European Road Safety Observatory

Facts and Figures – Serious injuries - 2023

This document is part of a series of 16 *Facts and Figures* reports. The purpose of these *Facts and Figures* reports is to provide recent statistics related to a specific road safety topic, for example a specific age group or transport mode. The *Facts and Figures* reports replace the Basic Fact Sheets series that were available until 2018 (containing data up to 2016). The most recent figures in this *Facts and Figures* report of 2022 refer to 2020. These reports can be found on the ERSO website (https://road-safety.transport.ec.europa.eu/statistics-and-analysis/data-and-analysis/facts-and-figures_en).

Contract	This document has been prepared in the framework of the EC Service Contract MOVE/C2/SER/2019-100/SI2.822066 with Vias institute (BE) and SWOV Institute for Road Safety Research (NL).
Version	Version 1.0, January 2023
Author	Freya Slootmans (Vias institute), Lies Bouwen (Vias institute)
Internal review	Niels Bos (SWOV)
Referencing	Reproduction of this document is allowed with due acknowledgement. Please refer to the document as follows: European Commission (2023) Facts and Figures Serious injuries. European Road Safety Observatory. Brussels, European Commission, Directorate General for Transport.
Sources	Information in this document is based largely on data in the CARE database (Community database on Accidents on the Roads in Europe). Other data are taken from Eurostat. Date of extraction: 6 January 2023

Contents **3**

1 Summary

This Facts and Figures report looks at serious injuries resulting from road crashes. Traditionally, fatalities have been used to monitor road safety performance but, in 2017, EU Transport Ministers, for the first time, set a target for reducing serious injuries, namely to halve the number of serious injuries in the EU by 2030. There are several sources of data for injuries, including police crash data and hospital data.

Police crash data is the primary source for the official crash data in EU Member States. Most countries have adopted definitions developed by ITF/Eurostat/UNECE (which classify road casualties into three categories of injury severity: fatality, serious injury, and slight injury). A seriously injured person is defined as any person injured who was hospitalized for a period of more than 24 hours. However, some countries define serious injuries in terms of type of injury, the inability to work, or the length of recovery. These differences in definition make comparison between EU Member States challenging: an injury recorded as "serious" in one country, could be recorded as "slight" in another country (Yannis et al., 2014; European Commission, 2021).

Underreporting and misreporting both pose challenges to the completeness and accuracy of the data. Crashes can be missing from the official crash data for several reasons: the police are not alerted because there was no other vehicle involved or because no one seems to be injured, or the parties involved reached a private settlement. Furthermore, victims are sometimes incorrectly registered as slightly or seriously injured. Most information on the accident is gathered at the scene of the crash. However, the nature and the severity of the injuries are often not evident to the police, who are not medically trained (European Commission, 2021).

According to police crash data, there were on average 7 serious injuries for each road fatality on European roads in 2019 (excluding FR and IT among others). The average ratio is affected by Germany and Austria in particular with high national ratios. Indeed the average ratio using MAIS3+ data is lower at 5 serious injuries per fatality. The number of police-reported serious injuries decreased by 12% between 2011-2013 with 2018-2020. A comparison of seriously injured and fatally injured victims yields the following findings:

- The proportion of female road users is higher among the seriously injured than among fatalities generally.
- The proportion of young people is higher among seriously injured victims, and the proportion of elderly is lower.
- There is a higher proportion of vulnerable road users and a lower proportion of car occupants among the seriously injured.

Other data sources are necessary to complement police crash data. **Hospital data** are drawn from different kinds of health data sources. The severity of injuries is derived from medical diagnoses, which substantially reduces the risk of misreporting. Furthermore, hospital data are less subject to underreporting than police data.

For this reason, the EU Transport Ministers agreed in 2017 to adopt a definition for serious injuries based on the Abbreviated Injury Scale (AIS). A serious road injury is a road casualty with a MAIS (Maximum AIS) score of 3 or more (MAIS3+). The preferred method to determine the number of MAIS3+ casualties is to create a link between police data and hospital data. Other methods are to report the number of serious injuries based on hospital data, or to apply correction coefficients to police data (Pérez et al., 2016). More information on the methods to determine the number of

serious road injuries can be found in the "Practical guidelines for determining the number of serious road injuries (MAIS3+)" [1]. Not all Member States have yet been able to collect MAIS3+ data. The methods used to collect MAIS3+ data differ across Member States. There are also flaws in hospitals registration systems, since not all casualties go to hospital after a road crash. There is also little information on crash characteristics to be found in hospital data. Some countries have no access to hospital data at all, or have no access to linking variables (such as date of birth or social security number).

There is a difference between the evolution in MAIS3+ casualties based on hospital data and the evolution in serious injuries based on police data. For some Member States, such as Portugal, Spain, Sweden and Finland, the difference is small. However, for some countries, such as Lithuania, the difference in evolution is striking.

The distribution of MAIS3+ casualties across age groups is very similar to the distribution across age groups for fatalities (police data). Another finding is that the proportion of car occupants is lower, while the proportion of cyclists is higher among MAIS3+ casualties.

One of the added values of hospital data is the detailed information on the types of injuries sustained by casualties. Using this data, it is possible to show the distribution of MAIS3+ injuries across body areas, by road user type, age and crash characteristics.

Hospital data usually also contain data on traffic casualties with less severe injuries as well (MAIS levels 1 and 2). Less severe injuries are much more prevalent than serious injuries but can also have a long-lasting impact on casualties' health.

[1] https://www.safetycube-project.eu/wp-content/uploads/SafetyCube-D7.1-Leaflet.pdf

Basic definitions

Fatalities:
Total number of persons fatally injured; correction factors applied when needed. Death within 30 days of the road crash, confirmed suicides and natural deaths are not included.

Seriously injured (CARE, national definitions from police reporting):
Total number of seriously injured persons adapted by correction factors when needed. Injured (although not killed) in the road crash and, in principle, hospitalised for at least 24 hours within 30 days from the crash.

Abbreviated Injury Scale (AIS):
This scale is used to rank the severity of injuries on a scale of 1 (slight injuries) to 6 (untreatable injuries). More information on AIS can be found on the website of the Association for the Advancement of Automotive Medicine (AAAM): https://www.aaam.org/abbreviated-injury-scale-ais/

MAIS3+ (hopsital data, injury severity derived from ICD injuries in hospital discharge registers, national methods):
Patients often have more than one injury. The Maximum Abbreviated Injury Score (MAIS) is the highest AIS score of all injuries of a person. A road casualty with a MAIS score of 3 or more is referred to as MAIS3+. MAIS3+ casualties are considered to be seriously injured patients. More information can be found in the Thematic report on serious injuries (https://road-safety.transport.ec.europa.eu/system/files/2022-01/Road%20Safety%20thematic%20report%20Serious%20injuries_final.pdf)

More detailed data:
This Facts and Figures report is accompanied by an Excel file (available online) containing a large set of detailed data. Each sheet in the Excel file corresponds to a Figure/Table in the report.

2 Police crash data

The main source of information on serious road traffic crashes and injuries is usually the police crash data. They provide the official data for most countries' statistics, at both national (a country's own official statistics) and European levels (the CARE database). Although the data collected by the police contain very detailed information about crashes, there are some issues related to the use of data on serious injuries. Underreporting and misreporting both pose challenges to the completeness and accuracy of the data (European Commission, 2021). In addition, there are problems of comparability, missing data or breaks in the time series for a number of EU Member States: France, the Netherlands, Ireland, Italy and Estonia. Consequently, these countries are excluded from the following graphs (based on CARE data). Germany is included, but accounts for a disproportionately high share of all serious injuries.

2.1 Trend in the number of police-reported serious injuries

According to police crash data, there were on average 7 serious injuries for each road fatality on European roads in 2019 (excluding FR and IT among others). The average ratio is affected by Germany and Austria in particular with high national ratios.

The evolution of police-reported serious injuries for individual Member States throughout the last decade is shown by comparing three-year-averages (2011-2013 with 2018-2020). Looking at the EU as a whole, the reported number of serious injuries decreased by 12%. Progress overall in reducing serious injuries has been considerably less than with road fatalities.

Both in Greece and Lithuania the number of serious injuries has more than halved, which is in line with to the sharp decreases in fatalities in these countries, while the number of serious injuries has increased in Latvia, Hungary, Portugal and Malta.

Figure 1. Number of police-reported serious injuries, and evolution in the number of serious injuries, per country (2011-2013 and 2018-2020). Source: CARE

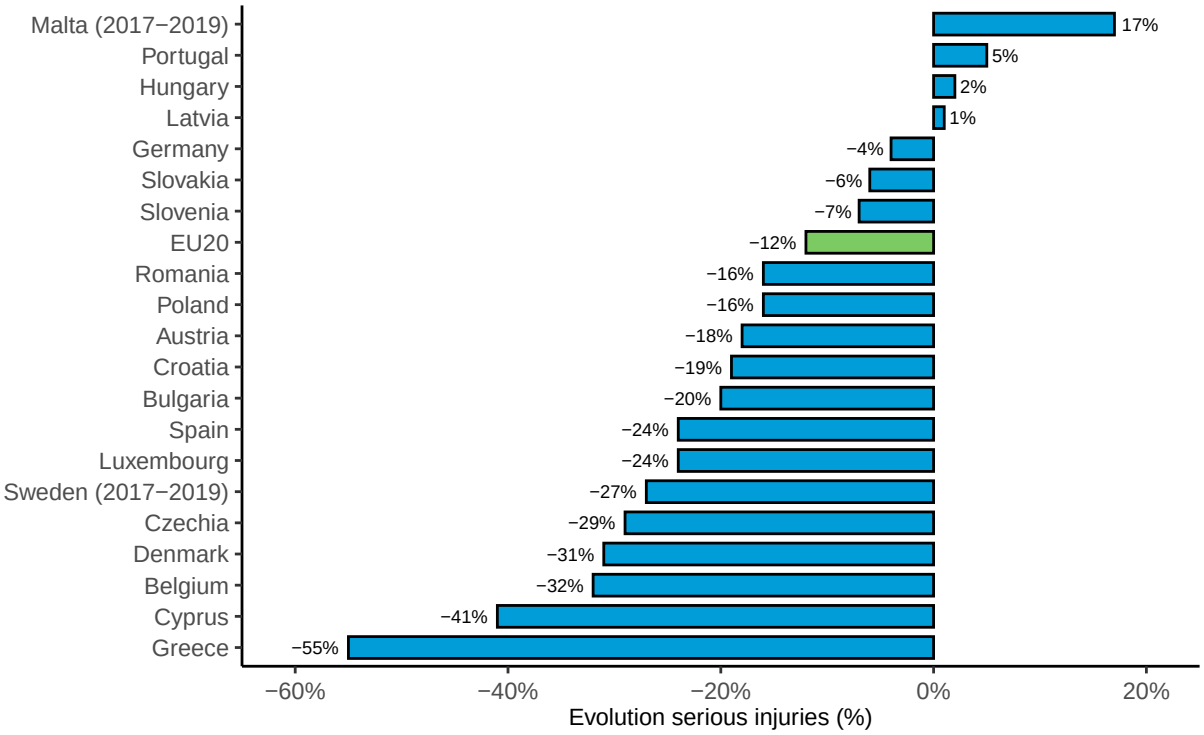
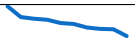
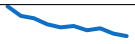
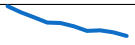
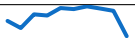


Table 1. Number of police-reported serious injuries, and evolution in the number of police-reported serious injuries, per country (2011-2013 versus 2018-2020). Source: CARE

	2011	2018	2019	2020	Evolution 2011-2013 and 2018-2020	Miniplot: trend since 2011
Austria	10958	7,631	7,384	6650	-18%	
Belgium	5739	3,636	3,600	2968	-32%	
Bulgaria	2366	1,983	1,937	1556	-20%	
Croatia	3413	2,731	2,488	2295	-19%	
Cyprus	561	348	340	211	-41%	
Czechia	3045	2,395	2,061	1760	-29%	
Denmark	2094	1,436	1,277	1203	-31%	
Finland	-	485	390	408		
Germany	68985	67,967	65,244	58005	-4%	
Greece	1626	727	652	518	-55%	
Hungary	5154	5,559	5,485	4655	2%	
Latvia	531	542	461	490	1%	
Lithuania	-	165	308	376		
Luxembourg	317	273	248	217	-24%	
Malta	237	317	305	-		
Poland	12585	10,941	10,633	8805	-16%	
Portugal	2265	2,195	2,383	1877	5%	
Romania	8768	8,144	8,125	5491	-16%	
Slovakia	1168	1,247	1,030	894	-6%	
Slovenia	919	821	814	678	-7%	
Spain	11347	8,935	8,613	6681	-24%	
Sweden	3127	2,195	1,951	-		

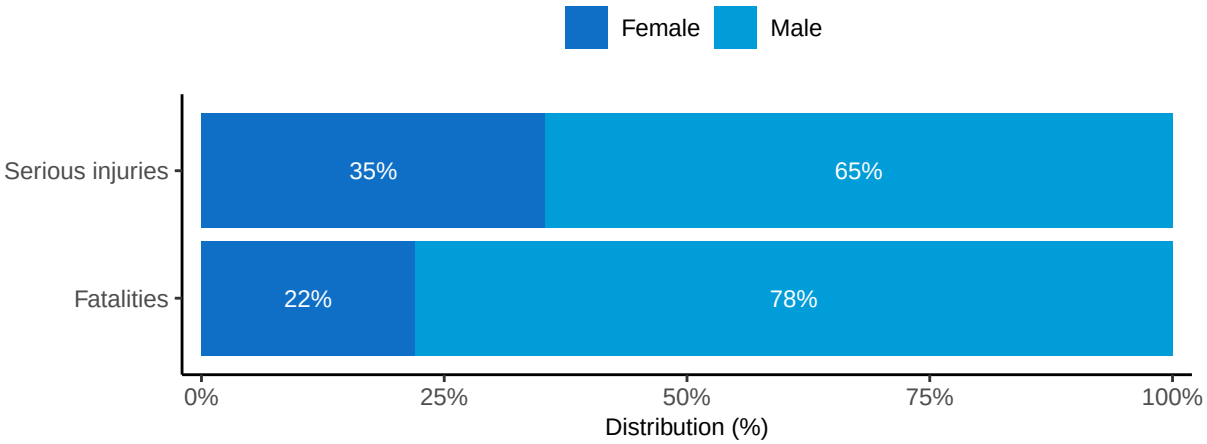
2.2 Distribution of police-reported serious injuries

In this section we will examine some distributions of police-reported serious injuries for various characteristics, such as gender and time of day, and compare them to the distribution of fatalities.

2.2.1 Gender

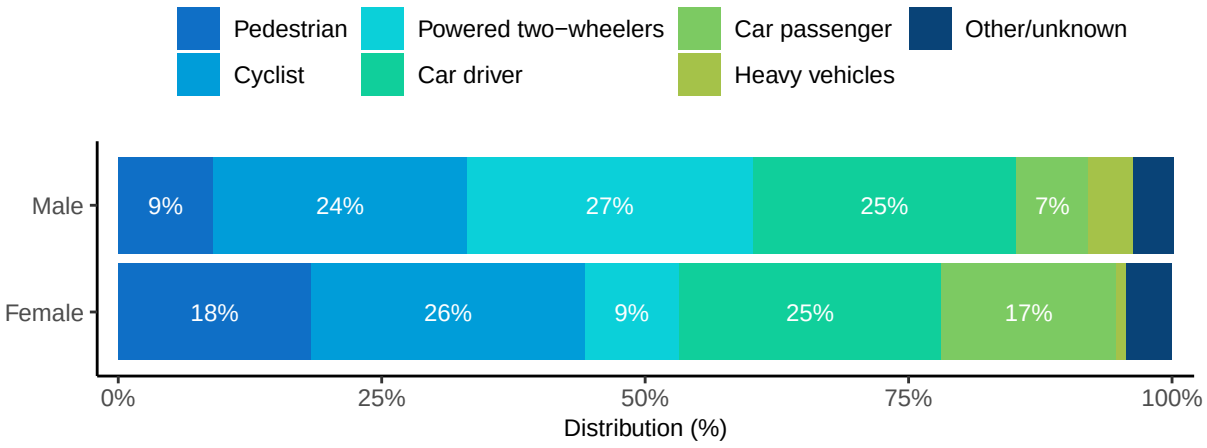
65% of police-reported serious injuries are male. The proportion of female road users is higher among serious injuries compared to fatalities (35% compared to 22%). Female serious road injuries are more often incurred by a pedestrian or car passenger compared with male serious injuries, while those affected are less often riding a powered two-wheeler or occupants in a heavy vehicle (bus/coach or a heavy goods vehicle).

Figure 2. Distribution of police-reported serious injuries and fatalities by gender in the EU27 (2020). Source: CARE



Female serious road injuries are more often incurred by a pedestrian or car passenger compared with male serious injuries, while those affected are less often riding a powered two-wheeler or occupants in a heavy vehicle (bus/coach or a heavy goods vehicle). The proportion of car drivers and cyclist is the same both for male and female serious injuries.

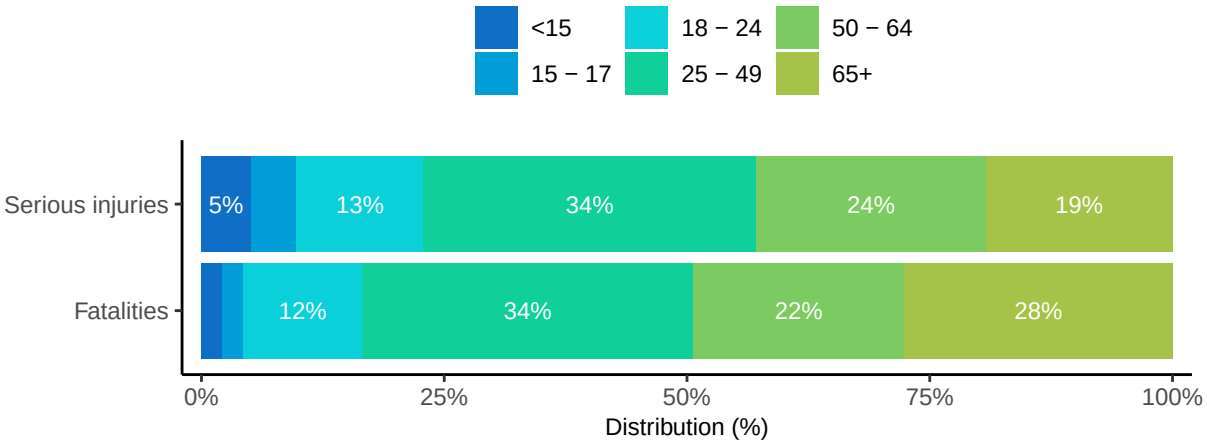
Figure 3. Distribution of police-reported serious injuries by gender and transport mode in the EU27 (2020). Source: CARE



2.2.2 Age

The **age** distribution also differs between serious injuries and fatalities. The proportion of young people (17 year olds or younger) is higher among seriously injured victims, while the proportion of elderly (65+ years old) is lower. This is possibly caused by the relatively higher vulnerability of the elderly.

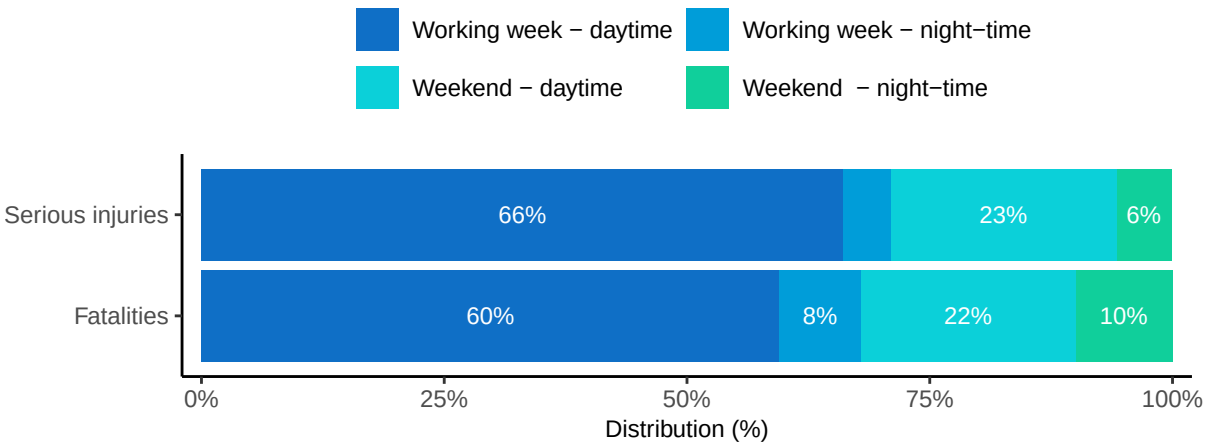
Figure 4. Distribution of police-reported serious injuries and fatalities by age group in the EU27 (2020). Source: CARE



2.2.3 Time

The proportion of serious injuries sustained during night-time is slightly lower compared to the proportion of fatalities during night-time. Possible explanation for the high share of night-time fatalities are higher driving speeds due to lighter traffic during the night, poor visibility, a higher share of young drivers, et cetera.

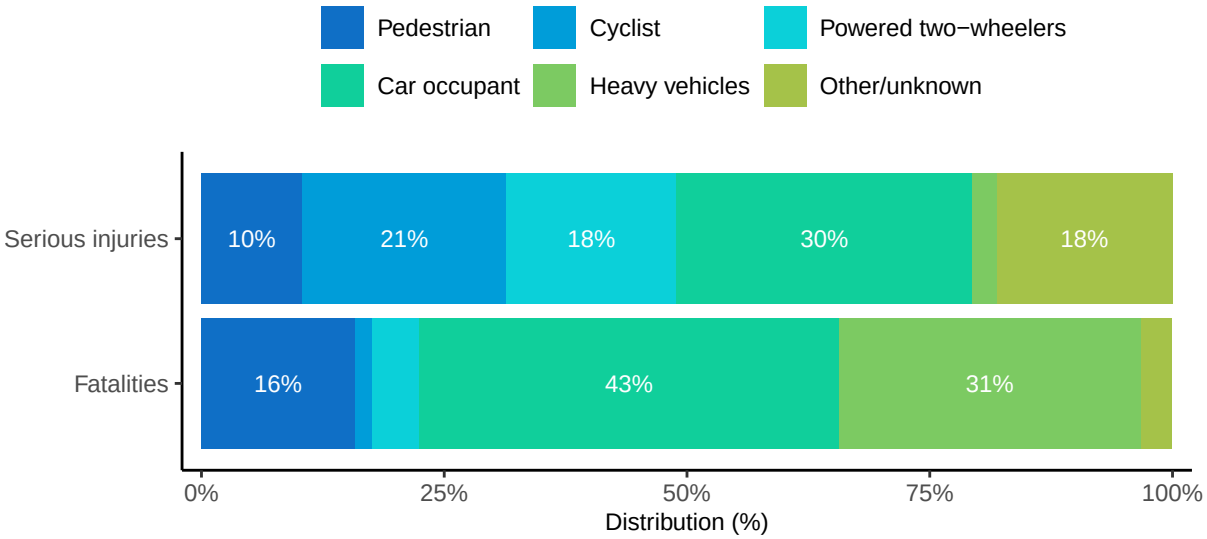
Figure 5. Distribution of police-reported serious injuries and fatalities by period of the week in the EU27 (2020). Source: CARE



2.2.4 Transport mode

Compared with road fatalities, there is a higher proportion of cyclists and powered two-wheelers and a lower proportion of car occupants among the seriously injured.

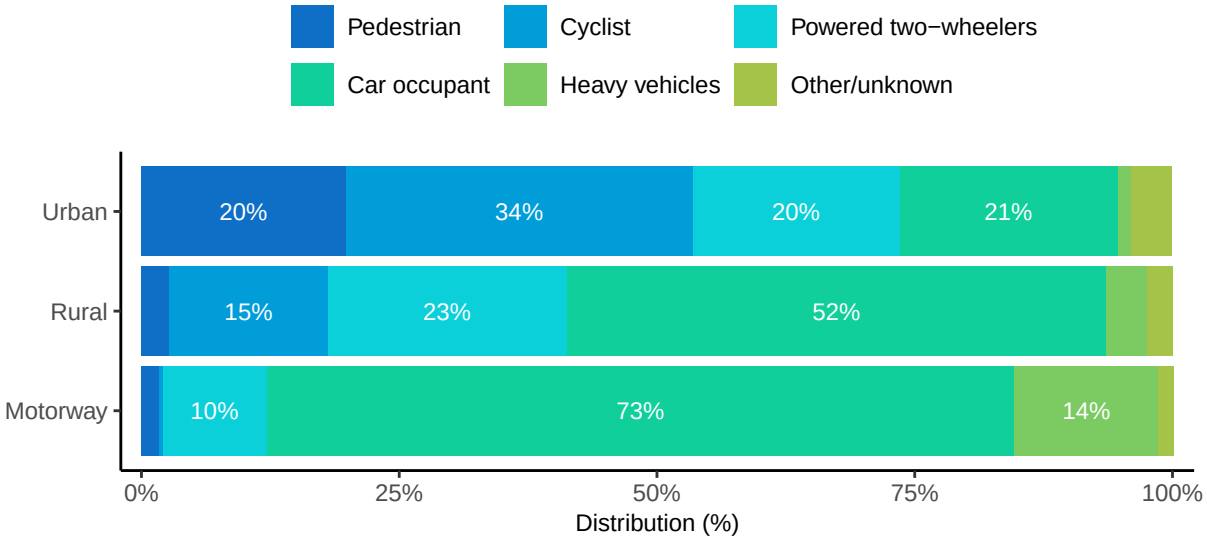
Figure 6. Distribution of police-reported serious injuries and fatalities by transport mode in the EU27 (2020). Source: CARE



2.2.5 Road type

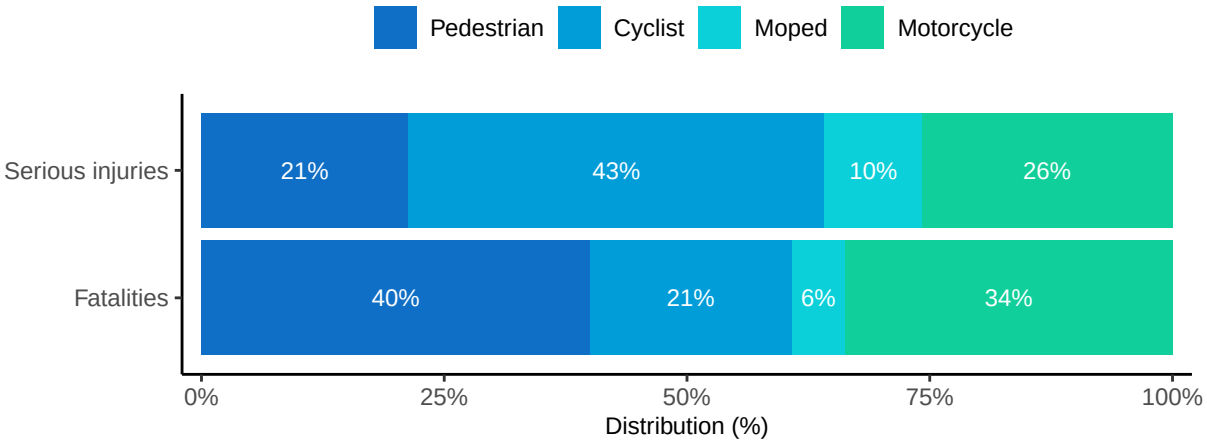
On urban roads, there is a high proportion of injuries involving pedestrians, cyclists and powered two-wheelers: together they account for 74% of serious injuries on this type of road. On motorways, seriously injured people are mostly traveling in a car or heavy vehicle. Rural roads have a lower share of pedestrian and cyclist serious injuries compared to urban roads.

Figure 7. Distribution of police-reported serious injuries by transport mode and area in the EU27 (2020). Source: CARE



When examining vulnerable road users, it is noticeable that the proportion of pedestrians is substantially higher among road fatalities compared to serious injuries whereas the opposite is the case with cyclists. Knowing that there is a substantial underreporting of serious injuries among cyclists (Bouwen et al., 2022; Bos et al., 2022), the proportion of cyclists among VRUs is presumed to be even larger.

Figure 8. Distribution of police-reported serious injuries and fatalities for vulnerable road users in the EU27 (2020). Source: CARE



3 Hospital data

Hospital Discharge Registers (HDR) are increasingly used to complement police crash data. Hospitals are obliged to collect and register patient data mainly for financial purposes. HDR's contain both administrative data (e.g. age, gender, date of admission and discharge) and medical data (medical diagnoses, mechanism or external cause of injury, and interventions) (Pérez et al. 2016). Although direct coding in AIS is preferred, medical diagnoses are usually coded using the WHO's International Classification of Diseases (ICD).

The severity of injuries can be derived from medical diagnoses which substantially reduces the risk of misreporting. This requires a transformation from ICD to AIS, which provides some challenges. Nevertheless, hospital data are not perfect, due to flaws in the hospitals registration systems. Furthermore, there is little information in hospital data on the circumstances of the crash.

3.1 MAIS3+

The ratio between MAIS3+ casualties and CARE fatalities (for those countries with MAIS3+ data) was calculated: there were around 5 serious injuries for each road fatality. This ratio was then applied to the police reported fatalities for countries without MAIS3+ data. According to this method, around 110,000 people were seriously injured on European roads in 2019.

In 2013, the EU High Level Group on Road Safety (European Commission, 2013) introduced a new common definition of a serious road injury, based on the Abbreviated Injury Score (AIS). This scale is used to rank the severity of injuries on a scale of 1 (slight injuries) to 6 (untreatable injuries). Patients often have more than one injury. The Maximum Abbreviated Injury Scale (MAIS) is the highest AIS score of all injuries of a person.

A serious road injury is a road casualty with a MAIS score of 3 or more (MAIS3+). Perez et al. (2016) identified three methods to collect this data:

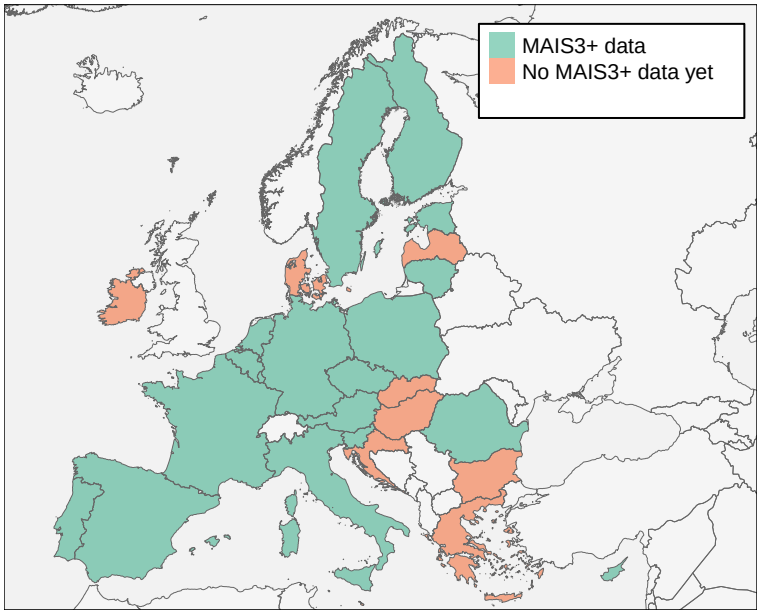
- Create a link between police data and hospital data.
- Report the number of serious injuries based on hospital data.

- Continue to use police data, but apply one or more correction coefficients derived from samples of hospital data.

The EU Transport Ministers agreed in 2017 to adopt the MAIS3+ definition for serious injuries and provide such data to the European Commission. However, as can be seen in the Figure below, not all Member States have yet been able to collect MAIS3+ data.

The linking of police data and hospital data would give the most complete set of information, and this is seen as the preferred data collection method. However, not all countries are able to link these two data sets. In reality, the method used to calculate MAIS3+ injuries differs across Member States. Furthermore, different ICD versions are currently in use. Some countries, such as Italy, use ICD-9 while other countries, such as Austria, Belgium, the Netherlands, Spain, Finland, and Portugal have switched to ICD-10. The transformation from ICD10 to AIS can be problematic.

Figure 9. Map of Member States collecting MAIS3+ data. Source: European Commission



3.1.1 Trend in the number of MAIS3+ casualties

The table below show the MAIS3+ data for 2018, 2019 and 2020 for the countries that are collecting MAIS3+ data.

Table 2. Number of mais3+ casualties per country (2018-2020). Source: CARE

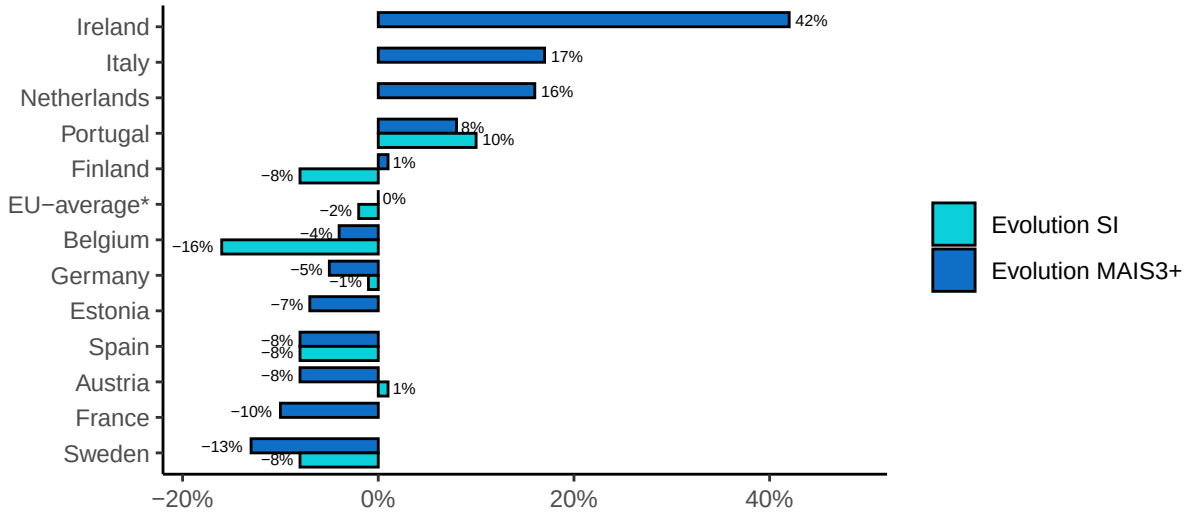
	2018	2019	2020
Austria	1,279	1211	
Belgium	3,549	3736	3240
Cyprus	85		
Czechia	2,619		
Estonia	420	356	346
Finland	956	894	
France	16,104	16248	13337
Germany	15,265	15311	13238
Ireland	475	523	406
Italy	18,614	17600	14102
Lithuania	163	110	86
Netherlands	6,800	6900	6500
Portugal	2,276	2272	2103
Spain	6,059	6162	
Sweden	914		

In the Figure below we calculate the evolution for both MAIS3+ casualties and serious injuries (based on police data) using 2-year averages. Because the serious injuries data in CARE is either not available or not reliable for Italy, France, the Netherlands and because there is no serious injury data for Estonia, no comparison is given for these countries.

There is a difference in the evolution for MAIS3+ casualties and serious injuries based on police data for most countries that are shown in the graph. For Portugal and Spain the difference is small. The evolution for Belgium anf Finland is better when looking at the CARE data compared to MAIS3+ data. For Portugal, Austria, Sweden and Germany the opposite is true.

It is important to remember that each country uses a different method to calculate MAIS3+ casualties, thereby complicating the comparison between countries. Furthermore, as some Member States have only begun to use MAIS3+ in recent years, adjustments to the method within a country may mean that the data are not consistent over time.

Figure 10. Trend of MAIS3+ casualties, compared to the trend of serious injuries based on police data for some European countries (2014-2015 versus 2018-2019). Source: European Commission, CARE

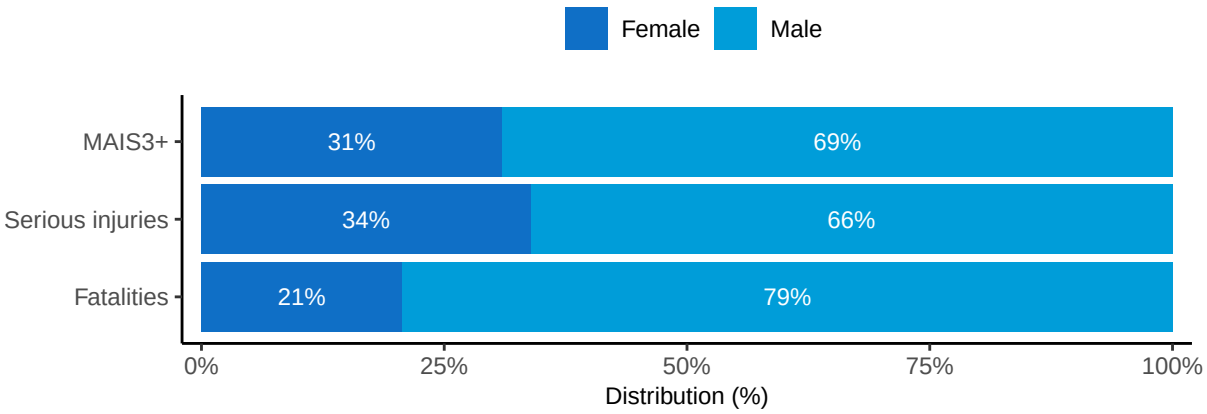


Notes:
− Estonia: 2015−2016 versus 2018−2019
− Sweden: 2014−2015 versus 2017−2018
* the EU average is calculated by summing the data from the countries shown in the graph

3.1.2 Distributions of MAIS3+ compared to police reported fatalities and serious injuries

The **gender** distribution for MAIS3+ casualties, seriously injured and fatalities is shown in Figure 11. The proportion of female road users is higher among MAIS3+ casualties and serious injuries compared to fatalities for the 4 countries that provided data for this comparison. There is little to no difference in the gender distribution of MAIS3+ casualties and seriously injured.

Figure 11. Distribution across gender for MAIS3+ casualties (HDR), serious injuries (CARE) and fatalities (CARE) for some European countries. Source: CARE, European Commission



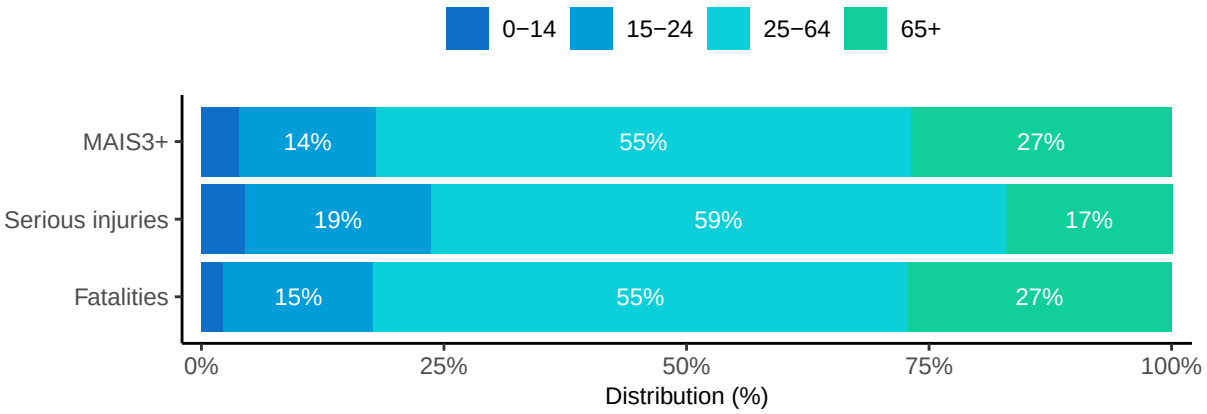
Note: the distribution is calculated for Belgium, Finland, Italy and Lithuania

The **age** distribution for Belgium, Finland and Italy has also been calculated. Again, we compare MAIS3+ casualties to seriously and fatalities, derived from police data.

Compared to fatalities, the proportion of young people is higher among the serious injured victims, while the proportion of elderly (65+ years old) is lower. However, the distribution across age groups

for MAIS3+ casualties is very similar to the distribution of fatalities.

Figure 12. Distribution across age groups for MAIS3+ casualties (HDR), serious injuries (CARE) and fatalities (CARE) for some European countries. Source: European Commission, CARE

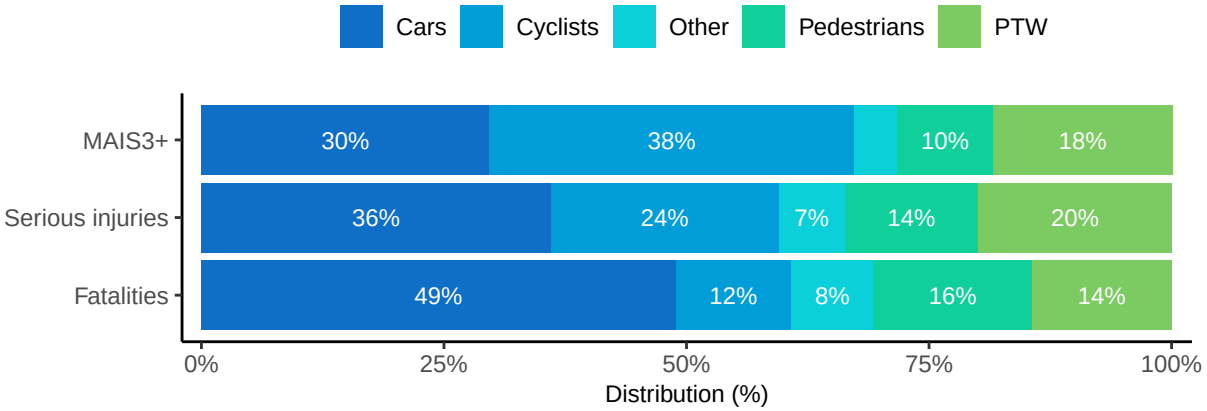


Note: the distribution is calculated for Belgium, Finland and Italy

The distribution across **transport modes** is calculated for Belgium, Finland and Lithuania. Comparing serious injuries to fatalities shows a higher proportion of vulnerable road users and a lower proportion of car occupants among the seriously injured.

This is even more pronounced when comparing MAIS3+ casualties to serious injuries and fatalities, derived from police data. The proportion of car occupants is lower, while the proportion of cyclists is higher.

Figure 13. Distribution across transport modes for MAIS3+ casualties (HDR), serious injuries (CARE) and fatalities (CARE) for some European countries. Source: European Commission, CARE



Note: the distribution is calculated for Belgium, Finland and Lithuania

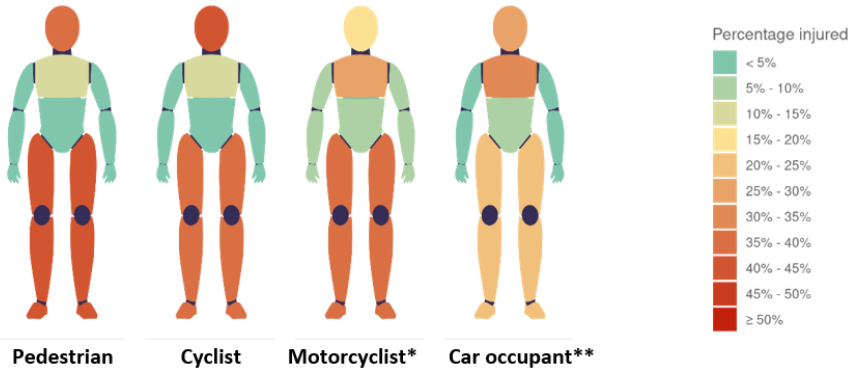
3.2 Injury types

One of the added values of hospital data is the detailed information on the types of injuries sustained by casualties. No medical background is needed to analyse this data as there are several injury matrices that can be applied to the data to extract the body region and the nature of injury from the ICD injury codes, such as the Barell matrix for ICD-9 (Barell et al., 2002) and the Injury Diagnosis Framework for ICD-10 (Hedegaard et al., 2020).

Figure 14 below shows the distribution by transport mode of AIS3+ injuries across 6 body areas (head/neck, chest, abdomen/pelvis, spine/back, upper extremities, lower extremities) for all MAIS3+ casualties for Belgium between 2016-2020, and for Czechia, France, Germany, the Netherlands, Sweden and the IGLAD database (Austria, Italy and Spain) between 2000 and 2014. For Belgium, persons with more than one AIS3+ injury are counted, while for all other countries only one injury was

Each body part is coloured according to the percentage of MAIS3+ casualties with an AIS3+ injury to that particular body part. Serious injuries frequently occur to the head and neck for cyclists and pedestrians, and frequently to the legs for pedestrians, cyclists and motorcyclists. Car occupants are most often injured in the chest and head. The most common types of injury differ by road user type, age, and crash characteristics (Bouwen et al., 2022). (For more information on injury patterns and mechanisms, see Thematic Report Serious injuries, EC, 2021.)

Figure 14. Example figure of injury body profile: distribution of AIS3+ injuries among all MAIS3+ casualties (Belgium (2016-2020) and Czechia, France, Germany, the Netherlands, Sweden and IGLAD database (2000-2014)). Source: Bouwen et al., 2022; Aarts et al., 2016



*** For Belgium, Czechia, France and the IGLAD database, all powered two-wheelers are taken into account**
**** For Belgium, all motorized vehicles (except PTWs) are taken into account**

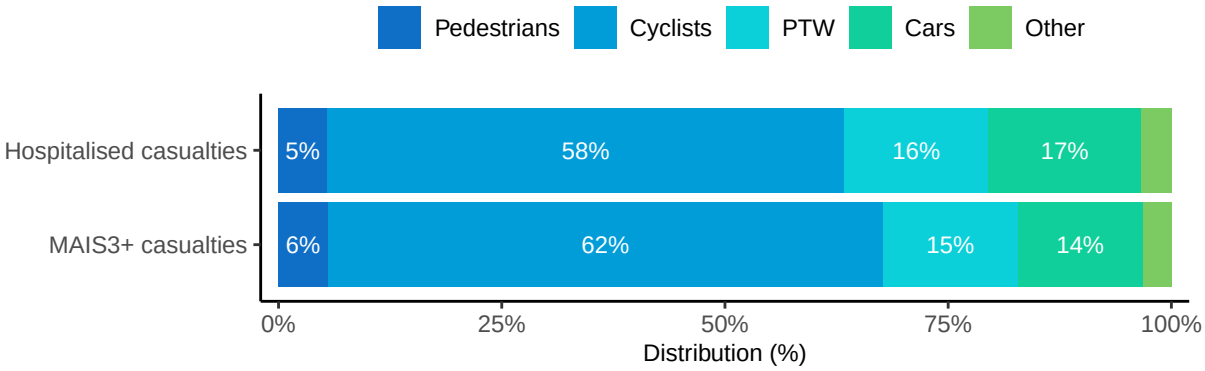
3.3 Other hospital data

Hospital data usually also contain data on traffic casualties with less severe injuries (MAIS levels 1 and 2). Less severe injuries are much more prevalent than serious injuries but can also have a long-lasting impact on casualties' health (European Commission, 2021). Depending on the hospital register, data is available on emergency care, outpatient/daycare, or inpatient care. What is included in the different registers often differs between countries, complicating any country-level comparisons.

The distribution of all hospitalised casualties (all severity levels) across **transport modes** is calculated for Belgium, Estonia, Lithuania, the Netherlands and Slovenia, and is compared to the distribution of MAIS3+ casualties for those same countries.

This figure shows that this distribution differs little between all hospitalised casualties and MAIS3+ casualties. The high proportion of cyclists is striking in both groups (58% and 62%). Furthermore, cars (17% and 14%) and powered two-wheelers (16% and 15%) also have a large share in the total number of victims.

Figure 15. Distribution across transport mode for hospitalised casualties and MAIS3+ casualties for some European countries. Source: European Commission



Notes:
− the distribution is calculated for Belgium, Estonia, Lithuania, the Netherlands and Slovenia
− 2019 data were used for the Netherlands and Slovenia, 2020 data were used for Belgium, Estonia and Lithuania

4 Notes

4.1 References

Aarts, L. T., Commandeur, J. J., Welsh, R., Niesen, S., Lerner, M., Thomas, P., Bos, N., & Davidse, R. J. (2016). Study on serious road traffic injuries in the EU. Publications Office of the European Union. https://doi.org/10.2832/29647

Barell, V., Aharonson-Daniel, L., Fingerhut, L. A., Mackenzie, E. J., Ziv, A., Boyko, V., Abargel, A., Avitzour, M., & Heruti, R. (2002). An introduction to the Barell body region by nature of injury diagnosis matrix. Injury Prevention, 8(2), 91–96. https://doi.org/10.1136/ip.8.2.91

Bos, N.M.; Bijleveld, F.D.; Aarts, L.T & Decae, R.J. (2022). Ernstig verkeersgewonden 2021. Schatting van het aantal ernstig verkeersgewonden in 2021. Den Haag: Stichting Wetenschappelijk Onderzoek Verkeersveiligheid

Bouwen, L., Nuyttens, N., & Martensen, H. (2022). Gehospitaliseerde verkeersslachtoffers – Analyse van Belgische ziekenhuisgegevens van 2005 t.e.m. 2020, Brussel: Vias institute

European Commission (2021) Road safety thematic report – Serious injuries. Eu-ropean Road Safety Observatory. Brussels, European Commission, Directorate General for Transport.

Hedegaard, H., Johnson, R. L., Garnett, M. F., & Thomas, K. E. (2020). The 2020 International Classification of Diseases, 10th Revision, Clinical Modification Injury Diagnosis Framework for Categorizing Injuries by Body Region and Nature of Injury. National Health Statistics Reports.

Pérez, K., Weijermars, W., Amoros, E., Bauer, R., Bos, N., Dupont, E., Filtness, A., Houwing, S., Johannsen, H., Leskovsek, B., Machata, K., Martin, J., Nuyttens, N., Olabarria, M., Pascal, L., & Van den Berghe, W. (2016). Practical guidelines for the registration and monitoring of serious traffic injuries, D7.1 of the H2020 project SafetyCube. https://www.safetycube-project.eu/wp-content/uploads/SafetyCube-D7.1-Practical-guidelines-for-the-registration-and-monitoring-of-serious-traffic-injuries.pdf

Yannis, G., Papadimitriou, E., Chaziris, A., & Broughton, J. (2014). Modeling road accident injury under-reporting in Europe. European Transport Research Review, 6(4), 425–438.

4.2 Definitions

The definitions below are taken from the CADAS Glossary and the UNECE Glossary.

CADAS Glossary: https://road-safety.transport.ec.europa.eu/system/files/2021-07/cadas_glossary_v_3_8.pdf

UNECE/ITF/Eurostat Glossary: https://www.unece.org/index.php?id=52120

Accident / crash
Definition: injury road accident, concerns an incident on a public road involving at least one moving vehicle and at least one casualty (person injured or killed). Note: the definition of “injury” varies considerably among EU countries thus affecting the reliability of cross country comparisons.

Seriously injured:
Total number of seriously injured persons adapted by correction factors when needed. Injured

(although not killed) in the road crash and, in principle, hospitalised for at least 24 hours within 30 days from the crash.

Abbreviated Injury Scale (AIS):
This scale is used to rank the severity of injuries on a scale of 1 (slight injuries) to 6 (untreatable injuries). More information on AIS can be found on the website of the Association for the Advancement of Automotive Medicine (AAAM): https://www.aaam.org/abbreviated-injury-scale-ais/

MAIS3+:
Patients often have more than one injury. The Maximum Abbreviated Injury Scale (MAIS) is the maximal AIS score of all injuries of a person. A road casualty with a MAIS score of 3 or more is referred to as MAIS3+. MAIS3+ casualties are considered to be seriously injured patients. More information can be found in the Thematic report on serious injuries (https://road-safety.transport.ec.europa.eu/system/files/2022-01/Road%20Safety%20thematic%20report%20Serious%20injuries_final.pdf).

Gender
On the basis of identification documents/ personal ID number or determined by the police.

Working week – daytime
Monday to Friday 6.00 a.m. to 9.59 p.m.

Working week – night
Monday 10 p.m. to Tuesday 5.59 a.m.
Tuesday 10 p.m. to Wednesday 5.59 a.m.
Wednesday 10 p.m. to Thursday 5.59 a.m.
Thursday 10 p.m. to Friday 5.59 a.m.

Weekend – daytime
Saturday to Sunday 6.00 a.m. to 9.59 p.m.

Weekend – night
Friday 10 p.m. to Saturday 5.59 a.m.
Saturday 10 p.m. to Sunday 5.59 a.m.
Sunday 10 p.m. to Monday 5.59 a.m.

4.3 Data source

The main data source for this report is CARE (Community database on Accidents on the Roads in Europe). The database contains data obtained from national data sources, not only EU members but also from the UK (up to 2018) and the 4 EFTA countries (Switzerland, Norway, Iceland, and Liechtenstein). The data in the report were extracted on 6 January 2023. As the database is not complete for all countries and all years, additional data were provided by the European Commission in order to be able to calculate the general total for fatalities for the EU27.

4.4 Missing data

Some countries did not provide data for all years and/or all variables to the CARE database. When data are missing for specific combinations of years and countries, imputation is used to fill in the empty cells. Imputation results for individual countries are never published in the Facts and Figures reports, but they are aggregated to generate an imputed number at EU27 level. The following imputation method for individual countries is used:

- Values missing at the end of a time series are given the last known value in the series.
- Values missing at the beginning of a time series are given the first known value in the series.
- If values are missing in the middle of a time series, linear extrapolation is used.


Publications Office