



# INJURIES IN EUROPE : A CALL FOR PUBLIC HEALTH ACTION

An update using the 2011 WHO Global Health Estimates



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## ABSTRACT

The WHO Global Health Estimates show that 555 000 deaths occurred in the WHO European Region due to injuries and violence in 2011, representing a decline of 26% from 2000. Injuries account for 6.1% of all deaths and are the leading cause of death in people aged 5-49 years. The three leading causes of injury deaths are self-directed violence (123 000), road traffic injuries (92 000) and falls (78 000). There are inequalities in injury deaths in the Region: mortality rates are 2.7 times higher in males than in females and 2.4 times higher in low- and middle-income countries compared to high-income countries. When all ages are considered, there has been a convergence in mortality since 2000 between low- and middle-income countries and high-income countries; however this gap has widened for children aged less than 15 years. Public health action is needed to reduce inequalities in injuries in the Region.

## KEYWORDS

VIOLENCE  
WOUND AND INJURIES – PREVENTION AND CONTROL  
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## KEY FACTS

- There were 555 000 deaths from unintentional and intentional injuries.
- Injuries are a leading cause of death in people aged 5–49 years.
- Road traffic is the leading cause of death in people aged 5–29 years.
- Costs of injuries to health care and society are very high.
- 53% of all injury deaths are due to self-harm, road traffic injuries and falls.
- Mortality rates due to injuries are 2.4 times higher in low- and middle-income than in high-income countries.
- Mortality rates due to injuries are 2.7 times higher in males than in females.
- Public health action is needed to reduce inequalities in injuries in the Region.

## BACKGROUND

Injuries (intentional and unintentional) are a leading cause of death and disability in the European Region of the World Health Organization (WHO). Whether unintentional or intentional, injuries are a profound drain on health and societal resources, and pose a threat to economic and social development in the Region (1, 2). The recently released WHO Global Health Estimates (GHE) provide a comprehensive assessment of mortality and loss of health due to diseases and injuries (3). Evidence supports the notion that injury deaths and disability can be reduced through concerted preventive initiatives.

## AIM

This fact sheet is intended to update policy-makers and practitioners of the significance of injury-related deaths and burden in the WHO European Region. It presents an overview of mortality and inequalities due to different mechanisms of injuries by age, sex, geography and income groups. The results presented here highlight the continual need for the implementation of prevention programmes.

## WHAT IS AN INJURY?

An injury is the damage caused by the acute transfer of energy, whether physical, thermal, chemical or radiant, that exceeds the physiological threshold, or by the deprivation of a vital element. Injuries can be unintentional, such as those caused by road traffic injuries, poisonings, falls, fire, heat and hot substances, drownings or submersion, or they can be intentional. Intentional injuries can be caused by violence, which is the intentional threat or use of physical force against oneself, another person or a community that results in injury, death, mental harm, maldevelopment or deprivation. Intentional injuries can be self-directed

(suicide or self-harm), interpersonal (intimate partner violence, youth violence, child maltreatment or elder abuse), collective (war), or legal intervention (1). The injury categories used in the GHE are described in Table 1.

## LEADING CAUSES OF INJURIES IN THE WHO EUROPEAN REGION, 2011

Injuries are one of the leading causes of death in the WHO European Region, and it is estimated that 555 000 deaths occurred due to injuries in 2011, accounting for 6.1% of all deaths. The three leading causes of injury deaths are self-directed violence

**Table 1. Major causes of injuries**

UNINTENTIONAL INJURIES	INTENTIONAL INJURIES
Road traffic injuries	Self-directed
Poisonings	Interpersonal violence
Falls	Collective violence and legal intervention
Fire, heat and hot substances	
Drowning	
Exposure to forces of nature	
Other unintentional injuries*	

\*Other unintentional injuries are injuries different from the main unintentional injuries categories, such as accidental threats to breathing (suffocation and strangulation), contact with venomous animals and plants or complications of medical and surgical care.

Source: elaborated from (3)

(123 000), road traffic injuries (92 000) and falls (78 000), that account for a combined 53% of all injury deaths in the European Region (Figure 1).

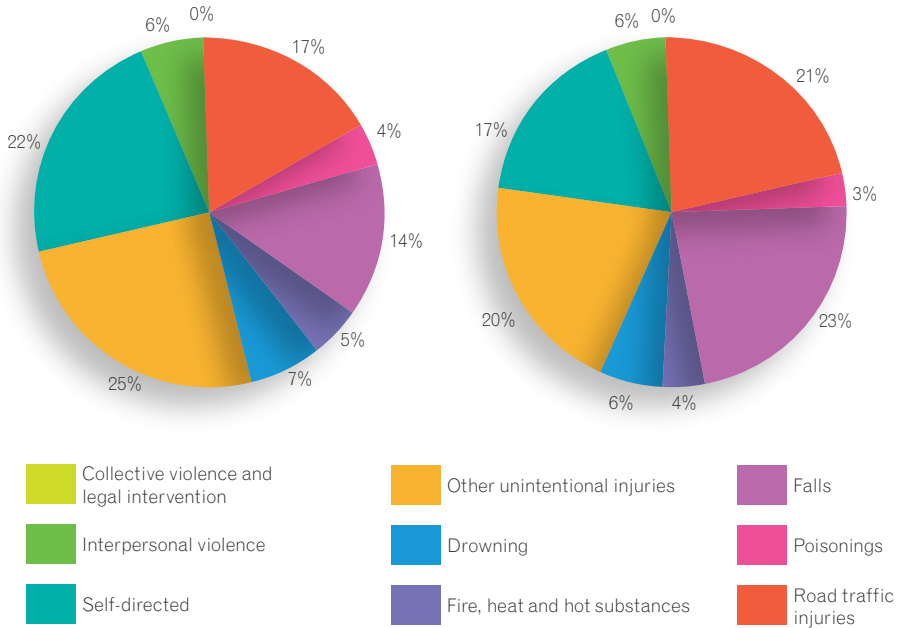
Injuries also contribute to the burden of disease, as measured using disability-adjusted life-years (DALYs) or years of healthy life lost due to premature death or disability. It is estimated that 32 million DALYs were lost due to injuries in 2011 (3). In contrast to mortality, the leading causes of DALYs lost in the Region are falls (23%), road traffic injuries (21%) and self-directed violence (17%) (Figure 1).

When comparing the percentage of deaths and DALYs lost from injury by age

group, younger people (aged 15–29 and 30–49 years) have a greater proportion of DALYs lost than deaths as compared to older people (Figure 2).

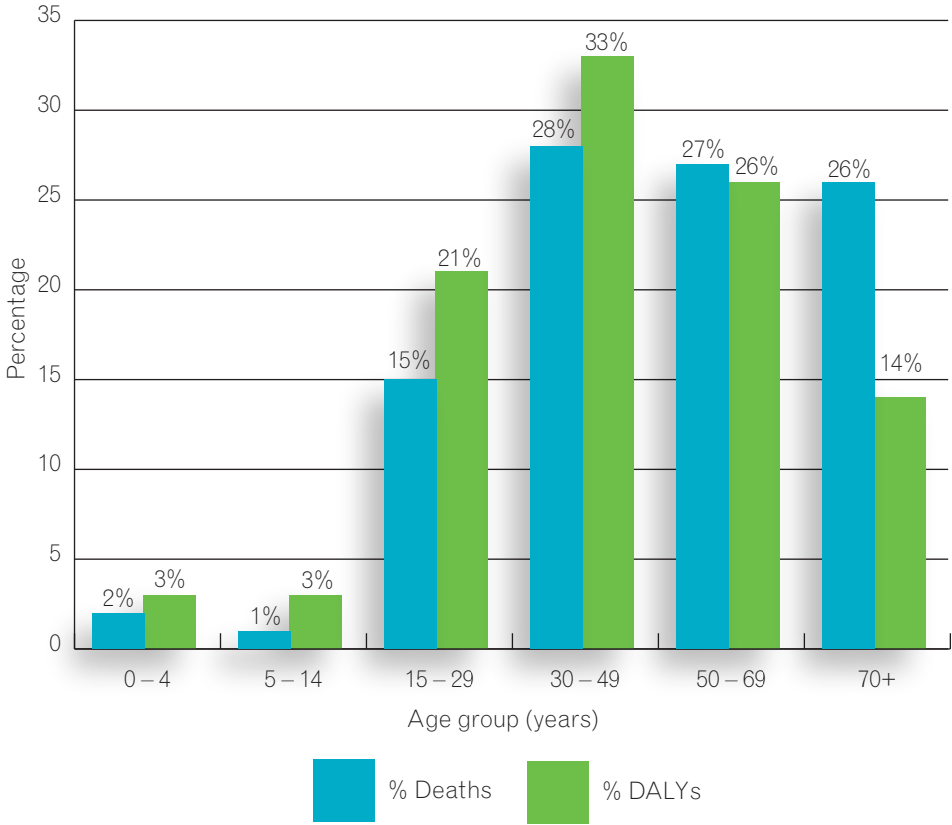
The majority of injury-related deaths are due to unintentional injuries (72%), compared to 28% from intentional injuries. Unintentional injuries are proportionally more prevalent in children aged 0–4 years and 5–14 years, with 96% and 85%, respectively, of all injury deaths (Figure 3). Self-directed violence is the leading cause of all intentional injuries (3) and the age group 15–49 has the highest proportion of intentional injury deaths (36%) (Figure 3).

**Figure 1. Proportion of injury deaths and DALYs lost in the WHO European Region by cause, 2011**



Source: elaborated from (3)

**Figure 2. Percentage of deaths and DALYs lost from all injuries in the WHO European Region by age, 2011**



Source: elaborated from (3)

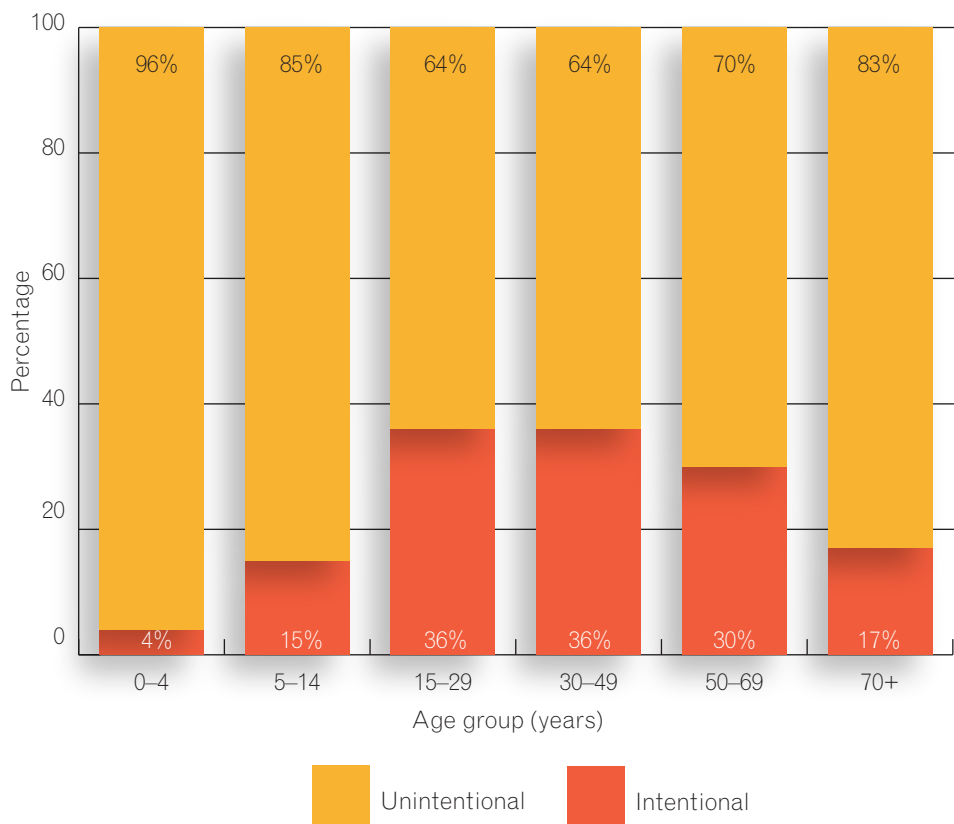
### COMPARISON IN THE WHO EUROPEAN REGION BETWEEN THE YEARS 2000 AND 2011

The recently published Global Health Estimates have used a comparable methodology for estimating the burden of disease and injury, and population for the years 2000 and 2011 (3). Previous estimates

of deaths and DALYs were published for the years 2001 (4), 2002 (4), 2004 (5) and 2008 (5) but are not comparable to 2011 due to methodological differences (6).

The overall number of estimated injury-related deaths has decreased from 753 000 in 2000 to 555 000 in 2011, a decline of 26% (Table 2). There was a decline in the burden of disease due to injuries of 24% from 42 million DALYs in 2000 to 32 million DALYs

**Figure 3. Proportion of unintentional and intentional injuries deaths for both genders by age group in the WHO European Region, 2011**



Source: elaborated from (3)

in 2011 (3). Injury deaths in the European Region accounted for 8.3% of all deaths in 2000 and this has fallen to 6.1% in 2011. During this period there has been a larger decrease in intentional injuries (35%) than unintentional injuries (22%). The largest decrease has been in interpersonal violence (53%) and poisoning (48%). In contrast falls were the only specific cause of injury deaths where an increase has been reported (3%) (Table 2).

Males experienced a large decrease in injury deaths during the period of 2000-2011. In 2000 there were 555 000 male injury deaths (74% of all injury deaths) and in 2011 this dropped to 396 000 accounting for 71% of all injury deaths. In 2011 despite this decrease, many more males died from injury than females.



Table 2. Deaths due to injuries in the WHO European Region, 2000–2011

CAUSE OF DEATH	2000	2011	change (2000-2011)
<b>Injuries</b>	<b>753000</b>	<b>555000</b>	<b>-26%</b>
<i>Unintentional injuries</i>	<i>510000</i>	<i>397000</i>	<i>-22%</i>
Road traffic injuries	128000	92000	-28%
Poisonings	42000	22000	-48%
Falls	75000	78000	3%
Fire, heat and hot substances	32000	26000	-17%
Drowning	58000	37000	-37%
Other unintentional injuries	172000	140000	-18%
<i>Intentional injuries</i>	<i>243000</i>	<i>158000</i>	<i>-35%</i>
Self-directed	166000	123000	-26%
Interpersonal violence	67000	31000	-53%
Collective violence and legal intervention	9000	2000	-73%

Source: elaborated from (3)

## INEQUALITIES IN INJURIES BY AGE AND SEX

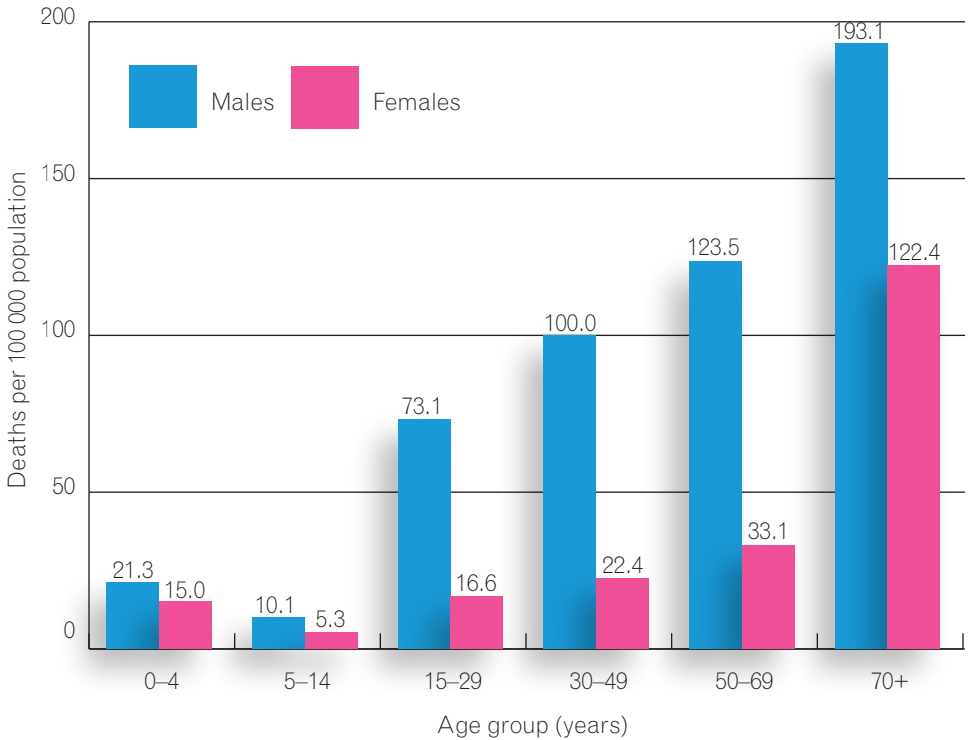
Analysis of injury mortality rates by age group shows that the highest death rates are in older people (aged 70 years and over) for both males and females. Injury death rates increase after the age of 14 years in both genders. The smallest gap between males and females deaths occurs in children under 5 years (Figure 4).

For all causes of injury, the mortality rate is 2.7 times higher in males than

in females. When examining individual causes of injury, the highest rate ratios of male versus female deaths are in drowning and self-harm, with ratios of 5.1 and 4.0, respectively (Figure 5). The lowest differences in death rates by gender are observed for falls and fire related-deaths, with male to female rate ratios of 1.5 and 2.3, respectively.

A breakdown of injury-related causes of deaths between age groups suggests different priorities in different age groups. Road traffic injury is the leading cause of death among young people aged 15–29

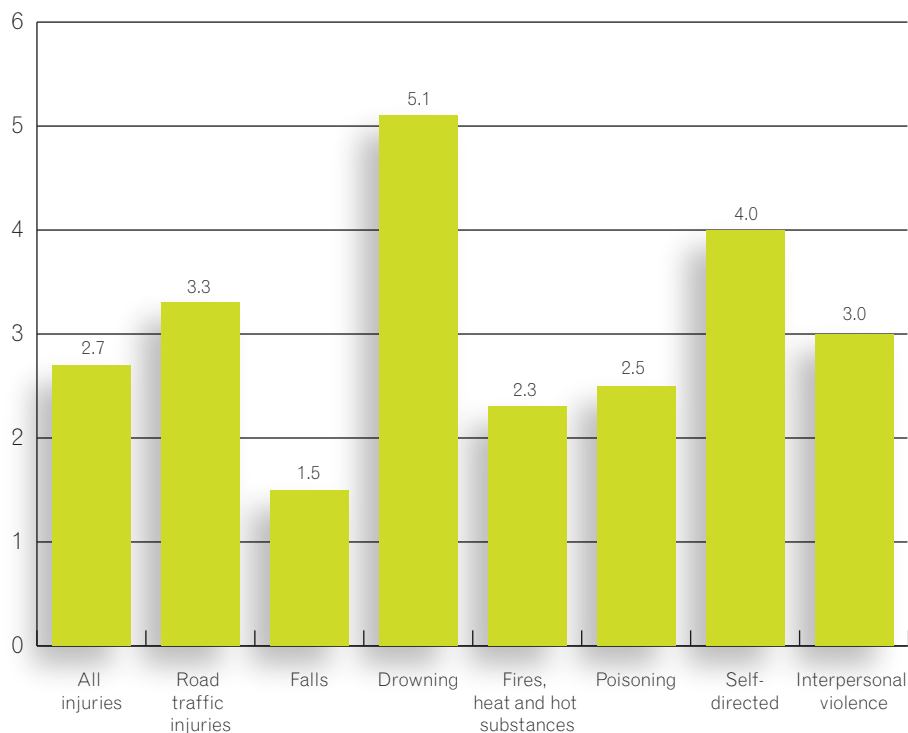
Figure 4. Age and gender specific injury mortality rates in the WHO European Region, 2011



Source: elaborated from (3)

years. Self-harm is of concern across different age groups, and it is among the 15 most frequent causes of death in people aged 5–69 years. Drowning is one of the main causes of death in people aged 0–29 years. Interpersonal violence is a leading cause in people aged 15–49 years. Fire, heat and hot substances are among the 15 most frequent causes of death in children aged 5–14 years (Table 3).

**Figure 5. Male to female mortality rate ratios of injury deaths in the WHO European Region, 2011**



Source: elaborated from (3)

## INEQUALITIES BY COUNTRY INCOME AND GEOGRAPHY IN THE WHO EUROPEAN REGION

During the past decades, the situation in the Region has improved considerably. Countries belonging to the European Union (EU) have witnessed a steady though not very steep decline since 1980, from a mortality rate of 63.1 per 100 000 population to 35.6 per 100 000 population in 2011. By contrast, there have been

mortality peaks in the Commonwealth of Independent States (CIS<sup>1</sup>) in 1994 and 2002 during periods of political, economic and social transition. Since 2002 mortality rates have declined sharply. There is nevertheless still a large gap in overall figures: in 2010, the death rate from injuries was three times higher in the CIS than in the EU (Figure 6) (7). Some of the greatest progress in the Region has been

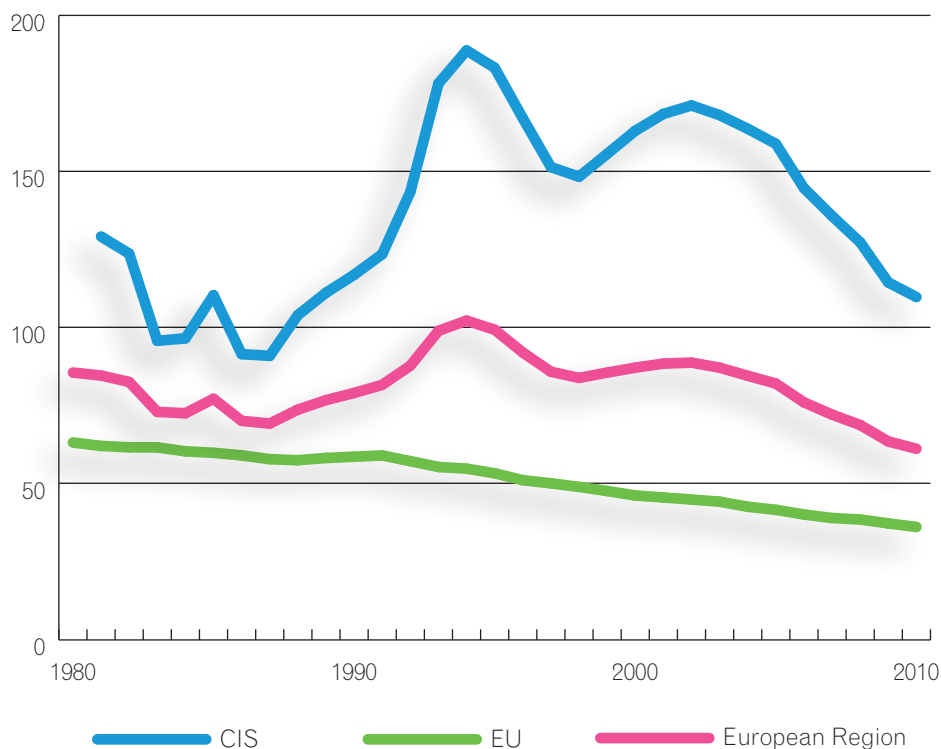
<sup>1</sup>This group of countries includes all the official and unofficial members as of 2006: Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Republic of Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine and Uzbekistan.

**Table 3. Number and rank of 15 leading causes of deaths for both genders in the WHO European Region 2011**

Rank	0–4 years	5–14 years	15–29 years	30–49 years	50–69 years	70+ years
1	Preterm birth complications 30216	Road traffic injury 2584	Road traffic injury 26912	Ischaemic heart disease 85834	Ischaemic heart disease 494001	Ischaemic heart disease 1657718
2	Lower respiratory infections 17820	Drowning 1790	Self-harm 22888	HIV/AIDS 48591	Stroke 223441	Stroke 1010335
3	Congenital heart anomalies 15242	Other malignant neoplasms 1502	Other unintentional injuries 13920	Cirrhosis of the liver 44055	Trachea, bronchus, lung cancers 184559	Other circulatory diseases 403905
4	Birth asphyxia and birth trauma 13648	Leukaemia 1428	Drowning 7194	Self-harm 41844	Cirrhosis of the liver 100004	Alzheimer's and other dementias 209930
5	Other congenital anomalies 8891	Lower respiratory infections 1399	Interpersonal violence 6877	Other unintentional injuries 33569	Other malignant neoplasms 94210	Trachea, bronchus, lung cancers 188656
6	Other neonatal conditions 7747	Other unintentional injuries 1375	Ischaemic heart disease 6623	Stroke 31167	Colon and rectum cancers 76692	Hypertensive heart disease 185868
7	Diarrhoeal diseases 5920	Other neurological conditions 1184	Drug use disorders 5827	Road traffic injury 29372	Breast cancer 60881	Chronic obstructive pulmonary disease 185356
8	Neonatal sepsis and infections 5356	Self-harm 714	HIV/AIDS 5052	Trachea, bronchus, lung cancers 18717	Other circulatory diseases 55716	Colon and rectum cancers 158615
9	Other infectious diseases 4060	Epilepsy 631	Cirrhosis of the liver 4671	Other malignant neoplasms 18216	Stomach cancer 50958	Lower respiratory infections 144166
10	Other unintentional injuries 3766	Endocrine, blood, immune disorders 581	Leukaemia 4386	Alcohol use disorders 17351	Chronic obstructive pulmonary disease 48704	Other malignant neoplasms 133244
11	Endocrine, blood, immune disorders 2912	Congenital heart anomalies 552	Tuberculosis 4325	Breast cancer 16926	Other digestive diseases 42973	Other digestive diseases 132680
12	Meningitis 2128	Other congenital anomalies 476	Other malignant neoplasms 4055	Tuberculosis 16832	Pancreas cancer 41983	Diabetes mellitus 116651
13	Drowning 1886	Lymphomas, multiple myeloma 449	Falls 3544	Cardiomyopathy, myocarditis, endocarditis 15923	Other unintentional injuries 33569	Prostate cancer 84601
14	Neural tube defects 1741	Fire, heat and hot substances 342	Stroke 3106	Other digestive diseases 15232	Cardiomyopathy, myocarditis, endocarditis 37883	Other respiratory diseases 76979
15	Other chromosomal anomalies 1690	Falls 341	Lower respiratory infections 3050	Interpersonal violence 13621	Self-harm 37351	Breast cancer 76279

Source: elaborated from (3)

**Figure 6. Trends in standardized mortality rates for all injuries in the WHO European Region, the European Union (EU) and the Commonwealth of Independent States (CIS)**



Source: (7)

achieved in the field of road safety, where mortality decreased by 25% between 2007 and 2010 despite an increase of 6% in registered vehicles during the same period (8).

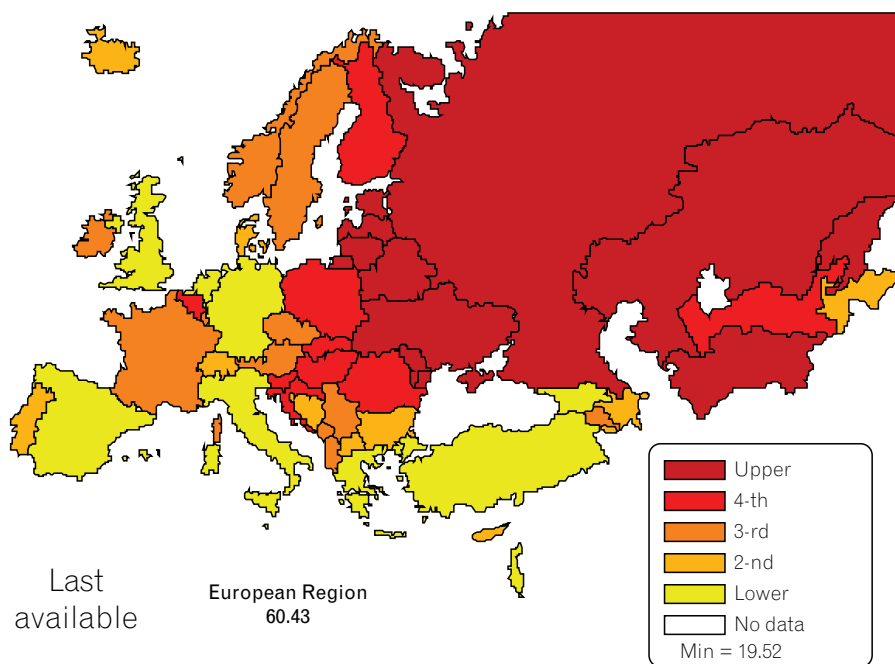
There are distinct geographic differences in injury-related standardized death rates between the Eastern and Western parts of Region (Figure 7). A seven-fold difference can be observed between countries with the highest and lowest mortality rates (7).

Countries are categorized as high-income countries (HIC) and low- to middle-

income countries (LMIC) according to the World Bank's estimates of gross national income per capita. In LMIC deaths from all injuries decreased from 519 000 in 2000 to 341 000 in 2011, a decline of 34%. In contrast, in HIC the total number of injury deaths decreased from 234 000 to 214 000, a decline of 8%. A proportionately greater decline has occurred in LMICs compared to HICs, suggesting that there is a convergence between countries belonging to these income groups.

In 2011 mortality rates for all injuries in LMIC are 2.4 times higher than in HIC

Figure 7. Age standardized death rate per 100 000 from all injuries in the WHO European Region (quintiles)



Source: (7)

(Table 4). When comparing specific causes of injuries, the highest mortality rate ratio of LMIC compared to HIC is that due to fire, heat and hot substances, which is 10.5 times higher in LMIC compared to HIC. Specific rate ratios are also very high in LMIC compared to HIC for drowning (7.8), interpersonal violence (7.4) and poisoning (5.6) (Table 4).

There has been a convergence in mortality rates between HIC and LMIC for the period of 2000–2011. During this period the mortality rate ratios for LMIC compared to HIC have decreased from 3.1

to 2.4 for all injuries. The biggest reduction in mortality rate ratios between LMIC and HIC has been seen in deaths from poisoning, interpersonal violence and in self-directed violence (Figure 8).

There has been a reduction in the gap between LMIC and HIC for almost all specific causes of injury, with the exception of road traffic injuries and fire-related deaths where there has been a small increase in this gap when compared to 2000. Despite a reduction in the total number of road traffic deaths (35 000), the gap between HIC and LMIC increased

**Table 4. Standardized mortality rates and rate ratios from all injuries by gender in LMIC and HIC in the WHO European Region, 2011**

CAUSE OF INJURY	DEATHS PER 100 000				RATE RATIOS		
	MALES		FEMALES		LMIC : HIC		
	HIC	LMIC	HIC	LMIC	MALES	FEMALES	TOTAL
All injuries	48.61	138.03	20.06	35.46	2.8	1.8	2.4
Unintentional injuries	30.48	99.11	14.90	26.87	3.3	1.8	2.7
Intentional injuries	18.14	38.92	5.16	8.59	2.1	1.7	2.0
Self-harm	16.86	27.37	4.61	5.35	1.6	1.2	1.5
Road traffic injuries	9.90	22.74	2.77	6.46	2.3	2.3	2.3
Falls	7.27	12.83	4.79	3.59	1.8	0.7	1.3
Poisoning	0.99	6.98	0.55	2.07	7.1	3.8	5.6
Drowning	1.62	13.82	0.40	2.45	8.5	6.1	7.8
Interpersonal violence	1.23	10.55	0.55	3.07	8.6	5.6	7.4
Fire, heat, hot substances	0.73	9.11	0.37	3.05	12.5	8.2	10.5

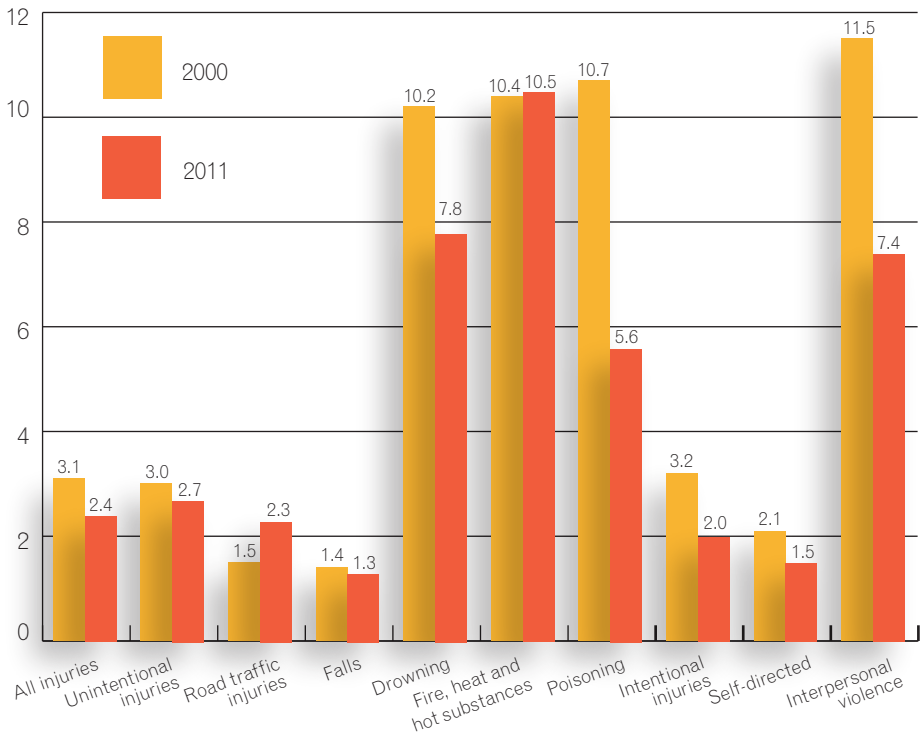
Source: elaborated from (3)

Note: HIC in the WHO European Region comprise: Andorra, Austria, Belgium, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Luxembourg, Malta, Monaco, the Netherlands, Norway, Poland, Portugal, San Marino, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom. LMIC comprise: Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Montenegro, Republic of Moldova, Romania, Russian Federation, Serbia, Tajikistan, The former Yugoslav Republic of Macedonia, Turkey, Turkmenistan, Ukraine and Uzbekistan.

due to the fact that there was a greater improvement in road safety in HIC with a greater decrease in road traffic deaths of 25 000 than in LMIC (10 000 deaths). LMIC during this period experienced increased exposure to traffic due to growing motorization (8).

However this progress has been unequal across the age groups and in children under 15 years the mortality gap between HIC and LMIC has actually widened. For all unintentional injuries this death rate ratio between LMIC to HIC has increased from 4.2 in 2000 to 6.1 in 2011, and for road traffic injury increased from 1.9

Figure 8. Rate ratios (LMIC vs HIC) for specific cause of injury in 2000 and 2011 in the WHO European Region



Source: elaborated from (3)

to 3.8 during this period (Figure 9). This highlights that renewed efforts need to be made, particularly in LMIC, to address this widened inequality.

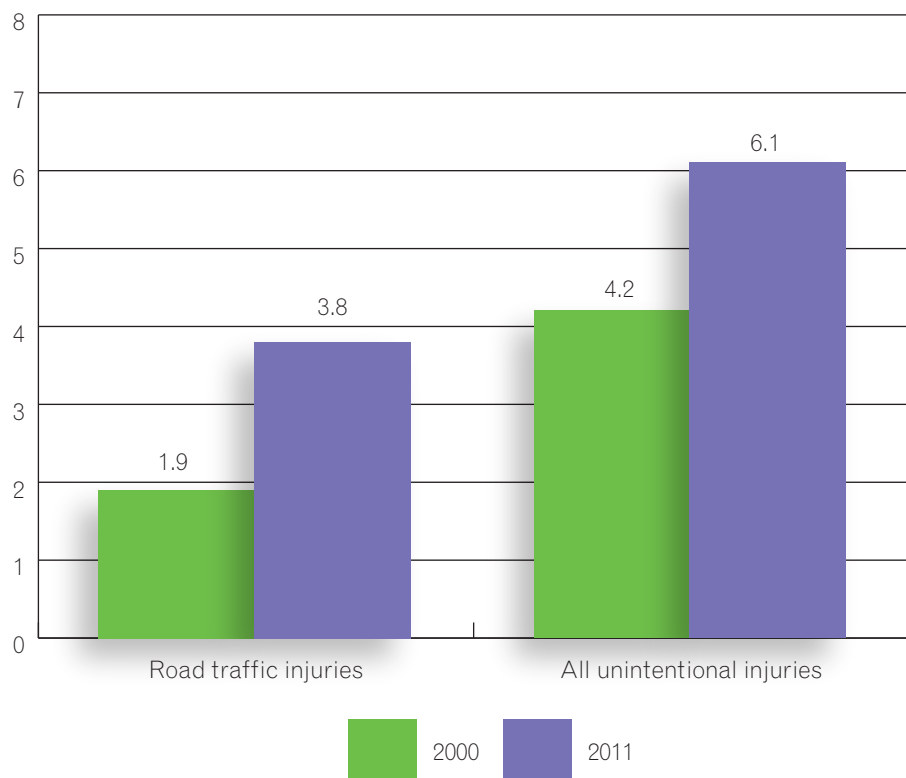
## INJURY DEATHS ARE ONLY THE TIP OF THE ICEBERG

Deaths from injuries are only the tip of the iceberg. For each death, there are an estimated 24 hospital admissions and 145 hospital outpatients. If applied to the WHO European Region, this suggests that there are about 13 million hospital admissions

and 80 million hospital attendances (Figure 10). A study conducted in the EU suggests that 9% of the total hospital bed days occupied are due to injuries, confirming the huge drain on health service resources (9). Comprehensive estimates for the societal loss to injuries are not available for all causes of injury. These are better studied for road traffic injuries, and estimates suggest that up to 3.86% of a country's gross domestic product may be lost due to road crashes annually (8). This is due to the high health care and societal costs, making demands on already overstretched resources.



**Figure 9. Death rate ratios in low- and middle-income countries compared to high-income countries in children aged under 15 years for unintentional injuries and road traffic injuries in 2000 compared to 2011**



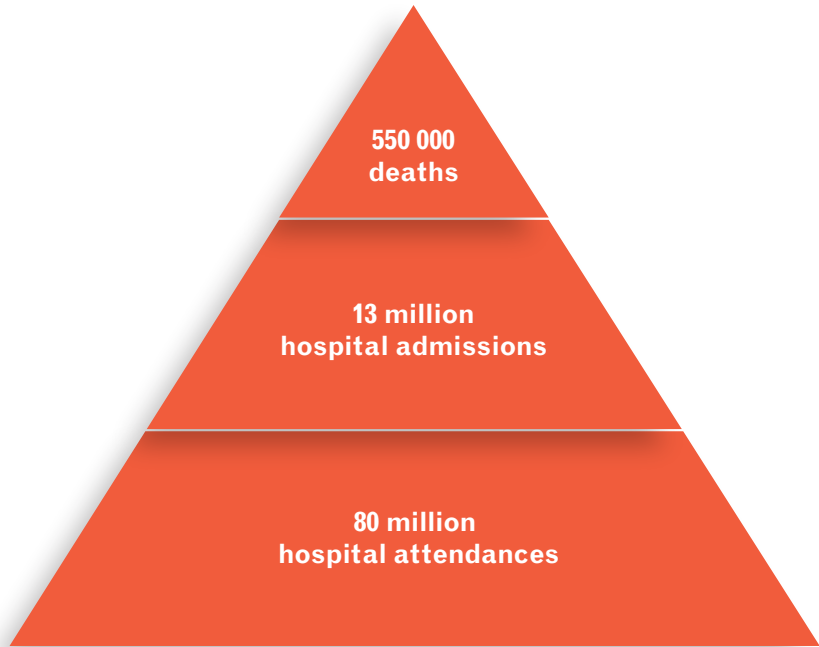
Source: elaborated from (3)

## POLICY FRAMEWORK

Unintentional injuries and violence have gained prominence in the public health agenda in the last years. International policy developments, such as World Health Assembly (WHA) Resolutions and United Nations General Assembly Resolutions, have emphasized the importance of a response to violence and injury both by society in general and health systems in particular:

- WHA56.24: Implementing the recommendations of the *World report on violence and health* (10)
- WHA 57.10: Road traffic safety and health (11)
- WHA 64.27: Child injury prevention (12)
- United Nations General Assembly Resolution 62/244: Improving global road safety (13)

Figure 10. Injury pyramid in the WHO European Region



Source: (9)

- United Nations General Assembly Resolution 68/269: Improving global road safety (14)
- The European Council recommendation on the prevention of injury and promotion of safety (16)

In WHO European Region injury prevention has also received policy priority:

- Regional Committee Resolution EUR/RC55/R9 on preventing injuries in the European Region (15)

These policy initiatives have emphasized injuries and violence as public health priorities, providing a policy platform from which a more systematic and coordinated approach to injury prevention can be applied at the national and local level.

## INTERVENTIONS TO PREVENT VIOLENCE AND INJURIES

The prevention of injuries and violence will only be effective if evidence-based interventions are implemented. The evidence has been systematically collated in a series of European and World reports on preventing injuries and violence (17-20). Systematic and organized evidence-informed approaches, based on sustained investment in safe environments (e.g. road and housing design) and products (e.g. childproof lighters and safe packaging of medicines), the use of legislation, regulation, enforcement and education to modify risk behaviors (e.g. drink-driving) have allowed many countries in the European Region to consistently reduce injury deaths. As illustrated in Table 5, many of these interventions have been shown to be cost-effective. For instance, it has been calculated that an investment of one Euro on smoke alarms brings a benefit of 69 Euros in terms of avoided costs (1, 21, 22).

Unfortunately the implementation of evidence-based interventions is not distributed equally across the Region. It is important that countries adopt a strong political commitment and multisectoral collaboration to address the burden of violence and injuries (15). Such efforts are best accompanied by implementation of budgeted national action plans that define responsibilities, set timelines and have quantified targets. However, in many countries of the Region, national policies are absent, and evidence-based interventions are rarely applied nationally or applied only at local level. Interventions need to be scaled up to the national level so that health and societal benefits can be

more equitably distributed, and the divide between and within countries across the Region can be reduced (2,21,22). The recent policy development at the global level with WHA67.15 on Strengthening the role of the health system in addressing violence, in particular against women and girls, and against children gives a renewed impetus to violence prevention activities (24).

The evidence presented in this factsheet shows that, although progress is being made, the burden of death and disability from injuries in the Region is still high and for children inequalities between HIC and LMIC have widened. There is an opportunity for the exchange of expertise between Member States, and stakeholders are called upon to take policy initiatives and evidence-based prevention programmes forward.

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**Table 5. Financial savings for selected injury prevention interventions**

<b>1 EURO INVESTED ON:</b>	<b>SAVINGS(€)</b>
Smoke alarms	69
Random breath testing of drivers for alcohol	36
Child safety seats	32
Bicycle helmets	29
Home visits and parent education against child abuse	19
Upgrading marked pedestrian crossings	14
Road lighting	11
Prevention counselling by paediatricians	10
Poison control services	7
Use of day time driving lights	4
Road safety improvements	3

Source: (1,2,20-22)

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This policy briefing was produced by A. Barone<sup>1</sup>, F. Mitis<sup>2</sup> and D. Sethi<sup>2</sup>

<sup>1</sup> Intern at World Health Organization Regional Office for Europe, and Student in the European Master in Sustainable Regional Health Systems

<sup>2</sup> World Health Organization Regional Office for Europe

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## The WHO Regional Office for Europe

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### World Health Organization Regional Office for Europe

UN City, Marmorvej 51, DK-2100 Copenhagen Ø, Denmark  
Tel.: +45 45 33 70 00. Fax: +45 45 33 70 01.  
E-mail: [contact@euro.who.int](mailto:contact@euro.who.int). Web site: [www.euro.who.int](http://www.euro.who.int)