

# Explanatory notes

## Background

The data presented in the following pages were obtained through a self-administered questionnaire implemented in the 178 countries and areas that participated in the first global survey on road safety in 2008. The survey focused on the recommendations of the *World report on road traffic injury prevention (1)* as the basis for its structure and content. Most countries used the same methodology for data collection, as outlined in a survey protocol developed for the study. In over 95% of the countries, the implementation of the survey was coordinated by a National Data Coordinator (NDC) identified by the country, and was completed by teams of 6–8 key respondents including the NDC. The NDCs were trained in the methodology and coordinated the collection, validation and clearance of data, as well as the data entry, in the countries concerned. The survey instrument, protocol and accompanying guidelines and training materials were all available in the six WHO languages (Arabic, Chinese, English, French, Russian and Spanish). Where needed, NDCs coordinated the translation of these documents into the local language and then back-translated them for the data entry which was done in English. More details on the methodology used for data collection can be found at [www.who.int/violence\\_injury\\_prevention/road\\_safety\\_status/2009](http://www.who.int/violence_injury_prevention/road_safety_status/2009).

The following sections contain country-by-country data obtained from the survey.

- Table A.1 includes the list of NDCs who, in collaboration with national authorities, played a key part in conducting the survey.
- Table A.2 provides detailed data on the 30-day adjusted number and rates per population of road traffic deaths, and on the proportion of road users by country/area. The table also includes modelled road traffic death numbers which have been generated. A short description of the process is presented below.
- Tables A.3–A.6 provide information on the status of laws, the enforcement of laws, and the coverage/wearing rates relating to the five road traffic risk factors (alcohol, seat-belts, child restraints, speed, and helmets).
- Table A.7 contains data on policy-related responses.
- Table A.8 includes information related to the availability of pre-hospital care.

The following section gives a brief description of the data processing, the comments on the obtained results (specifically on the reported, adjusted and modelled country-level death data) and the method used to develop the model.

## Data processing

The data processing involved completion of the survey instrument and data entry at a country level, and validation at a regional level. Data cleaning, analysis and report-writing were done at WHO headquarters in Geneva.

## Reporting of country-level data

The final country responses were entered by NDCs into an online database specially prepared by WHO for this project. NDCs also uploaded supporting documents where applicable and available. Data were then validated at a regional level. Once finalized and approved by Regional Data Coordinators (RDCs), the data were then exported into Microsoft Excel for cleaning. At this stage, each country's data were examined for accuracy, consistency and validity on a question-by-question basis. Where necessary, NDCs were contacted and additional supporting documents were requested to clarify inconsistencies. A copy of the survey instrument and study protocol can be found at [www.who.int/violence\\_injury\\_prevention/road\\_safety\\_status/2009](http://www.who.int/violence_injury_prevention/road_safety_status/2009).

As part of the data cleaning and validation process, exploratory analysis was done using STATA (2). The same software was used for all analysis and results presented in the earlier sections of this report.

## Types of data utilized

Three types of data are used in this report:

- reported data from countries and secondary sources;
- data adjusted for the 30-day definition of a road traffic death in order to facilitate comparability;
- modelled numbers.

### Reported data

In addition to the data obtained directly from countries, secondary data sources were used to:

- classify countries into income categories;
- generate road safety indicators such as the adjusted road traffic deaths and modelled road traffic death rates (with a 90% confidence interval) as reported in Table A.2.

Population and income data from the United Nations Population Division (3) and the World Bank (4) were used for this analysis.

Population estimates for 2007 are reported in Table A.2. Where there was no estimate available for a country for that year, published data for the latest year were used. For the modelling process, population estimates corresponding to the year of reporting were used (4).

In Table A.2, World Bank (Atlas method) gross national income per capita (GNI) for 2007 (5) (or latest available year) was used to categorize countries into:

- low-income = \$935 or less;
- middle-income = \$936 to \$11 455;
- high-income = \$11 456 or more.

More detailed subgroupings were used in the modelling process.

### Adjusted data

As discussed in the first section of this report (see page 28), underreporting has been acknowledged for many years as an important reason for the difficulty in comparing road traffic crash data between countries. Additionally, the lack of harmonized definitions for road traffic deaths, the use of different data sources, and the quality of the reporting system have also been documented. Consequently a number of mechanisms were employed to address some of these issues in order to make data more comparable. This global survey employed the following two methods:

- the European Conference of Ministers of Transport (ECMT) standardized 30-day road crash fatality factors (6) to adjust all reported country/area data;
- a model using negative binomial regression (see page 233).

The “reported” data in Table A.2 have been adjusted to this 30-day definition (see Table 1 for adjustment factors) and the new adjusted number is therefore used in the corresponding model and its result is presented in Table A.2.

**Table 1. ECMT standardized 30-day road crash fatality adjustment factors**

|                    | 30-DAY TOTAL | ADJUSTMENT FACTOR |
|--------------------|--------------|-------------------|
| ON THE SCENE/1 DAY | 77%          | 1.30              |
| 3 DAYS             | 87%          | 1.15              |
| 6 DAYS             | 92%          | 1.09              |
| 7 DAYS             | 93%          | 1.08              |
| 30 DAYS            | 100%         | 1.00              |
| 365 DAYS           | 103%         | 0.97              |

## Modelled data

### *Developing a model*

Before the modelling exercise, simple exploratory analyses were done to evaluate the distribution of the reported data, to identify potential outliers and to determine the extent of missing data. Decisions as to whether to include these outliers in the analyses, or whether to exclude them, were taken at several stages of the analysis. Where appropriate, imputation was done to compensate for missing information.

### *Completeness of data*

Having adjusted the reported data to a 30-day definition to facilitate comparability, the next step in the process was to explore the completeness of the reported death data on the basis of reported vital registration (VR) data. Information on the completeness of VR data was obtained from previous WHO published reports (7, 8) and was updated with the latest information from the WHO mortality database. This information was then used to classify countries into two groups, namely:

- Group 1: countries with VR completeness greater or equal to 85% and external causes of death coded to undetermined intent less than 30% (Table 2);
- Group 2: countries with VR completeness less than 85% or external causes of death coded to undetermined intent greater than 30%.

**Group 1** countries include 37 high-income, 36 middle-income and 2 low-income countries (Table 2). Data from these countries were used as a reference in constructing the negative binomial model. As such, no estimation was done for these countries.

**Group 2** countries include 3 high-income, 48 middle-income and 43 low-income countries. Estimated data based on the prediction model described above are provided for these countries.

Countries/areas with populations of less than 100 000 and which thus have low numbers of deaths were also excluded from the modelling process (Table 3).

Table A.2 gives the 30-day adjusted number of deaths for all countries, and for group 2 countries the modelled number of deaths with a 90% confidence interval. Those without a range are Group 1 and the countries in Table 3 where no modelling was done.