Injuries in Europe: a call for public health action
An update from 2008 WHO Global Burden of Disease

Key facts

- There were 664 000 deaths from unintentional and intentional injuries
- They are the leading cause of death in people aged 5-44 years
- Costs to health services and society are very high
- The leading causes are self-directed violence, road traffic injuries and poisoning
- There are inequalities in injury deaths with some of the world's highest rates in low- and middleincome countries and the lowest rates in highincome countries
- Mortality rates in low- and middleincome countries are three times higher than in highincome countries
- Male mortality rates are 3.3 times higher than in females
- Public health action is needed to reduce the inequalities in injuries in the Region
- Much is to be gained from the transfer of evidence-based prevention

1. Background

Injuries and violence are a neglected epidemic in the World Health Organization European Region (1). The recently released WHO Global Burden of Disease - 2008 Statistics provides an opportunity to update policy-makers and practitioners of the significance of injury-related deaths (2). There is evidence that this leading cause of death and disability can be reduced through concerted preventive initiatives and the results presented here highlight the need for a call for action for the implementation of prevention programmes.

2. Aim of this fact sheet

This document aims to highlight the burden of injury deaths in the WHO European Region and describe inequalities in injuries by age, sex and geography.

3. What is an injury?

An injury is defined as the physical damage that results when a human body is suddenly subjected to energy in amounts that exceed the threshold of physiological tolerance, or from a lack of one or more vital elements (for example, oxygen). The energy could be mechanical, thermal, chemical or radiant. Injuries are categorized as intentional or unintentional (

Table **1**). The main causes of unintentional injuries are road traffic crashes, poisonings, drowning, falls and fires. Intentional injuries result from violence and can be directed at others (interpersonal violence), to the self (self-directed violence) or at groups (collective violence). Violence is the intentional threat or use of physical force against oneself, another person or a larger group that results in injury, death, psychological harm, maldevelopment or deprivation (3).

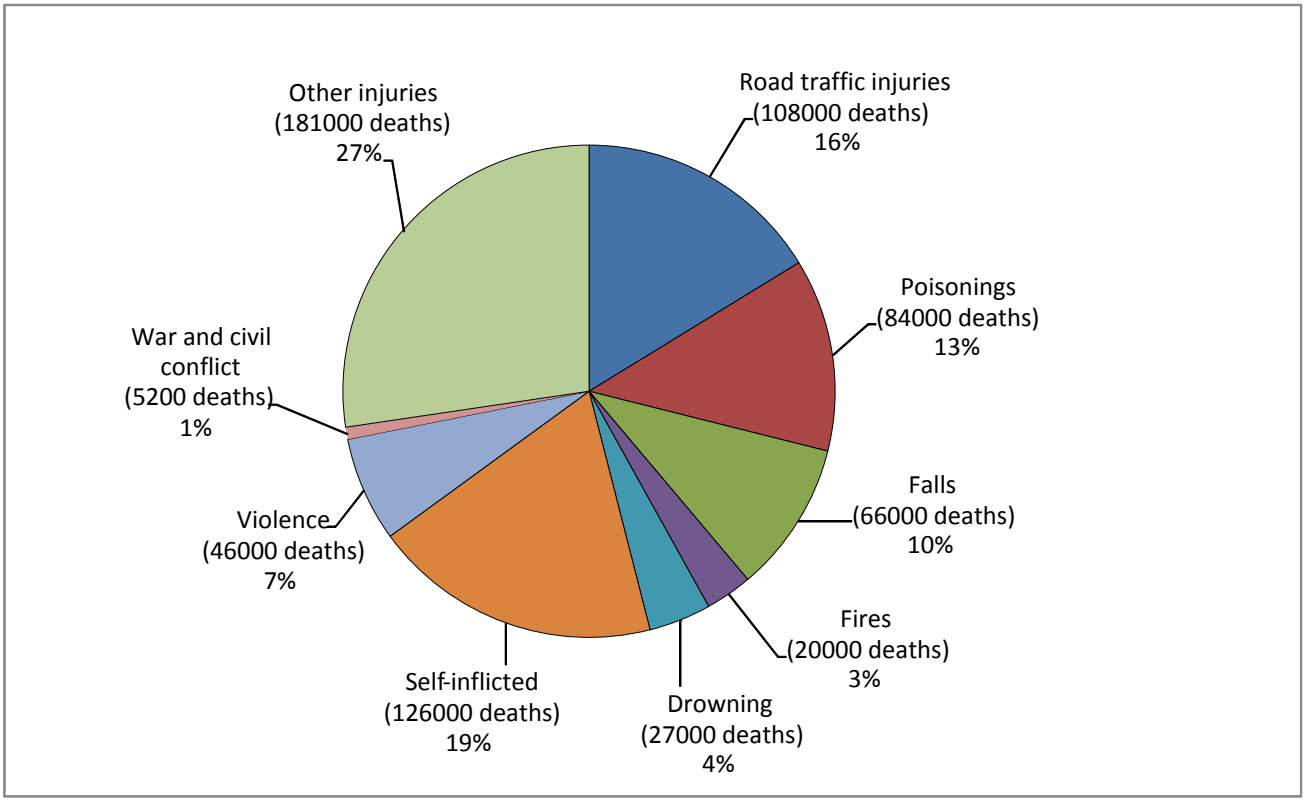
Table 1. Major causes of injuries

UNINTENTIONAL INJURIES	INTENTIONAL INJURIES
Road traffic injuries	Self-inflicted
Poisonings	Interpersonal violence
Falls	War and civil conflict
Fires	Other intentional injuries
Drownings	
Other unintentional injuries	

4. Recent trends in injuries in Europe

Injuries continue to be a leading cause of death in the Region. In 2008, there were an estimated 664 000 deaths among its 53 countries, accounting for 7% of deaths from all causes in the Region (2). The overall number of estimated injury-related deaths in the Region has decreased from 791 000 between 2002-2008, despite a little increase in total population (from almost 888 to 889 millions) (Table 2). The majority of deaths from injuries in the Region continue to be from unintentional injuries (Figure 1 and Figure 2). The 5 leading causes of injury death in the Region are self-directed violence, road traffic injuries, poisonings, falls and interpersonal violence. Compared to 2002, there has been an increase in the proportion of deaths from unintentional injuries in the Region from 67.5% of all injury deaths to 73.3%. Overall about 27% of deaths are due to intentional injuries, though in young people aged 15-44 years, this almost amounts to a third.

Figure 1. Injuries by cause in the WHO European Region 2008 (rounded to thousands)



Source: (2)

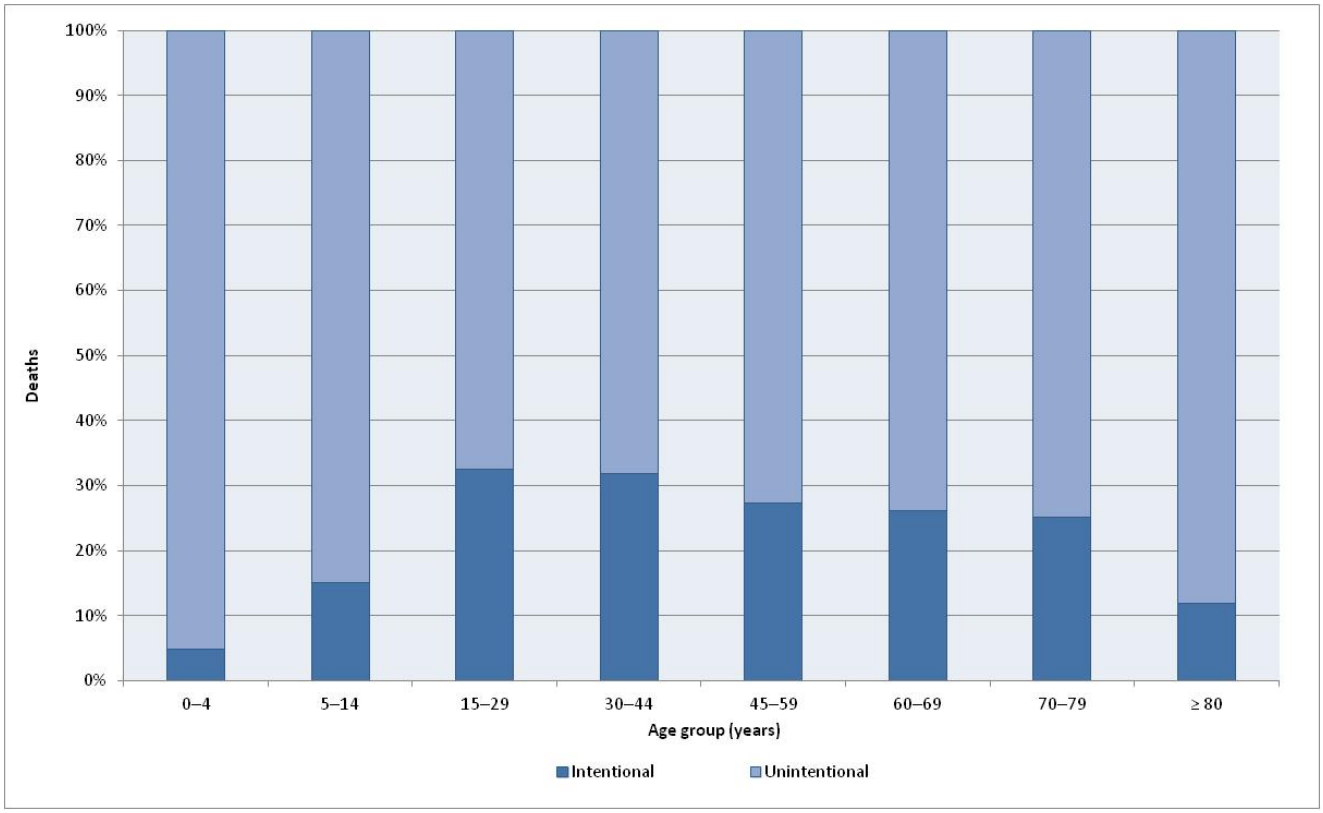
Note: Other Injuries refer to all other injuries which do not fit into the main categories above. The major part of these are unintentional injuries and include causes such as choking, suffocation, strangulation, injury due to impact with a physical objects, animal bites etc.

Table 2. Deaths due to injuries in WHO European Region in 2002, 2004, 2008

CAUSE OF DEATH	2002	2004	2008
Injuries	**790 878**	**789 130**	**663 912**
Unintentional Injuries	*534 267*	*563 550*	*487 004*
Road Traffic Injuries	126 546	129 133	107 850
Poisonings	109 870	106 997	84 059
Falls	79 636	78 734	65 991
Fires	24 333	23 105	20 436
Drowning	37 986	34 224	27 216
Other Unintentional Injuries	155 897	191 358	181 427
Intentional Injuries	*256 611*	*225 580*	*176 908*
Self-Inflicted Injuries	163 878	150 547	125 875
Violence	72 753	65 257	45 743
War	19 287	9 672	5 281
Other Intentional Injuries	694	103	35

Source: (2, 4, 5)

Figure 2. Percentage of deaths from unintentional and intentional injuries by age group in the WHO European Region

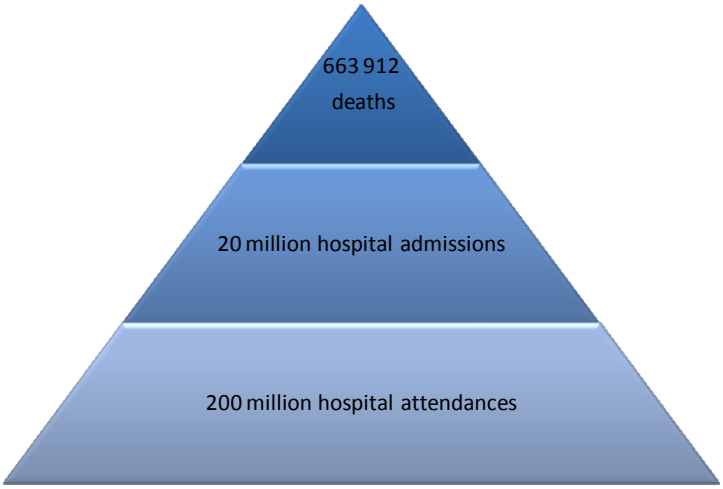


Source: (2)

5. Deaths from injuries are only the tip of the iceberg

Deaths from injuries represent the most extreme events and there is a clinical iceberg. For every injury death there are an estimated 28 hospital admissions, 136 emergency department visits and 73 outpatient clinic visits related to injuries, in addition to the thousands of people who self-treat their injuries (5, 6). In the Region this would be equivalent to 20 million injury-related hospital admissions and 200 million injury related hospital attendances (Figure 3). In the European Union this has been estimated at 7 million injury-related hospital admissions annually in the EU, constituting 9% of all hospital days (7). This poses huge economic and human resource demands on the European Region's health care systems, particularly for emergency departments and trauma services, that are all ready stressed by other health demands.

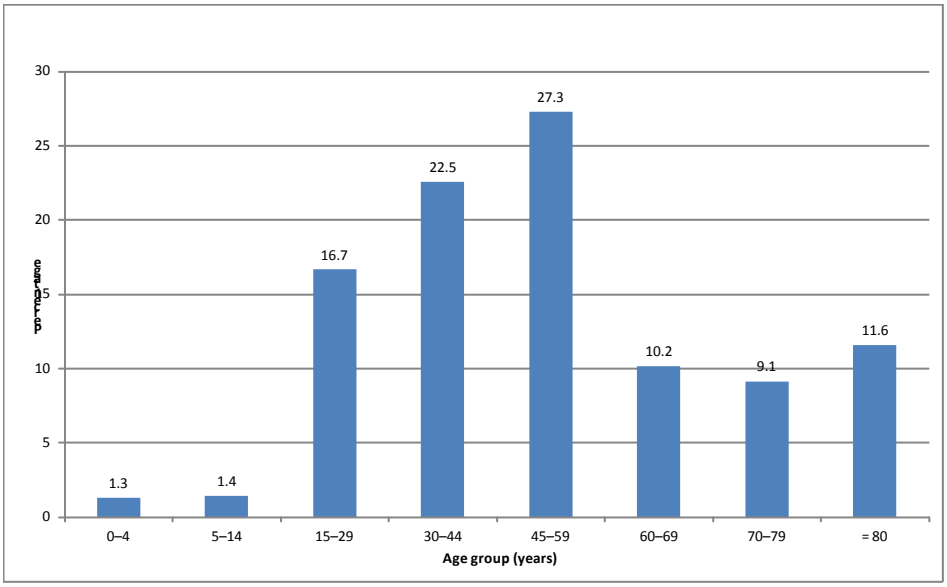
Figure 3. The injury pyramid in WHO European Region



6. Inequalities in injuries by age

Analysis of the population groupings from the WHO Global Burden of Disease data reveals inequalities in injury mortality by age. The 2008 data shows that the proportion of deaths from all causes of injuries continues to be higher among the younger aged populations (Figure 4) and nearly two-thirds of injury deaths occur while people are in their working-age.

Figure 4. Percentage of deaths from all injuries by age in the WHO European Region



Source: (2)

A breakdown of the leading causes of death across the age groups reveals that injuries are overwhelmingly ranked as the lead cause of death in the Region for the younger age groups of between 5 and 44 years. (Table 3).

Table 3. Leading causes of deaths specific age groups in the WHO European

Rank	Age 0-4	Age 5-14	Age 15-29	Age 30-44	Age 45-59	Age 60+
1	Prematurity and low birth weight 29459	Road traffic injuries 3034	Road traffic injuries 31923	HIV/AIDS 38169	Ischaemic heart disease 258631	Ischaemic heart disease 1895146
2	Lower respiratory infections 20102	Drowning 1756	Self-inflicted injuries 23636	Ischaemic heart disease 37381	Cerebrovascular disease 101210	Cerebrovascular disease 1155865
3	Neonatal infections and other conditions 16046	Leukaemia 1363	Poisonings 11901	Self-inflicted injuries 31070	Trachea, bronchus, lung cancers 83986	Trachea, bronchus, lung cancers 284217
4	Birth asphyxia and birth trauma 12844	Lower respiratory infections 1316	Violence 10288	Road traffic injuries 26189	Cirrhosis of the liver 74227	Chronic Obstructive Pulmonary Disease 218394
5	Congenital heart anomalies 11187	Self-inflicted injuries 711	HIV/AIDS 7889	Poisonings 24331	Breast cancer 38436	Colon and rectum cancers 207142
6	Diarrhoeal diseases 8372	Epilepsy 532	Tuberculosis 5909	Cirrhosis of the liver 24143	Self-Inflicted Injuries 35632	Hypertensive Heart Disease 203147
7	Upper respiratory infections 4921	Congenital heart anomalies 524	Drowning 5539	Tuberculosis 23516	Colon and rectum cancers 32621	Alzheimer and Other Dementias 168476
8	Meningitis 3180	Endocrine disorders 498	Cirrhosis of the liver 4114	Cerebrovascular disease 16190	Poisonings 32541	Lower Respiratory Infections 160978
9	HIV/AIDS 1615	Violence 452	Ischaemic heart disease 3888	Violence 14822	Stomach cancer 28036	Diabetes Mellitus 135973
10	Road traffic injuries 1374	Lymphomas, multiple myeloma 446	Cerebrovascular disease 3646	Breast cancer 8603	Road traffic injuries 22862	Stomach cancer 113861
11	Endocrine disorders 1207	Cerebrovascular disease 411	Falls 3188	Inflammatory heart diseases 7714	HIV/AIDS 22546	Breast cancer 107186
12	Hepatitis B 1080	Poisonings 377	Leukaemia 2890	Trachea, bronchus, lung cancers 7129	Tuberculosis 21525	Inflammatory Heart Diseases 83933
13	Drowning 1070	Falls 351	Lower respiratory infections 2745	Drowning 6519	Inflammatory heart diseases 20415	Prostate cancer 82500
14	Spina bifida 1012	Nephritis and nephrosis 286	Inflammatory heart diseases 2515	Falls 5976	Hypertensive heart disease 19079	Pancreas cancer 82482
15	Iron deficiency anemia 806	Fires 284	Epilepsy 2193	Drug use disorders 5417	Lower respiratory infections 18922	Cirrhosis of the liver 82022

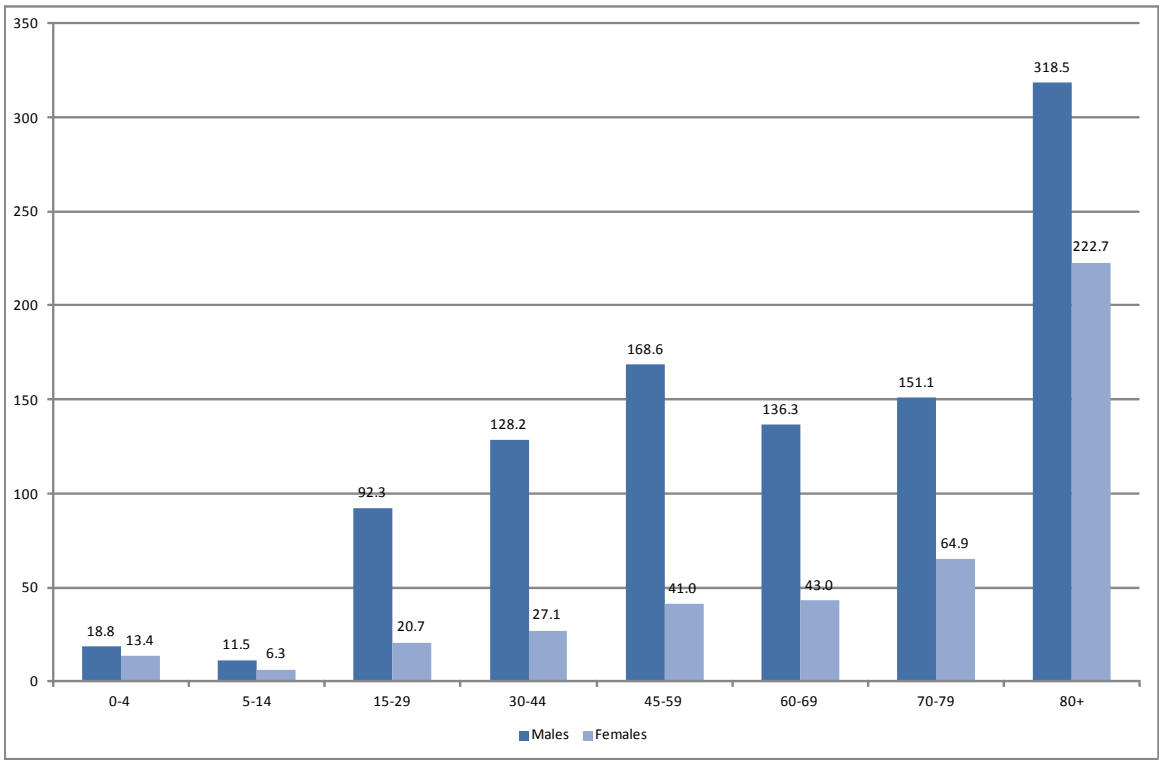
Source: (2)

Injuries result in high health and social care costs, which are borne not only by victims and their families but by society as a whole . As nearly two-thirds of injury deaths occur whilst people are in their working-age, this represents a large drain on societal resources and productivity. As injuries affect people when they are most productive during a younger age, this is a cause of high economic loss. While the economic impact has not been assessed for all injuries, estimates for road traffic injuries, amount to 2% of the national GDP in most European countries; estimates from individual countries suggest that the loss for domestic violence is 2% of GDP in the United Kingdom and for home and leisure injuries this has been estimated as 6.4% of GDP in Norway. (8, 9, 10). Therefore, it is likely that for all injuries, the total societal cost is substantial.

6. Inequalities in injuries by gender

Rates in males are higher than females for all age groups (Figure 5). This rate ratio of males to females is highest for young people aged 15-44 years (4.6) and is lowest at children less than 5 years old (1.4) and in older people aged 80 years and over (1.4).

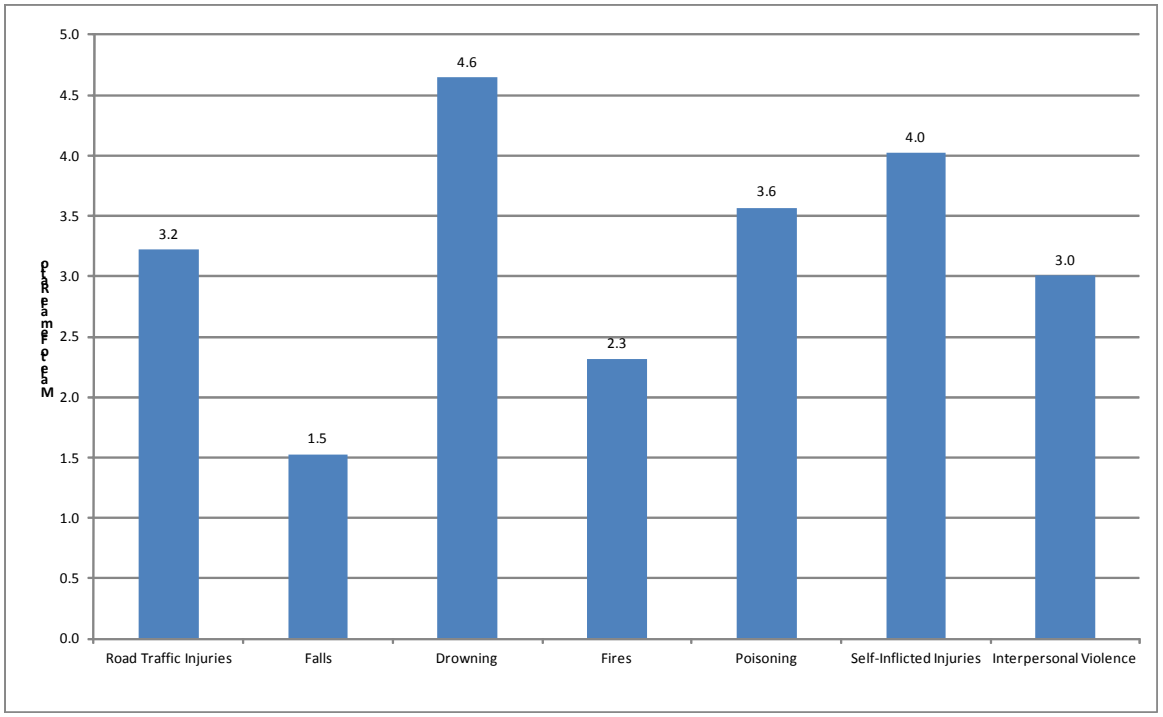
Figure 5. Age and gender specific injury mortality rates in the WHO European Region



Source: (2)

For all causes of injury, the mortality rate is 3.4 times higher in males than in females. When individual causes of injury are examined this reveals some interesting patterns. Drowning and self-inflicted injuries have the highest proportion of male deaths with rate ratios of 4.6 and 4.0 respectively (Figure 6). For falls the rate ratio of males to females is lowest at 1.5.

Figure 6. Male to female rate ratios of injury deaths in the WHO European Region

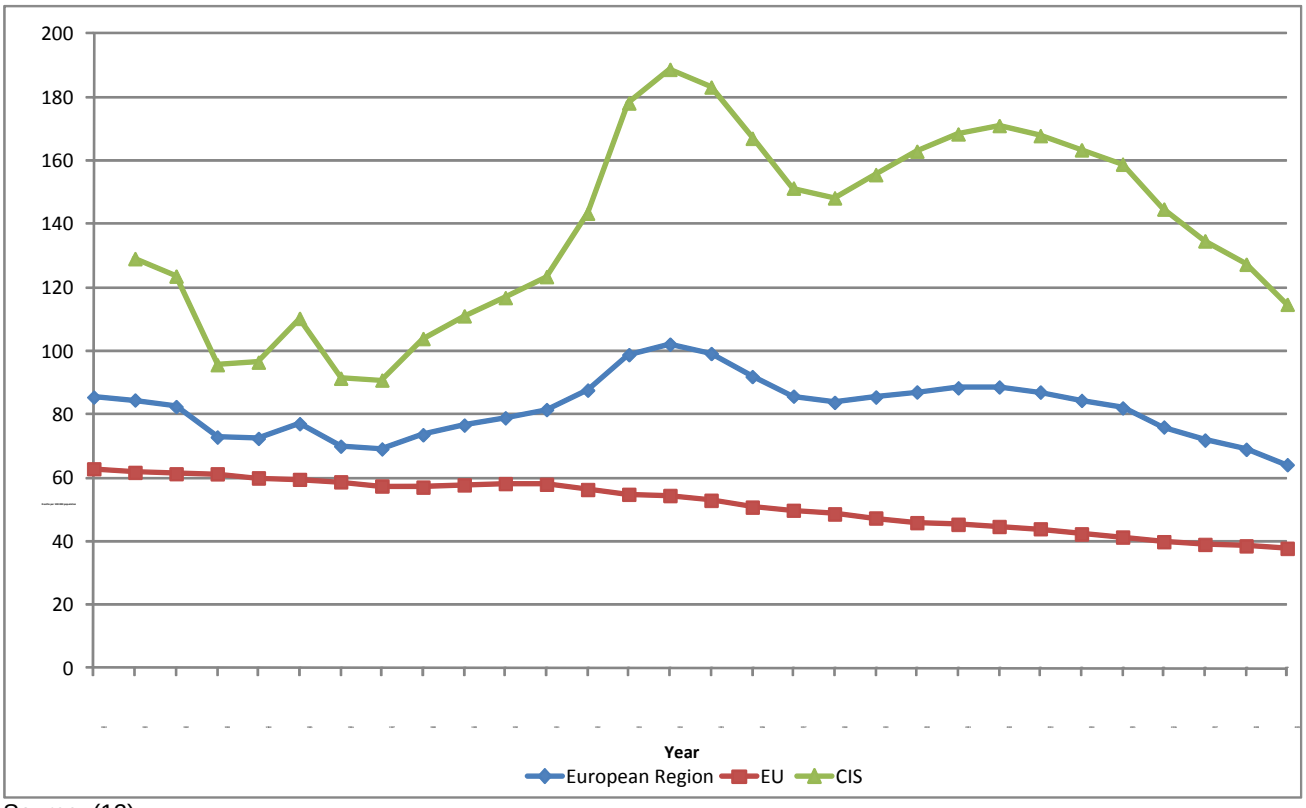


Source: elaborated from (2)

7. Inequalities by country income and geography in the European Region

There is great variation in socioeconomic level and political systems in the WHO European Region. Historical data shows a peak in injury mortality in the Commonwealth of Independent States (CIS) during the 1990's during a period of socioeconomic and political transition (11). With the subsequent economic, regulatory and social stability injury mortality has decreased. However, there still remains a large dichotomy in injury mortality rates between the European Union (EU) and the CIS, where death rates are 3 times higher (12) (Figure 7).

Figure 7. Trends in standardized mortality rates for all injuries in the WHO European Region, the European Union and the Commonwealth of Independent States



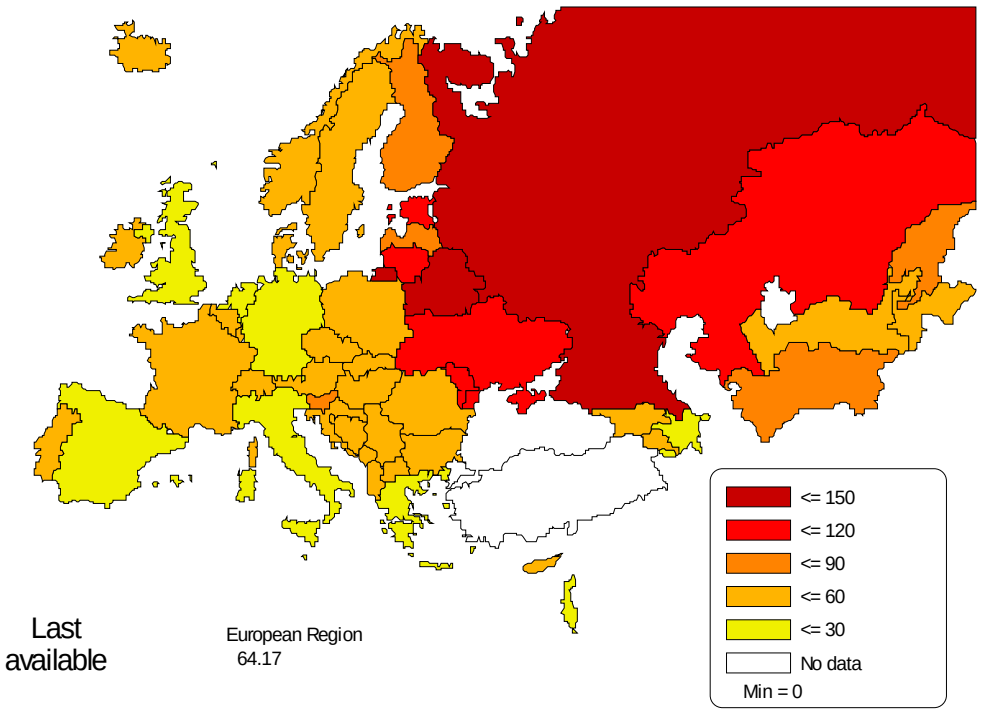
Source: (12)

Similarly, there are distinct geographic differences with injury-related standardized death rates, when mapped, between the Eastern and Western parts of Region (9). There is a 5 fold difference between the country with the highest mortality rate (Russian Federation) and that with the lowest mortality rate (Netherlands).

Based on World Bank's gross national income per capita estimates, the 53 countries in the Region are categorized as high income countries (HIC) (greater than US $12,196) and low- to middle income countries (LMIC). Data analysis by these income groupings illustrates differences in injury mortality. Overall death rates from all injuries in the LMIC are 3 times higher than those in HIC (Source: (12)

Table 4). Comparison for specific causes of injury reveals that mortality rates are almost 9 times greater for poisoning, approximately 8 times greater for interpersonal violence, almost 7 times greater for fires and 5 times greater for drownings in LMIC than in HIC. When considered separately by gender, death rates are higher in LMIC than in HIC for all causes, with the exception of falls in females which are higher in HIC.

Figure 8. Age standardized death rate from all injuries in the WHO European Region



Source: (12)

Table 4. Standardized mortality rates and rate ratios from all injuries by gender in low- to middle-income countries (LMIC) and high-income countries (HIC) in the WHO European Region

CAUSE OF INJURY	DEATHS PER 100000				RATE RATIOS		
	MALES		FEMALES		LMIC : HIC		
	HIC	LMIC	HIC	LMIC	MALES	FEMALES	TOTAL
All injuries	54.08	182.64	19.53	45.61	3.38	2.33	3.01
Unintentional injuries	35.66	135.46	14.08	35.10	3.80	2.49	3.33
Intentional injuries	18.43	47.18	5.46	10.51	2.56	1.92	2.36
Self-inflicted injuries	16.68	29.66	4.71	5.63	1.78	1.20	1.60
Road traffic injuries	11.88	26.41	3.28	8.01	2.22	2.44	2.22
Falls	7.26	9.89	3.78	2.63	1.36	0.70	1.08
Poisoning	3.26	30.52	0.97	7.80	9.36	8.01	8.72
Drowning	1.72	9.34	0.44	1.80	5.43	4.12	5.05
Violence	1.70	15.30	0.75	4.60	9.01	6.14	7.93
Fires	0.88	6.64	0.38	2.27	7.56	5.97	6.90

Source: elaborated from (2)

Note: HIC in 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, Netherlands, Norway, Poland, Portugal, San Marino, Slovakia, Slovenia, Spain, Sweden, Switzerland, 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, Uzbekistan

8. Policy framework

For a lot of years injuries were a low priority in the public health agenda because they were considered as unavoidable events. However, in the last few decades an evidence-based public health approach, based on the improvement of surveillance systems, the analysis of risk factors, the implementation, evaluation and scaling up of interventions, has been adopted. Following this approach, a wide set of evidence-based interventions has been implemented and evaluated (1,3,8,13) and this has allowed several countries, above all in western and northern Europe, to reach very low mortality levels, through sustained investment in safe environments (road and housing design) and products (childproof lighters), legislation, regulation, enforcement and education to modify risk behaviours (drink–driving). These interventions have been proven to be cost-effective. For instance, it has been calculated that an investment of on euro on random breath testing for driving under the influence of alcohol, brings a benefit of 36 Euros in terms of avoided costs.

This effort has been accompanied by the improvement of surveillance systems and by a strong political commitment and multisectoral collaboration to implement budgeted national action plans characterized by the setting of responsibilities, timelines and quantified targets. However, in several countries of the European Region national policies are absent and evidence-based interventions are rarely applied or applied only at local level and need to be scaled up at national level so that the divide between countries across the Region can decrease.

Unintentional injuries and violence are gaining prominence in the public health agenda. Their importance has been highlighted in recent international policy developments such as World Health Assembly Resolutions and United Nations General Assembly resolutions prioritizing violence and injury prevention:

- WHA56.24: *Implementing the recommendations of the World report on violence and health* (14)
- WHA57.10: *Road traffic safety and health* (15)
- WHA 64.27 Child injury prevention (16)
- United Nations General Assembly resolution 62/244: *Improving global road safety* (17)

In Europe injury prevention has also received policy priority:

- Regional Committee Resolution EUR/RC55/R9 on Preventing injuries in the European Region (18)
- The European Commission has the complimentary Communication and Council Recommendation on injury prevention for adoption in 2006 (19)

These initiatives have emphasized injuries as a public health priority and, although not legally binding, provide a policy platform from which a more systematic and coordinated approach to injury prevention can be made at a national and local level.

This factsheet has shown that although the burden of injury deaths in the Region is still high, progress is being made. There is an opportunity for the exchange of expertise between Member States. Stakeholders are called to take forward preventive action by harnessing the momentum gained through these policy initiatives.

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Acknowedgements: this policy briefing has been produced by JS. Jackson[1], F. Mitis[2], D. Sethi[2]
[1] Emergency Medicine Physician
[2] World Health Organization Regional Office for Europe