ANNEX 2
METHODS

Standardized mortality rates and rate ratios

Mortality data by age and sex provide a convenient and essential measure of disease or injury estimates of lives lost. The first analytical step in any estimation of the burden of disease or injury is to assess the age-specific death rates, by sex, for a given population for the reference year chosen for the study. This last should be chosen to be the most recent year for which data are available and might coincide with the census year or one for which extensive epidemiological and demographic data are accessible from other sources *(1)*. In this report, two mortality indicators were calculated for further analysis:

1. Age-specific crude mortality rates (CDR) were calculated as follows:

$$CDR = \frac{D_i}{P_i}$$, with D = deaths; P = population; and i = age group.

2. Standardized mortality rates use a set of weights from a standard population, the reference population (European or world population structure) to compare different mortality profiles inside the WHO European Region. The formula is as follows *(1)*:

$$\sum_{i=0}^{N} \frac{D_i}{P_i} \times W_i$$, with D = deaths; P = population; i = age group; and N = last age group;

$$\text{W = weight } = \frac{\text{Reference population}_i}{\text{Total reference population}_i}$$

Age-standardized rates were calculated using the direct method and the European standard population structure (Table 3).

Table 1
European standard population weights

Age (years)	<1	1–4	5–9	10–14	15–19
Weight	0.06	0.22	0.24	0.24	0.24

Source: WHO European detailed mortality database, update November 2007 *(2)*.

As deaths from injury may be rare, a three-year average was used to increase reliability. Similarly, countries with a population of less than 1 million were excluded from the calculation: Andorra, Cyprus, Iceland, Luxembourg, Malta, Monaco, Montenegro and San Marino. Charts were constructed in order of rank.

Children's lives lost and estimated potential lives saved

The number of potential lives saved was calculated using country-level data derived from the European detailed mortality database. This estimate measures the potential lives saved if all countries had the same standardized mortality rate as the one with the lowest rate in the European Region. The countries with the lowest rates for each injury mechanism were used: Sweden for falls and road traffic injury, Switzerland for fire, Denmark for poisoning, the United Kingdom for drowning and

the Netherlands for all other unintentional injury deaths. Estimated mortality rates were calculated by applying age-specific rates to the respective age band of each country available on the WHO European detailed mortality database using a method described previously *(3)*. In selecting countries with the lowest rate, only those with reliable data and a population exceeding 5 million were considered. The calculation was performed for children aged 0–19 years for an average of a three-year period (2003–2005 or the most recent three years available). Table 8 (Annex 4) shows the results for individual countries.

Limitations of mortality datasets

The European mortality databases have data for all 53 Member States in the WHO European Region. However, the comparability between countries may be limited due to differences in classification systems, completeness, accuracy and recording practices. Some countries have had problems with precise mortality data since the 1990s caused by severe socioeconomic difficulties and armed conflicts. This is especially true for some of the countries in central Asia (such as Tajikistan), in the Caucasus (such as Azerbaijan and Georgia), and in the Balkan region (such as Albania and Bosnia and Herzegovina). Mortality data are not available for Turkey. Only the countries with the most reliable data were used for comparing standardized mortality rates between countries in rank and calculating death rate ratios (WHO European detailed mortality database).

References

1. Mathers C et al. *Global Burden of Disease 2000: version 2 methods and results*. Geneva, World Health Organization, 2002 (GPE Discussion Paper, No. 50; http://www3.who.int/whosis/discussion_papers/pdf/paper50.pdf, accessed 21 November 2008).
2. European detailed mortality database (DMDB) [online database]. Copenhagen, WHO Regional Office for Europe, 2008 (http://www.euro.who.int/InformationSources/Data/20070615_2, accessed 10 November 2008).
3. Adamson P, Micklewright J, Wright A. *A league table of child deaths by injury in rich countries*. Florence, UNICEF Innocenti Research Centre, 2001 (Innocenti Report Card Issue No. 2).