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MORTALITY FROM ROAD TRAFFIC INJURIES IN CHILDREN AND YOUNG PEOPLE

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Standardized death rates for road traffic injuries in people aged 0-24 years

This indicator presents data on mortality from road traffic injuries (RTIs) for people aged 0–24 years, extracted from the WHO European health for all mortality database (1). Data for injury rates and for the number of injured per motor vehicle in this age group are taken from the United Nations Economic Commission for Europe (UNECE) statistical database (2). This document also contains information on the environment and health context and on the policy relevance and context, as well as an assessment of the situation in the WHO European Region

KEY MESSAGE

☹ High rates of injuries and fatalities persist across the European Region, with large health inequalities among the countries. Children are especially vulnerable to RTIs, owing to their specific physical circumstances. The heavy burden of injury on pedestrians and cyclists calls for measures to ensure that children and young people are able to move about safely and healthily. The achievements of some countries in this area indicate that it is feasible to reduce mortality and that RTIs should receive close attention at all levels of society.

RATIONALE

RTIs are the third leading cause of death among people aged 0–24 years in the European Region. These deaths are largely preventable through the concerted efforts of institutions and civil society and by implementing effective measures that tackle leading risk factors and enable a comprehensive and safe road traffic system to be created. The indicator reflects the impact and effectiveness of measures aimed at reducing RTIs.

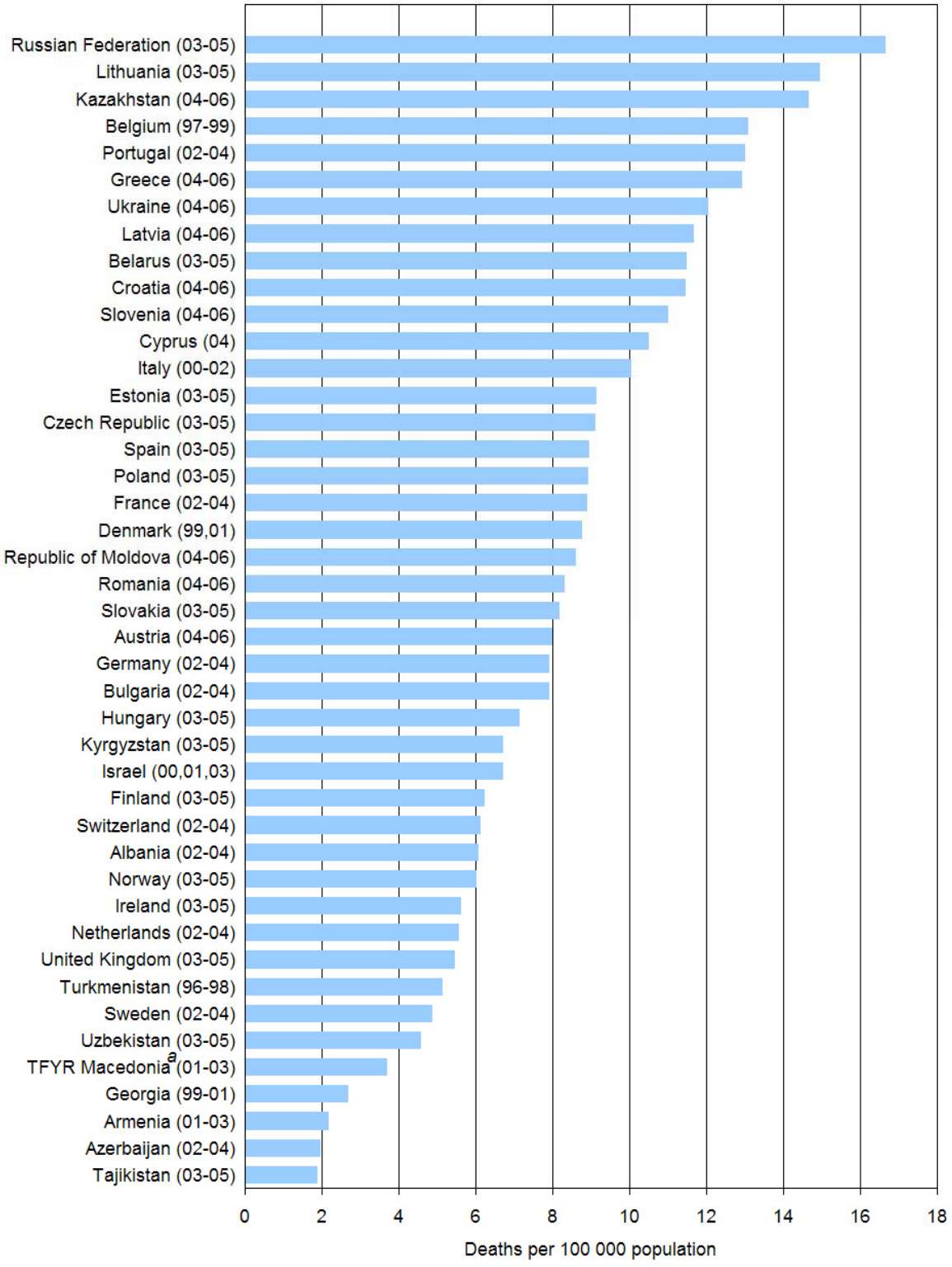
PRESENTATION OF DATA

Fig. 1 shows the standardized death rates (SDR) for RTIs in people under 25 years of age for countries in the WHO European Region with more than one million inhabitants. The rates are the average of data available for the most recent three years. The very low SDR of some countries in the Caucasus and central Asia may be related to the low density of motor traffic and underreporting.

Fig. 2 presents the standardized RTI rates in people under 25 years of age by mode of transport: car occupants, pedestrians and cyclists, motorcyclists and moped riders, and “other”. The latter category refers to unknown modes of transport, mostly the result of incomplete health system reports. With the exception of Slovenia, this it is a negligible proportion of the total. It should be noted that practices of data collection and reporting differ among countries, as does the definition of an injured person.

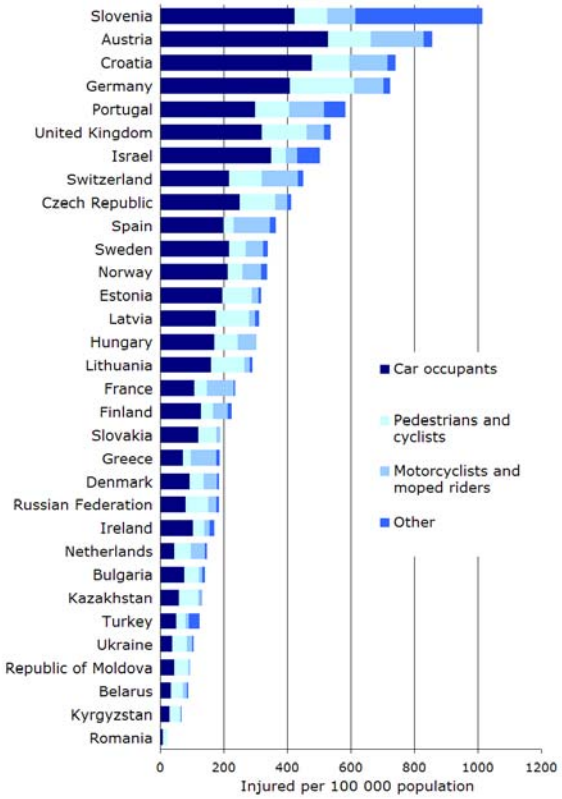
Fig. 3 shows the number of injured people aged 0–24 per 100 000 motor vehicles. It provides an indirect indication of the scale of road safety improvements that need to be made in countries.

Fig. 1. Standardized death rates (three-year average) for road traffic injuries in people aged 0–24 years in 43 countries of the WHO European Region



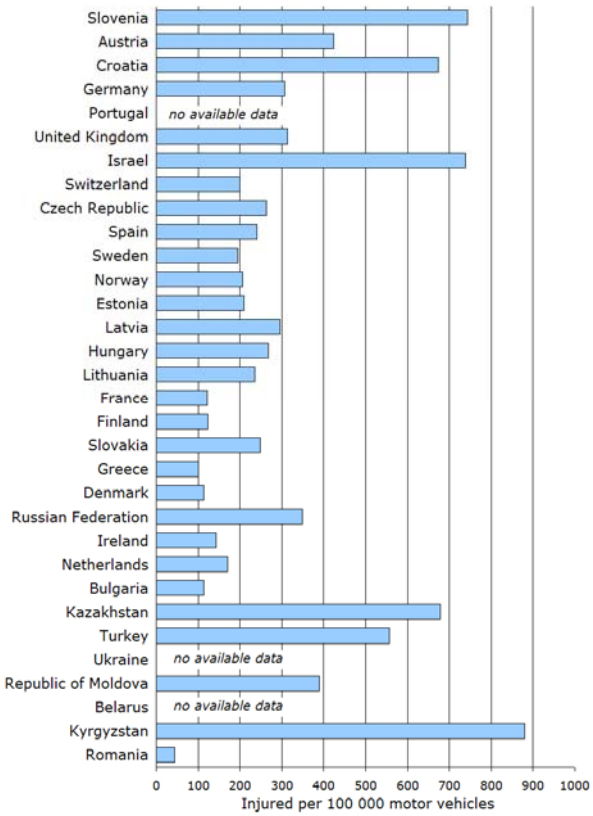
[a] TFYR Macedonia = the former Yugoslav Republic of Macedonia.
Source: WHO European health for all mortality database *(1)*.

Fig. 2. Standardized road traffic injury rates in people aged 0–24 years, 2003/2004, in 32 countries of the WHO European Region



Source: UNECE statistical database (2).

Fig. 3. Numbers of people aged 0–24 years injured in road traffic accidents per 100 000 motor vehicles, 2003/2004, in 32 countries of the WHO European Region



Source: UNECE statistical database (2).

HEALTH AND ENVIRONMENT CONTEXT

About 100 children and young people aged 0–24 years die from RTIs in the WHO European Region every day. As many as 33% of all deaths from RTIs occur to people in this age group and around 5% to children under 15 years of age. Children and young people are particularly vulnerable to RTIs as they have different physical and psychological characteristics than adults. Children aged under 10 years have a limited ability to cope with traffic and are disproportionately represented in deaths involving pedestrians. They are more at risk in heavy or fast traffic, when visibility is limited, or when a driver's attention is not focused on pedestrians and cyclists. In the event of an accident, children are particularly vulnerable: their head-to-body ratio increases the risk of head injury and their height increases the likelihood that vital body parts are hit when collisions occur. Further, RTIs lead to post-traumatic stress disorder in up to 33% of children involved. A disproportionate number of car drivers and motorcyclists incurring RTIs are young people. This is due to a combination of limited experience, a tendency to engage in risky behaviour and a greater vulnerability to the effects of alcohol, especially among young males. Some 80% of 0–24-year-olds involved in vehicle accidents are males (3).

Some risk factors combine with socioeconomic determinants, further exacerbating the adverse effects on health. For instance, delay in detecting a crash and difficulty in rescue influence the post-crash outcome of injuries. Not fastening one's seat belt or not wearing a helmet influences the severity of the outcome of an accident (4). Environmental conditions are believed to contribute significantly to RTIs in Europe, with the attributable mean fraction estimated at 25%, and 35% (44 000 deaths annually) from RTIs may be attributed to environmental conditions (5). This points to the importance of addressing land-use policies and practices. Particularly important environmental factors contributing to road safety are road design, urban structure and density, the matching of road design and vehicles, street lighting and signs, and road maintenance.

There is evidence of effective interventions that can reduce RTIs and ensure healthy mobility. Traffic calming measures, especially in built-up areas, are highly effective, for example. Speeding is the major risk factor in vehicle accidents: a 5% increase in average speed leads to a 20% increase in mortality. Mandatory helmet laws raise the helmet-wearing rate to more than 90%. Wearing a helmet reduces the risk and severity of injuries by about 72% and that of mortality by 39%. Another highly effective road traffic safety measure is random breath testing, which leads to a reduction of about 40% in mortality from alcohol-related road traffic accidents (6).

POLICY RELEVANCE AND CONTEXT

Strong political commitment and evidence-supported policies are required for the adoption of a comprehensive approach to road safety. Indicators based on mortality from RTIs support policy evaluation by providing benchmarks and setting a baseline against which progress can be monitored over time. Measuring the expected benefit of an action in connection with the estimated societal costs of RTI mortality helps to implement effective policies.

In 2001, the European Commission released the Transport White Paper, which sets out the goal of saving 25 000 lives a year on European roads by 2010 (8). The primary objectives are harmonization of traffic rules and their enforcement, standardization of high-level safety technology in every new vehicle, improvements in infrastructure and emergency medical services, and the implementation of a detailed accident database.

In 2004, the Fourth Ministerial Conference on Environment and Health adopted the CEHAPE (Children's Environment and Health Action Plan for Europe) (7). One of the CEHAPE goals (RPG II) aims to reduce RTIs and ensure safe conditions that also facilitate more physical activity among children. It advocates the strengthened implementation of road safety measures, including adequate speed limits and education for drivers and children, and enforcement of the corresponding legislation.

ASSESSMENT

The magnitude of the death rates among children and young people due to RTIs in the European Region is unacceptably high. RTIs are the third leading cause of death in this age group, and every year there are some 32 000 fatalities from RTIs among 0–24-year-olds in the Region. Approximately four fifths of those deaths occur among those aged 15–24 years (9). RTIs in children and young people have a high burden of disease owing to the considerable number of years of life lost to premature mortality and the often severe and lifelong disability among survivors. This, accompanied by the devastating impact on the lives of victims and their families and the loss in productivity, results in high costs to society: estimates suggest that RTIs cost about 2% of gross domestic product (10). The estimated annual costs of road traffic fatalities among those aged 0–24 years in the European Region are US$ 38 billion.[1]

Fig. 1 reveals large inequalities among countries. Geographically, the highest death rates occur in the eastern part of the Region, with the exception of those in the south-east. Among the EU member States, those in the north have lower mortality than those in the south. The very low mortality rates in the 0–24-year age group reported by some countries are most likely related to socioeconomic factors such as fewer motor vehicles per capita and to underreporting. Large differences in RTI mortality in this age group can also be seen in countries with similar socioeconomic backgrounds, pointing out the significant room for improvements in RTI prevention policies. Extremely high mortality rates occur in Kazakhstan, Lithuania and the Russian Federation. As shown in Fig. 2, these countries have relatively low injury rates in this age group, pointing to accidents of a very high level of severity. Reducing the high toll in these countries will require infrastructural improvement, especially in terms of road conditions, motor vehicle technology and emergency medical services. Conversely, some countries with below-average mortality rates such as Austria, Germany and the United Kingdom have a high injury rate because of the low level of accident severity.

The standardized injury rate shown in Fig. 2 provides an insight into the real burden of road traffic accidents. The number of deaths represents only the tip of the iceberg: on average, there are 35 injuries for each fatality and many people suffer from the long-term consequences of RTIs. These data should therefore be interpreted with caution. The number of RTIs in this particular age group is even more affected by underreporting than the number of deaths. Not surprisingly, in many of the countries, car occupants account for the largest proportion of road traffic injuries owing to the extensive

[1] The estimate includes the following cost elements: value of a statistical life calculated through the willingness to pay (WTP) approach; net lost production and administrative costs weighted by the countries' gross national income (GNI); and medical and hospital costs weighted by the countries' costs per day of hospitalization. The sources of the underlying data are UNECE and WHO databases.

use of cars. The proportion of injured motorcyclists and moped riders differs greatly among the countries, being particularly high in countries in the south of the Region, such as France, Greece, Portugal and Spain. Pedestrians and cyclists are disproportionately represented, and any approach to road traffic safety has to put vulnerable road users like these, especially among children and young people, in the forefront. Bicycle lanes and safe areas to play are effective measures for ensuring safety. It is also very important to provide safe routes for children to walk or cycle school. Unsafe roads deter parents from allowing their children to walk or cycle to school, thus depriving them of valuable physical activity. Hence road safety measures aimed at providing safe routes to school also help to reduce overweight and obesity in children and adolescents, a major risk factor for chronic diseases. An exemplary approach is the "Walking School Bus" or "Bicycle Train" introduced in many countries in the Region.

Fig. 3 gives an insight into the socioeconomic determinants of road traffic accidents. It shows that most countries with very low injury rates have an extremely high number of RTIs per motor vehicle. This signifies an urgent need for road safety measures. An indirect indication of the magnitude of the necessary road safety improvements is provided by Fig. 3. In particular, countries in transition such as Croatia, Kyrgyzstan, Kazakhstan, the Republic of Moldova and the Russian Federation have a very high number of injuries per motor vehicle because they have experienced a rapid increase in the density of motor traffic. Their road infrastructure and regulatory controls lag behind (9). The health risk per motor vehicle could be reduced by improving the level of safety of both roads and vehicles.

To create a healthy environment on the roads of the European Region, it is essential to learn from the experiences of other countries and to scientifically review the effectiveness of policies. Particular attention should be paid to high-risk groups such as male adolescents. It has been proved that many lives can be saved through better enforcement of speed limits, stricter driving tests, reducing the level of drink–driving, mandatory helmets for motorcyclists and moped drivers, mandatory use of seat belts in cars, and the provision of areas free of motor traffic where there are a lot of children living (9). Comprehensive strategies are important, as the road traffic system is very complex. A good example of a successful approach to evidence-based road traffic safety is the Swedish Vision Zero project, which receives a lot of international attention (11). It includes a wide range of measures such as the installation of roundabouts to calm traffic, central barriers on highways, 30-km/h speed limits in built-up areas, clearing the roadside areas of potential dangerous objects such as trees, mandatory daytime running lights, mandatory cycle helmets for children under the age of 15, and in-depth studies of all fatal collisions. As a result, the Swedish SDR for road traffic accidents among children and young people has more than halved over the last 15 years. This shows that it is possible to reduce mortality despite a high density of motor traffic, and is a clear sign of a positive future development in the European Region.

DATA UNDERLYING THE INDICATOR

Data source

Data on SDR from transport accidents come from the WHO health for all mortality database (November 2007 edition) under "Standardized death rates, transport accidents, per 100 000" (1). The source of data used for Fig. 2 and 3 (absolute numbers of injured and killed per transport type, motor vehicles and population of the age group under consideration) is the UNECE statistical database (2).

Description of data

It should be noted that some countries have stopped reporting mortality data on motor-vehicle traffic injuries. The indicator on transport accidents is a proxy that allows a more comprehensive and up-to-date comparison to be made at the European level, although it should be understood that it includes deaths occurred in other types of transport accident (for example, railway and aviation). It is defined as including ICD-9 BTL code B47; ICD-9 codes 800–848; ICD-10 codes V01–V99; ex-USSR 175 list 160–162; ICD-10 Mortality Condensed list 1: 1096; and EUROSTAT list of 65 causes: 60. The injury rate includes individuals who sustained one or more serious or slight injuries, but also those who died immediately or within 30 days as a result of the accident. It should be noted that practices of data collection and reporting differ among countries, as does the definition of an injured person (in the Netherlands, for example, an injured person is defined as one taken to hospital after the accident). The presentation includes WHO European Region countries with more than 1 million inhabitants.

Method of calculating the indicator

The indicator represents the SDR for road traffic injuries in people aged 0–24 years. The SDR is calculated using the direct method and standard WHO European Region population structure. They were calculated by staff of the WHO Regional Office for Europe using the data on deaths by cause, age and sex and mid-year population by age and sex annually reported to WHO by Member States. Three-year averages of the SDR have been calculated in order to smooth out short-term fluctuations.

Geographical coverage
SDR data for 43 Member States of the WHO European Region are used for this fact sheet (1). Member States with populations below 1 million (Andorra, Cyprus, Iceland, Luxembourg, Malta, Monaco and Montenegro) are not included. There are no data for Bosnia and Herzegovina. The UNECE statistical database (2) supplied additional data for 32 Member States.

Period of coverage
Mortality rates show the average of the last three years available, as reported in the WHO health for all mortality database, November 2007 version. Data from 1980 are available in the database.

Frequency of update
Annually.

Data quality
It should be noted that mortality rates and (in particular) injury rates for some countries may be biased owing to underreporting, especially in the central Asian republics, the Caucasus countries and some countries in the Balkans. Since health data recording and handling systems and practices vary between countries, so do the availability and accuracy of the data. Some countries are not able to ensure exact coding of underlying causes and complete registration of all deaths and injuries. In certain cases, underregistration of deaths may be as high as 20% and this must be borne in mind when making comparisons between countries. This problem can be further aggravated by a lack of sufficiently accurate population estimates used as the denominator when calculating indicators. The problems are caused by a lack of surveillance through severe socioeconomic difficulties and armed conflicts in some countries (1).

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FURTHER INFORMATION

Prevalence of overweight and obesity in children and adolescents. Copenhagen, WHO Regional Office for Europe, 2009 (ENHIS fact sheet No. 2.3, www.euro.who.int/ENHIS).

Percentage of physically active children and adolescents. Copenhagen, WHO Regional Office for Europe, 2009 (ENHIS fact sheet No. 2.4, www.euro.who.int/ENHIS).

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