Injuries in the European Union 2009-2018

This report is the eighth edition of a series of bi-annual reports, which are published by EuroSafe since 2006. It deals mainly with non-fatal injuries, which are treated in emergency departments of hospitals (data from the European Injury Database EU-IDB). It provides a summary of ten years of data 2009-2018.

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1. Background and purpose

The EU IDB (European Injury Database) is a unique data source that contains standardized cross-national data on the external causes and circumstances of injuries examined and treated in emergency department of hospitals. Its main purpose is to facilitate the development and evaluation of injury prevention policies and programmes, which aim to control external risks. The information provided is complementary to death and hospital discharge statistics as well as to specific surveillance systems on road and workplace accidents. Unique is the wealth of information about external circumstances of injuries as needed for evidence-based prevention actions.

IDB data are collected by dedicated national agencies and provided to the EU IDB data base, to provide central access for various stakeholders as governments, researchers, safety promotion agencies and businesses. At EU level, the system is legally based on the Council Recommendation on the Prevention of Injury and the Promotion of Safety 2007 [1] and the EU Regulation on Community Statistics on Public Health and Health and Safety at Work 2008 [2] and other decisions. For more details on background and methodology see the IDB Operating Manual [3] and the IDB metadata [4]. The EU IDB is publicly accessible through a web-gate of the Italian National Institute of Health in Rome (Istituto Superiore di Sanità), which is hosting the databank [5]. Certain basic analyses can be done online, but more complex multi-country data queries shall be addressed to EuroSafe [6].

The IDB methodology is based on the former European Home and Leisure Accident Surveillance System (EHLASS) and has been further developed and standardized by means of European projects with financial support of former European Health Programmes. The IDB surveillance system uses two data sets of different complexity: the Full Data Set (IDB-FDS) and the Minimum Dataset (IDB-MDS). The Full Data Set (IDB-FDS) includes many details of an injury event, particularly external circumstances of the incidence as place of occurrence, mechanism of injury, activity carried out by the patient when injured and on involved substances, products or counterparts [7].

At present, IDB-FDS data get collected and shared by ten European countries and IDB-FDS data are frequently used to analyse the role of specific risks of certain activities (e.g. do-it-yourself activities, types of sport), certain places (e.g. home bathrooms, school gyms, nursing homes) or certain consumer products (e.g. power-tools, trampolines, firework, furniture, playground-equipment etc.). This report does not deal with IDB-FDS data and analyses.

As the completion of a comprehensive data set like IDB-FDS requires dedicated and trained staff and assigned financial resources, most countries which collect IDB-FDS data do this only in a sample of hospitals. The Minimum Dataset (IDB-MDS) contains fewer data elements and the information needed for its completion is usually already recorded in the standard patient information system in the participating hospitals. IDB-MDS can be extracted from data coded according to ICD-10 or NOMESCO classification, but also from IDB-FDS data. The collection of IDB-MDS data is possible for large samples without noteworthy additional burden to staff, patients and hospital administrations, apart from resources needed for its first implementation and the managing of the data flow [8].

While IDB-FDS data provides the basis for qualitative analyses of external circumstances and injury patterns (accident investigation), the main purpose of IDB-MDS is to provide public health indicators as incidence rates of road, workplace or home accidents, injuries due to assaults or deliberate self-harm. While IDB-MDS data are publicly accessible at the EU IDB web-gate [5], IDB-FDS data can be analysed only by authorised persons due to data protection regulations.

This report is the eighth edition of a series of bi-annual reports, which are published by EuroSafe since 2006 [9]. It analyses *IDB-MDS* data 2009-2018, more precisely crude injury rates based on IDB-MDS data. Its purpose is to assess the sustainability of the European injury data exchange, the validity of core indicators derived from the system and the cross-country comparability. Target groups of the reports are decision makers in the areas of public health and health information, injury prevention and safety promotion at EU as well as national level, and particularly the national IDB data providing agencies.

2. IDB implementation in countries

Participating countries

Eligible for participation in the IDB data exchange are the 27 EU member states, the three EEC countries Iceland, Norway and Liechtenstein, the five EU candidate countries Albania, North-Macedonia, Montenegro, Serbia, and Turkey and the United Kingdom, all together 36 countries. In the given context we call these countries “the European IDB region” (Figure 1).

Figure 1: Map of the European IDB-region.
Dark blue indicates that IDB data have been shared during the years 2009-2018,
light blue indicates countries that can participate, but have not yet shared data.

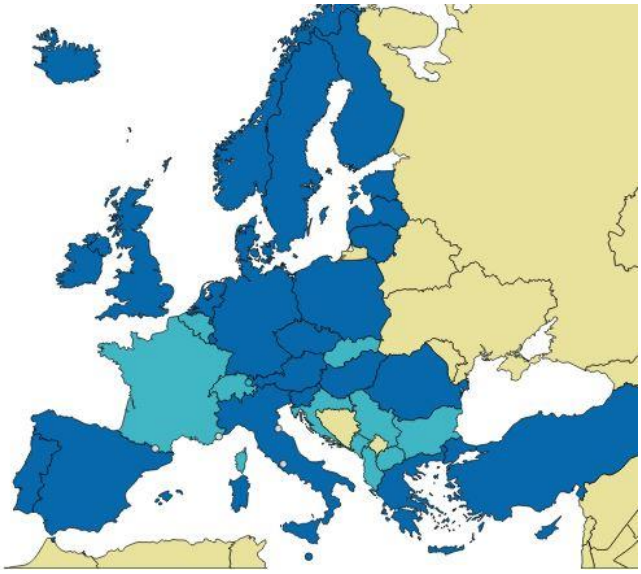


Table 1 shows for all eligible countries their status in the IDB-network and to what extent countries have been able to deliver data. Any national agency which handles injury data, can become network member, when its application has been approved by the network’s assembly. However, full members are only agencies, which actually collect data according to the IDB standards and share these data through the joint data base [10].

Others can participate in the exchange of experiences as observer, but do not have decisions rights and do not get access to IDB micro data. A green tick in Table 1 means that the country has participated as full member of the IDB-network in the indicated year.

Table 1: 36 eligible countries: IDB-network status by country and year 2009-2018.
✓ indicates full member (active IDB data supplier)

	Country	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
1	Albania	Not eligible yet					No competent authority identified				
2	Austria	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3	Belgium	No competent authority identified									
4	Bulgaria	No competent authority identified									
5	Croatia	Observer, no data									
6	Cyprus	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
7	Czechia	✓	✓	✓	✓	✓	Observer, no data				
8	Denmark	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
9	Estonia	Observer, no data			✓	✓	✓	✓	✓	✓	✓
10	Finland	n.d.	✓	✓	✓	✓	✓	✓	✓	✓	✓
11	France	Data available, observer									
12	Germany	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
13	Greece	Observer, no data			✓	No competent authority identified					
14	Hungary	Observer, no data				✓	No competent authority identified				
15	Iceland	n.d.	✓	✓	✓	✓	Observer, no data				
16	Ireland	Observer, no data				✓	✓	Observer, no data			
17	Italy	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
18	Latvia	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19	Liechtenstein	No competent authority identified									
20	Lithuania	Observer, n.d.		✓	✓	✓	✓	✓	✓	✓	✓
21	Luxembourg	Observer, no data			✓	✓	✓	✓	✓	✓	✓
22	Macedonia	Observer, no data									
23	Malta	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
24	Montenegro	Not eligible		Observer, no data							
25	Netherlands	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
26	Norway	Observer, no data			✓	✓	✓	✓	✓	✓	✓
27	Poland	Observer, no data				✓	Observer, no data				
28	Portugal	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
29	Romania	Observer, no data				✓	Observer, no data				
30	Serbia	Not eligible				Observer, no data					
31	Slovakia	Observer, no data									
32	Slovenia	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
33	Spain	Observer, no data				✓	Observer, no data				
34	Sweden	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
35	Turkey	Observer, no data				✓	✓	✓	✓	✓	✓
36	U. Kingdom	n.d.	✓	✓	✓	✓	✓	✓	✓	✓	✓
No. of members		12	15	16	20	25	19	18	18	18	18
No. of observers		14	14	13	10	5	7	8	8	8	8
No collaboration		10	7	7	6	6	10	10	10	10	10

From Table 1 can be seen that the number of data suppliers increased during the JAMIE project [11] till 2013 but dropped 2014 after the termination of EU co-funding. However, a stable core of 18 countries remained, which are still collecting and sharing IDB-data, despite lack of any EU-funding.

National IDB data administrators

For their participation in the IDB-network, countries have to designate a National IDB data administrator. This can be a competent national authority (governmental bodies) or a national expert agency. Most of them are national agencies, subsidiary to the Ministry of Health, e.g. national public health institutes or national agency for disease control (see Table 2). In the course of the past ten years 26 countries have delivered at least a one-year data file, 18 of them are expected to provide data for the year 2018. A green tick indicates that this partner

has continued with the IDB data collection and its participation in the EU injury data exchange after the end of EU co-financing.

Table 2: 26 IDB-data suppliers by type of organisation and status in the IDB-network (✓ indicates active network-member)

	Country	Type of organisation	Status (2018)
1	Austria	NGO, charity	✓
2	Cyprus	Ministry of Health	✓
3	Czech Republic	University hospital	Dropped out
4	Denmark	National public health institute	✓
5	Estonia	Ministry for Social Affairs	✓
6	Finland	National agency for health and welfare	✓
7	Germany	Regional Ministry of Health and welfare	✓
8	Greece	National school for public health	Dropped out
9	Hungary	National public health institute	Dropped out
10	Iceland	Ministry of Health	Dropped out
11	Ireland	NGO, charity	✓ but no recent data
12	Italy	National public health institute	✓
13	Latvia	National centre for disease prevention	✓
14	Lithuania	National Public Health institute	✓
15	Luxembourg	National Public Health Institute	✓
16	Malta	Ministry of Health	✓
17	Netherlands	NGO, charity	✓
18	Norway	University institute	✓
19	Poland	University hospital	Dropped out
20	Portugal	Ministry of Health	✓
21	Romania	University institute	✓ but no recent data
22	Slovenia	National Health agency	✓
23	Spain	University hospital	Dropped out
24	Sweden	National board for health and welfare	✓
25	Turkey	National Public Health agency	✓
26	United Kingdom	University institute	✓
Ministry		6	5
Subsidiary national agency		11	9
University unit		6	2
NGO, charity		3	2
No recent data		0	8
IDB data suppliers		26	18

In particular, academic institutes seem to have difficulties in finding sustainable funding for injury data collection, as they highly dependent on external (project) funding. Ministries, national (public health) agencies or charities seem to be more successful in allocating longer-term resources for data gathering and processing, and evidently have an immediate benefit by using the data for own policy purposes and prevention programming.

Data sources

The IDB-MDS data set has been developed with a view to maximise a flexible and easy implementation in busy emergency departments, and with due consideration of the great variation in existing patient registration practices in hospitals. The MDS data elements and codes are detailed in the MDS data dictionary [8]. MDS data can be extracted from FDS-data and from hospital records using other classification systems like WHO's ICD-10. Transcoding routines FDS>MDS and WHO's ICD>MDS can be downloaded from data toolbox at the EuroSafe web-gate [13].

Table 3: Format of shared IDB-data by country and year 2009-2018
FDS>MDS indicates MDS data extracted from FDS microdata, FDS+MDS indicates separate FDS and MDS microdata samples, MDS indicates just MDS microdata (no FDS), AGG indicates aggregated MDS data (no microdata).

	Country	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
1	Austria	FDS> MDS	FDS> MDS	FDS> MDS	FDS> MDS	FDS> MDS	FDS> MDS	FDS> MDS	FDS> MDS	FDS> MDS	FDS> MDS
2	Cyprus	FDS> MDS	FDS> MDS	FDS> MDS	FDS> MDS	FDS+ MDS	MDS	MDS	MDS	MDS	MDS
3	Czechia	FDS> MDS	FDS> MDS	FDS> MDS	FDS> MDS	FDS> MDS					
4	Denmark	FDS> MDS	FDS> MDS	FDS> MDS	FDS+ MDS	FDS+ MDS	FDS+ MDS	FDS+ MDS	FDS+ MDS	AGG	AGG
5	Estonia				MDS	MDS	MDS	MDS	MDS	MDS	MDS
6	Finland		MDS	MDS	MDS	MDS	MDS	MDS	MDS	MDS	MDS
7	Germany (Brandenbg.)	FDS> MDS	FDS> MDS	FDS> MDS	FDS> MDS	FDS> MDS	FDS> MDS	FDS> MDS	FDS> MDS	FDS> MDS	FDS> MDS
8	Greece				FDS> MDS						
9	Hungary					FDS+ MDS					
10	Iceland		MDS	MDS	MDS	MDS					
11	Ireland					MDS	MDS				
12	Italy	FDS> MDS	FDS> MDS	FDS+ MDS	FDS+ MDS	FDS+ MDS	FDS+ MDS	FDS+ MDS	FDS+ MDS	FDS+ MDS	FDS+ MDS
13	Latvia	FDS> MDS	FDS> MDS	FDS> MDS	FDS> MDS	FDS> MDS	FDS> MDS	FDS> MDS	FDS> MDS	FDS> MDS	FDS> MDS
14	Lithuania			MDS	MDS	MDS	MDS	MDS	MDS	MDS	MDS
15	Luxembourg				MDS	FDS+ MDS	FDS+ MDS	FDS+ MDS	FDS+ MDS	FDS+ MDS	FDS+ MDS
16	Malta	FDS> MDS	FDS> MDS	FDS> MDS	FDS> MDS	FDS> MDS	FDS> MDS	FDS> MDS	FDS> MDS	FDS> MDS	FDS> MDS
17	Netherlands	FDS> MDS	FDS+ MDS	FDS+ MDS	FDS+ MDS	FDS+ MDS	FDS+ MDS	FDS+ MDS	FDS+ MDS	FDS+ MDS	FDS+ MDS
18	Norway				MDS	MDS	MDS	MDS	MDS	MDS	AGG
19	Poland					FDS+ MDS					
20	Portugal	FDS> MDS	FDS> MDS	FDS> MDS	FDS> MDS	FDS> MDS	FDS> MDS	FDS> MDS	FDS> MDS	FDS> MDS	FDS> MDS
21	Romania					FDS+ MDS					
22	Slovenia	FDS> MDS	FDS> MDS	FDS+ MDS	FDS+ MDS	FDS+ MDS	FDS+ MDS	FDS+ MDS	FDS+ MDS	FDS+ MDS	FDS+ MDS
23	Spain (Navarra)					FDS> MDS					
24	Sweden	FDS> MDS	FDS> MDS	FDS> MDS	FDS> MDS	FDS> MDS	FDS> MDS	FDS> MDS	FDS> MDS	MDS	MDS
25	Turkey					FDS> MDS	FDS> MDS	FDS> MDS	FDS> MDS	FDS> MDS	FDS> MDS
26	UK (Wales)		AGG	AGG	AGG	AGG	AGG	AGG	AGG	AGG	AGG
Only MDS data		0	3	4	7	7	7	5	5	6	5
FDS and MDS		12	12	12	13	18	12	12	12	10	10
MDS aggregated		0	0	0	0	0	0	1	1	2	3
IDB data suppliers		12	15	16	20	25	19	18	18	18	18

The most frequent situation is, that only IDB-FDS data is collected in a sample of hospitals and MDS records are extracted from these data. In Table 3 this is indicated as "*FDS>MDS*". The advantage of this approach is that a relatively large number of FDS records is available; the disadvantage is that the sample is usually relatively small (or even biased) for estimating national rates.

Some countries collect FDS as well as MDS data in two different samples of hospitals. This is symbolized by "*FDS+MDS*" in Table 3. The advantage is that large and representative MDS-data sets can be collected at relatively low costs, while a smaller, perhaps less representative, set of FDS records is additionally made available.

A third group of countries collects and deliver only MDS data, indicated as "*MDS*" in Table 3. These countries were not able so far to win at least one reference hospital for the collection of IDB-FDS data.

A fourth group of countries decided not to share anonymized MDS microdata, but is able to provide aggregated data, i.e. a standard set of injury indicators (indicated as "*AGG*"). This results in IDB-rates for various population groups, locations, activities and type of injuries. The main reason for not sharing micro-data is increased data protection concerns, obviously a consequence of the (new) GDPR 2016.

Some countries produce FDS data from previously developed comprehensive injury patient registers, which use other compatible classification systems then IDB. These systems have a longer history that EU-IDB and its FDS-classification and actually contributed to the development of the EU-level injury classification. Their data can be easily transcoded into IDB-FDS, which is the case in Italy (Sistema Informativo Nazionale sugli Incidenti in Ambiente di Civile Abitazione SINIACA), Netherlands (Dutch injury Surveillance System DISS), and which was the case in Denmark and Sweden (NOMESCO Classification of external causes of injuries). Unfortunately, Denmark and Sweden have terminated the collection of IDB-FDS data due to data protection concerns, triggered by the new GDPR 2016.

As said, MDS records can be extracted from FDS records but also from a variety of national patient registries such as national health insurance data bases or national patient registers. The MDS core elements type of injury, injured part of body and mechanism of injury can be derived through transcoding routines from ICD-9 (Italy) and ICD-10 (Cyprus, Denmark, Estonia, Finland, Iceland, Ireland, Lithuania, Slovenia, UK).

Table 3 demonstrates that the introduction of IDB-MDS in 2010 obviously helped to bring new countries on board, which were not able to collect IDB-FDS data: Estonia, Finland, Iceland, Ireland, Lithuania, Norway, and the UK.

Every IDB-MDS dataset is accompanied by national metadata file, which provide further information as to the quality of the samples and the method used for the estimation of IDB-rates. These metadata are accessible through the IDB web-gate [5] and inform about various data quality aspects. A few aspects are explored in the following.

Sample quality

Table 4 shows that, with the increasing number of IDB data suppliers, also the number of reference hospitals increased substantially and in 2018 their number is four times higher than in 2009, while the number of data delivering countries raised just from 12 to 18 over the same period. As mentioned above, the reason for this is the introduction of IDB-MDS, which can be collected in large numbers, and consequently most new IDB-countries collect just

IDB-MDS. A few countries (Cyprus, Denmark, Sweden) stopped the FDS data collection and switched to MDS data.

The size and quality of national IDB samples vary considerably (see Table 4). While e.g. the Latvian sample covers almost all existing hospitals, or Denmark about 50%, the proportion of reference hospitals in all hospitals is less than 1%. However, more important for the accuracy of national estimates is the representativity of the sample of reference hospitals and resulting cases.

A rough indicator is the number of hospitals, which produce the IDB-MDS data. The IDB Manual recommends a minimum of 9 hospitals for countries with a population of over 40 million inhabitants, 7 hospitals for populations between 12-49 million, 5 hospitals for 3-12 million, 3 hospitals for 1-3 million. The different sample size should take account of the greater geographic, sociological and cultural diversity of bigger countries. Only Ireland (4,6 million inhabitants) and Germany (i.e. the state of Brandenburg with about 2,7 million inhabitants) do not meet this minimum requirement.

Table 4: No. of IDB MDS-reference hospitals by country and year 2009-2018

	Country	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
1	Austria	9	10	11	9	5	5	5	11	12	12
2	Cyprus	2	2	2	1	4	5	5	5	5	5
3	Czechia	8	8	8	31	31	No data				
4	Denmark	4	4	40	34	31	25	30	30	30	30
5	Estonia	No data			27	32	22	19	19	19	18
6	Finland	n.d.	22	21	20	19	19	19	19	17	17
7	Germany	1	1	1	1	1	1	1	1	1	1
8	Greece	No data			1	No data					
9	Hungary	No data				1	No data				
10	Iceland	n.d.	1	1	1	1	No data				
11	Ireland	No data				1	1	No data			
12	Italy	12	4	91	95	124	124	11	124	124	124
13	Latvia	25	21	21	21	20	22	23	23	24	24
14	Lithuania		n.d.	71	69	103	91	87	89	79	79
15	Luxembourg	No data			5	5	3	3	3	3	4
16	Malta	1	1	1	1	2	2	2	2	2	2
17	Netherlands	12	13	14	14	13	14	14	14	14	14
18	Norway	No data			15	16	17	17	17	20	18
19	Poland	No data				1	No data				
20	Portugal	5	4	4	4	4	4	4	4	8	19
21	Romania	No data				3	No data				
22	Slovenia	15	15	4	4	4	4	4	4	4	4
23	Spain (Navarra)	No data				1	No data				
24	Sweden	8	8	6	6	6	5	5	5	4	70
25	Turkey	No data				15	15	15	16	16	16
26	UK (Wales)	n.d.	4	5	5	5	5	5	5	4	4
MDS hospitals		102	118	301	364	333	384	269	349	391	461
IDB data suppliers		12	15	16	20	25	19	18	18	18	18

The IDB Manual requests that the sample of hospitals is balanced with respect to size (small, middle, large), type of hospitals (general hospital, child hospital, trauma centre, university hospital) and sociological characteristics of their catchment areas (urban and rural area), which seems to be the case for most IDB countries. In small countries, even very few hospitals can cover the majority if not all of ED attendances as in Cyprus, Iceland, Luxembourg, or Malta. Other countries cover very large proportions of their hospitals as the Czech Republic, Denmark, Estonia, Finland, Italy, Latvia or Lithuania. Finland delivers a

random sample of 10% of all its recorded ED attendances; the actual number of involved Finish hospitals is ten times higher (about 170) than shown in Table 4.

If all ED attendances in reference hospitals or covered (or if sampling of cases within hospitals is unbiased), the composition of the sample of reference hospitals is decisive. Usually, the number of cases treated in just one single emergency department of an usual public hospital would be large enough for a statistically sufficiently accurate estimate, but only under the condition, that this hospital is representative for the entire country. The validity of national estimates depends on a balanced and representative sample of reference hospitals. If this sample is skewed (e.g. toward certain types of injuries or admissions), even a huge number of records cannot iron out such a bias [3].

Therefore, the guidelines for the operation of an IDB-data collection system requires a carefully balanced sample of hospitals and strongly recommends the additional validation of the sample. The distributions of the age of the patients, of type of injury and the proportion of admissions in the data sample shall be compared to that in all national injury cases (or at least all admitted injury cases) and shall not significantly deviate. According to the metadata of the national IDB samples, many countries does not yet validate their samples of hospitals in this demanding way, but most have balanced samples with respect to size, type and location of reference hospitals.

For most countries and years, the samples can be considered as representative, however it is less clear how far the sample is representative for the European IDB region or the EU-27 specifically. The total number of reference hospital (461 in 2018) looks impressive, but the sample is not validated at European level. Some big countries are represented by only one hospital (Germany, Spain) and France is missing entirely. However, national estimates for 26 countries (thereof 23 EU member states) are available. The average of these national estimates can be taken at least as a rough European estimate (for the EU-27 or the IDB region, depending on the selected countries).

Usually, reference hospitals record all their injury patients, on a basis of 24 hours per day, 7 days per week, all year round. Sampling within hospitals take place only in few countries, i.e. Austria and Germany, but both countries have taken measures to correct resulting biases before calculating national estimates.

Scope

The IDB standards demand, that the IDB data collection covers all types of injuries, all age-groups, and admissions as well as ambulatory treatments. Not all countries meet these requirements: in some countries data collection covers only certain “domains of prevention” or certain age-groups, or only admissions or take place just in one smaller part of the country (see Table 5).

Table 5 shows, that most countries, which started a pilot IDB data collection with a restricted scope, were not able to convert this project into a sustainable injury surveillance system. The Czech Republic registered exclusively child injuries, and only when cases are admitted to hospital care for at least one day. Ireland does not include children younger than 15 years. The data from Iceland include road traffic injuries, but do not specifically code “road traffic injuries”. The temporary pilot implementations in Greece, Hungary, Poland collected rather small samples and did not produce national IDB-rates.

Table 5: Restrictions of the scope of shared IDB-data and status in the IDB-network by country in 2018

	Country	Type of restriction (✓ indicates no restriction)	Status (✓ indicates active data supplier)
1	Austria	✓	✓
2	Cyprus	✓	✓
3	Czechia	Only children 0-18, bias toward admissions, no rates	Dropped out
4	Denmark	✓	✓
5	Estonia	✓	✓
6	Finland	✓	✓
7	Germany	Data only from state of Brandenburg, raw data biased toward admissions – aggregated data reports to be used	✓
8	Greece	No restrictions, but biased and small sample, no rates	Dropped out
9	Hungary	No restrictions, but biased and small sample, no rates	Dropped out
10	Iceland	Road injuries not specifically coded – extrapolation needed regarding road transport accidents	Dropped out
11	Ireland	No data on children 0-15 – extrapolation needed regarding children	Observer
12	Italy	✓	✓
13	Latvia	Raw data biased toward admissions	✓
14	Lithuania	✓	✓
15	Luxembourg	✓	✓
16	Malta	✓	✓
17	Netherlands	✓	✓
18	Norway	✓	✓
19	Poland	Only children 0-18, small sample, no rates	Dropped out
20	Portugal	Only home and leisure accidents – extrapolation needed regarding road transport, workplace and violence	✓
21	Romania	✓	Observer
22	Slovenia	✓	✓
23	Spain	Data from Navarra region only	Dropped out
24	Sweden	✓	✓
25	Turkey	✓	✓
26	United Kingdom	Data from Wales only	✓

Over the years 2010-2018, the number of countries with a full scope has increased mainly through newcomers, who collect only IDB-MDS data. Among the countries with a sustainable data collection, Italy implemented in 2011 a separate MDS data collection in several provinces and overcame the previously given restriction to home and leisure accidents, road traffic injuries and violence, which is inherent in Italy's FDS data collection (system SINIACA). Lithuania has been able to expand its data collection in 2013 from admissions to all injury cases, i.e. also ambulatory treatments.

Most countries with a sustainable injury monitoring system cover all injuries. Portugal is restricted by law to home and leisure accidents (neither road traffic and work-place accidents nor injuries due to violence). Three larger countries are represented only by one of their regions: Germany by State of Brandenburg, Spain by Region of Navarra, the United Kingdom by Wales. The restriction to provinces in some countries is due to the fact, that the competence for processing health data is a provincial and not a federal competence.

Data used for this report

Basis is the stock of IDB-MDS data [4] of the databank of the Italian National Institute of Health in Rome (Istituto Superiore di Sanità) [5] as available by 31 May 2021. This data stock covers the years 2009 – 2019, but the upload of 2019 data is not yet completed partly due to the Covid-crisis. Therefor the current analyses have been restricted to the rather complete ten years 2009-2018.

From this data stock, the standard set of 28x9 IDB-rates (Annex b) has been calculated for many countries and years as possible. In most cases, delivered data sets consist of microdata plus reference population data (see the Manual [3]) in order to allow a maximum flexibility of analyses. Some countries are not able to share microdata, due to national data protection regulations (United Kingdom, Denmark, Norway), but deliver directly the standard set of 28x9 rates. These aggregated data reports have been incorporated into the repository of IDB-rates for as many countries and years as possible.
Additionally, incomplete tables of rates for Germany 2013 and 2015 have been used for the analyses for this report. For some data sets additional calculations have been carried out:

IDB-rates in this data stock are displayed as per 1000 persons. A few datasets (one country/one year) have been found erroneous in the sense, that rates are presented per 100 (e.g. Netherlands 2017) or per 10000 (e.g. Cyprus 2015); these datasets have been corrected before analyses.

For countries that do not cover all types of injuries or all age groups (incomplete scope of data collection, see table 5), additional extrapolations have been carried out in order to estimate the rates for all injuries and all age-groups:

- Portugal: Only home and leisure accidents
- Ireland: No children
- Iceland: Road transport injuries not explicitly displayed

These extrapolations have been carried out by using the average shares of the other countries, i.e. shares of “domains” of other countries except Portugal and Iceland, shares of age-groups of other countries except Ireland.

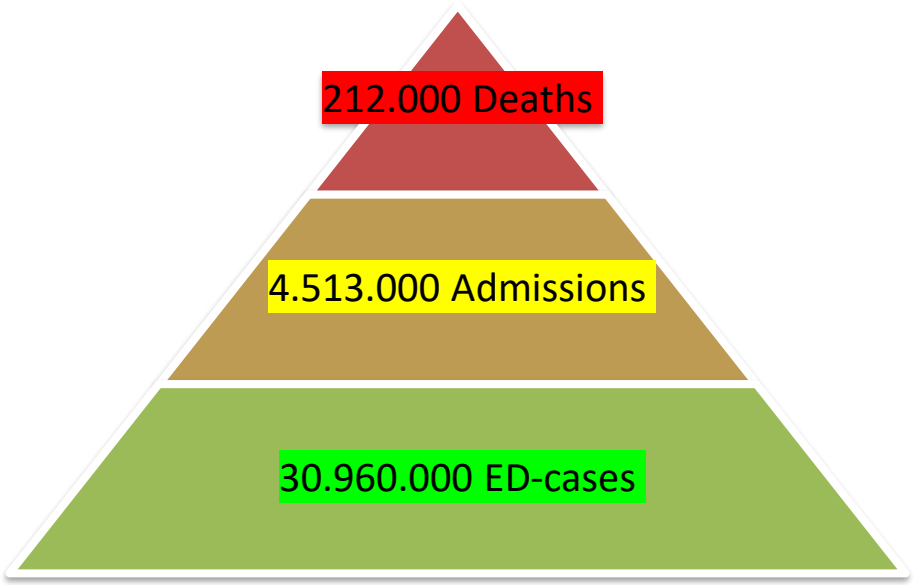
3. IDB injury rates in the European IDB-region

The injury pyramid of the EU

The estimated yearly injury rate is 80.10 (per 1000, average 2009-2018) for all IDB countries (the entire "European IDB region") and 78.27 for the EU-27, when Iceland, Norway, Turkey and UK are excluded from the calculation. In other words, every year about 7.8% of the European population suffers an injury which needs to be treated in an emergency department. In the middle of the period 2009-2018, the population of the 27 member states was 442.883.888 (Eurostat, Population on 1 January 2014), which leads to estimated 35.472.780 injury patients, who are treated in emergency departments of EU hospitals.

Eurostat reports for the EU-27 in the period of 2009-2018 an average of 212.052 fatalities due to injuries (external causes of death). 12,72% of the IDB-cases got admitted and 87,28% ambulatory treated (see also page 15), which leads to estimated 4.512.535 inpatients and 30.960.245 pure ED-cases in the EU-27. This leads to the usual "injury pyramid" (Figure 1).

Figure 2: The injury pyramid for the EU-27: Estimated number of injuries per year (rounded to 1000), based on the averages for 2009-2018.



Sources: Eurostat: Cause of deaths statistics, deaths due to external causes, EuroSafe: IDB-MDS

It should be noted that this pyramid is not complete, as there are many more (probably mainly minor) injuries, which are treated in primary health care facilities or do not get medicall treatement at all. The number of these injuries is unknown at EU-level. Attempts have been made to estimate the figure through household surveys, however it turned out that recall biases lead to a strong underestimation of minor injuries in particular.

EU-IDB rates

Table 6 shows national IDB-rates (crude rate of injuries treated in hospital-based emergency departments), which could be used for this report. Generally, IDB-rates were calculated by the combination of raw-data (micro-data) with the corresponding reference population data. For details see the IDB Operating Manual [3]. For some years and countries, the national IDB-data administrators have provided the rates directly through aggregated data reports (In Table 6 these rates are marked with *).

Due to various challenges, estimates could not be calculated for all IDB-countries and not for all years. For some countries and/or years, the MDS-data file is simply missing. Changes in the hospital sample, changes in the administrative framework for the data flow, changes in the IT-environment could be reasons for such gaps. Some data files could not be used, because the samples were too small and/or strongly biased. Sometimes rates could not be calculated due to missing or erroneous reference population data.

Table 6: IDB-rates for all ED-treated injuries by country and year 2009-2018.
* Estimates are reported separately by countries (not in the IDB-databank); ** Estimates are the results of additional projections using EU-averages (for countries with an incomplete scope of survey).

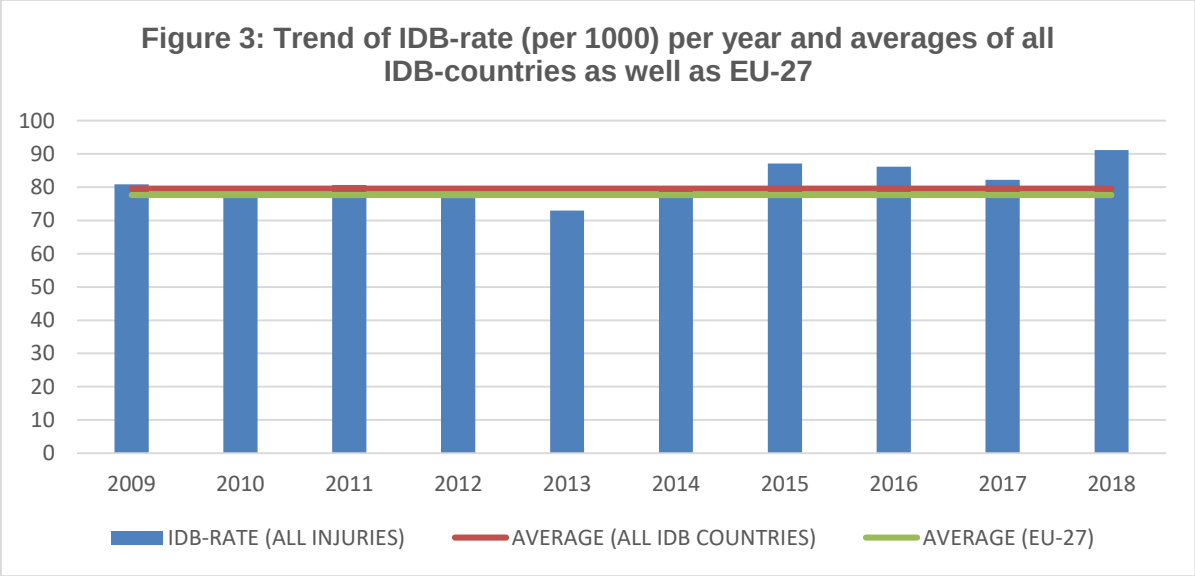
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Average
AT	103,18	95,31	92,06	100,50	97,59	97,02	87,08	84,35	83,12	85,52	92,57
CY	93,12	89,15					47,79	30,71	20,05	91,00	61,97
DK	110,24	107,54	107,98	100,83	96,77	82,89	96,91	93,83	82,02	80,44	95,94
EE				45,58	62,65	67,38	76,92	115,17	113,27	113,48	84,92
FI		31,32	35,69	38,13	39,78	37,88		44,69	44,85	46,31	39,83
GE	46,23	49,93	46,89	52,60	55,05*	58,89*					51,60
IC		93,22	92,97	93,74	88,29						92,05
IE					77,69**						77,69
IT			113,38	109,97	119,90	120,92	124,70	143,09	142,70	141,02	126,96
LV	75,46	73,34	76,89	80,10	84,07	83,25	84,29	87,83	93,60		82,09
LT					82,97	106,95	110,72	112,73	111,22	113,24	106,31
LU					114,33	119,53	121,27	112,83	112,30	119,54	116,63
MT	95,37	103,37	96,44	121,26	66,43	29,02	33,50	59,96	61,82		74,13
NL	51,19	48,41	49,71	41,31	43,85	45,68	59,67	58,41	47,56		49,53
NO				60,11	59,47	58,74	58,86	58,31	57,90	57,82	58,75
PT			115,76**	94,94**	65,18**	138,76**	124,76**	101,55**	125,76**	131,02**	112,21
RO					63,97						63,97
SI			52,18	50,99	49,89	48,95	50,95	50,15	54,61	53,52	51,40
SP					61,27						61,27
SE	71,90	68,32	63,53	54,70	55,15	55,88	56,32			52,39	59,77
TR					51,97	74,12	146,43	113,65			96,54
UK		85,90	105,90	106,26	110,24	112,79	113,89	111,77		100,68	105,93
AV. All IDB	80,83	76,89	80,72	76,73	73,64	78,74	87,13	86,19	82,20	91,23	80,10
AV EU-27	80,83	74,08	77,32	74,24	72,74	78,07	82,68	84,25	84,07	93,41	78,27

For countries with a restricted scope, the rates for all injuries had to be extrapolated. As Portugal reported only home and leisure accidents, the rate for Portugal was expanded by the average percentage of other injuries (road traffic and workplace accidents and injuries due to violence; all other countries, all years). As Ireland reported only injuries of patients 15 years and older, the rate for Ireland had been expanded by the average percentage of childhood injuries (all other countries, all years). Table 6 shows the "corrected" rates with **.

For this report all data have been used, which were available by end of May 2021. Due to the Covid-crisis, some countries could not submit IDB-data in time. Datasets which are expected to be delivered at later stage, are marked with a star.

Trend

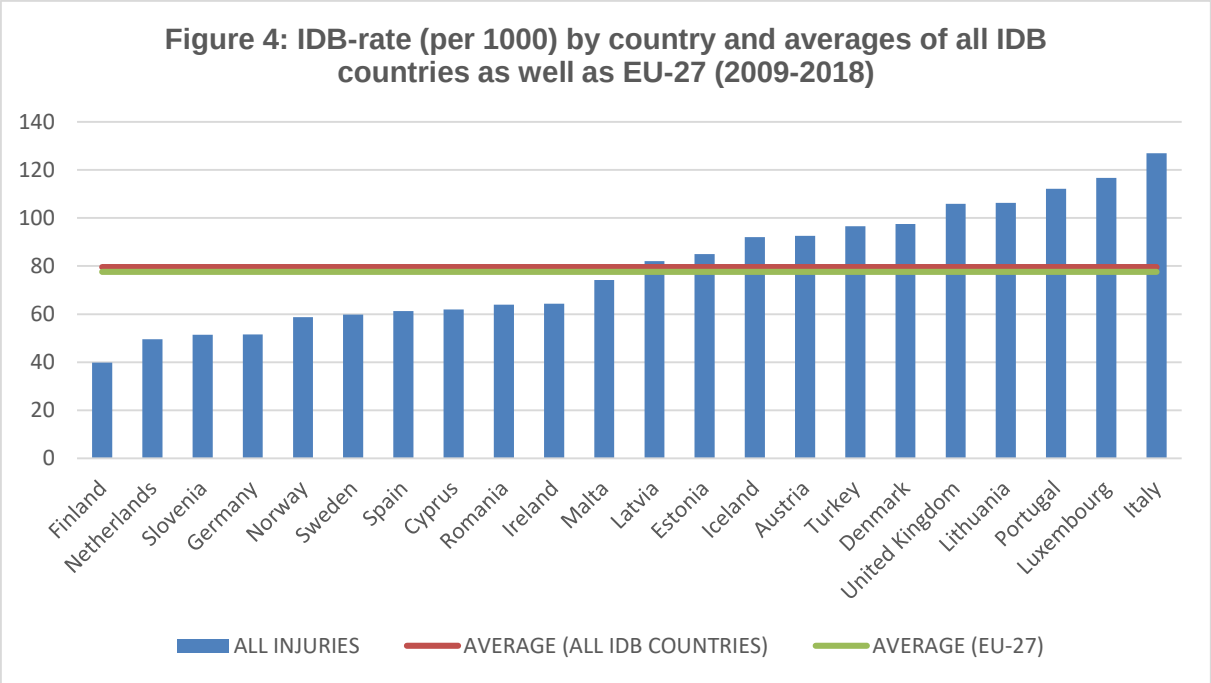
Figure 3 shows the IDB-rates of all injuries and all IDB countries for the years 2009-2018.



There seems to be a slight upward-trend over the period of 10 years, however differences between years are more likely due the varying composition of the sample of reporting countries.

Countries

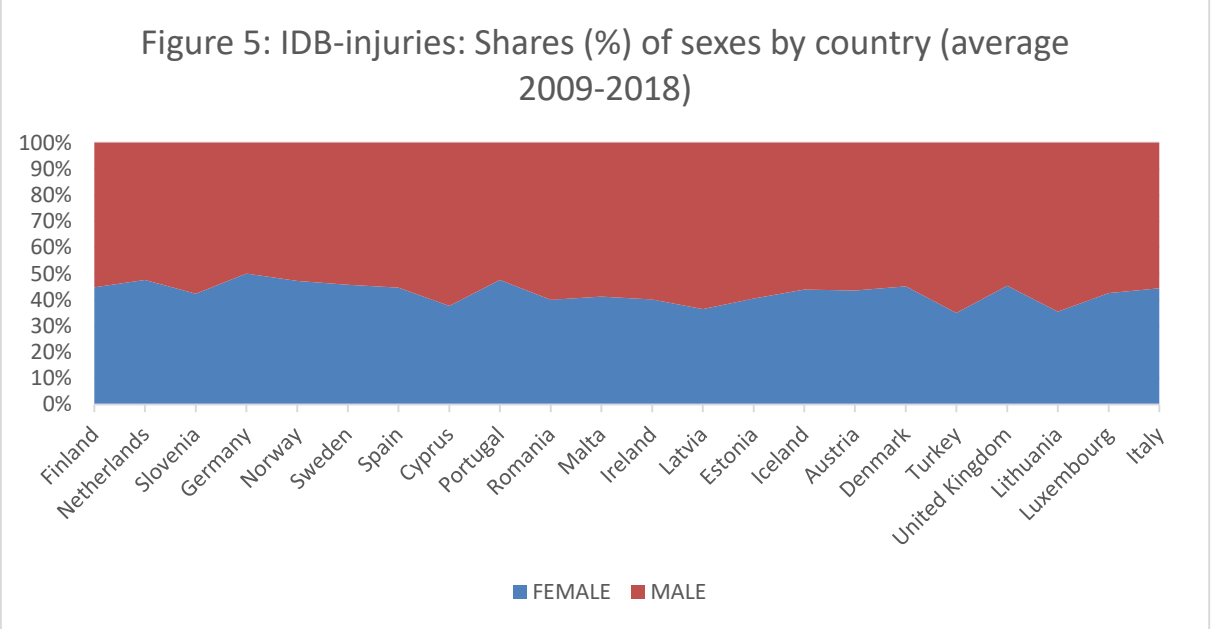
Figure 4 shows considerable differences between reporting countries; the rates range from 38.91 in Finland (lowest) to 126.96 in Italy (highest), which results in a range factor of 3.19. There are various reasons for these rather big differences, which are certainly not only due to different injury morbidity. An important factor is the organisation of the national health care system, which results in different accessibility of secondary health care facilities. The hospital ED based IDB-rate will be lower, if more injury patients are treated in primary health care facilities (e.g. in Finland and the Netherland). Other influential factors are biased national hospital samples, varying percentages of injuries from foreign residents (workers and tourists), while the denominator for IDB-rates is always the resident population.



Nevertheless, at present, the average over all countries provides a sufficiently valid or at least the best available estimate for the magnitude of (non-fatal) injuries in Europe. The number of hospital-treated injuries (admissions and ED-cases) is complementary to mortality data, the best actually available information source for injury morbidity and an essential basis for assessing the health and economic burden of injuries.

Gender

Figure 5 shows the relation between sexes by country (all injuries, 2009-2018).



In the average, 57% of injuries affect males. but this proportion can vary between countries. Turkey has the biggest difference between the sexes with 65% of all registered injuries affecting males, and 35% females. In Germany(Brandenbourg) the report is almost 50:50.

Age group

Figure 6 affirmed an already well-known fact, that children, adolescents and young adults bear the highest injury risk, and middle-aged adults the lowest.

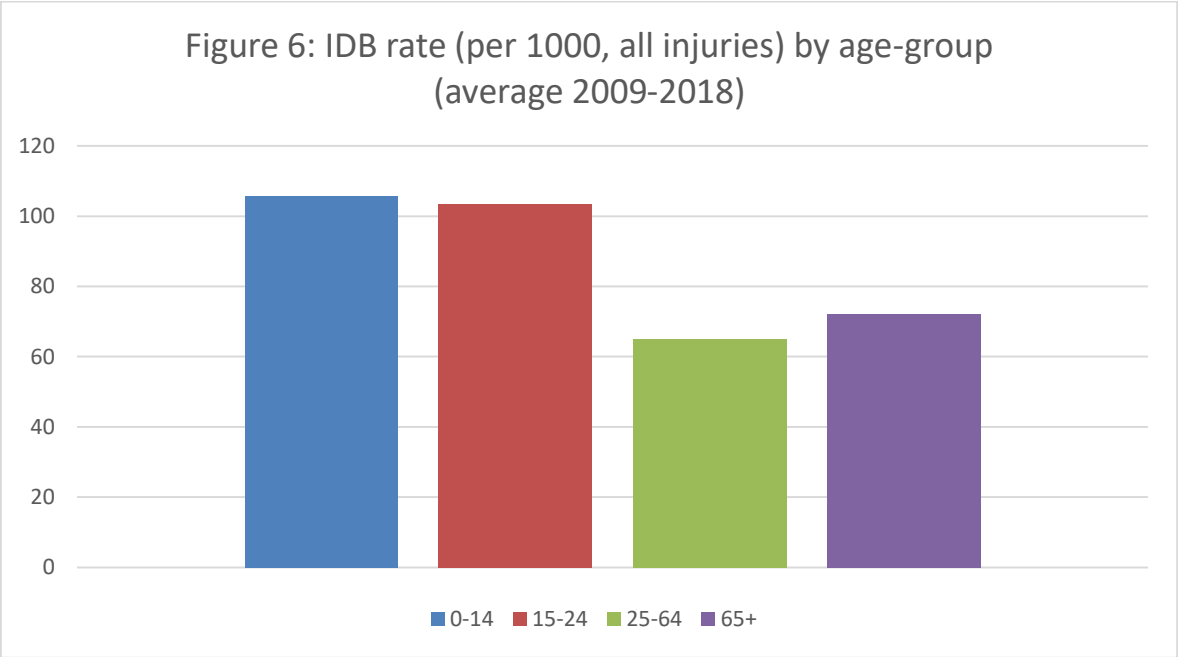
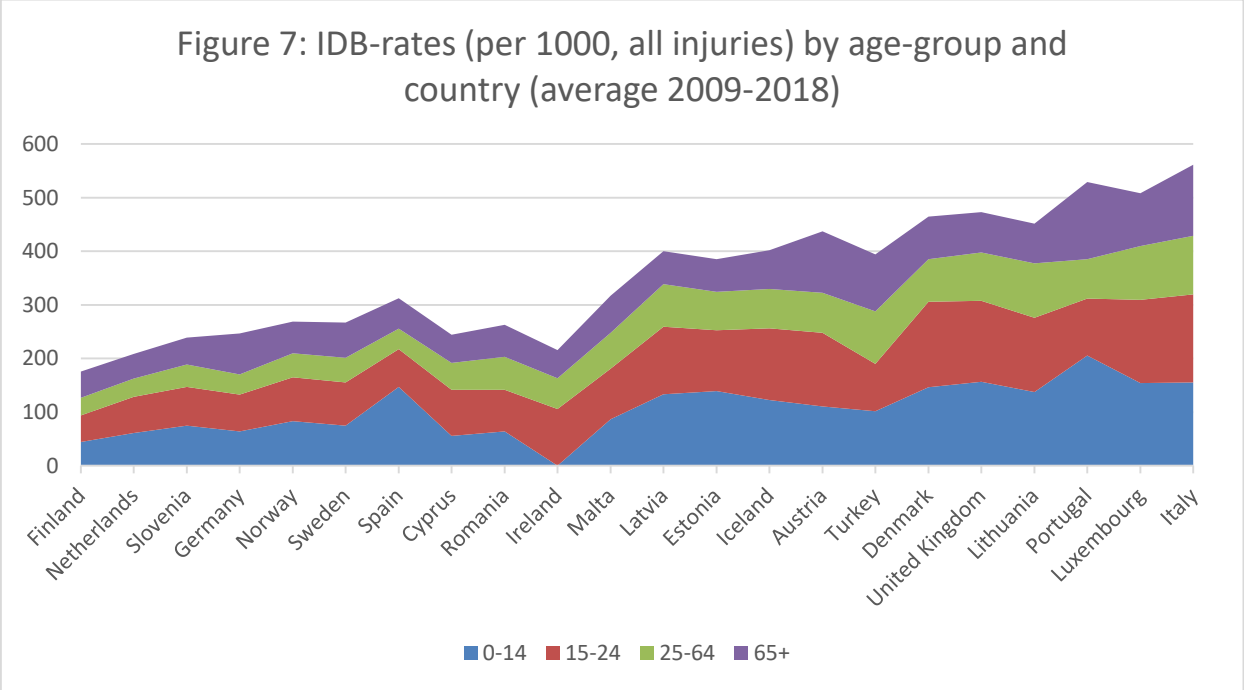
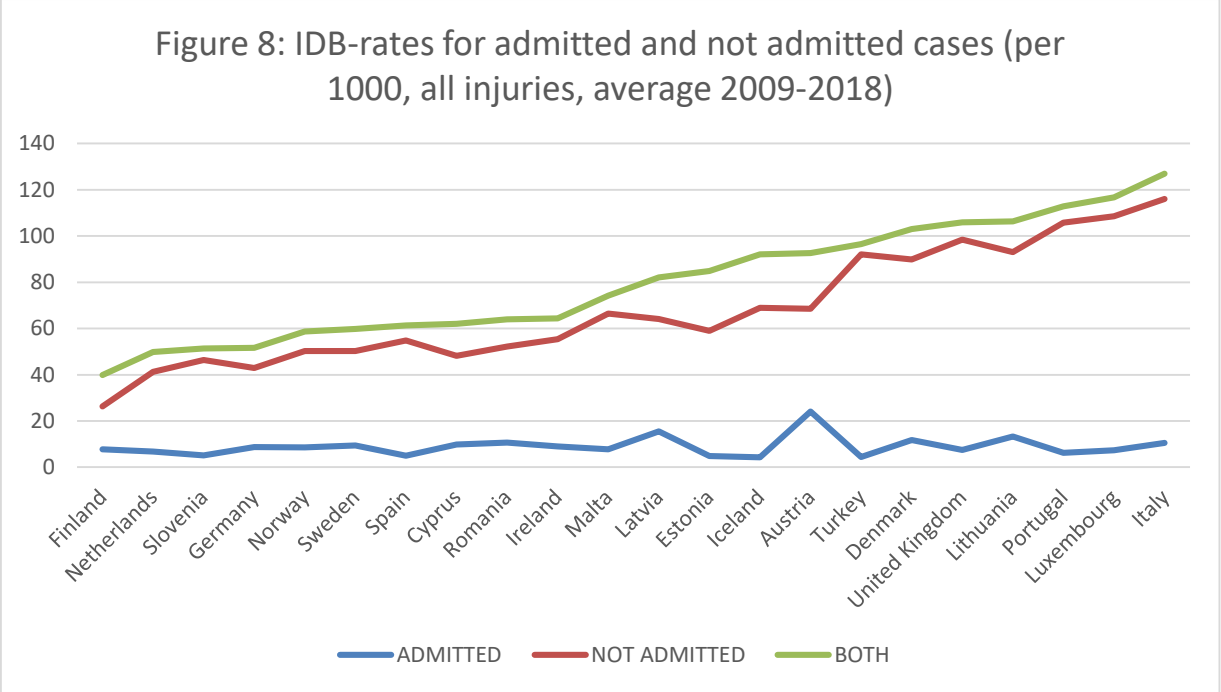


Figure 7 shows the age-specific IDB-rates by country. For most countries, the rates for children, adolescents and young adults are above the general rate, and for adults and seniors below, however there are some country-specific deviations, which eventually could be partly caused by over- or underreporting of certain age-groups. In particular, Ireland does not record child injuries, and Table 7 does not show an extrapolated figure for child injuries in Ireland, while the general rate for Ireland in Table 6 and Figure 4 has been extrapolated, based on the average shares of child injuries in other countries.



Severity

In the given context, only the hospital admission rate and the share of admissions in all cases get discussed. The IDB-rates by country are presented in Figure 8. The average hospital admission rate for all injuries is 9.00 (per 1000). The average ambulatory treated injuries rate is 68.11 (per 1000).

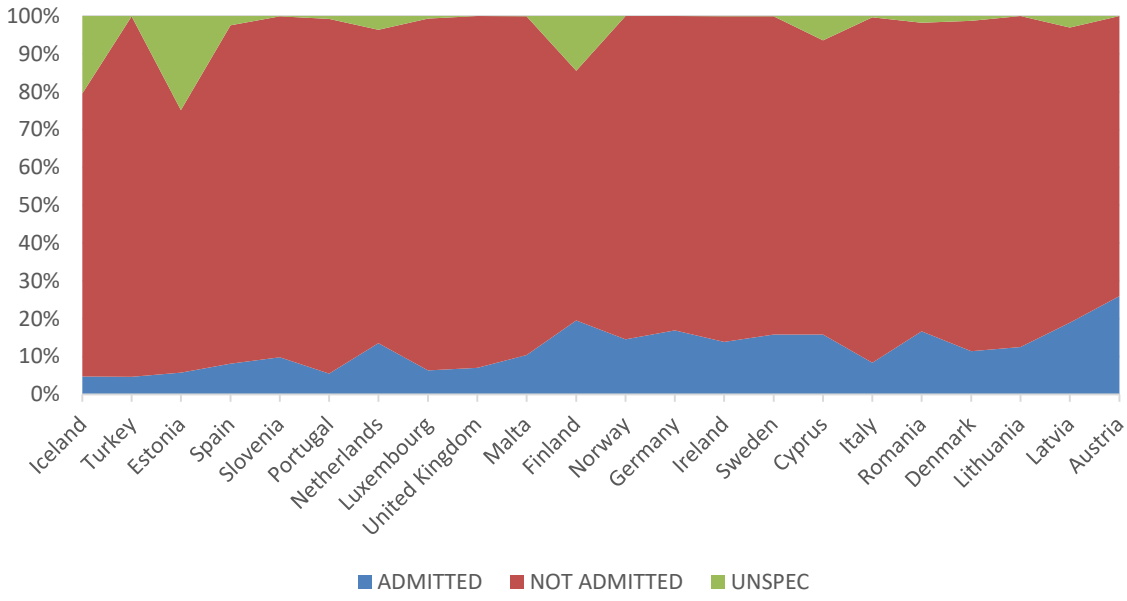


The admission rate ranges from 4.33 in Iceland to 24.01 in Austria. The rather big differences are obviously not only the result of national differences of the severity of injuries. The accessibility of hospitals can play an important role, but also the applied criteria for being admitted may vary between countries. It is well known that some countries (e.g. Austria) have generally higher rates of inpatients, for all diagnoses including injuries. Systematic over-reporting of inpatients in some countries could also explain part of the differences.

The rates shown for Germany are an approximation, based on estimates for the federal state of Brandenburg for 2009-2014; there are no estimates for more recent years yet available. All data samples from Brandenburg are strongly biased toward admission due to a systematic under-reporting of just ambulatory treated patients. While all admitted cases were covered, interviews with ambulatory treated patients were carried out only on one day of the week, so that only one seventh of not admitted cases are reported. The rates for Germany in table 8 have been extrapolated accordingly.

Another indicator for the severity is the share of admissions in all registered cases (Figure 9). In the average, 11.28% of all cases get admitted, 85.30% need only ambulatory treatment and 3.42% are unspecified in this respect (average of all IDB countries). The same figures for the EU are: 12.35% admitted, 84.72% not admitted, 2.93% unspecified. Assuming, that unspecified cases are distributed to “admitted” and “not admitted” in the same ratio as the specified cases, we can estimate 11.68% admitted, 88.32% not admitted for all IDB countries, and 12.72% to 87.28% for the EU-27. This estimate has been used for the EU-injury pyramid (page 15).

Figure 9: Percentages of admitted, ambulatory treated and unspecified IDB cases by country (all injuries, average 2009-2018)



This indicator shows also a remarkable high value for Austria, which may be a result of the particular recording method in this country: data get captured in hospitals by external interviewers, who do not operate at night and during weekends, which probably leads to a systematic over-reporting of inpatients. However, it remains difficult to interpret most of the national differences of this measurement. Comparisons with other big groups of diseases would be interesting.

European Core Health Indicators

The European Commission together with the EU member states has identified 88 European Core Health Indicators (ECHIs) [14]. Among these ECHIs, four are related to injuries:

- Home, leisure and school accidents (HLA or ECHI-29b),
- Road traffic accidents (RTA or ECHI-30b),
- Work-place accidents (WPA or ECHI-31).

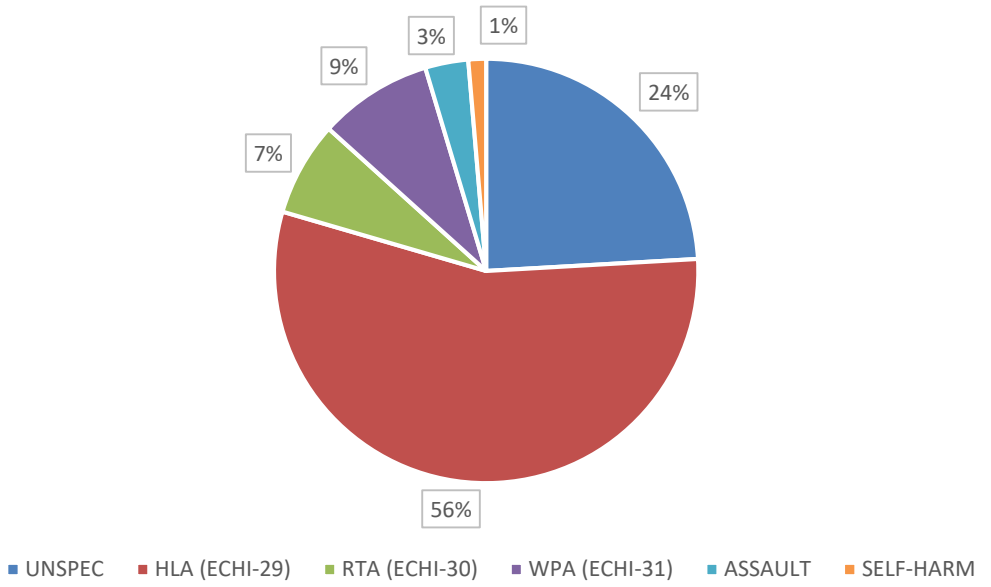
Beside accidents (i.e. unintentional injuries), also injuries due to violence are extremely interesting:

- Injuries due to assaults (interpersonal violence),
- Injuries due to intentional self-harm.

For all these groups of injuries – or more precisely for the control of respective risks – different policy sectors are responsible. Such “domains of prevention” are e.g. the policy sectors for health, transport, labour and inner security. HLA could be further split into subgroups of accidents, for which further policy sectors bear responsibility, e.g. accidents related to consumer products , sports, educational institutions or nursing homes. In this summary report we refrained from such detailed analysis but relevant subgroups of injuries can be further analysed using IDB-data(references).

For the time being, only ECHI-29b (home, leisure and school accidents) is formally defined as indicator based on IDB-data [15] and regularly upload to the DG SANTE’s ECHI web-gate [14]. Figure 10 shows the percentages of main groups of injuries (ECHIs) related to main domains of prevention.

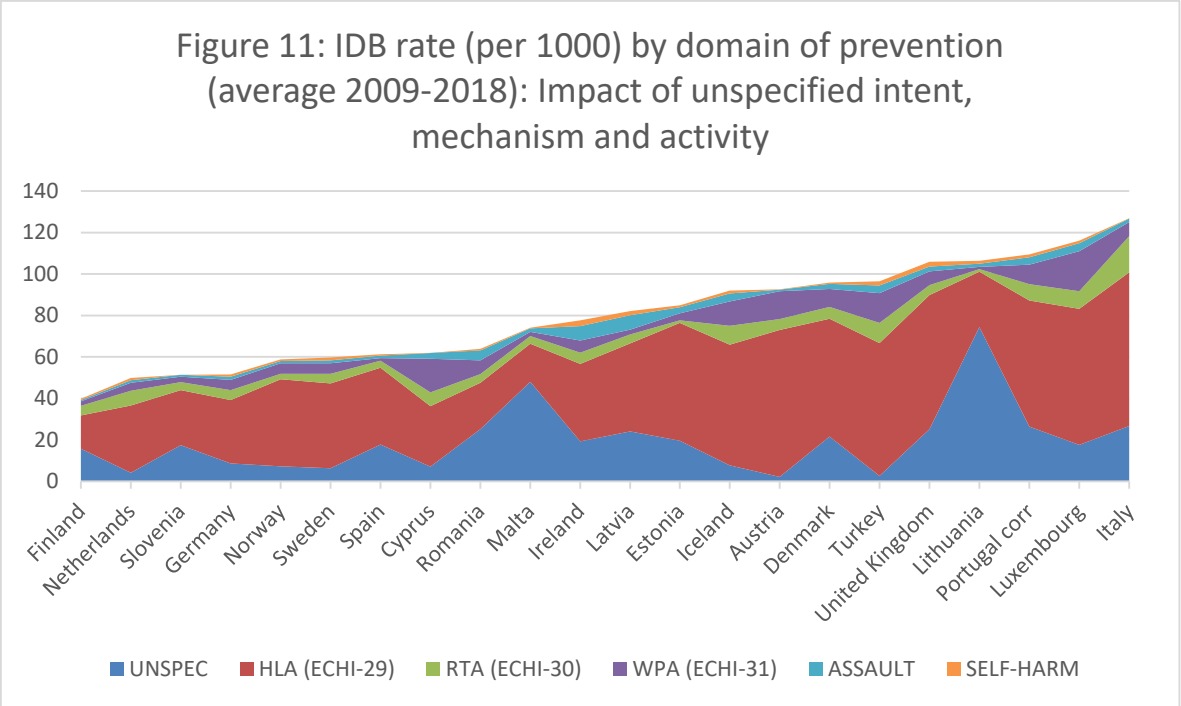
Figure 10: Percentage of main groups of injuries (all countries, average 2009-2018)



Home, leisure, and school accidents, hold by far the biggest share of injuries(56%), followed by workplace (9%), road transport (7%), assault (3%) and intentional self-harm (1%). Figure 8 shows also, that about 24% of all injuries could not be allocated to one of these groups. This is important as the definition of domains depends on specified data elements Intent, Activity, and Mechanism of injury, and with missing specifications the allocation of an injury case to a “domain” is not possible.

Unspecified cases lower the rates of domains. This is less a problem for assaults and acts of self-harm, which are defined by only one MDS data element (Intent), and also for road transport accidents (RTA = ECHI-30) and workplace accidents (WPA = ECHI-31), which are defined by two data elements (Intent & Mechanism or Intent & Activity respectively). Particularly sensitive are home and leisure accidents (HLA = ECHI-29), which are defined by three data elements: Intent, Activity and Mechanism of injury, whereof Activity is rather frequently unspecified. As a consequence, in particular ECHI-29 tends to be underestimated.

Figure 11 shows big differences between countries, particularly for the rate of unspecified domain.



Extremely high shares of unspecified “domain” show Lithuania (74%) and Malta (50%), the lowest shares the Netherlands (4%) and Austria (2%). It seems, that complete coding of cases is more difficult, when data get extracted from existing databases (e.g. from health insurances) or when coding is done by hospital administration staff, who have other priorities than the accurate coding of external circumstances, which are less important for treatment and accounting services. On the other hand, the quality of coding tends to be better, when recording is done in dedicated reference hospitals and/or by dedicated staff.

4. Country comparison by ECHI-indicators

IDB-rates – what they mean

Basically, in health statistics it is common to speak of incidence rates, i.e. the frequency of diseases and injuries in a certain population, e.g. the resident population of a country, to denote the occurrence of disease, illness or accident. However, in reality this suffers a number of limitations: Many (minor) diseases, including injuries, do not get medically treated and many others get treated in primary health care facilities, e.g. by family doctors, whose interventions do not get documented in detail in most countries.

In fact, widely available are statistics on the causes of deaths, based on deaths certificates, and statistics on health disorders treated in hospitals, based on the documentation of health services provided in these facilities, e.g. hospital admissions or discharges and presentations at emergency departments. Such figures serve as indicators for injury induced mortality and morbidity but shall not be understood as the underlying and not directly observable injury incidence itself.

Nevertheless, *at national level*, within a given national health care system these indicators are extremely meaningful to compare various health diseases and injuries, population groups and periods of time. or the development over time and serve as reliable indicators for the underlying and not directly observable incidence.

Obviously, hospital statistics depend not only on morbidity but also on accessibility and affordability of these services, which restricts the interpretation of hospital-based rates at international level. Also, IDB-rates are rates of certain medical services, in particular of treatments in hospital-based emergency departments and admissions to inpatient treatment. The national health care system and its financing have a substantial impact: In some countries, EDs are open to everyone in need, in others the access to hospitals requires the assignment of a primary health care unit. In densely populated countries the average distance to hospitals is much lower than in others. Also, the share of non-residents (foreign workers, tourists) plays a role, as the resident population is defined as denominator for IDB-rates. In consequence, *at international level*, service-based rates shall not be interpreted as a measure of morbidity, although this is legitimate for intra-country analysis of morbidity based on the same health system. This needs to be considered also for IDB injury data.

Nevertheless, sharing of hospital data at European level is extremely valuable. IDB-estimates are comparable cost indicators and – most notably - allow to produce estimates for the entire European Union, under the condition that these figures are understood as only referring to presentations at Emergency Departments in the respective countries. The existence of a comparable injury surveillance system is indispensable, even when the comparability of national IDB-rates is limited. IDB-standards, which has been developed over many years with the help of various European projects, provide the basis for a common methodology and solid national injury surveillance systems.

And not the least, reliable national injury figures are essential to guide and evaluate national as well as Community public health and consumer policies and related prevention programmes. Without national injury measures, Community programmes in the area of public health or product safety can hardly be evaluated. It must be seen as a significant shortcoming of any national health information system, if it does not cover injuries, and if a government has no reliable information on e.g. child accidents, home and leisure accidents, injuries due to violence or self-harm or injuries related to the use of consumer products

European Core Health Indicators on injuries

The concept of European Core Health Indicators (ECHI) presupposes that these indicators should be comparable within the EU in order to make country differences visible. It is important to remind that Commission and member states acknowledge that international comparability is the main purpose of producing national injury statistics as ECHIs, and to provide data to support the evaluation of national level health actions [16], while taking into account divergences between health service systems in countries and resulting limitations in comparability of data reported.

Table 7 contains IDB rates by country for the ECHI injury indicators 29-31 (HLA, RTA, WPA) and for assault (interpersonal violence), intentional self-harm and cases, which could not be allocated to one of these domains (unspecified cases).

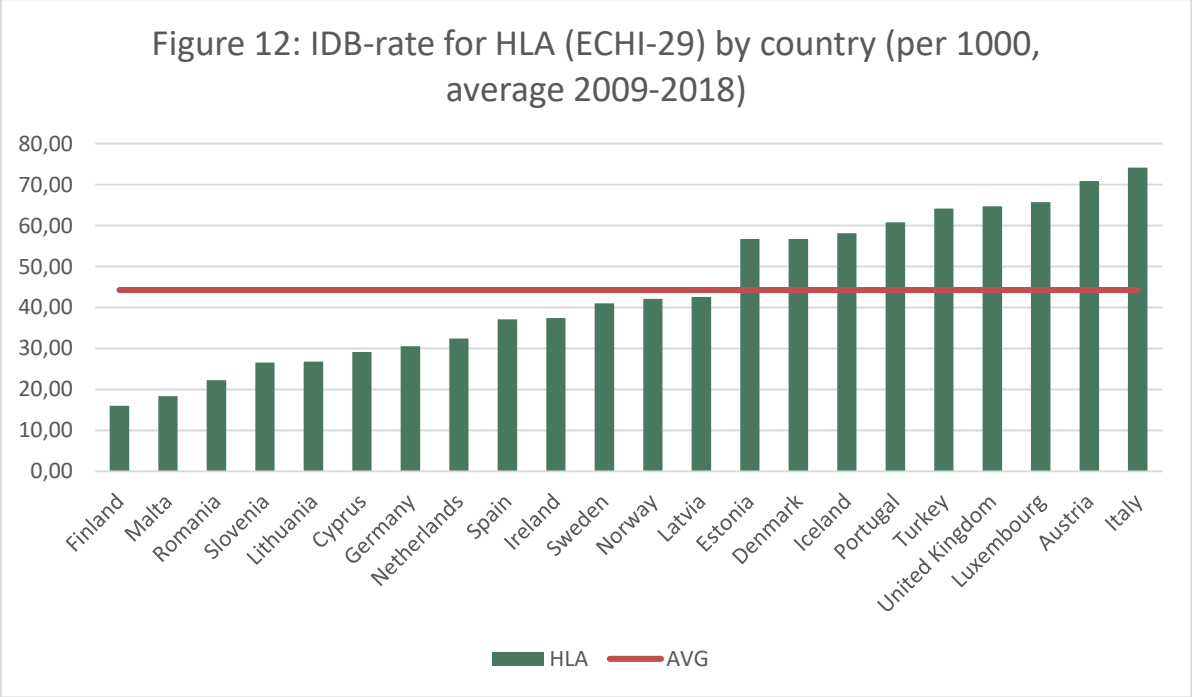
Table 7: IDB-rates (per 1000, average 2009-2018) by country and domain of prevention. ** Rates are the result of additional projections using EU-averages (for countries with incomplete scope of survey).

COUNTRY	UNSPEC	HLA (ECHI29)	RTA (ECHI30)	WPA (ECHI31)	ASSAULT	SELF-HARM	ALL INJURIES
Finland	15,73	16,00	4,69	2,08	0,66	0,68	39,83
Netherlands	3,83	32,48	7,15	3,81	1,29	0,97	49,53
Slovenia	17,35	26,61	3,94	2,63	0,79	0,08	51,40
Germany	8,59	30,55	4,91	4,83	1,52	1,20	51,60
Norway	7,15	42,10	2,54	5,17	1,01	0,77	58,75
Sweden	6,23	41,02	4,64	5,01	1,40	1,48	59,77
Spain	17,74	37,11	3,35	1,17	1,22	0,68	61,27
Cyprus	7,05	29,18	6,67	16,27	2,71	0,08	61,97
Romania	25,15	22,31	4,16	6,73	4,71	0,91	63,97
Malta	47,92	18,40	3,74	2,01	1,74	0,33	74,13
Ireland	19,19	37,46**	5,38**	5,87	6,98**	2,82	77,69**
Latvia	24,01	42,58	4,32	2,24	6,90	2,04	82,09
Estonia	19,63	56,73	1,30	3,43	2,94	0,90	84,92
Iceland	7,70	58,16**	9,19**	11,72	3,92	1,37	92,05
Austria	2,09	70,88	5,32	13,36	0,79	0,14	92,57
Denmark	21,60	56,77	5,83	8,63	2,35	0,76	95,94
Turkey	2,55	64,21	9,61	14,37	3,74	2,06	96,54
United Kingdom	25,17	64,69	4,79	6,60	2,40	2,27	105,93
Lithuania	74,33	26,85	1,11	1,14	1,60	1,27	106,31
Portugal	29,08	60,80	7,87**	9,39**	3,56**	1,51**	112,21**
Luxembourg	18,07	65,76	8,48	19,29	3,84	1,19	116,63
Italy	26,74	74,13	17,32	6,88	1,64	0,24	126,96
Average	19,40	44,31	5,74	6,94	2,62	1,08	80,10

Home, leisure, school accidents

Regarding ECHI 29b (“Home, leisure and school accidents”), the average rate (entire IDB-region, 2009-2018) is 44,31 per 1000 inhabitants (Figure 12). The rate ranges from 16,00 (minimum) in Finland to 74,13 in Italy (maximum), which is a range factor of 4,63 – compared

to 3,19 for all injuries (see page 17). The question is, how reliable is the measurement for home and leisure accidents and how far it might be enlarged by sampling, coding and other data quality issues. As another comparison value may serve the rate of hospital discharges (due to injuries) as reported by the national hospital discharge statistics. These figures are frequently used as reference statistics to estimate the IDB-rates at national level. The rates (indicator HIHSI036260, per 100.000, most recent year 2016) can be retrieved from the ECHI web-gate [14] and ranges from 7.607 (Cyprus, minimum) to 31.063 per 100.000 (Bulgaria, maximum), which results in a range factor of 4,08, also smaller than the 4,63 for ECHI29b. This is an indicator, that national differences are not only the result of different injury risk, but also of sampling and other data quality issues, which deserves further attention.

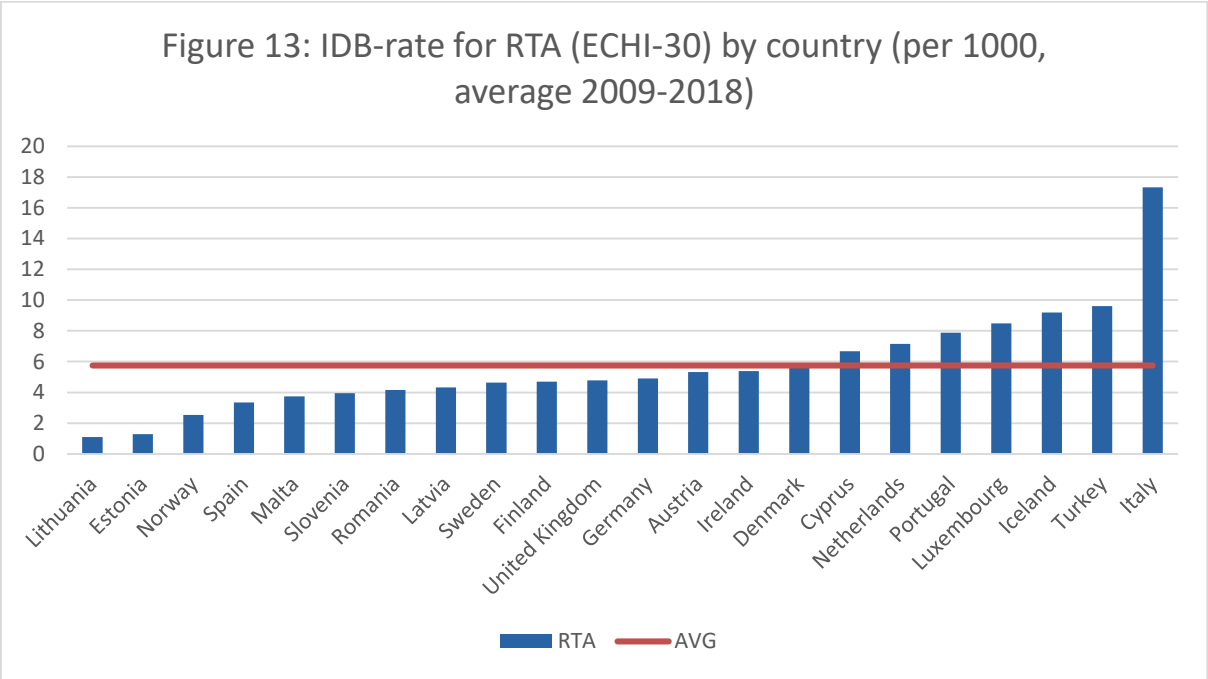


More details on home, leisure and school injuries are presented at the EuroSafe web-gate, in the chapter “Look at the figures” [17]. These analyses are not repeated here. A related indicator is ECHI-29a “Home, leisure, school injuries: self-reported incidence”, which gets established through the European Health Interview Survey EHIS [18]. The most recent data stem from 2014 and are published by Eurostat [19]. The EU average of ECHI-29a is 82 per 1000 and almost the double of ECHI-29b. The survey covers also primary health care services, while ECHI-29b is based on secondary health services (hospitals) but excludes children 0-14. These two measurements concern seemingly the same but are factually hardly comparable due to the different methodologies and differences in national implementations. A study in Luxembourg did not produce such huge differences; for people aged 25–64 years old, surveys provide similar estimates of hospital treated HLA and RTA but overestimate the number of hospital admissions, probably due to a recall-bias [20].

Road traffic accidents

Regarding the following ECHI indicators (e.g. ECHI-30b, ECHI-31 and ECHI-32) the IDB-results (Figure 13, 14 and 15) should be only understood as very preliminary results, highlighting potential data issues in countries and providing hints for further improvement. The ECHIM project [15] did not mention yet IDB as the preferred data source for ECHI-30b (injuries due to road traffic: register based incidence), ECHI-31 (injuries at workplace) and ECHI-32 (suicide attempts). Nevertheless, it shall be noticed that the system in principle is able to provide estimates for ECHI-30b and 31 and offers a meaningful alternative to ECHI-32.

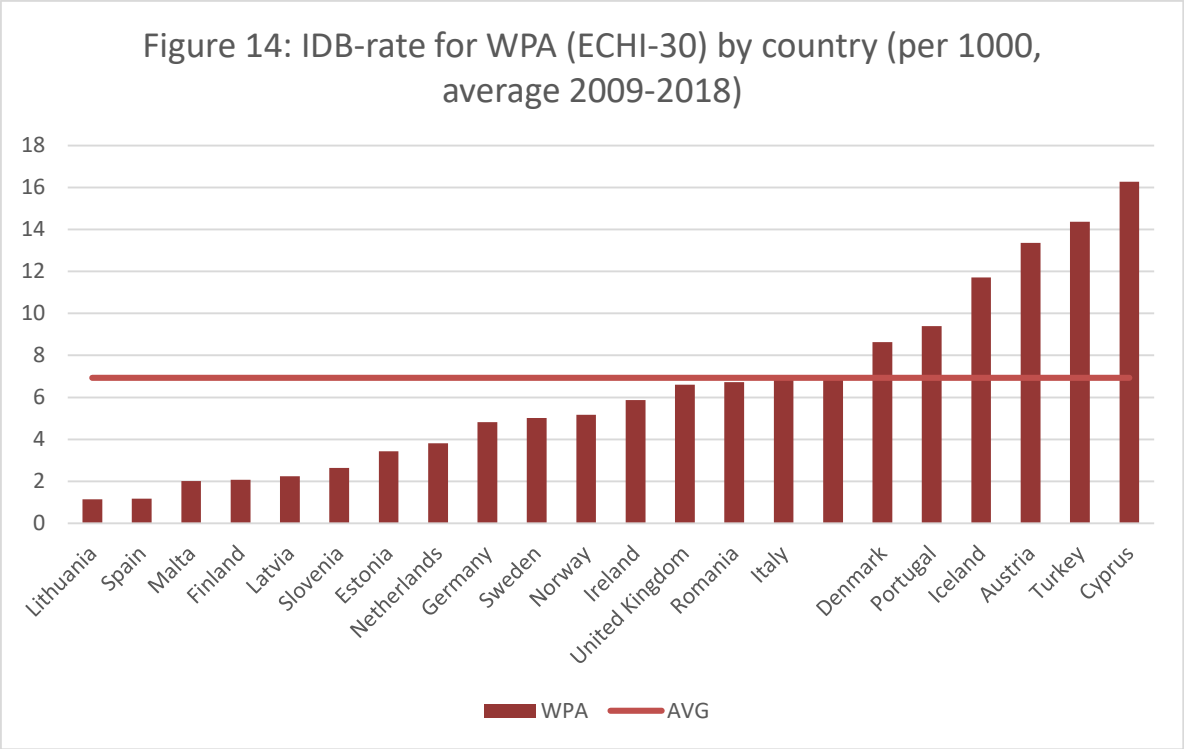
The average of the IDB based ECHI-30b ("road traffic accidents") is 5,74 per 1000 persons, and the national estimates range from 1,11 in Lithuania to 17,32 in Italy. The IDB based ECHI-30b (Figure 13) shows a remarkable high rate for Italy, but also noticeable low rates for Lithuania and Estonia. The ECHIM project [15] originally mentioned police reports as the preferred data source for non-fatal injuries, however it seems that these data are not available anymore; the annual ERSO report for 2016 analyses just fatalities and refers to the IDB estimates for non-fatal road traffic injuries [21].



The alternative indicator ECHI-30a "Road traffic injuries: Self-reported incidence", based on EHIS 2014 [14] shows also considerably higher figures, with an EU average of 17 per 1000. It can be assumed, that one cause for this difference is that EHIS covers many more minor injuries, e.g. with bicycles, which did not get any medical treatment or treatment of primary health care facilities.

Workplace accidents

The IDB based estimates for ECHI-31 (work-place accidents) (Figure 14) show even bigger differences between countries than regarding home and road accidents, which cannot be caused only by different morbidity. The average rate is 6,94 (per 1000), the lowest rate shows Lithuania (1,14), and the highest rate Cyprus (16,27), which leads to a range factor of 14,27, and it is obvious that the national figures are not comparable at international level. It needs to be further investigated, what the causes are. However, it has to be noticed that the ESAW (European Statistics on Accidents at Work) [22], which is defined as the preferred data source for ECHI-31 according to the ECHIM project [15], reports incidences for work-place accidents, which range from 61,9 in Romania to 3570,8 in Portugal per 100.000 workers – a range factor of 57,7.



Injuries due to assaults

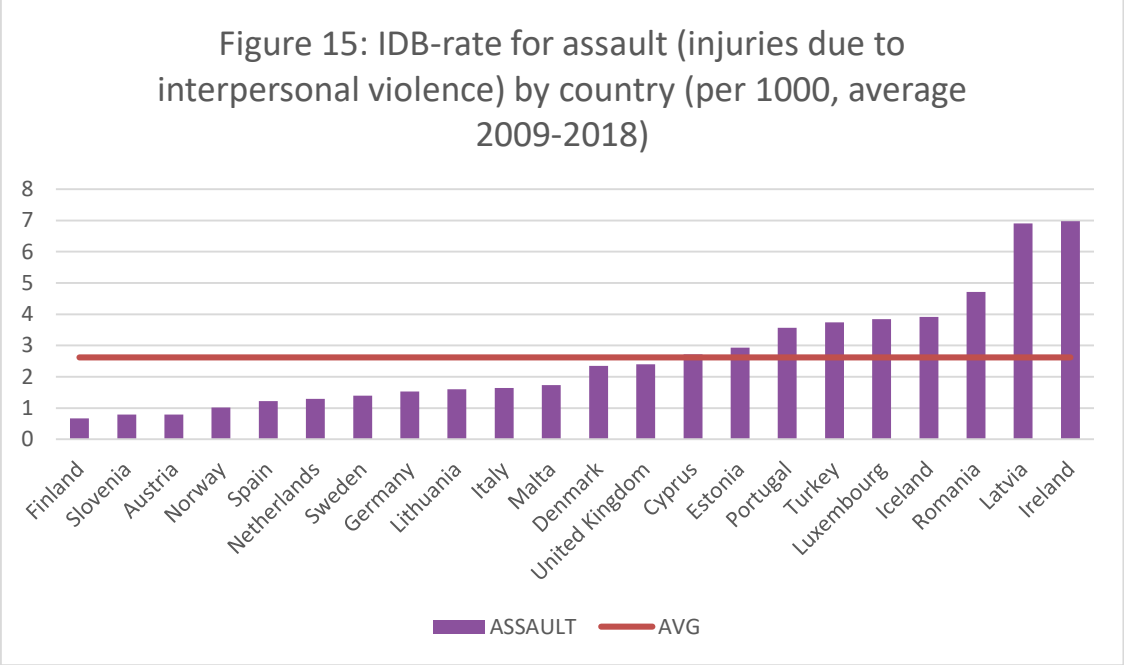
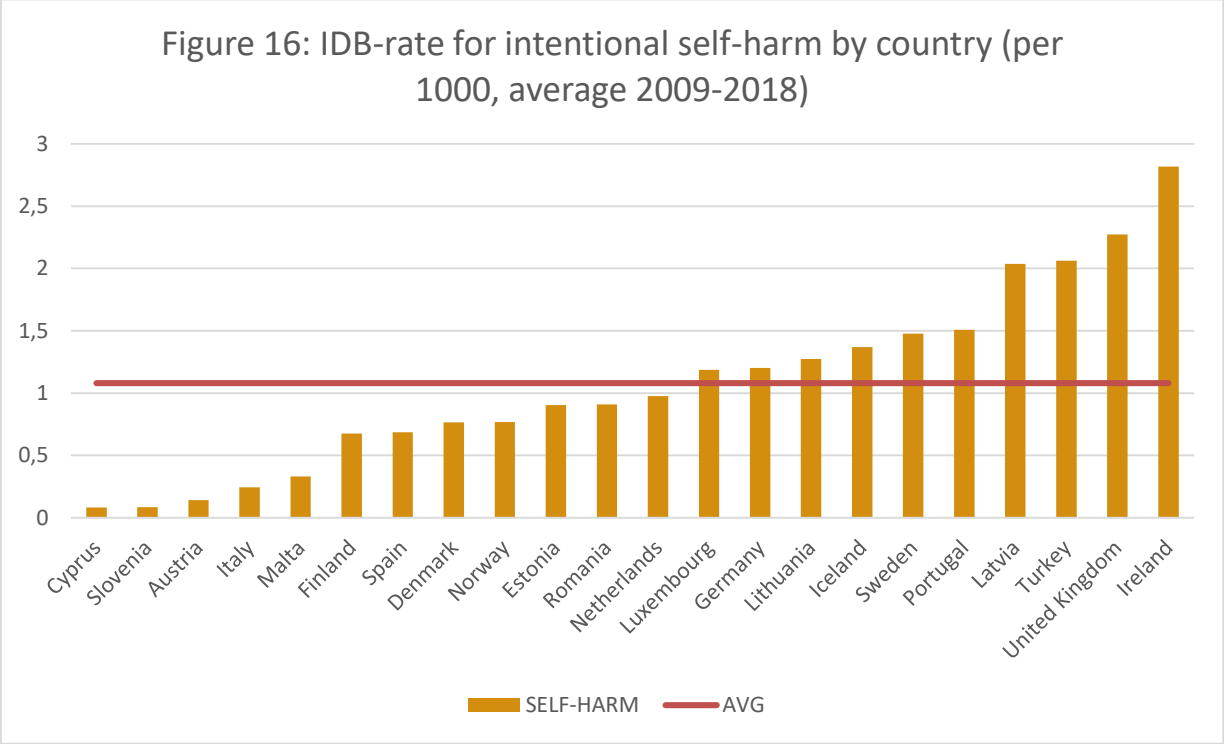


Figure 15 shows the national IDB-rates for assaults, with an average of 2,62 per 1000. The rates range from 0,66 in Finland to 6,98 for Ireland. Such wide range between national estimates indicates that sampling and or coding biases play a role. Further studies will be needed in order to assess, how ED based data can be improved in order to deliver additional valuable information on the health burden of assaults.

Intentional self-harm

Suicide attempts cannot be identified in IDB, as there is no information available, how serious the intention of a patient was to kill him/herself. However, it may turn out that there is no other data source at all available for this purpose, and in this case, “Injuries due to deliberate self-harm, treated in emergency departments” could be considered as alternative indicator. The estimated rates for self-harm range from 0,08 in Cyprus and Slovenia to 2,82 in Ireland, with an average of 1,08 (Figure 16). Again, it is not clear, what causes the huge differences between countries. The outstanding high rate for Ireland could be influenced by the fact, that the rate stems from one sample without children (0-14) and that data were collected by an agency, which is particularly focused on suicide prevention. If this is true, in reverse it could be assumed that acts of self-harm get under-reported in some other countries. There seems to be several challenges to record intentional self-harm in a harmonized way in hospitals all over Europe. Cultural differences in dealing with mental health problems may play a role, and in particular self-poisoning with painkillers or soporifics are probably often coded as (accidental) poisoning, although poisoning with painkillers happen seldom unintentionally.



5. Discussion and conclusions

Injury data from emergency departments of hospitals (secondary health care system) are a valuable source of information on the health burden of non-fatal injuries and complementary to mortality data and specific injury surveillance systems as far road traffic and work-place accidents. While deaths represent the “tip of the iceberg”, i.e. the most severe injuries, emergency attendances represent the huge volume of injuries, which cause most of the health care costs due to injuries. Population surveys cover the entire spectrum of non-fatal injuries but suffer inherent limitations in gathering information on the causation of injury events reported by respondents and their outcome (health burden).

The methodology of the European Injury Database (EU-IDB) provides a well elaborated standard for collecting injury data in emergency departments, which has potential to fulfil the Eurostat-methodological requirements for a European health statistic.

According to these standards, currently 18 countries collect and share data, whereof 15 are EU member states. These countries, joined in the EU IDB-network, share their data through a joint database, hosted by ISS Rome, under the coordination of EuroSafe. The main objective of this undertaking is to provide an unique data source for comparable European injury indicators as ECHI-29b (home and leisure injuries: register based incidence), and a complementary data source for ECHI-30b (road traffic injuries: register based incidence) and ECHI-31 (workplace injuries).

Since 2014, the IDB data collection exchange is operating without any EU-subsidies, relying now solely on resources provided by participating countries and temporary resources provided by ISS and EuroSafe. However, the capacities for central services as data management, cross-country analyses and data clearing house services are extremely limited und not sufficient to secure on the long term a proper maintenance of the system and support to data users.

For this report, data from ten years (2009-2018) were analysed. The results demonstrate that despite some fluctuations over the years, the system delivers stable and valid indicators for the magnitude of the injury problem in Europe and the EU in particular. In the EU-27, estimated 4,5 million patients get admitted to hospitals annually, and further 31,0 million seek ambulatory treatment in emergency departments of hospitals.

More than 55% of all injuries occur at home, at school or during leisure activities. With a view to these figures, it appears that there is a window of opportunities in reducing injuries by increasing investments in preventing for example childhood injuries, sport injuries and falls in older people – by earning from the successes achieved in past decades in the fields of road and workplace safety.

The quality of data delivered is satisfactory, but certainly open for improvements in many aspects. There are shortcomings e.g. regarding the content-related scope of the data collection, the geographic coverage of all EU member states and collaborating countries, the representativeness of data samples, the completeness of records and the quality of coding. Larger European countries seem to have problems in providing national coordination to and consolidation of local injury surveillance efforts. Germany participates, but only with a somewhat skewed sample from one single reference hospital; UK is relying on data provided only by Wales (All Wales Injury Surveillance System AWISS); France collects emergency department data but does not share its data with the IDB-network; Belgium, Bulgaria, Greece and Hungary could not designate a competent authority or agency for injury data.

The international comparability of national rates, e.g. of the ECHI indicators (29b, 30b, 31) seems to be impaired by various inadequacies as sampling biases, incompletely specified records and issues related to the inclusion/exclusion criteria. Nevertheless, only international comparisons make such inconsistences visible and offer the opportunity for improvement.

Emergency departments in hospitals provide the best setting for collecting information on large number of injuries at reasonable costs. The rather simple single-screen IDB-MDS facilitates the data collection for comparable national indicators on the burden of injury. Most of the information required for the IDB-MDS is stored in the patient's history anyway and just needs to be made available. Technological developments in medical administration and data linkage offer new opportunities for reducing the costs of data collection and for improving the data quality.

The IDB-methodology allows countries to collect accident and injury data from a representative sample of emergency departments using a standardized coding system on the circumstances of an injury-event and its outcome. The system complements existing data sources such as the routine causes of death statistics, hospital discharge registers and data sources specific to injury areas, including road accidents and workplace accidents. IDB-data make it possible to estimate the health burden of injuries for various population groups and various settings as home, leisure activities, sport, road traffic, workplace, deliberate self-harm and interpersonal violence. Further indicators as costs of hospital services or disability adjusted life years can be derived by combing IDB data with additional data.

However, the continuation and wider implementation of the IDB across Europe requires a stronger political commitment from EU-institutions and member state governments. A binding arrangement for all countries to provide ED-based injury data would be extremely helpful in ensuring continued EU-level exchange of vital injury data in the forthcoming years. Central services, e.g. for operating the databank and providing public access to data, regular analyses and reports, data clearinghouse services need additional funding in order to better use the wealth of information already stored in the IDB databank.

Taking into account the EU-ambitions for health promotion and consumer protection, these certainly require appropriate monitoring in member states and at the EU-level. Therefore, the European Union is currently considering to create more appropriate information infrastructures, respectively for health and consumer policies, in view of enhancing evidence-based policy-making across the European Union. Such a system should include knowledge and information should include injury data as a key component.

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7. Annexes

a) MDS data-file: data elements and format

Data Element	No. characters	Position Start	Position End	Format	Type
Recording country	2	1	2	nn	Numeric
Provider (hospital) code (optional)	3	3	5	nn	Numeric
Unique national record number	7	6	12	nnnnnnn	Numeric
Age category of patient	2	13	14	nn	Numeric
Sex of patient	1	15	15	n	Numeric
Permanent country of residence	1	16	16	n	Numeric
Month of attendance	2	17	18	nn	Numeric
Year of attendance	4	19	22	nnnn	Numeric
Treatment and follow-up	1	23	23	n	Numeric
Nature of injury 1 (primary injury)	2	24	25	nn	Numeric
Nature of injury 2 (secondary injury)	2	26	27	nn	Numeric
Part of the body injured 1 (primary injury)	2	28	29	nn	Numeric
Part of the body injured 2 (secondary injury)	2	30	31	nn	Numeric
Intent	1	32	32	n	Numeric
Location (setting) of occurrence	1	33	33	n	Numeric
Mechanism of injury	1	34	34	n	Numeric
Activity when injured	1	35	35	n	Numeric
Narrative (optional)	120	36	155	120n	Alphanumeric
Total record length	**155**	1	155		

b) Template for the report of aggregated DB-MDS data (standard set of IDB indicators)

		ALL PATIENTS	GENDER		AGE-GROUP				SEVERITY	
			FEMALES	MALES	0-14a	15-24a	25-64a	65+	ADMITTED	ED TREATED
PLACE	ECHI-29b: HLA									
	ECHI-30b: RTA									
	ECHI-31: Accidents at work									
	Injuries due to assaults									
	Deliberate self-harm									
	Accidents at home									
	Accidents at school									
	Sport accidents									
CAUSE	Road traffic injury									
	Fall									
	Cut/pierce									
	Poisoning									
	Burn/scald									
	Other/unknown									
TYPE OF INJURY	Contusion/bruise									
	Open wound, abrasion									
	Fracture									
	etc.									
	All injuries									

c) Metadata for an MDS data-file (version 2021+)

Country: nnnn			
Year: nnnn			
	Question	Specification	Please tick or fill in
Scope			
1	All age groups?	All age-groups covered	Y/N
2	All injury categories (home, leisure, sport, school, road, paid work, self-harm, assault)?	All MDS options for intent, setting and activity covered	Y/N
3	All injury mechanisms?	All MDS options for injury mechanism covered and coded	Y/N
4	All injury types and all body parts?	All MDS options for injury types and body parts covered and coded	Y/N
5	Admissions and ambulatory treatments?	All MDS options for treatment and follow-up covered	Y/N
Inclusion / exclusion of cases			
6	Only patients diagnosed as suffering from injury?	Equivalent to ICD-10 S00-T98 (chapter XIX)	Y/N
7	Consequences of medical interventions excluded?	Equivalent to ICD-10 codesT80-T88 and T98.3 excluded	Y/N
8	Follow-up treatments excluded?	No double counting of cases	Y/N
9	Non-residents included?		Y/N
9a	% Non-residents		nn.n%
Representativeness of the sample			
10a	Nuber of records in the sample		nnnnnn
10	Recommended number of cases?	More than 10.000 cases	Y/N
11	Number of hospitals in the sample?		nnn
12	Recommended number of hospitals?	All hospitals (nat. pop <1m); minimum 3 hospitals (nat. pop. 1-3m), 5 (nat. pop 3-12m), 7 (nat. pop. 12-40m), 9 (nat. pop. >40m)	Y/N
13	Sample of hospitals balanced by hospital size?	Small, middle-size, large hospitals included	Y/N
14	Sample of hospitals balanced by geo-coverage?	Hospitals with urban & rural catchment areas included	Y/N
15	Sample of hospitals balanced by hospital type?	General hospitals, trauma centre or university hospital, child clinic included. Primary health care and day-care centres excluded	Y/N
16	Validation checks?	Representativeness of current sample of hospitals has been controlled at least by age and type of injury	Y/N
Quality of recording			
17	Rate of admissions?	Percentage of treatment code 1	nn.n%

18	Average rate of “unknown”?)?	Average percentage of codes 9 or 99 of the following 10 MDS data elements: age, sex, month, treatment, nature of injury1, part of body1, intent, location, mechanism, activity (mandatory data elements where “unknown” is allowed).	nn.n%
19	Rate of children?	Percentage of children 0-14a	nn.n%
Quality of estimated rate			
20	IDB (ED presentation) rate available?	Crude rate, standardised for age and sex, using Eurostat population projection by 1 January	Y/N
20a	Genral IDB-rate	All injuries and all subgroups (per 1000 residents)	nnnnn.nn
21	Valid at national level?	Tick no, if rate is valid at regional level and add name of the region	Y/N
22	Recommended method of projection used (or no projection needed)?	HDR-method or EDR-method is used for projection (or IDB-MDS file contains all national cases)	Y/N
23	Medical interventions consistently excluded for projection?	If HDR or EDR method is applied: medical interventions excluded in both, IDB and HDR (or EDR)	Y/N
24	Follow-up treatments consistently excluded for projection?	If HDR or EDR method is applied: follow-up treatments excluded in both, IDB and HDR (or EDR)	Y/N
25	Day-care patients consistently excluded for projection?	If HDR or EDR method is applied: day care patients excluded in both, IDB and HDR (or EDR)	Y/N
26	Non-residents consistently included for projection?	If HDR or EDR method is applied: non-residents included in both, IDB and HDR (or EDR)	Y/N
27	Random sampling in hospitals?	If sampling within one or several hospitals occurs: Sampling scheme prevents from biases	Y/N
28	Known bias (e.g. regarding admissions) corrected?	No bias is known or bias has been corrected by means of external statistics before calculating rates	Y/N
Data delivery			
29	MDS data successfully uploaded?		Y/N
30	FDS data successfully uploaded?		Y/N
31	Reference population data file provided?	Automatic calculation of IR at IDB web-gate will be enabled	Y/N
32	List of FDS reference hospitals provided?		Y/N
National data provider			
33	National register name (and eventual abbreviation)		xxx
34	Name of organization	In national language and English	xxx
35	Name of respondent (contact person)		xxx
36	E-mail address of contact person		xxx
37	Date of completion of this form		xxx

d) IDB data providers 2009-2018

The 22 national IDB-partners that contributed to this report 2009-2018 by collecting injury data in accordance with the IDB-methodology and provided national rates for analysis at EU-level, are:

- Austria Austrian Road Safety Board
- Cyprus Ministry of Health
- Denmark National Institute of Public Health
- Estonia Ministry of Social Affairs
- Finland National Institute for Health and Welfare
- Germany Brandenburg State Dept. for Hlth and Cons. Prot.
- Iceland Ministry of Health
- Ireland National Suicide Research Foundation
- Italy National Institute of Health
- Latvia National Centre for Disease Prevention & Control
- Lithuania National Institute of Hygiene
- Luxembourg Luxembourg Institute of Health
- Malta Ministry of Health
- Netherlands Consumer Safety Institute
- Norway Norwegian Safety Forum
- Portugal National Institute of Public Health
- Romania Babes-Bolyai University
- Slovenia National Institute of Public Health
- Spain Health Agency of the Region of Navarra
- Sweden National Board of Health
- Turkey Turkish National Public Health Agency
- United Kingdom Swansea University, College of Medicine