (none)
- file transfer of aggregate Tables via Internet (WHO)
- file transfer of disaggregate data on magnetic tapes (WHO)
- file transfer of aggregate Tables on CD-ROM (none)
- file transfer of aggregate Tables on disks (IRTAD)

With the exception of RSQI, all data files plan to offer electronic output services in the future. These future services are expected to concern mainly on-line consultation of aggregate Tables, possibly through the www pages.

Consideration of the various international data files shows that, the better the data file is (more complete data, better quality, better output services) the more difficult it is for the user to have access. CARE and IRTAD services offering different high-end services cannot be accessed by all users, while standard publications of Eurostat, ECMT and UN are available to everybody at a low cost.

7. Conclusions

An important work effort has been dedicated over the last decades on the development of international road accident data files. Today, there exist at least eight international data files at European level offering various series of road accident data. The objectives and scopes of these data files differ among the various data providers making them to function in complementarity in most of the cases. The quantity and quality of available data contained inside these international data files is improving year by year, reflecting not only an intensification of work effort on behalf of the data providers but also an increasing demand by the international statistics users.

The fact that there are various international data files for road accidents at European level is positive for the road accident statistics users, because they can choose from a variety of information. Road accident statistics users can not only use several sources for cross checking data but also complete blanks in their data from one source with the use of appropriate data from the other. Access to these road accident statistics is rather easy to obtain for most of the international data files.

However, use of international statistics on road accidents should take place with great attention on behalf of the user. Data incomparability and unavailability makes any data analysis process a difficult task limiting very often the range of interesting and reliable analysis results. The user should always take into account notes on data definitions and particularities provided by the data provider and proceed very carefully when making European-wide comparisons.

The objectives of the international road accident data analysis are far from being reached, but there exist today a solid basis for further improvement of the supply of international road accident statistics in order to better meet the rapidly increasing demand for international road accident data. A number of actions are required in order to face the structural problems which prevent international road accident statistics providers to cope satisfactorily with this demand.

This research showed clearly that the harmonisation of road accident data and of the related collection systems²⁷ at European level, is necessary for the further improvement of the current situation. This harmonisation will improve radically the actual level of service in the provision of international road accident statistics. More comparable data will open the way for reliable pan-European road accident analyses allowing for results useful for the improvement of road safety in Europe. Furthermore, the European road safety community will benefit a lot from a more uniform road accident data collection and elaboration system as exchange of comparable international experience is a serious element for the design of an effective road safety policy.

Special attention should also be paid to the appropriate coordination of the various international data files in order to avoid duplication of work as well as for the cross checking of the information collected. Initiatives such as those of ECMT, UN/ECE and Eurostat for a common form for the collection of national basic road accident information should be encouraged at European level minimising thus data differences in the various international data files.

Furthermore, a number of methodological issues should be treated jointly by all international road accident statistics providers so that services offered to the end user have quality standards above a minimum level. For example, data cross-checking should take place at European level by the data providers and not by each user separately. Additionally, the statistics providers can benefit a lot (in time, resources and data quality) from the exchange of experience gained through the various applied methodologies.

Finally, the new technological improvements impose also a new approach in the system of road accident data collection, elaboration and dissemination. A number of necessary structural changes in this field are easier to implement today due to the new technological applications. The road safety community of Europe should follow and benefit from this new technological reality.

8. References

- 1 FERSI, Road safety in Europe, FERSI Mission paper, FERSI, 1997.
- 2 GERONDEAU, DURAND, ELLINHAUS, FERRI, HANNIGAN, KOORNSTRA, VALDEZ. - Report of the high level group for a European Policy for Road Safety, Commission of the European Communities, Brussels. - February 1991.
- 3 EUROPEAN COMMISSION, A plan for road safety in Europe 2000+, Communication to the Council, European Commission, Brussels, June 1997.
- 4 CETE DU SUD-OUEST, CAREPLUS, A proposal for improving the comparability of road accidents within EU Member States using the CARE data base, Bordeaux, January 1997.
- 5 OECD, International Road Traffic and Accident Databases, Seminar proceedings, Helsinki, 11-13 September 1995.
- 6 NATIONAL TECHNICAL UNIVERSITY OF ATHENS / DTPE, Overview of international road accident data files, NTUA/DTPE, Athens, November 1996.
- 7 INTERNATIONAL ROAD TRANSPORT UNION, World Transport Data, IRF, Geneva, 1996.
- 8 COMMISSION OF THE EUROPEAN COMMUNITIES, Council decision 93/704/EC of 30 November 1993 establishing a Community data base on road accidents, Office for official publications of the European Communities, OJ No L 329, Brussels, 30 December 1993.
- 9 BRISAER (A.), Towards a European policy on Road Safety, 1st Panhellenic congress on Road Safety, NTUA, AUTH, TCG, MPW, Thessaloniki, 28-29 March 1994.
- 10 NATIONAL TECHNICAL UNIVERSITY OF ATHENS / DTPE, Current and future potential of a European road accident data base with disaggregate data, NTUA/DTPE, Athens, November 1996.
- 11 EUROSTAT, Transport annual statistics 1988-1994, Office for official publications of the European Communities, Luxembourg, 1996.
- 12 BRUHNING (E.), Five years of IRTAD: Review and perspectives, Seminar on international road traffic and accident data bases, OECD, Helsinki, 11-13 September 1995.
- 13 BAST, International road traffic and accident data - 1994, BAST, Bergisch Gladbach, 1996.
- 14 HIRSTO (J.), ECMT Accident Statistics, Seminar on international road traffic and accident data bases, OECD, Helsinki, 11-13 September 1995.

- 15 EUROPEAN CONFERENCE OF MINISTERS OF TRANSPORT, Statistical Report on Road Accidents in 1994, ECMT, Paris, 1996.
- 16 UNITED NATIONS, Statistics of road traffic accidents in Europe and North America - 1995, United Nations, Economic Commission for Europe, Geneva, 1995.
- 17 WORLD HEALTH ORGANISATION, Manual of the international statistical classification of diseases, injuries and causes of death, Ninth Revision, Volume 1, WHO, Geneva, 1977.
- 18 WORLD HEALTH ORGANISATION, International statistical classification of diseases and related health problems, Tenth Revision, Volume 1, WHO, Geneva, 1992.
- 19 WORLD HEALTH ORGANISATION, World health statistics annual - 1994, WHO, Geneva, 1995.
- 20 INTERNATIONAL ROAD FEDERATION, World Road Statistics 1990-1994, IRF, Geneva, 1995.
- 21 WALSH (W.), Crash data plans for the United States, Seminar on international road traffic and accident data bases, OECD, Helsinki, 11-13 September 1995.
- 22 NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION- Traffic Safety Facts - 1995, US NHTSA, Washington, October 1996.
- 23 NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION- Traffic Safety Data 1988 - 1993, CD-ROM, US NHTSA, Washington, 1995.
- 24 WALSH (W.), SHELTON (T.), Exposure data for motor vehicle crash data analysis, Seminar on international road traffic and accident data bases, OECD, Helsinki, 11-13 September 1995.
- 25 YANNIS (G.), GOLIAS (J.), FRANTZESKAKIS (J.), Report on national road accident analyses in the EU countries, "Journal of IAATS", Vol.20, No.2, 1996, pp. 60-68.
- 26 HVOSLEF (H.), Under-reporting of traffic accidents to the police, IRTAD, Bergisch Gladbach, 19 August 1994.
- 27 YANNIS (G.), Road accident data registration systems in the twelve EC member states, 1st Panhellenic congress on Road Safety, NTUA, AUTH, TCG, MPW, Thessaloniki, 28-29 March 1994.