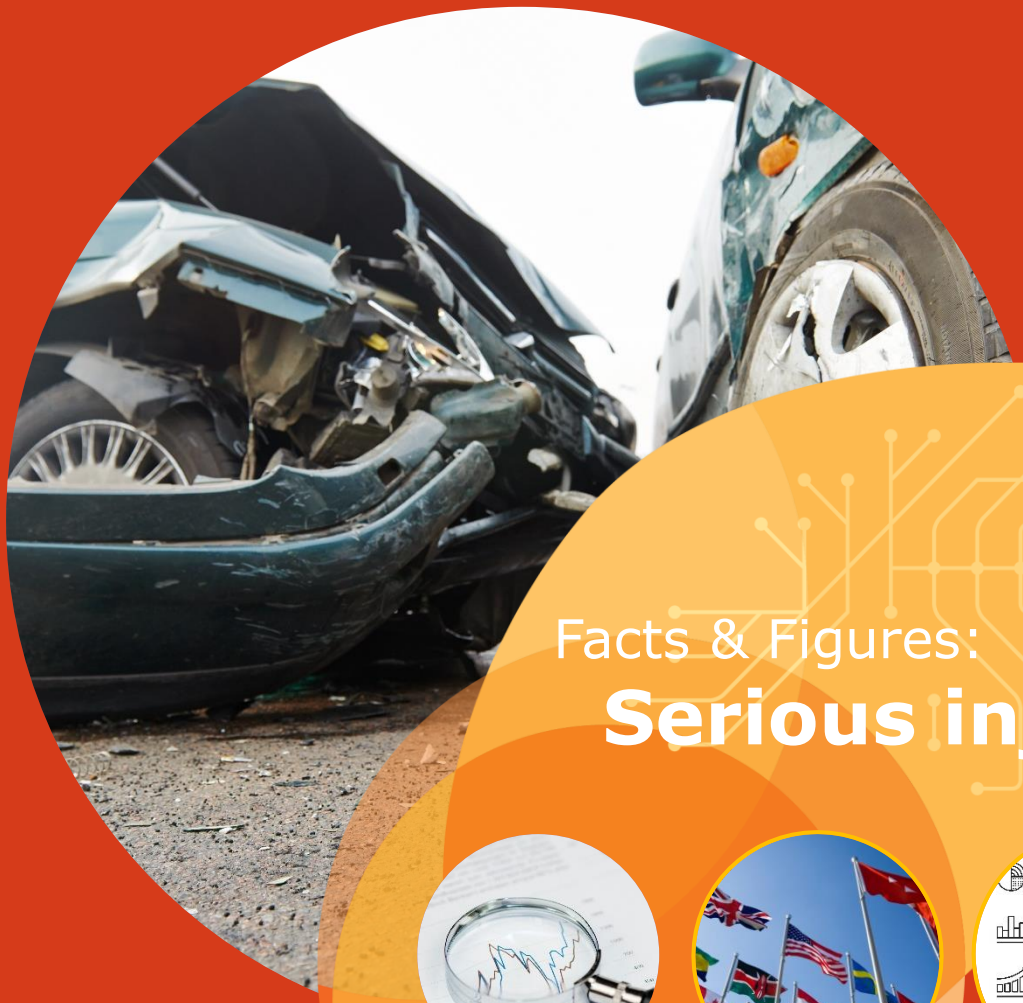
European Commission



Facts & Figures:

Serious injuries

Mobility and Transport

This document is part of a series of 20 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 most recent figures in this Facts and Figures report of 2024 refer to 2022. 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/2022-55/SI2.888215 with National Technical University of Athens (NTUA), SWOV Institute for Road Safety Research and Kuratorium für Verkehrssicherheit (KFV).
Version:	October 2024
Authors:	Susanne Kaiser, Martin Donabauer, Aggelos Soteropoulos (KFV)
Internal Review:	Ingrid van Schagen (SWOV), Katerina Folla (NTUA)
Referencing:	Reproduction of this document is allowed with due acknowledgement. Please refer to the document as follows: *European Commission (2024) 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: May 2024

Disclaimer

Whilst every effort has been made to ensure that the matter presented in this document is relevant, accurate and up to date, the (sub)contractors cannot accept any liability for any errors or omission, or reliance on part or all of the content in another context.

Any information and views set out in this document are those of the author(s) and do not necessarily reflect the official opinion of the European Commission. The Commission does not guarantee the accuracy of the data included in this study. Neither the Commission nor any person acting on the Commission's behalf may be held responsible for the use that may be made of the information contained therein.

© European Commission, 2024.

The EU does not own the copyright in relation to the following elements:

Cover page photos, © www.istockphoto.com

Contents

European Commission

1. Summary

This Facts and Figures report looks at serious injuries resulting from road crashes in EU and EFTA countries. 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** (2019 has since been chosen as the baseline year). There are several sources of data for injuries, including police crash data and hospital discharge data.

Police crash data is the primary source for the official crash data in EU Member States. **According to police crash data, there are on average around 8 serious injuries for every road fatality on EU roads** (France and Italy excluded among others). This ratio of serious to fatal injuries is especially high in Austria, Croatia and Germany, impacting the overall EU average. The police-based data indicates an **average decrease of 19% in serious injuries over the decade 2012-2022**. The share of males among seriously injured road users is 64% compared with 77% of road fatalities. In the age category 65+, the ratio of male to female victims becomes smaller. **Vulnerable road users** (pedestrians, cyclists, moped riders and motorcyclists) **make up a large share of serious injuries (57% EU average)**. Most of the serious injuries in the EU occur on **urban roads, accounting for 57%, half of which are pedestrians. This compares with 38% of fatalities.**

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+).

Around half the EU countries provide data on MAIS3+. Based on this data, on average, there were around 5**serious injuries for each road fatality in the EU in 2022.** This would equate to around 100,000 seriously injured people. Based on MAIS3+ data, the share of males among seriously injured road users lies between 61% in the Netherlands and 76% in Spain. Regarding the distribution among age groups, **the Netherlands show a high share of seriously injured road users aged 65 or older while in France, a quarter of seriously injured road users are 15 to 24 years of age.** Looking

at the numbers of serious injuries in relation to fatal injuries per road user type for selected countries show that **ratios are especially high for cyclists** (between 7 in Spain and 26 in the Netherlands). In general, the **ratios for cyclists based on MAIS3+ data are also significantly higher compared to ratios based on police crash data**, **indicating substantial underreporting of cycling crashes** for the latter.

European Commission

2. Police crash data

Traditionally, the main source of information on road crashes resulting in serious injuries has been the crash data recorded by the police. These are the official data for most countries' crash statistics, at national and European level (CARE database).

In general, a seriously injured person is defined as any person injured who was hospitalised 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. The lack of standardisation poses a challenge to comparability between countries (Yannis et al., 2014). For an overview of national definitions see ETSC (2024).

Although the data collected by the police are very detailed, care should also be taken when using and interpreting them due to underreporting and misreporting. These issues impact the completeness and accuracy of the data (European Commission, 2021). Estonia, France and Italy provide police data on all injuries but do not distinguish between slightly and seriously injured. Instead, they provide hospital-based data on MAIS3+. Breaks in time series are recorded for Ireland, Netherlands and Romania. It is important to note that Germany accounts for a disproportionately high share of all police-reported serious injuries in the EU.

2.1 Absolute number of police-reported serious injuries

Table 1. Serious injuries per country in the EU27 and EFTA based on police-reported data (2012-2022). Source: CARE

Country	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	LT*	ST*
Belgium	4,736	4,581	4,484	4,181	4,095	3,762	3,636	3,600	2,968	3,098	3,400	-28%	-6%
Bulgaria	2,204	2,304	2,175	2,295	2,503	1,951	1,983	1,937	1,556	1,458	1,766	-20%	-9%
Czechia	2,934	2,721	2,714	2,487	2,530	2,287	2,395	2,061	1,760	1,580	1,681	-43%	-18%
Denmark	1,809	1,736	1,556	1,465	1,505	1,378	1,436	1,277	1,203	1,163	1,227	-32%	-4%
Germany	66,279	64,057	67,732	67,706	67,426	66,513	67,967	65,244	58,005	55,137	57,727	-13%	-12%
Ireland	474	508	755	826	956	1,055	1,359	1,506	1,147	-	-	-	-
Greece	1,399	1,212	1,016	999	879	706	727	652	518	610	664	-53%	2%
Spain	10,445	10,086	9,574	9,495	9,755	9,546	8,935	8,613	6,681	7,784	8,502	-19%	-1%
Croatia	3,051	2,831	2,675	2,822	2,746	2,776	2,731	2,488	2,295	2,610	2,910	-5%	17%
Cyprus	551	407	467	377	406	388	348	340	211	252	253	-54%	-26%
Latvia	493	452	434	479	525	496	542	461	490	-	-	-	-
Lithuania	-	579	536	426	742	368	165	308	376	392	476	-	55%
Luxembourg	339	316	245	319	249	256	273	248	217	267	267	-21%	8%
Hungary	4,921	5,369	5,331	5,575	5,541	5,630	5,559	5,485	4,655	4,595	5,041	2%	-8%
Malta	299	265	292	306	293	312	317	305	242	339	-	13%	11%
Netherlands	-	-	-	13,327	13,502	13,075	13,470	12,425	10,222	7,424	8,420	-	-
Austria	8,017	7,344	7,434	7,486	7,566	7,664	7,631	7,384	6,650	6,945	7,258	-10%	-2%
Poland	12,049	11,672	11,696	11,200	12,078	11,103	10,941	10,633	8,805	8,276	7,541	-37%	-29%
Portugal	1,941	1,946	2,010	2,148	1,999	2,117	2,195	2,383	1,877	2,161	2,302	19%	-3%
Romania	8,860	8,158	8,122	9,056	8,285	8,183	8,144	8,125	5,491	3,796	3,690	-	-
Slovenia	848	708	826	932	850	851	821	814	678	784	862	2%	6%
Slovakia	1,122	1,088	1,098	1,121	1,027	1,103	1,247	1,030	894	854	866	-23%	-16%
Finland	-	-	-	477	460	409	485	390	408	368	334	-	-14%
Sweden	2,976	2,716	2,389	2,445	2,347	2,275	2,195	1,951	1,646	1,696	1,911	-36%	-2%
Iceland	136	177	177	178	215	189	183	182	149	199	195	43%	7%
Norway	699	703	674	693	656	665	602	565	627	569	578	-17%	2%
Switzerland	4,202	4,129	4,043	3,830	3,785	3,654	3,873	3,639	3,793	3,933	4,002	-5%	10%

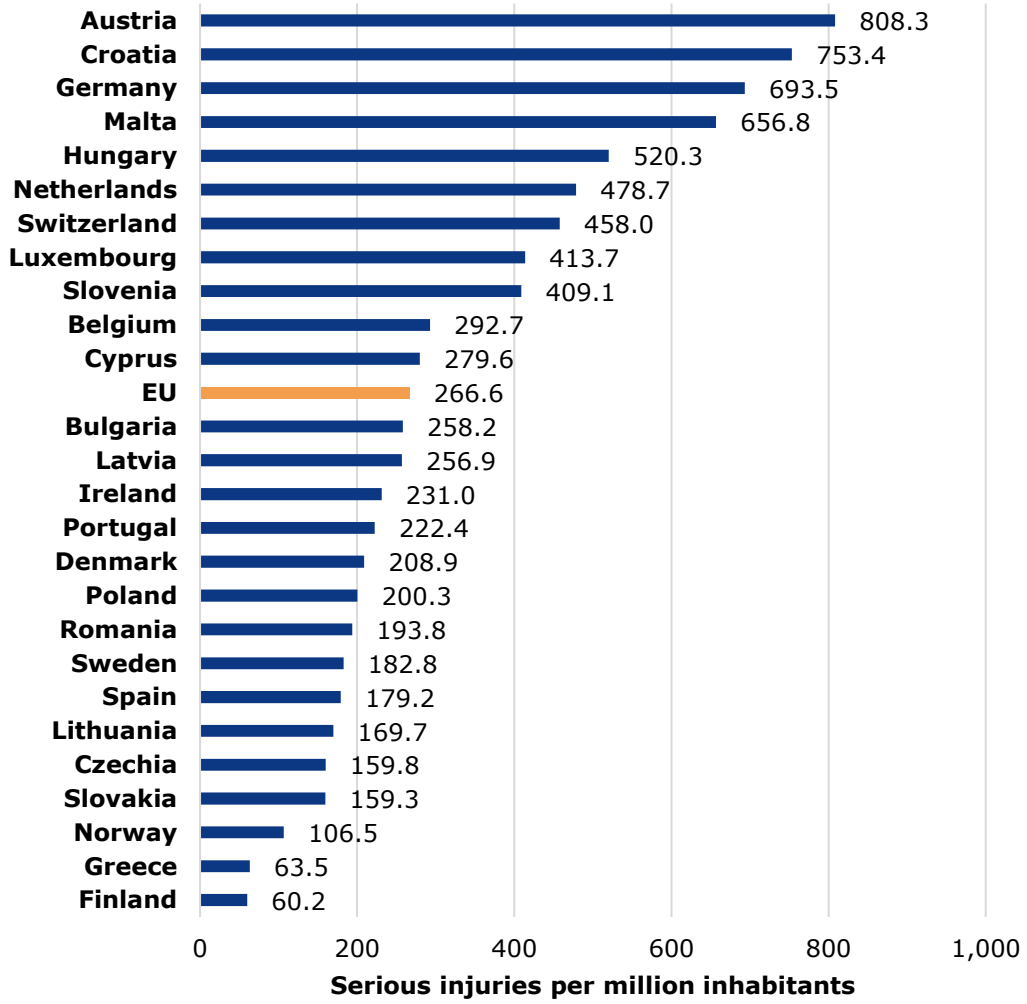
*LT = Long term change of last available year over 2012.
*ST = Short term change of last available year over 2019.
Notes:
- Short and long term trends are not provided for Ireland, Netherlands and Romania due to breaks in time series.
- Estonia, France and Italy provide police data on all injuries but do not distinguish between slightly and seriously injured. Instead, France and Italy provide hospital-based data on MAIS3+. Estonia uses hospital data to determine how long the person remained in hospital.

European Commission

2.2 Police-reported serious injuries per million inhabitants

According to police crash data, Austria, Croatia and Germany show high numbers of serious injuries per million inhabitants in 2022, more than twice as high as the EU average (Figure 1). On average there were **around 8 serious injuries for each road fatality in the EU** in 2022 (excluding Italy and France amongst others).

Figure 1. Serious injuries per million inhabitants per country in the EU27 and EFTA based on police-reported data (2022). Source: CARE

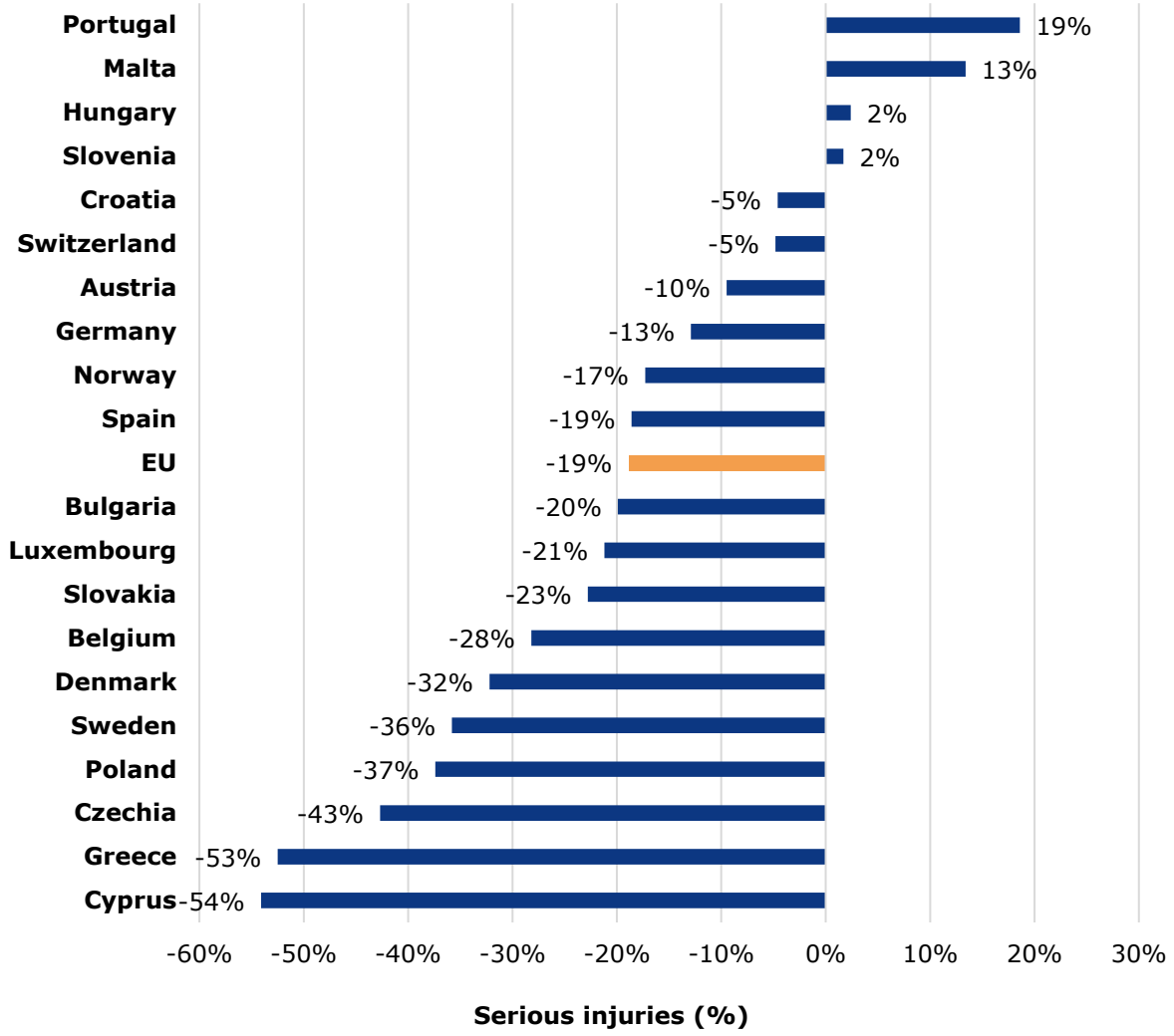


Notes:
- Estonia, France and Italy provide police data on all injuries but do not distinguish between slightly and seriously injured. Instead, France and Italy provide hospital-based data on MAIS3+. Estonia uses hospital data to determine how long the person remained in hospital.
- Iceland is not included in the figure because the number of serious injuries is very low.
- For Ireland, Latvia and Malta the missing value for 2022 was imputed with the last known value in the series.

2.3 Trend in the number of police-reported serious injuries

The evolution of police-reported serious injuries for individual Member States throughout the last decade is shown in Figure 2. **The EU average indicates a decrease of 19% in serious injuries within a decade**. The numbers of serious injuries have increased in Portugal, Malta, Hungary and Slovenia.

Figure 2. Percentage long term change in the number of serious injuries per country in the EU27 and EFTA based on police-reported data (2012-2022).

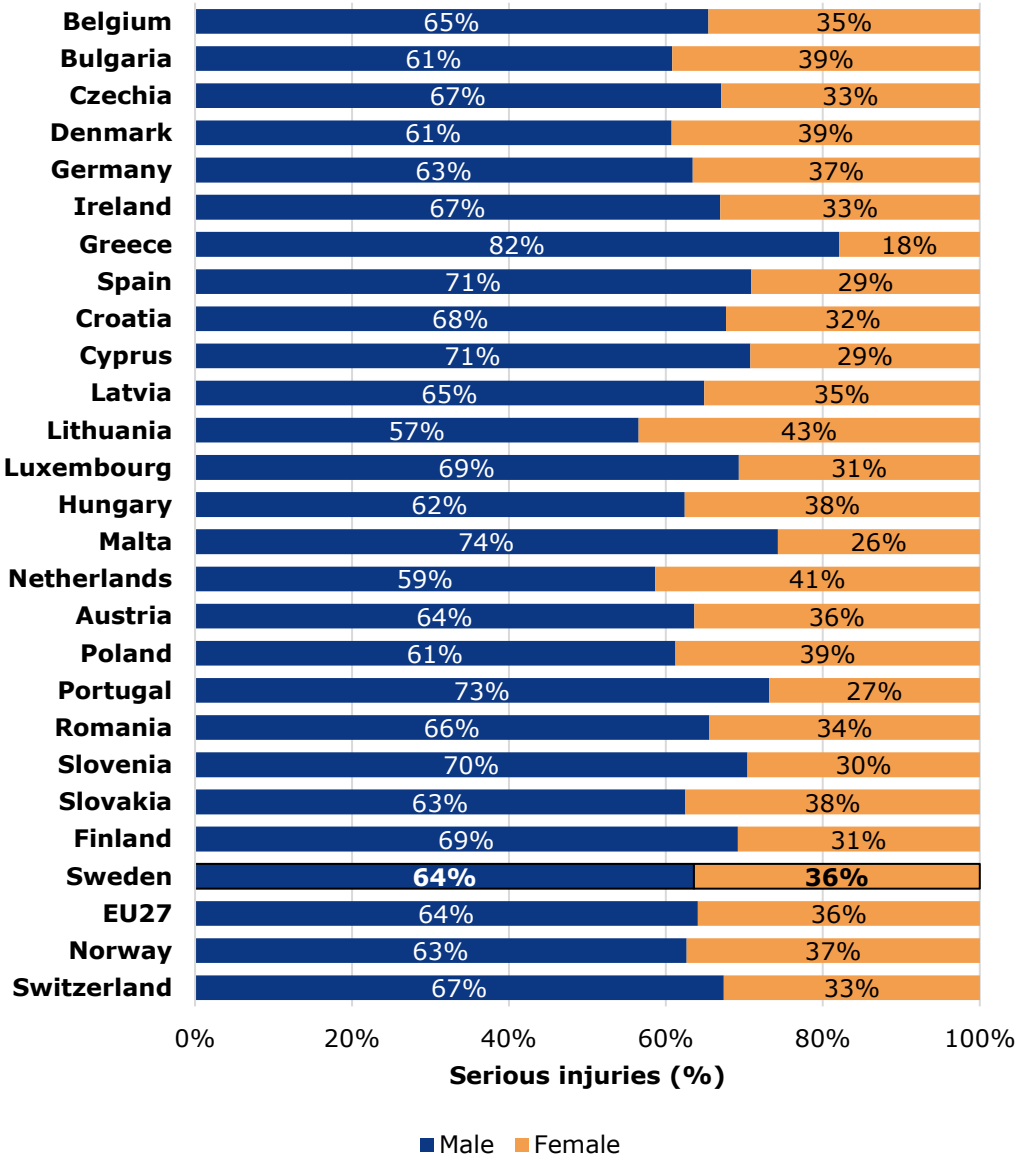


Notes:
- Estonia, France and Italy provide police data on all injuries but do not distinguish between slightly and seriously injured. Instead, France and Italy provide hospital-based data on MAIS3+. Estonia uses hospital data to determine how long the person remained in hospital.
- Iceland is not included in the figure because the number of serious injuries is very low.
- Ireland, Netherlands and Romania are not included in the figure because there is a break in time series.
- For Latvia and Malta the missing value for 2022 was imputed with the last known value in the series.

2.4 Gender and Age

According to the police records, in the EU on average, **the share of males among seriously injured road users is 64%, while the share is 77% among road fatalities.** This ratio is relatively high in Greece (82% male serious injuries), which is more in line with the high share of males in fatalities.

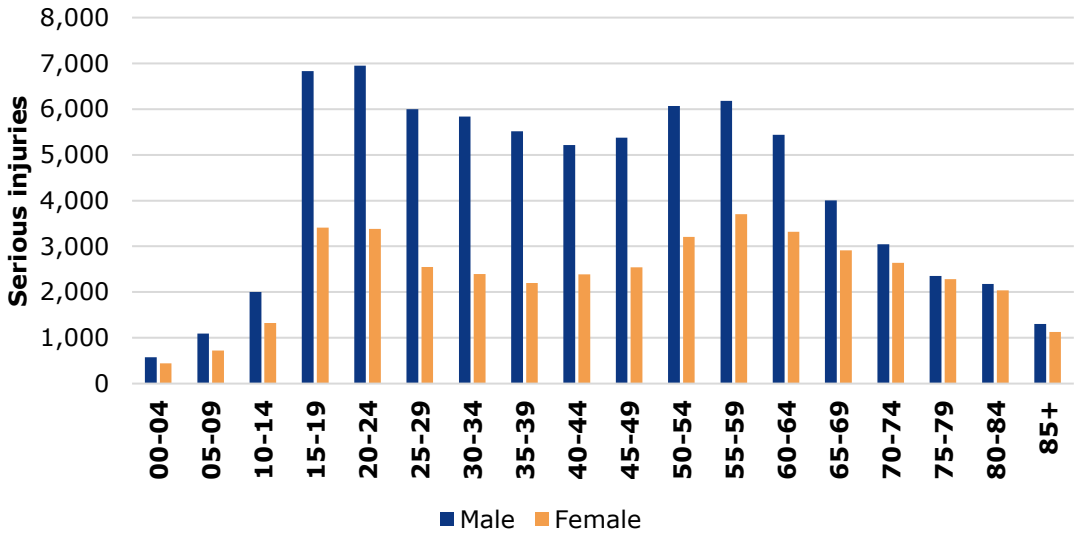
Figure 3. Distribution of serious injuries by gender per country in the EU27 and EFTA based on police-reported data (2022). Source: CARE



Notes:
- Estonia, France and Italy provide police data on all injuries but do not distinguish between slightly and seriously injured. Instead, France and Italy provide hospital-based data on MAIS3+. Estonia uses hospital data to determine how long the person remained in hospital.
- Iceland is not included in the figure because the number of serious injuries is very low.
- For Ireland, Latvia and Malta the missing value for 2022 was imputed with the last known value in the series.

Figure 4 shows that **the share of seriously injured men and women considerably varies by age groups.** From the age of 15 onwards the share of males increases considerably until the age of 24, and this trend remains up to the age category of 60-64. **From 65 years of age onwards, the ratio of male to female victims becomes smaller.**

Figure 4. Distribution of serious injuries over 5-year age categories and by gender in the EU27 based on police-reported data (2022). Source: CARE

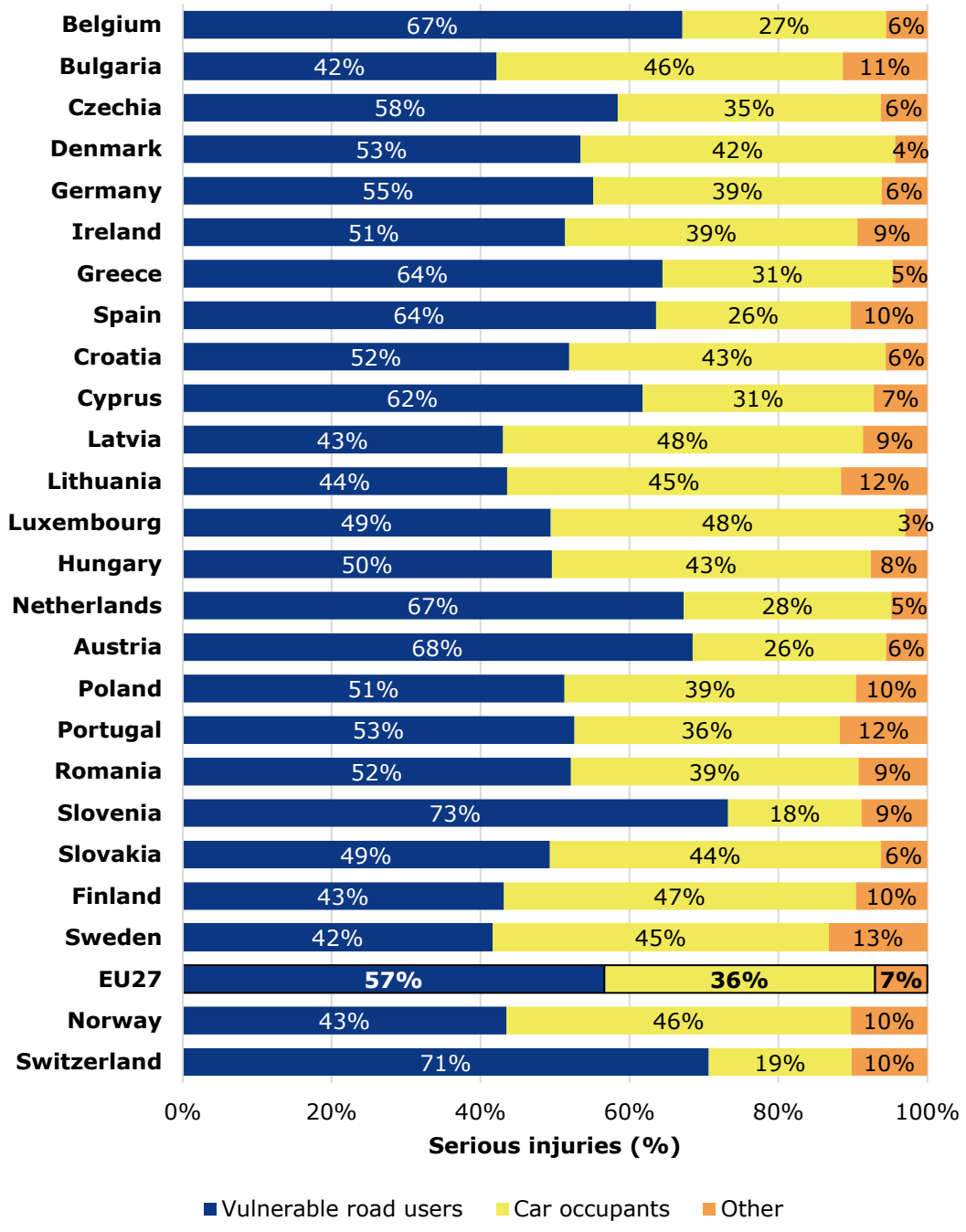


Notes:
- Estonia, France and Italy provide police data on all injuries but do not distinguish between slightly and seriously injured. Instead, France and Italy provide hospital-based data on MAIS3+. Estonia uses hospital data to determine how long the person remained in hospital.
- For Ireland, Latvia and Malta the missing value for 2022 was imputed with the last known value in the series.

2.5 Road users

Vulnerable road users (pedestrians, cyclists, moped riders and motorcyclists) **make up a large share of seriously injured road users, with 57% on average in the EU** according to the police data. Among road fatalities the EU average is 47%. Serious injuries of vulnerable road users are particularly underrepresented in police crash data compared to hospital data. A comparison of the two data sources regarding different road user groups can be found in section 3.4.

Figure 5. Distribution of serious injuries by transport mode per country in the EU27 and EFTA based on police-reported data (2022). Source: CARE

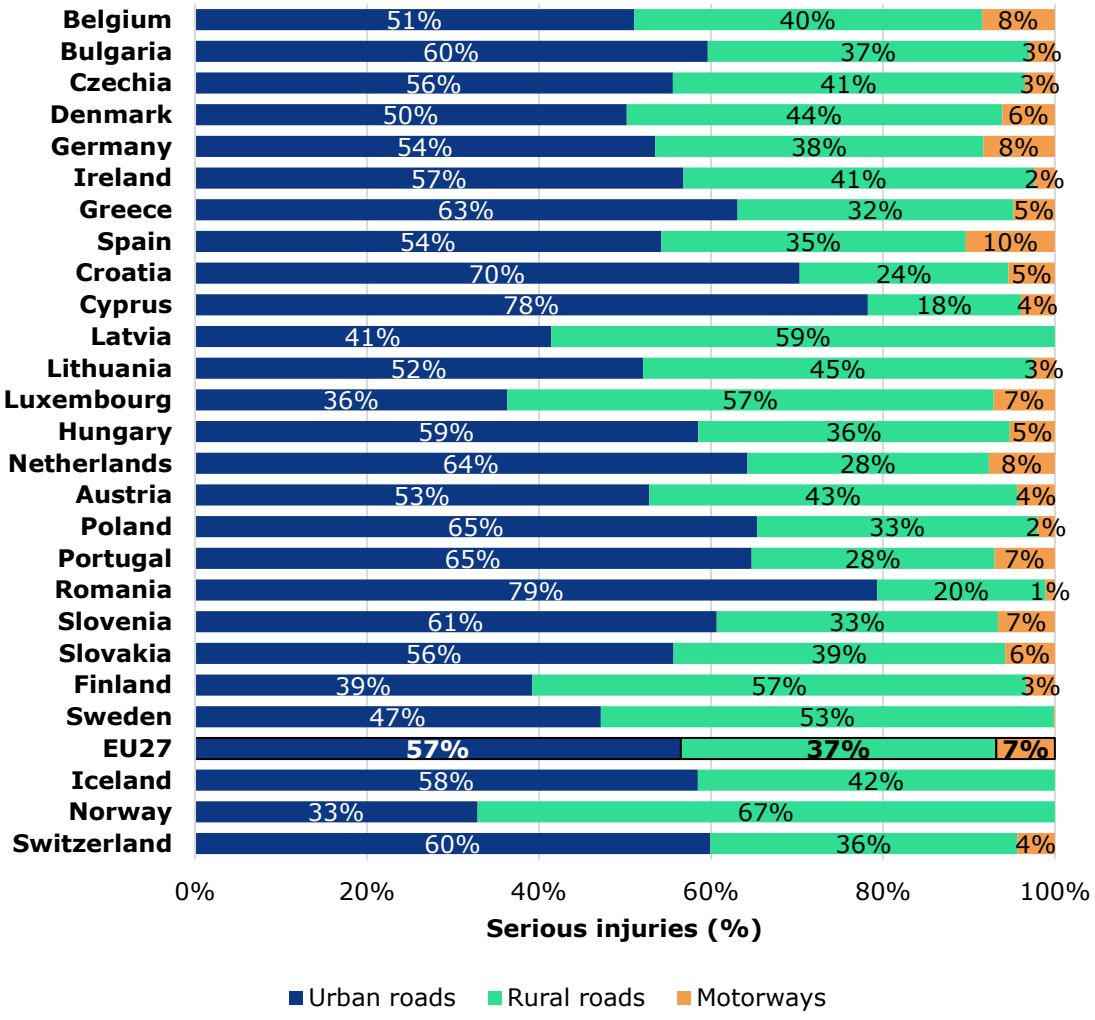


Notes:
- Estonia, France and Italy provide police data on all injuries but do not distinguish between slightly and seriously injured. Instead, France and Italy provide hospital-based data on MAIS3+. Estonia uses hospital data to determine how long the person remained in hospital.
- Iceland is not included in the figure because the number of serious injuries is very low.
- For Ireland, Latvia and Malta the missing value for 2022 was imputed with the last known value in the series.

2.6 Road type

Most of the serious injuries in the EU occur on **urban roads, accounting for 57% of serious injury crashes**. For road fatalities, this share is 38%.

Figure 6. Distribution of serious injuries by road type per country in the EU27 and EFTA based on police-reported data (2022). Source: CARE

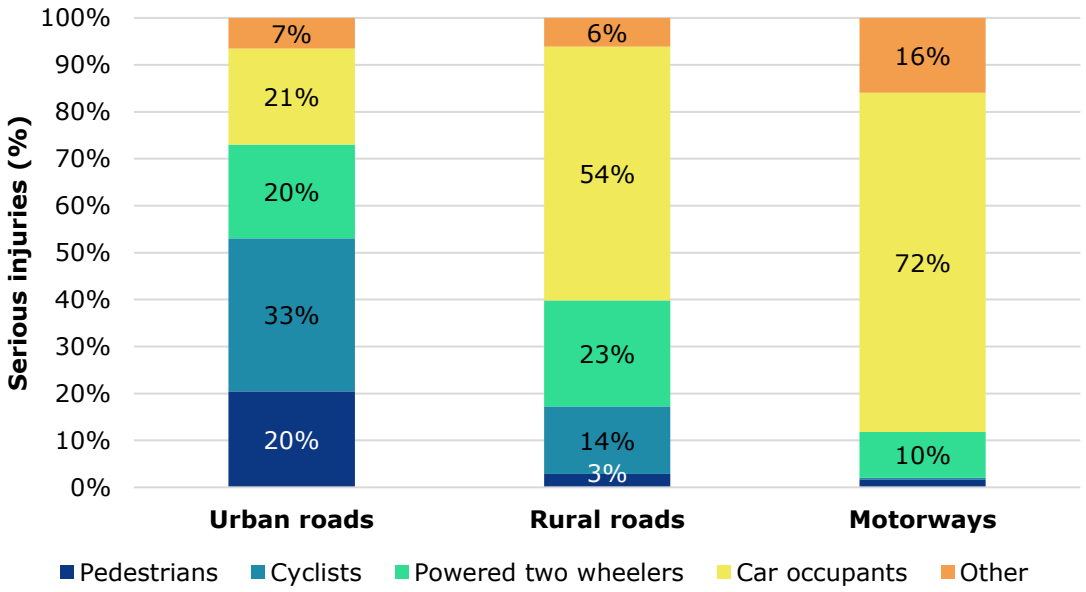


Notes:
- Estonia, France and Italy provide police data on all injuries but do not distinguish between slightly and seriously injured. Instead, France and Italy provide hospital-based data on MAIS3+. Estonia uses hospital data to determine how long the person remained in hospital.
- Iceland is not included in the figure because the number of serious injuries is very low.
- For Ireland and Latvia the missing value for 2022 was imputed with the last known value in the series.
- Malta is not included in the figure due to data inconsistencies.

Looking closer at seriously injured road users on urban roads reveals that **cyclists and pedestrians make up for more than 50% of all serious injuries (33% and 20%). Compared to the distribution of fatalities, the share of cyclists in serious injuries is much**

higher (15% among fatalities). In reality, the shares of pedestrians and cyclists, in particular, are likely to be substantially higher due to underreporting of these types of crashes (e.g. Bos et al., 2022 or Bouwen et al., 2022).

Figure 7. Distribution of serious injuries by transport mode and road type in the EU27 based on police-reported data (2022). Source: CARE



Notes:
- Estonia, France and Italy provide police data on all injuries but do not distinguish between slightly and seriously injured. Instead, France and Italy provide hospital-based data on MAIS3+. Estonia uses hospital data to determine how long the person remained in hospital.
- For Ireland, Latvia and Malta the missing value for 2022 was imputed with the last known value in the series.

3. Hospital data (MAIS3+)

Data from Hospital Discharge Registers (HDRs) provide an alternative measure to the police-reported data on serious injuries resulting from road crashes. Hospitals are obliged to collect and register patient data mainly for financial purposes. HDRs 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).

The Abbreviated Injury Scale (AIS) is a globally accepted anatomical-based trauma classification of injuries published by the Association for the Advancement of Automotive Medicine (AAAM). It is used by medical professionals to describe injuries and rank their severity on an ordinal scale from 1 (minor injuries) to 6 (non-treatable injuries). As one person can have more than one injury, the Maximum Abbreviated Injury Scale (MAIS) is the maximum AIS of all injury diagnoses for a person. Injuries diagnosed equivalent to a score of 3 or higher (more severe) on the MAIS are considered to be serious injuries. As the severity of injuries are derived from medical diagnoses, this substantially reduces the risk of misreporting.

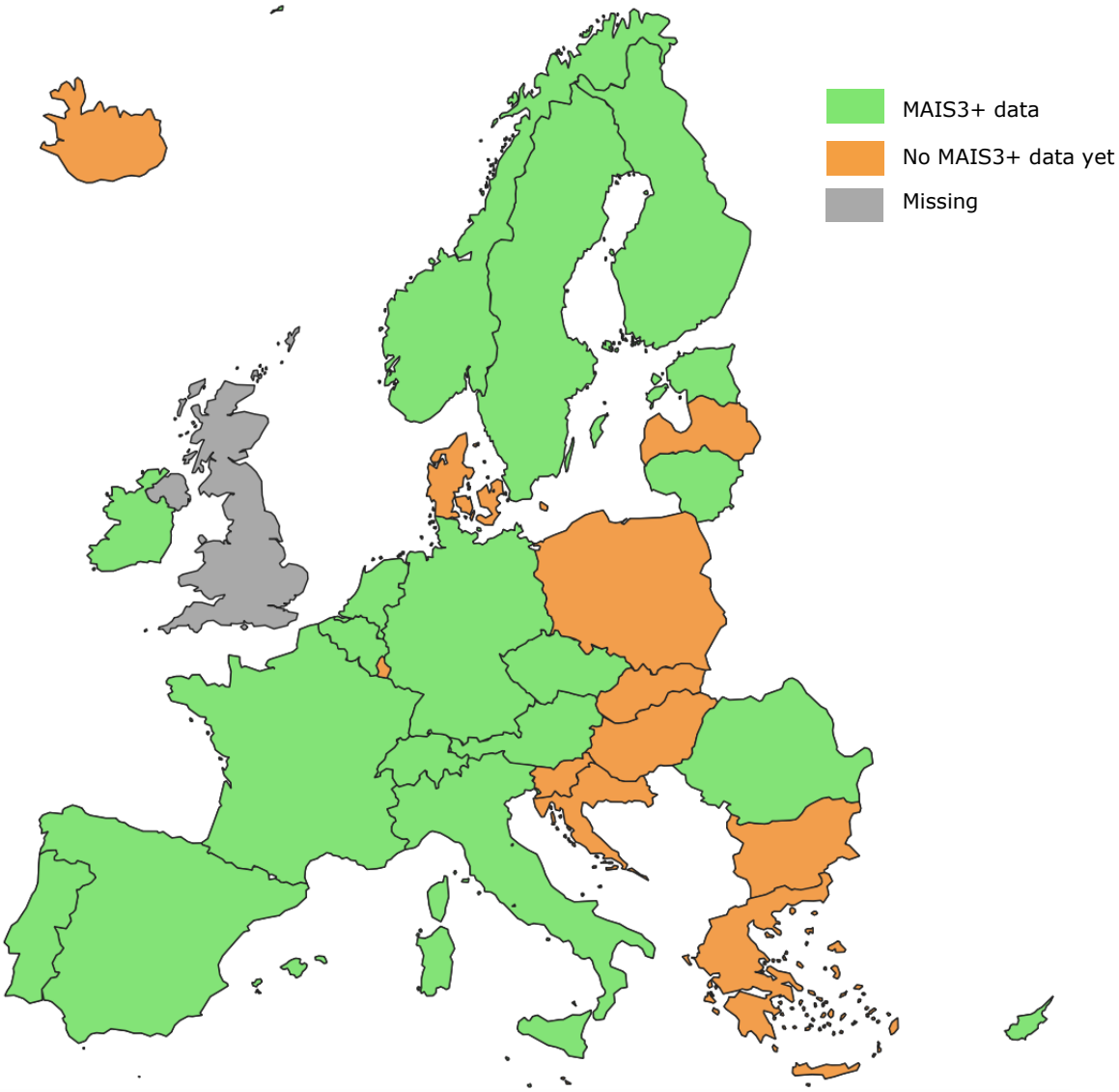
Although direct coding in AIS is preferred, medical diagnoses are usually coded using the WHO's International Classification of Diseases (ICD). This requires a transformation from ICD to AIS, which provides some challenges. The Commission has worked closely with Member States and AAAM who provided a conversion tool. They also provided some tutorials and other training tools which have been made public[1]. In 2017, EU Transport Ministers agreed to provide MAIS3+ data to the Commission.

Figure 8 shows countries which have provided MAIS3+ data for 2022 (or up till 2021, 2020 or 2019).

Several countries have produced further analysis using MAIS3+ including the Netherlands[2], Ireland[3] and Belgium[4]. In France, they measure also the injuries with long-term consequences, looking at those with traumatic sequelae one year after the crash[5].

[1] https://road-safety.transport.ec.europa.eu/european-road-safety-observatory/data-and-analysis/serious-injuries_en
[2] https://swov.nl/en/fact-sheet/serious-road-injuries-netherlands
[3] https://www.rsa.ie/road-safety/statistics/road-traffic-collision-data
[4] https://www.vias.be/en/research/notre-publications/statistisch-rapport-gehospitaliseerde-verkeersgewonden-in-2022/
[5] https://www.onisr.securite-routiere.gouv.fr/etat-de-linsecurite-routiere/bilans-

Figure 8. Map of countries collecting MAIS3+ data in the EU27 and EFTA in 2022 or last year available. Source: European Commission



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, few 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.

annuels-de-la-securite-routiere/bilan-2023-de-la-securite-routiere

3.1 Absolute numbers of serious injuries (MAIS3+)

On average, when looking at MAIS3+ data, there were **around 5 serious injuries for each road fatality in the EU in 2022**[6] (for countries with MAIS3+ data). Applying this ratio to the road deaths in the EU27 according to CARE would result in around 100,000 seriously injured road users in 2022.

Table 2. Absolute number of MAIS3+ causalities per country in the EU27 and EFTA (2019-2022) and ratios of serious injuries to fatalities in the EU27 and EFTA (2022 or last available year). Source: European Commission, CARE

	2019	2020	2021	2022	Ratio MAIS3+ serious injuries to fatalities
Belgium	3,493	3,167	3,150	3,386	6.3
Czechia	2,619	-	-	-	4.2
Germany	15,311	13,238	12,244	12,485	4.5
Estonia	356	346	-	-	5.9
Ireland	523	406	483	567	3.7
Spain	6,162	4,793	5,654	6,066	3.5
France	16,248	13,337	15,944	15,956	4.9
Italy	17,600	14,102	15,990	16,875	5.3
Cyprus	85	-	-	-	1.7
Lithuania	110	86	81	74	0.6
Netherlands	6,940	6,510	6,760	8,230	12.6
Austria	1,211	988	1,078	1,204	3.3
Portugal	2,281	2,201	2,267	2,327	3.8
Romania	-	-	3,796	3,690	2.3
Finland	894	915	807	835	4.3
Sweden	702	590	901	1,230	5.4
Norway	565	627	569	578	4.7
Switzerland	3,086	3,207	3,385	3,760	15.6

Notes:
- MAIS3+ data for Czechia and Cyprus refer to 2018 instead of 2019; Romania began to use MAIS3+ in CARE as from 2021; Break in time series for Sweden in 2022, largely due to a new law-making hospital data reporting mandatory from 1st of June 2021 (informed consent was no longer necessary from this date).
- MAIS3+ data is currently not available for Bulgaria, Denmark, Greece, Croatia, Latvia, Luxembourg, Hungary, Malta, Poland, Slovenia, Slovakia and Iceland.

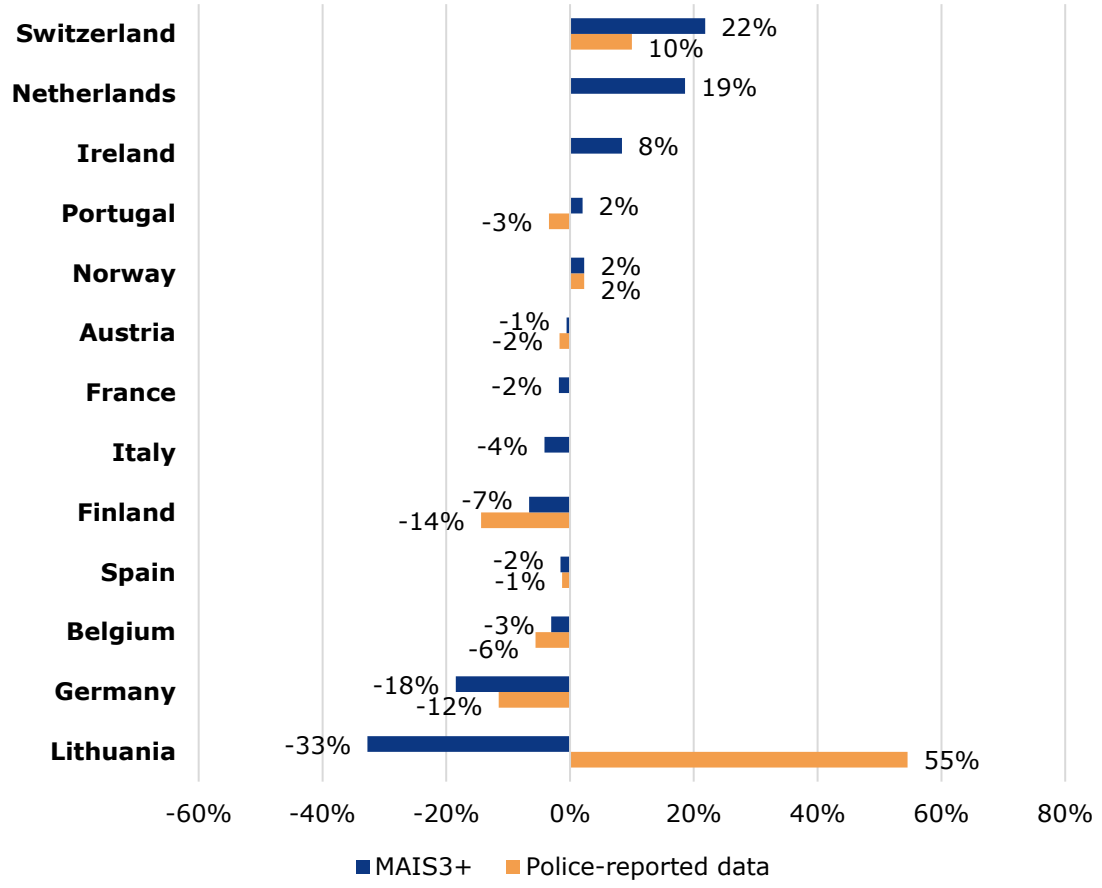
[6] or last available year

European Commission

3.2 Trend in the number of serious injuries (MAIS3+)

The figure below shows the development of serious injuries since 2019 for countries providing MAIS3+ data. This is contrasted with the respective decreases and increases based on police-reported data (whenever applicable, see Section 2). There is a difference in the development of serious injures based on the MAIS3+ and police-reported data for most of the countries displayed. There is a substantial difference in the data depending on the data source for Lithuania.

Figure 9. Percentage short term change in the number of MAIS3+ casualties, compared to percentage short term change of serious injuries based on police-reported data per country in the EU27 and EFTA (2019-2022). Source: European Commission, CARE



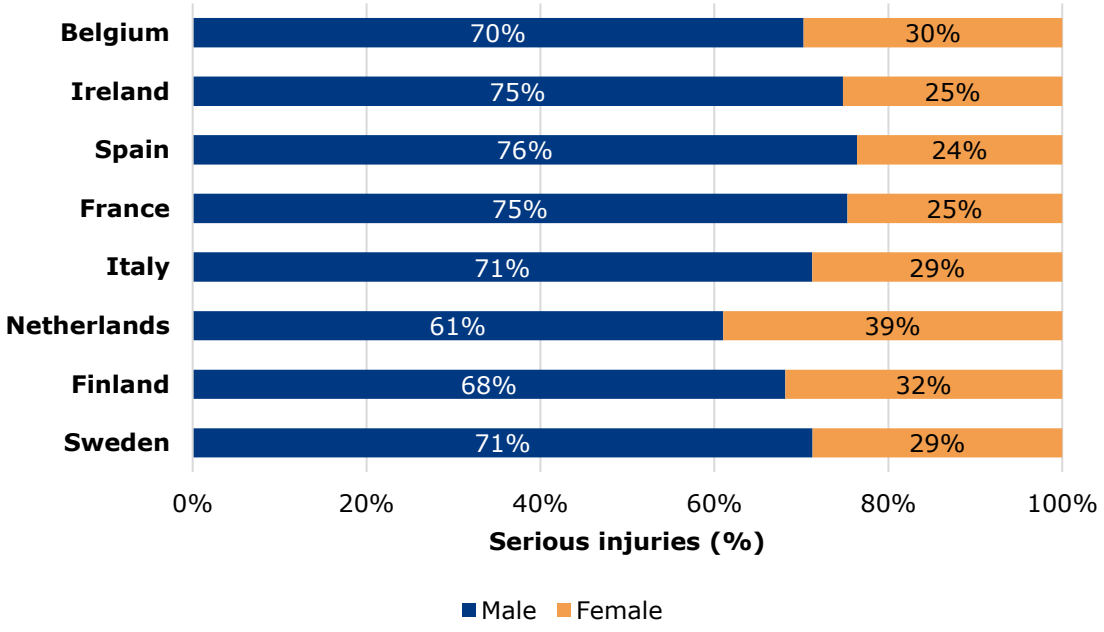
Notes:
- Sweden is not included due to a break in time series in 2022 for MAIS3+ data collection, largely due to a new law-making hospital data reporting mandatory from 1st of June 2021 (informed consent was no longer necessary from this date).
- Czechia, Estonia and Cyprus are not included due to missing MAIS3+ data for 2022 or 2021.
- Romania started collecting MAIS3+ data in 2021 and therefore is not included.

3.3 Gender and Age

Looking at crash data in more detail and breaking down datasets into meaningful groups is insightful. Eight EU countries are providing not only the total number of (MAIS3+) seriously injured but also by age group, gender and road user type: Belgium, Ireland, Spain, France, Italy (gender and age only), Netherlands, Finland and Sweden.

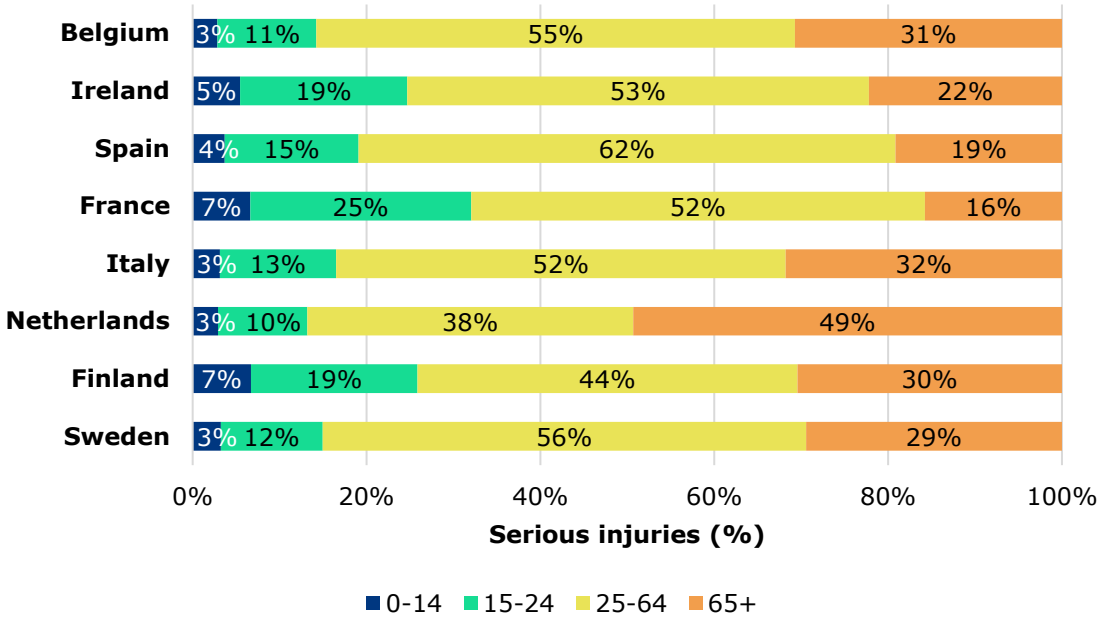
The share of males among seriously injured road users based on MAIS3+ data varies between 61% in the Netherlands and 76% in Spain.

Figure 10. Distribution of serious injuries by gender (2022). Source: European Commission



Based on the MAIS3+ data, the distribution of serious injuries by age groups varies between countries. **The Netherlands show a high proportion of seriously injured road users in the age group 65+**, accounting for almost half of all serious injuries. **In France, a quarter of serious injury casualties fall upon the group 15- to 24-year-old** road users.

Figure 11. Distribution of serious injuries by age groups (2022). Source: European Commission



3.4 Road users

On average there are around 5 serious injuries for each fatality in the EU and for all road user groups (2022). For five countries it was possible to calculate this ratio for different road user groups for 2022 and to compare them with ratios based on police-reported data (Table 3). For cyclists, the **ratios are significantly higher compared with those based on police crash data,** except for Spain, **indicating underreporting of cycling crashes leading to serious injuries**.

Table 3. Ratios of MAIS3+ casualties to road fatalities and police-reported casualties to road fatalities per road user group for selected EU countries (2022). Source: European Commission, CARE

	Year	Cars		PTW		Pedestrians		Cyclists	
		MAIS3+	Police	MAIS3+	Police	MAIS3+	Police	MAIS3+	Police
Belgium	2022	3	4	8	8	4	5	16	12
Spain	2022	1	3	4	7	2	5	7	9
France	2022	3	n.a.	7	n.a.	4	n.a.	11	n.a.
Netherlands	2022	3	10	15	23	6	7	26	14
Finland	2022	2	1	6	3	3	1	16	2
Sweden	2022	3	8	5	7	4	8	25	13

Notes:
- Ireland was excluded because there is no data on MAIS3+ casualties and fatalities for the same year available.
- Italy was excluded because there is no break down data on road user groups available.

3.5 Other hospital data

Other hospital data on road crashes 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. 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.

By way of illustration, in Ireland, a study of records for the period 2014-2022, revealed that, in general, the number of hospitalised casualties with injuries from road traffic collisions is higher than the number of serious injuries recorded by the police. For example, in 2022 there were 2,344 hospitalised cases, 1,683 reported by police and 567 recorded as MAIS3+.

The size of this difference can vary for each road user type. For instance, the number of cyclists recorded in hospital data is between 2 and 3 times higher than the number of cyclists with serious injuries in police records.[7]

[7] https://www.rsa.ie/docs/default-source/road-safety/r2---statistics/analysis-of-road-users/serious-injuries-in-ireland-using-hospital-and-an-garda-s%C3%ADoch%C3%A1na-data-2014-2022.pdf?sfvrsn=98136496_5

4. Notes

4.1 References

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. European Road Safety Observatory. Brussels, European Commission, Directorate General for Transport.

ETSC (2024). Ranking EU progress on road safety. 18th Road Safety Performance Index (PIN) Report. ETSC-18th-PIN-Annual-Report-DIGITAL-V3.pdf

Pérez, K., Weijermars, W., Amoros, E., Bauer, R., Bos, N., Dupont, E., …, Van den Berghe, W., (2016), Practical guidelines for the registration and monitoring of serious traffic injuries, D7.1 of the H2020 project SafetyCube.

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 as well as the UNECE Glossary.

CADAS Glossary:
https://road-safety.transport.ec.europa.eu/system/files/2023-09/CADaS%20Glossary_v%203_8_1.pdf

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

Accident / crash
An 'injury' road crash 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 and is open to interpretation by the police thus affecting the reliability of cross-country comparisons.

Car / passenger car
Motor vehicle with 3 or 4 wheels, mainly used to transport people, seating for no more than 8 occupants. Motor vehicles with these characteristics used as taxis as well as motor caravans are also included.

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

Seriously injured (as reported)
Total number of persons seriously injured as reported by the country to the European Commission. The standard definition is hospitalised for at least 24 hours although a number of countries deviate from this.

Rural roads (roads outside urban areas)
Public roads outside urban boundary signs, excluding motorways.

Urban roads (roads inside urban areas)
Public roads inside urban boundary signs.

Victims
Total of fatalities, seriously injured, slightly injured and injured.

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 the four EFTA countries Switzerland, Norway, Iceland, and Liechtenstein. The data in the report were extracted in May 2024.

4.4 Small cells

Absolute numbers of fatalities can be very small for small countries, which can strongly influence trend indicators and other derived indicators such as mortality. Care should be taken when interpreting these numbers. When commenting on the figures, countries with small numbers were omitted.

4.5 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.

Figures that only contain information on the relative distribution of fatalities have not been obtained through imputation. The report always mentions in footnotes when imputation was used. If this is not mentioned in the footnotes, no imputation was used.

4.6 Data cleaning

Area / Road type

- Malta 2020 area: 'rural' recoded to 'unknown'

Junctions

- Several data issues due to different coding, inconsistent use of categories and different breaks in time series
- General grouping:
  - 'not at junction'
  - 'unknown'
  - all other codes combined to 'junction'

Data cleaning and recoding was done in the following countries: Bulgaria, Estonia, Finland, Germany, Greece, Ireland, Lithuania, Malta, Slovenia, Switzerland

4.7 COVID-19 pandemic

The impact of the global COVID-19 pandemic on the CARE data for 2020 and 2021 is evident. Overall traffic volumes dropped sharply during the pandemic, which was associated with a significant drop in

road traffic crashes and fatalities. However, the pattern was not homogeneous throughout the EU-27. For example, the number of fatalities actually increased in three Member States in 2020 during COVID-19. Therefore, the impact varied from country to country and there were also behavioural changes - for example there is some evidence of increased speeding. Further research is needed to understand the impact of the pandemic on road safety.

4.8 More detailed data

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

European Commission


Publications Office