COMMISSION OF THE EUROPEAN COMMUNITIES

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REPORT FROM THE COMMISSION

on progress with the project and its future prospects

CARE

Community Database on Road Traffic Accidents
Council Decision of 30 November 1993
(93/704/EC)

Table of Contents

1. Introduction

1.1 Basis for the report

Road traffic accidents in the Member States of the European Union annually claim about 45 000 lives and leave more than 1.5 million people injured, representing estimated costs of 150 million ECU. Since 1984 a large number of measures to reduce road accidents have been taken at the Community level. Along with these measures, the Council adopted a Decision on 30 November 1993 on the creation of a Community database on road accidents (93/704/EC).[1]

It was commonly agreed that such a database at the Community level would make it possible to identify and quantify road safety problems, evaluate the efficiency of road safety measures, determine the relevance of Community actions and facilitate the exchange of experience in this field.

Article 6 of the Council Decision requires the Commission to prepare a report on progress with the project and its future prospects three years after the application of the Council Decision.

1.2 The history of CARE

Following on from a Council Resolution in 1984 calling for Community action in the field of road safety, the European Parliament requested the creation of a Community road accident database in its resolution in 1986 on Community measures for the reduction of road accidents.[2]

In 1988 an OECD expert group outlined the way towards a "Framework for consistent traffic and [disaggregated] accident statistical databases". In 1989 the Commission announced the creation of an accident database in its communication "Road Safety: a priority for the Community". Two years later this concept was adopted by a high-level group of experts and was likewise classified as a priority ("Gerondeau report", February 1991).

Based on a feasibility study conducted by the Commission and in close concertation with the governmental experts' working group, the High-Level Group on Road Safety at its meeting of 15 and 16 October 1992 confirmed for its part the necessity of the creation of such a database.

In 1993, the Commission presented both its White Paper on the Future Development of the Common Transport Policy and its communication for an action programme on road safety, where the matter was again considered as a priority. A corresponding proposal (COM (93) 348 final) was presented to the Council and to the European Parliament in July 1993.[3] The Council eventually adopted the above proposal on the creation of a Community database on road accidents on 30 November 1993.

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[1] OJ No 329, 30.12.1993, p. 63,
[2] OJ No C 68, 24. 3. 1986, p. 35.
[3] OJ No C 225, 20. 8. 1993, p. 6.

2. Current situation

2.1 The CARE concept

CARE represents the creation of a Community database on road accidents resulting in death or injury. The major difference between CARE and most other existing international databases is the high level of disaggregation, i.e. CARE comprises data on individual accidents as collected by the Member States. This structure allows for maximum flexibility and potential with regard to analysing the information contained in the system and opens up a whole set of new possibilities in the field of accident analysis.

Instead of entering into a lengthy process of defining and adopting a new standardized structure for a Europe-wide accident database and recognising that this would require considerable changes for the national administrations (such as the harmonization of accident reports, definitions and collection methodologies) the Council decided - on the basis of the proposal from the Commission - that the national data sets should be integrated into the CARE database *in their original national structure and definitions, with confidential data blanked out,* and that a framework should be designed that would make the national data sets accessible at the Community level (see figure 1).

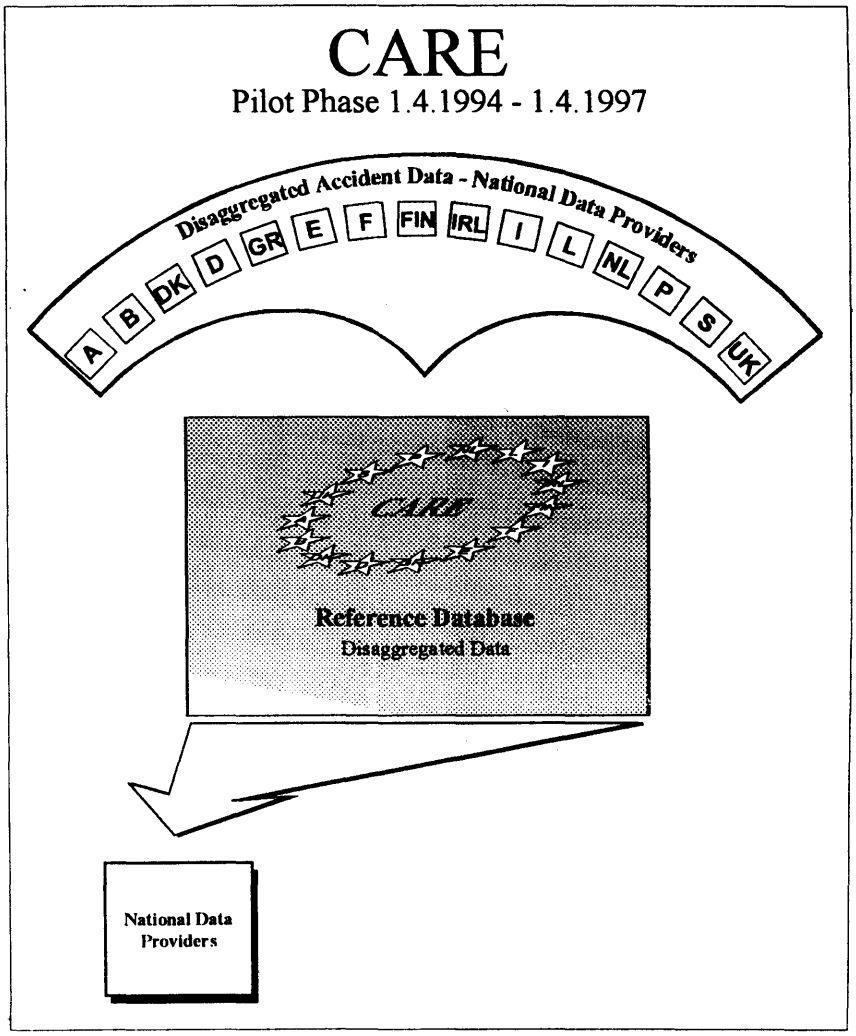

Figure 1: CARE - The current situation

2.2 Initial phase

The initial phase of CARE formally commenced on 1 April 1994. For this to happen, the Member States were requested to communicate their national data files for the years 1991 and 1992 to the Statistical Office of the European Communities (SOEC) before 31 March 1994. Table 1 shows the transmission dates of the annual national files at the time this report was drafted.

All Member States are now sending their relevant files on a regular basis. The statistics for 1991 to 1995 of Austria, Finland and Sweden have also already been included in the CARE database.

Table 1: Data transmitted by the Member States

	Transmission Date										
	2.Qu.94	3.Qu.94	4.Qu.94	1.Qu.95	2.Qu.95	3.Qu.95	4.Qu.95	1.Qu.96	2.Qu.96	3.Qu.96	4.Qu.96
A									92-95		91
B	91	92/93							94		95
D				91/92			93	94			
DK		91/92		93		94					95
E	91/92				93/94				95		
F	91			92/93	94				95		
FIN										91-94	95
GR	91			92/93							94
I				91-93					94		
IRL	91	92		93			94				
L								92-93		94	91
NL	91	92		93	94				95		
P	91			92	93					94	95
S									91-94		95
UK(GB)	91/92			93		94			95		
UK(NI*)	91/92				93			94			95

*): Due to technical reasons Great Britain and Northern Ireland are listed separately in the statistics

Table 2 shows the current status within CARE of the data transmitted by the Member States at the time this report was drafted:

Table 2: Status of data within CARE

	1991	1992	1993	1994	1995
A	R	RC	RC	RC	RC
B	RC	RC	RC	RC	R
D	r	r	r	r	
DK	RC	RC	RC	RC	RC
E	RC	RC	RC	RC	RC
F	RC	RC	RC	RC	RC
FIN	RC	RC	RC	RC	RC
GR	RC	RC	RC	Rx	
I	RC	RC	RC	RC	
IRL	RC	RC	RC	RC	RC
L	RC	Rc	Rc	Rc	
NL	RC	RC	RC	RC	RC
P	RC	RC	RC	RC	Rx
S	RC	RC	RC	RC	RC
UK(GB)	RC	RC	RC	RC	RC
UK(NI*)	RC	RC	RC	RC	RC

Legend : R = Data received
r = Data sent in accordance to Regulation 1588/90 on the transmission of confidential data
C = Data loaded into CARE
c = Data partially loaded into CARE (pending definitive data)
x = Data not readable

*): Due to technical reasons Great Britain and Northern Ireland are listed separately in the statistics

2.3 Data transmission, access and validation

The Member States actively took part in the establishment of CARE, depending on their available resources. The integration of the new Member States into CARE went smoothly, due to their active participation.

The transmission of the Member States' accident data is currently carried out via electronic media (tape or diskette) on an annual basis, with a delay of not longer than nine months after the end of the corresponding year. There is information on about 1.2 million road accidents to be annually loaded into the CARE database.

The Member States are responsible for the quality of the national road accident data they provide and are requested to *validate* the results of the statistical treatment of their data after its inclusion into the CARE database. To access the respective national data within CARE a data link and dedicated software is required. The Member States each appoint a single institution and notify the Commission of its identity. Currently, the national statistical offices have been asked by the Member States to fill this role, the rationale behind this being that the data provider should also be the one to validate the data treatment within CARE. The process of validation (i.e. the confirmation that the information produced by the CARE database is identical to the results of respective queries at the national level with national systems) is considered essential for the reliability of CARE.

After the validation of its "own" data in the CARE system by the appointed national body, the Member State grants access to its data to all the other appointed national bodies on a reciprocity basis.

Table 3 shows the access levels the different Member States (MS) have reached within the CARE project, at the time this report was drafted:

Table 3: Access levels of the Member States

	A	B	D	DK	E	F	FIN	GR	I	IRL	L	NL	P	S	UK (GB)	UK (NI)
Data Sent	□	□	□*)	□	□	□	□	□	□	□	□	□	□	□	□	□
Data loaded into CARE	□	□		□	□	□	□	□	□	□	□	□	□	□	□	□
On-Line Connection		□		□	□	□			□	□	□	□	□		□	□
Training		□		□	□	□				□		□	□		□	□
Testing		□		□	□	□				□		□	□		□	□
Validation by MS				□	□	□				□		□	□		□	□
Access granted to other MS				□	□	□				□		□	□		□	□
Reciprocal access installed				□	□	□				□		□	□		□	□

*) = in accordance with Regulation 1588/90 on the transmission of confidential data

At the time of writing this report, ten Member States have so far been connected to the CARE system, mainly for the purpose of data validation, as shown in table 4. The new Member States are not yet listed, since they have been asked to send their data only in recent months and have not yet established a connection to the CARE database.

Table 4: *Access to CARE by the Member States for purposes of validation (observation period: 7 February 1995 to 12 December 1996)*

	No of connections		Connection time				CPU time			
	abs.	%	h	min	sec	%	h	min	sec	%
E	530	46	51	36	54	30	2	28	32	26
UK (GB)	210	18	41	02	38	24	5	46	15	61
NL	114	10	30	16	44	18		38	38	6
P	89	8	15	20	6	9		19	53	3
F	91	8	10	21	58	6		3	23	-
IRL	30	3	8	51	30	5		10	22	2
B	37	3	6	39	24	4		4	26	-
DK	25	2	4	33	28	3		3	47	-
UK (NI)	6	-	2	23	54	1		1	50	-
I	14	1		19	36	-			11	-
L	8	-		22	14	-			2	-
GR	0	-								
D	0	-								
Sum:	**1154**	**100%**	**171**	**48**	**26**	**100%**	**9**	**37**	**19**	**100%**
Commission	2203		392	30	06		119	39	37	

2.4 Data confidentiality and security

The question of confidentiality boils down to whether it is possible for a user of the system to identify persons involved in an individual accident. Whereas the data loaded into the system is disaggregated down to individual accidents for each country, any report produced by the system for an end-user is an aggregation of some sort, e.g. all accidents by month and age group of casualties. As the resulting report contains tens, hundreds or thousands of casualties, it is therefore not possible to identify an individual from such a report.

In addition, the Member States, in consultation with the Commission, blank out confidential data fields, i.e. any information which may readily identify an individual (such as vehicle number plate, name or address of person) before the data is sent to the Commission. If necessary, such sensitive data can still be excluded by the CARE database administrator.

Nobody, other than the database administrator, can access original accident data records as transmitted by the Member States. Following protected processing of the data and under certain conditions, authorized users get access to a so-called reference database, which is a CARE subset containing data as agreed upon with the representatives of the Member States: therefore, no confidential information is available to users of the CARE system.

A CARE user must have a valid user identification and a password. State-of-the-art encryption techniques have been applied to make unauthorized access impossible in practice. The procedure of asking for data is carried out in a menu-driven environment which does not allow a user to enter any commands other than those allowed by and applying to the CARE system.

Discussions with specialists from the Member States have shown that the above measures guarantee the confidentiality, security and integrity of the data held in the CARE database.

2.4.1. Treatment of data explicitly declared as confidential

As seen in table 3, Germany insisted upon the application of the procedure laid down in the Council Regulation 1588/90 on the transmission of confidential data. At present, discussions are under way with the German authorities in order to prepare for rapid integration of the German data into the CARE system.

2.5 Heterogeneous data definitions and structures

The data resulting from accident reports contains detailed information on the accident location, the (injured) persons and the vehicle(s) involved as well as a vast amount of additional information, potentially ranging from details about the pre-crash sequence or the damage to the vehicles to the type of dangerous load carried. The details provided as well as the definitions and the number of variables all vary considerably between the Member States - a problem that was already identified at the project feasibility stage.

It has been mentioned earlier that the treatment of data with such heterogeneous definitions and structures is a fundamental element of the correct operation of CARE. Therefore, a number of organisational measures at the system level have been made to allow for compatibility between national accident data without requiring any additional data treatment or adaptation by the Member States.

Data is made compatible in three ways:

- The translation of the original variable definitions into a common language, namely English, makes such variables instantly comparable, like "month = January", "day = Sunday" etc.

- For some variables compatibility is achieved through the application of simple mathematical rules: the age of a driver will either result from the age field, like "age of driver = 31", or from the field containing the driver's date of birth, like "date of birth = 1965.10.05".

- The "harmonization" of other variables, such as the different national values for "light conditions" or "road conditions" is a far more complex problem. The feasibility of "harmonizing" heterogeneous data has been demonstrated by a consortium of partners from six different Member States, the project being called **CARE PLUS**. The major objective was to set up, by the end of 1996, structural transformation rules for important variables, with their number initially being limited to 28. In addition, a second objective is to compile a dictionary of the definitions of variables and parameters used in the 15 Member States' national files.

The Commission's intention is *not* to propose changes to the definitions of the Member States' databases but rather to provide a framework of transformation rules to be implemented in the CARE database with a view to increasing data compatibility and thus enhancing the functioning of the system. Nonetheless, the outcome of the above efforts will be a set of common variables which could serve as a reference for future adaptions at the national level if a Member State so wishes.

2.6 Results and conclusions from the first three years

2.6.1 Database in operation

The pilot phase of CARE started on 1 April 1994. Within a relatively short timescale, considering the task's complexity, the basic principles have been agreed upon and the technical problems concerning the operation of such a complex system consisting of many different databases have been solved.

2.6.2 Data homogeneity

The process of "harmonization", i.e. the setting up of transformation rules between the different Member States' databases, based on the methodology as provided by the CARE PLUS group, is advancing in a promising way.

2.6.3 Data availability

Today for the first time valuable reports have been made feasible through CARE that no other database could provide. As an example, Annex II features - amongst others - a comparison of the involvement of different age groups in road accidents at the Community level - an analysis made possible only through the computation of national disaggregated accident data.

2.6.4 Data confidentiality and security

A high-level standard of data confidentiality and security has been an integral part of the system design from the very beginning. Although CARE contains national data at a very detailed level, it is impossible for any user to identify individual persons through the CARE database.

2.6.5 Cooperation with the Member States

Close cooperation with the CARE Governmental Experts Group plays a valuable part in the process of developing CARE, the role of the national data providers being essential to its current and future operation as regards the validation of data, i.e. confirmation that information produced by the CARE system accurately reflects the figures retrieved from national databases and as regards the permission to open the relevant annual data to other users on a reciprocity basis.

2.6.6 Data quality

The contents of CARE directly reflect the national databases' contents. The quality of any analysis is thus directly dependent on the quality of the underlying national accident data, which itself is highly dependent on the national data collection methodology. It is known that the extent of underreporting of accidents not only varies between the Member States but also depends on accident severity. While fatal accidents are widely covered, the same is not true for injury-only accidents. Moreover, a wide interpretation of certain variables occurs, for example "accident severity = unknown". Accident causes, where reported, are rather subjective and - if used at all - must be processed with utmost care. Furthermore, the national data shows a certain degree of incompleteness, mainly depending on the accident severity.

2.6.7 *Data complexity*

A user-friendly system has been developed which makes the production of flexible aggregated reports based on disaggregated accident data a straightforward task. However, the possibility of false interpretations of what the system provides does exist, especially if users are not experts in processing road safety databases. Users of the CARE database should thus have a certain knowledge of the system architecture as well as of the heterogenous data structures CARE is built upon. A thorough training for the statistical experts dealing with the CARE database is necessary to ensure that credible results are obtained from CARE.

2.6.8 *Publications*

In agreement with the Member States, which supply the data, the Commission and the Member States have agreed not to circulate the statistics resulting from CARE during the pilot phase of the project.

3. The future prospects

3.1 Towards an advanced Information System

The process of improving the "homogenization" of accident data within the CARE system should be further continued, as outlined in chapter 2.5. The Member States' support and cooperation will play a vital part in this process which - as a first step - will lead to a high degree of *compatibility* of the underlying accident data.

In this respect the inherent *incomparability* of national accident data still remains the main source of possible *misinterpretation* when performing comparative analyses at the international level and thus must be considered as a priority to be tackled in the development of any future system.

In this context, additional information should be made available to supplement CARE in order to enable sound comparisons to be made on the basis of Community accident data and thereby improve the potential for road accident analysis at the Community level. Additional information could include:

- **exposure** data, such as
    - vehicle - kms
    - vehicle fleet
    - passenger - kms
    - population
    - road network characteristics etc.
- results of in-depth studies on accident and injury **causation**
- **road safety measures**: relevant national legislation, level of enforcement, results of efficiency studies on different measures and actions, ...
- etc.

Such additional information would finally lead to an *Information System* (see figure 2), comprising an information pool derived from various data sources which would be treated as *additional files* and should be linked to the accident database, forming the basis for system. In addition, a comprehensive *glossary* would be made available, providing definitions of national variables, transformation rules and other textual information that plays an essential role in comparative research.

The development of such a Road Safety Information System would enable great improvements to be made in areas such as accident *data quality* and *availability*. Problems such as underreporting cannot be settled in the short term, but by assessing the extent of the problem and incorporating this dimension in CARE such issues can analytically and systematically be taken into account in the system. The same applies to the availability and the differing assessment methods for exposure data and other information.

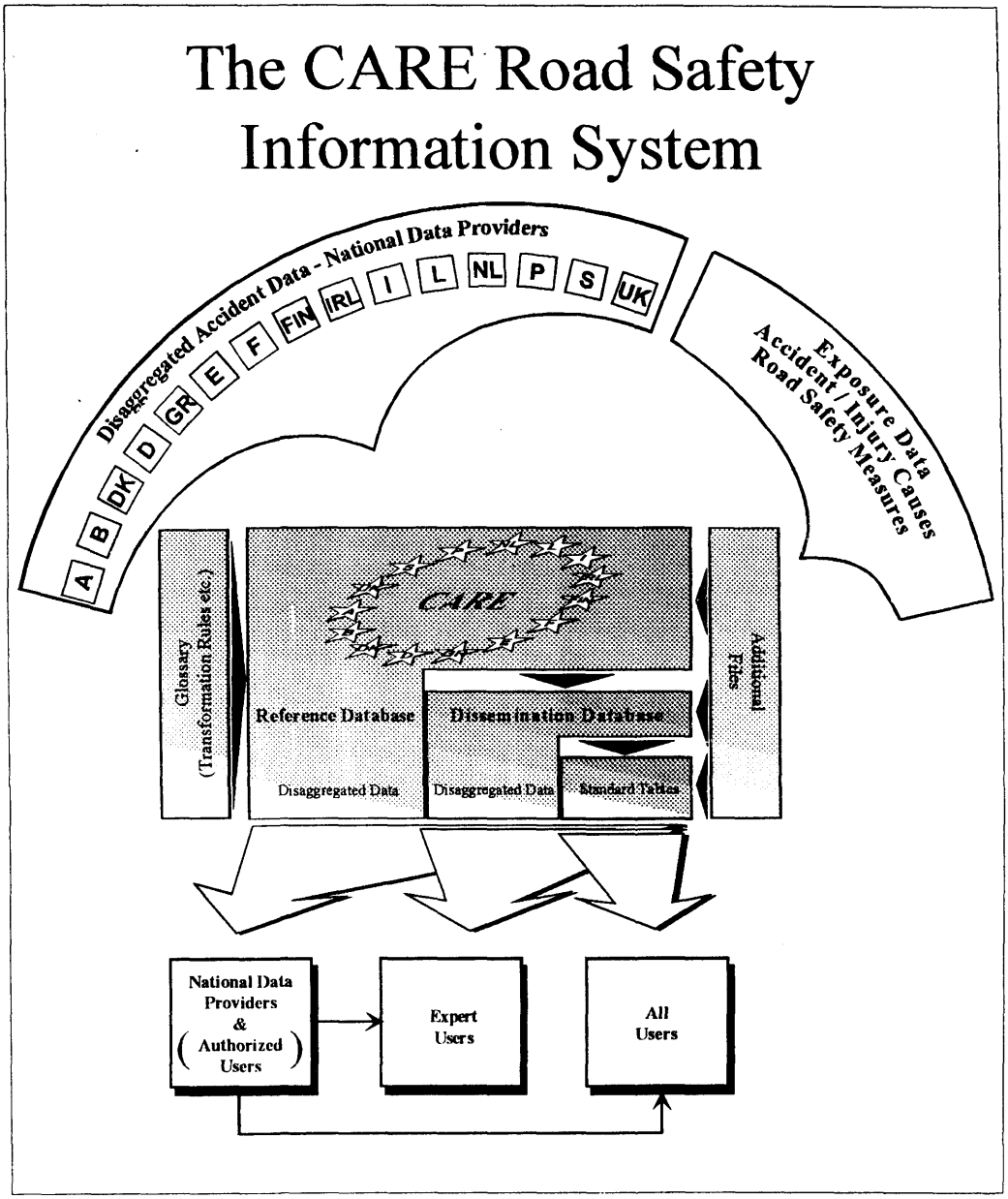

Figure 2: The CARE Road Safety Information System

3.2 Policy on use and dissemination of information

The high level of data confidentiality and security as implemented in the current system, i.e. the inaccessability of individual data together with the application of elaborate access procedures, will remain central to the CARE concept.

The procedures for granting access to CARE and the ways of disseminating information need to be considered very thoroughly: forming queries within CARE is straightforward, but *asking the right questions* is a complex task and inherently poses a potential for misinterpretation: *Well-trained personnel with a* thorough knowledge of national data structures and definitions will certainly be required to work at the most detailed level of CARE data.

The accessibility criteria of the future Road Safety Information System as well as the type and content of information presented will be a major factor determining the degree of its use. A self-contained system available to the Member States' administrative departments only would limit its potential for the road safety work of the Community, whereas a well-designed system presenting useful and varying degrees of information to a larger group of users - with different levels of authorization - would create a new basis for the improvement of road safety on European roads.

Whatever the system, and having regard to the recitals of Council Decision 93/704/EC of 30 November 1993 data relating to identifiable persons will be treated in accordance with the data protection legislation in force.

Information circulation policy should aim to reach the greatest possible number of users under the best possible conditions, but without prejudice to the existing financing sources of national data suppliers.

3.2.1 Online access to the Reference Database

Currently, the Member States' data providers are the only bodies entitled to access the CARE Reference Database, containing accident data at the most detailed level. However, *their* potential interest in the use of international data may be limited. Therefore, consideration should be given to extending access, e.g. to one institution per Member State concerned with road safety, to make the best use of the CARE Reference Database. The national data provider should play a valuable part in the process for the validation of the national data within CARE, unless the Member State chose to delegate this task to the additional institution it has appointed. Under certain conditions accident reports could then be provided to other users by the authorized institutions.

3.2.2 Online access to the Dissemination Database

A subset of the CARE Reference Database, comprising disaggregated *data with a high degree of comparability*, as agreed upon with the Member States, could be created in order to provide wider access to the road safety community. An appropriate knowledge will still be required for the correct utilization of this so-called Dissemination Database, but thorough training in data definitions and structures will not be necessary. Thus this part of the CARE Information System will serve as a flexible interface to a range of expert users whose demands vary with the current research tasks and whose needs are not sufficiently catered for by international statistics reports today.

As a first step, the Dissemination Database could contain information on fatal accidents only, which simultaneously would ensure both a high quality and a high rate of availability of the underlying data. In addition, the amount of data to be handled would be just a fraction of the original Community accident data as represented in the reference database. In this way response times would be reduced, an advantage which would be much appreciated by users.

3.2.3 Access to standard tables within the CARE Information System

A variety of periodically updated standard tables - as agreed upon with the Member States - could be set up and made accessible on-line. An interactive user interface

would guide the user through the information available to provide for straightforward results. Large access to this part of the system would be granted to all users of the CARE Information System.

3.2.4 Publications

Periodical publications of standard tables will serve as an essential means of providing efficient and widespread use of CARE, in the classical form of printouts, electronic media like Internet and CD-ROMs or the usual channels used by EUROSTAT. Such standard aggregated statistics with contents previously agreed upon with the Member States will aim to meet the demands of the majority of the users whilst maintaining certain quality criteria. Such tables could also be provided to other organisations such as the United Nations Economic Commission for Europe (UNECE) or the European Conference of Ministers of Transport (ECMT) in the framework of the cooperation agreement with these international organisations.

3.3 General aspects of the future development of CARE

The variety of services of the future CARE Information System will provide a new approach to Community accident data analysis, tailor-made for the different demands of different user groups, ranging from scientific research tasks in the road safety area to general reports.

Moreover, the CARE Information System will not only be a useful tool for accident analysis. It will also facilitate the exchange of information in the area of road safety and therefore serve as a platform for advisory bodies, institutions and authorities as well as industrial partners and associations concerned with road safety, at local, regional, national or Community level. The Community Transport Policy will also benefit from the tools featured in the CARE Information System.

Since Council Decision 93/704/EC is part of the provisions included in the Agreement on the European Economic Area, the incorporation of the statistical files for Iceland, Liechtenstein and Norway will eventually need to be envisaged, as it was included in the EEA Agreement by Decision 7/94 of the Joint Committee of 21 March 1994.

4. Conclusion

Based on the experience gathered during the implementation of the Council Decision, i.e. the setting up of the CARE database, it can be concluded that the results of the pilot phase have been positive, as outlined in chapter 2.

The future prospects of the CARE database, as outlined in chapter 3, and, in particular, its evolution into a Road Safety Information System are very promising for the road safety community and reflect the concerns and objectives underlying the Council Decision of 30 November 1993.

Cooperation with the Member States, especially through the CARE Governmental Expert Group, should be continued and reinforced, as it plays a vital part in the management of the Community database and the quality of the data therein as well as in the development of a policy as regards user access and dissemination of the data derived from CARE.

The Commission will periodically report on the progress of the CARE Information System to the High Level Group of representatives of the Member States on road safety.

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18