



European Road Safety Observatory

Facts and Figures – Motorways – 2021

This document is part of a series of 18 *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 2021 refer to 2019.

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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 September 2021

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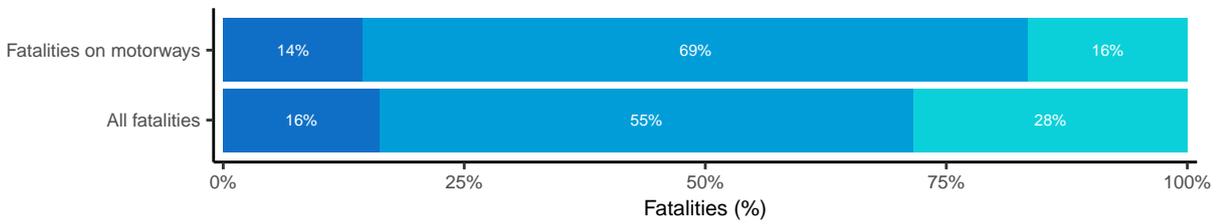
1 Key Facts

Motorway Fatalities 2019

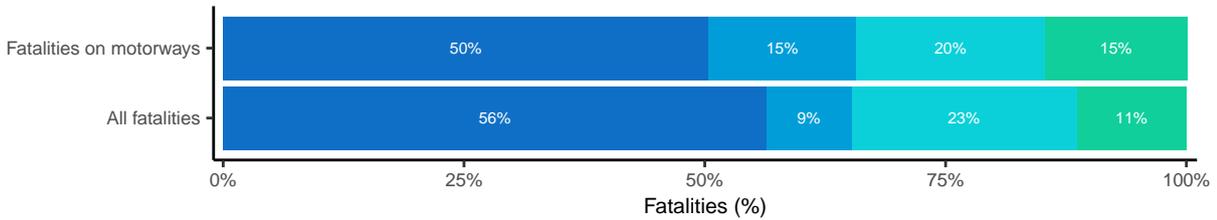
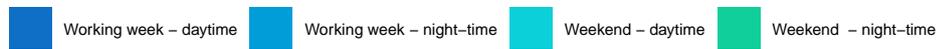


- 1,938 fatalities
- 9% of all road fatalities
- 13% decrease since 2010 compared to 23% increase on all roads

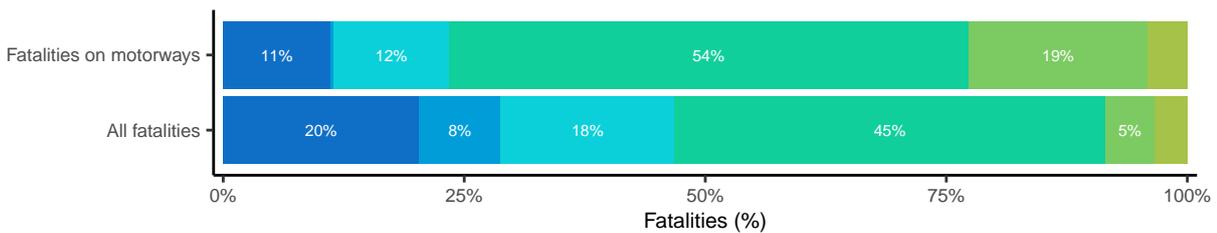
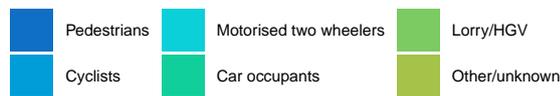
Age



Period of the week



Transport modes involved



This Facts and Figures report looks at motorways, which are public roads with dual carriageways, and at least two lanes each way. Some types of road user, such as pedestrians, bicycles, mopeds and agricultural vehicles, are prohibited from using motorways.

The highest mortality rates (number of fatalities per million inhabitants) on motorways were observed in Belgium and Bulgaria. Finland, Poland and Romania had the lowest mortality rates. **The mortality rate on motorways was generally lower in the north of the EU compared to other parts of the EU.** Mortality is an important indicator, but does not take into account differences in the general state of road safety across countries. It is important to also look at the proportion of fatalities on motorways within the total number of road fatalities: **the proportion was highest in Southern Europe**, and was also high in parts of western Europe. Fatalities per 1,000 km of motorway were also compared between EU Member States, to take into account the differences between motorway networks. **The fatality rate per 1,000 km of motorway was highest in Eastern Europe and lowest in the nordic countries.**

In 2019, 9% of all road fatalities in the EU27 occurred on a motorway. **The number of fatalities on motorways decreased by 13% between 2010 and 2019, compared to the overall 23% decrease on all roads over the same time period.** Accordingly, the proportion of fatalities on motorways has increased slightly since 2010. The countries with the highest number of motorway kilometers also have the highest number of fatalities on motorways.

Road fatalities on motorways also differed in other respects when compared to all fatalities combined:

- The proportion of 25-64 year old fatalities on motorways was higher while the proportion of 65+ year olds killed was lower compared to all fatalities. In 2019, 68% of motorway fatalities were between 25 and 64 years old, compared to 55% of all fatalities.
- The proportion of fatalities in heavy goods vehicles and lorries was highest on motorways (compared to other roads). The proportion of fatalities among vulnerable road users was low on motorways, which can be explained by the fact that certain types of road user are prohibited from traveling on motorways. The proportion of pedestrians among fatalities on motorways however was 11%, even though pedestrians are not allowed on motorways.
- The share of fatalities on motorways was proportionally lower during the daytime of the working week and higher during night-time both in the working-week and at the weekend. There was a large peak in fatalities during the night from Saturday to Sunday.

Basic definitions*Motorway:*

Public road with dual carriageways and at least two lanes each way. Entrance and exit signposted. Road with grade separated interchanges. Road with a central barrier or central reservation. No crossing permitted. No stopping permitted unless in an emergency. Entry prohibited for pedestrians, animals, bicycles, mopeds, agricultural vehicles.

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.

More detailed data:

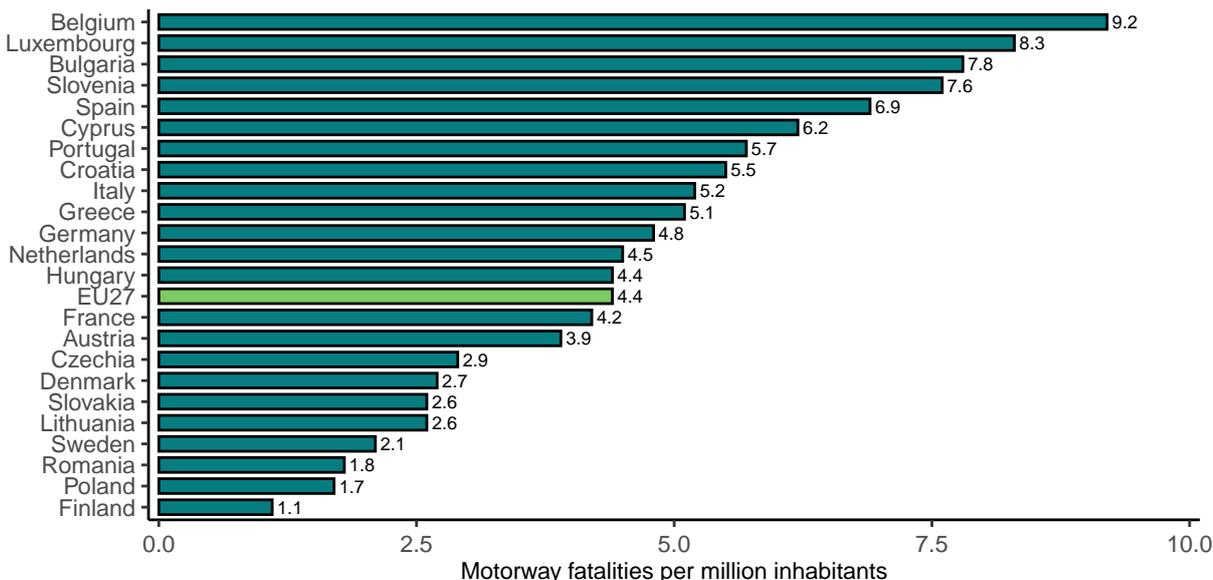
This Facts and Figures report is accompanied by an excel file (available online) containing a large set of additional detailed data. Each sheet in the excel file corresponds to a Figure/Table in the report.

2 Main trends

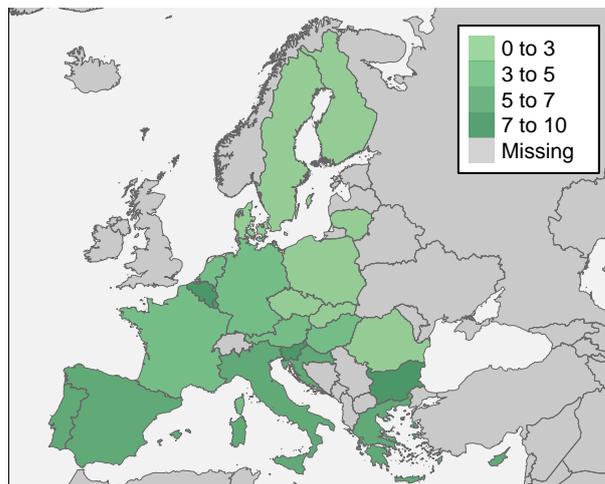
2.1 Mortality rate: number of road fatalities per million inhabitants

Belgium and Bulgaria have the highest mortality rate (number of fatalities per million inhabitants) while Finland, Poland and Romania have the lowest. Of the countries with the highest number of fatalities on motorways, only France has a mortality rate slightly below the European average. **The mortality rate on motorways is relatively lower in the Nordic countries.**

Figure 1. Motorway fatalities per million inhabitants per country in the EU27 (2017-2019). Source: CARE, EUROSTAT



Note: countries that are not included in the Figures are Estonia, Ireland, Latvia and Malta because these countries have missing values in the time series 2017-2019



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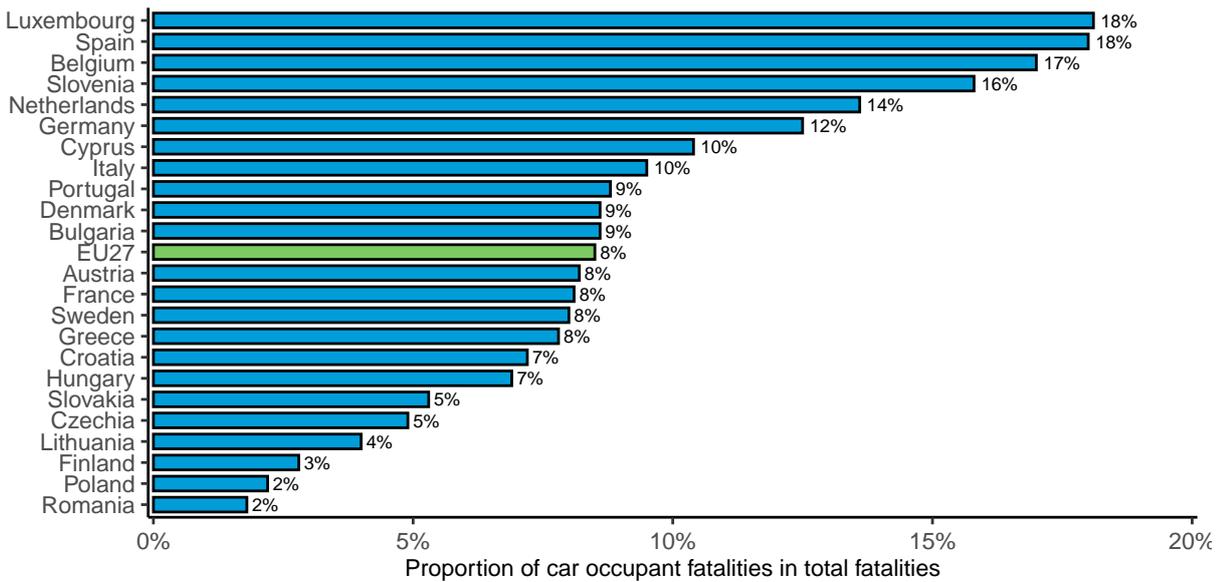
2.2 Number of fatalities on motorways as a proportion of total fatalities

The mortality rate is an important indicator, but does not take into account differences in the general state of road safety in countries. In other words, it is possible that the mortality rate for motorways in a specific country is high because the total mortality rate for all road users in that country is high.

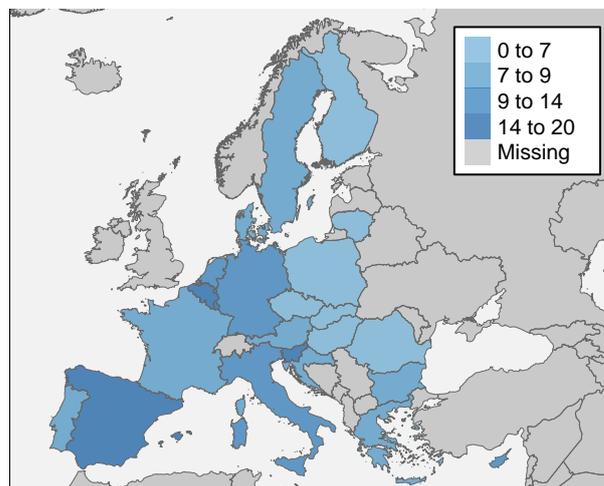
Therefore, it is important to also look at the proportion or share of motorway fatalities in the total number of road fatalities.

The proportion of fatalities on motorways is highest in Southern Europe, and is also high in parts of Western Europe. Romania has the highest proportion of fatalities on motorways. Belgium has a high mortality rate on motorways as well as a high proportion of fatalities on motorways in total road fatalities.

Figure 2. Proportion of motorway fatalities in the total number of fatalities, per country in the EU27 (2017-2019). Source: CARE



Note: countries that are not included in the Figures are Estonia, Ireland, Latvia and Malta because these countries have missing values in the time series 2017–2019



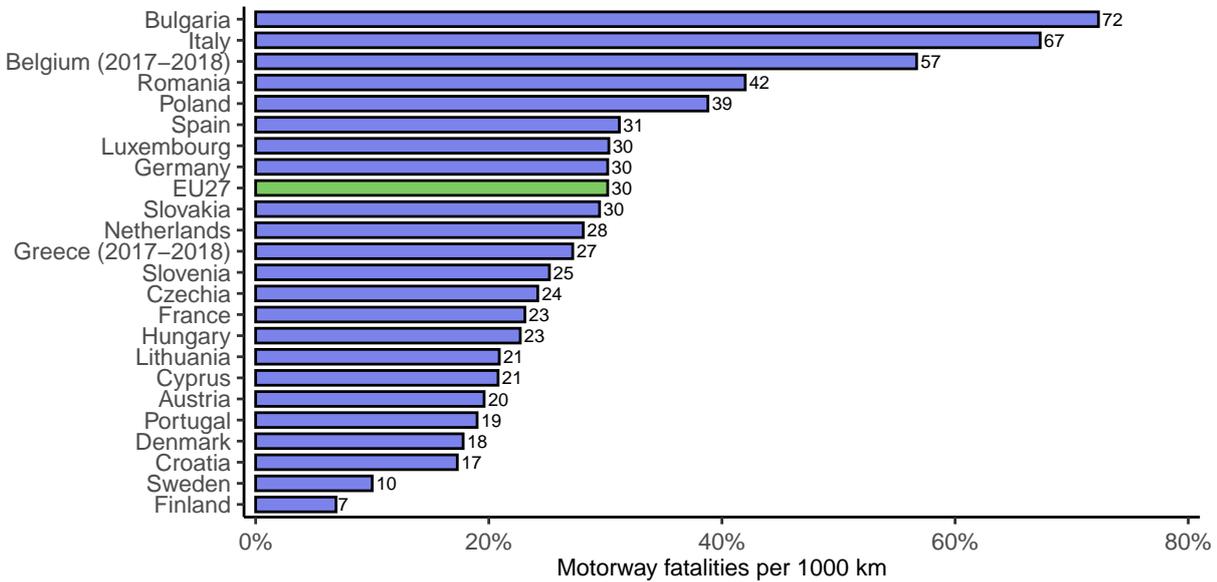
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2.3 Number of fatalities on motorways per 1.000 kilometers of motorway

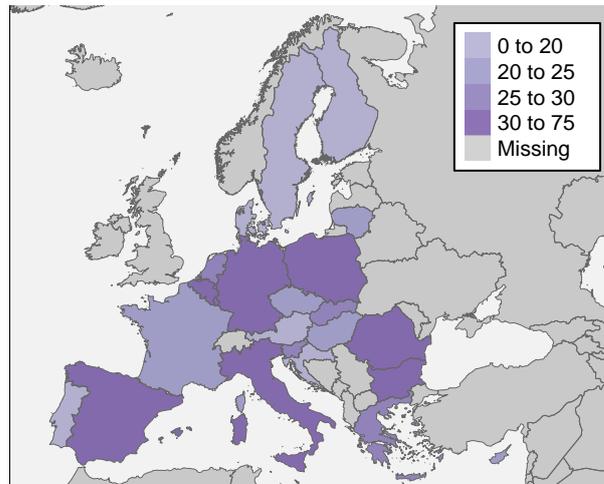
In the Figure below, fatalities per 1000 km of motorways are compared between countries. This makes it possible to take into account the differences between motorway networks. **The fatality rate per 1000 km of motorway is highest in Eastern Europe** and also in Belgium, and lowest in

the Nordic countries.

Figure 3. Motorway fatalities per 1.000 km of motorway per country in the EU27 (2017-2019). Source: EUROSTAT, EUROPEAN COMMISSION



Note: countries that are not included in the Figures are Estonia, Ireland, Lithuania and Malta because these countries have missing values in the time series 2017-2019

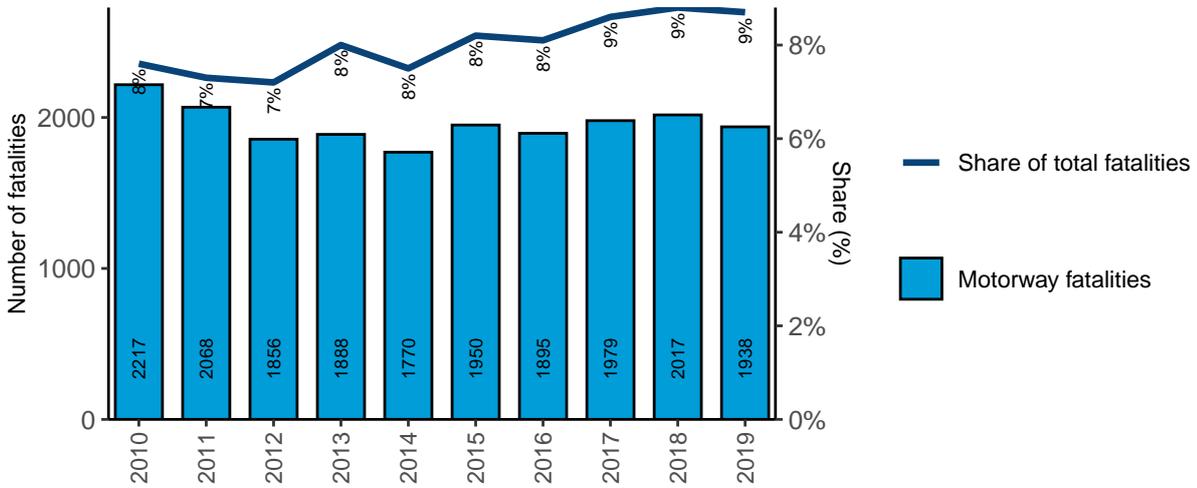


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2.4 Fatalities

In 2019, 9% of all road fatalities in the EU27 occurred on motorways. The relative proportion of fatalities on motorways has increased slightly in the time period 2010-2019. **The number of fatalities on motorways decreased by 13% between 2010 and 2019, while the total number of fatalities decreased by 23% over the same time period.**

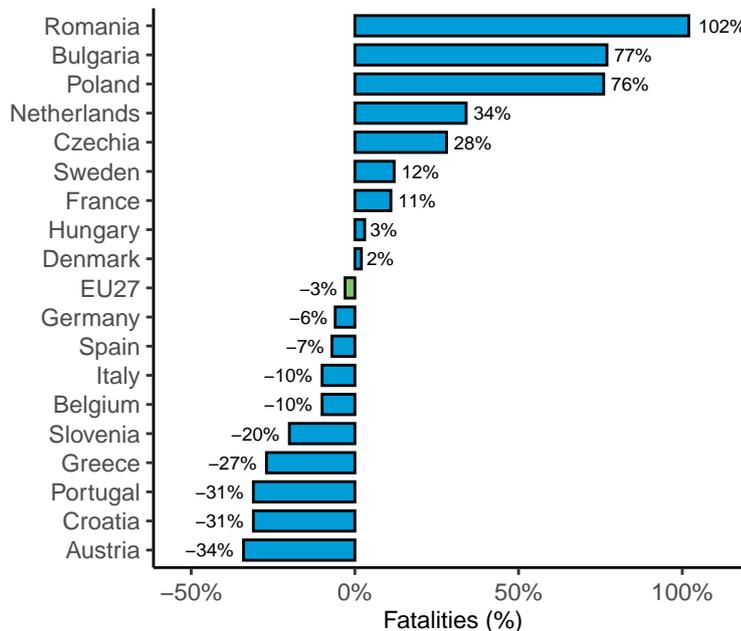
Figure 4. Annual number of motorway fatalities, and their share in the total number of fatalities in the EU27 (2010-2019). Source: CARE



Note: countries that are not included in the Figure are Estonia, Latvia and Malta because these countries have missing values in the time series 2010–2019

Among the EU Member States with the highest number of fatalities on motorways, France shows a less pronounced decline in number of motorway fatalities compared to the EU average, while in Germany, Spain and Italy the trend is better than average. The number of fatalities on motorways in Romania has doubled in a decade. There were also notable increases (more than 75%) in Bulgaria and Poland.

Figure 5. Percentage change in the number of fatalities on motorways per country in the EU27 (2017-2019 and 2010-2012). Source: CARE



Notes:
 Countries that are not included in the Figure are Estonia, Latvia and Malta because there is no data on fatalities on motorways in the time series 2010–2019
 The trend is not shown if there are fewer than 10 fatalities in one year

Table 1. Number of and trend in fatalities on motorways per country in the EU27, EFTA and UK (2010-2012 versus 2017-2019). Source: CARE

	2010	2017	2018	2019	Trend 2017 - 2019 vs 2012 - 2010	Miniplot: trend since 2010
Austria	59	45	28	29	-34%	
Belgium	109	98	102	116	-10%	
Bulgaria	37	62	58	45	77%	
Croatia	33	22	28	18	-31%	
Cyprus	8	5	8	3		
Czechia	28	25	35	31	28%	
Denmark	26	12	21	14	2%	
EU27	2217	1979	2017	1938	-3%	
Finland	4	8	5	6		
France	238	281	268	260	11%	
Germany	430	409	424	356	-6%	
Greece	87	54	61	50	-27%	
Hungary	44	34	46	48	3%	
Ireland	8	-	-	-		
Italy	376	296	330	310	-10%	
Lithuania	-	12	4	6		
Luxembourg	29	3	9	3		
Netherlands	63	82	76	75	34%	
Poland	28	70	52	70	76%	
Portugal	111	51	57	67	-31%	
Romania	18	36	24	43	102%	
Slovakia	14	21	14	8		
Slovenia	19	19	14	14	-20%	
Spain	413	308	323	340	-7%	
Sweden	23	20	24	20	12%	
Switzerland	23	25	19	24	-37%	

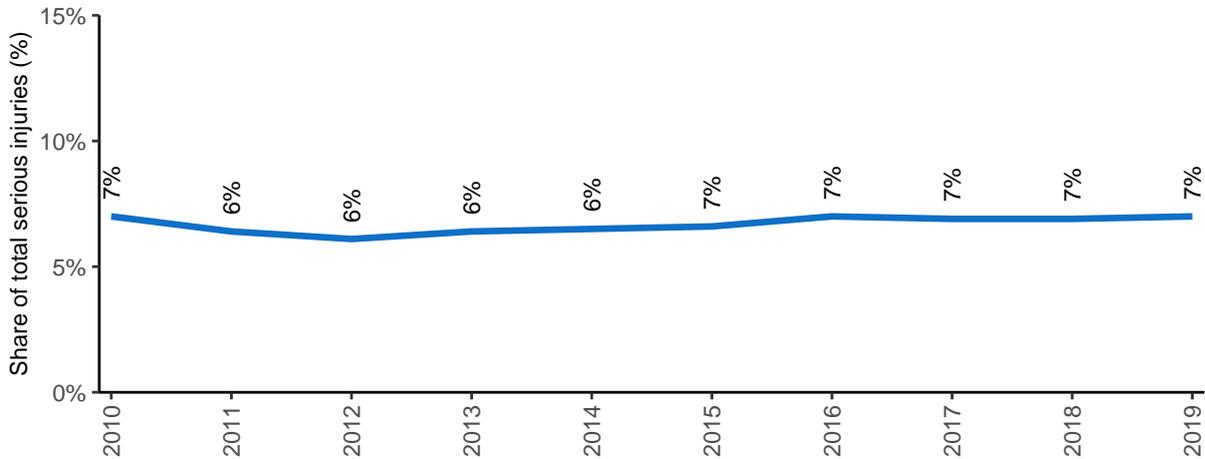
Note:

The trend is not shown if there are fewer than 10 fatalities in one year

2.5 Serious injuries

7% of all serious injuries in the EU27 in 2019 occurred on motorways. The relative proportion of serious injuries has remained constant over the time period 2010-2019.

Figure 6. Share of serious injuries on motorways in the total number of serious injuries in the EU27 (2010-2019). Source: CARE

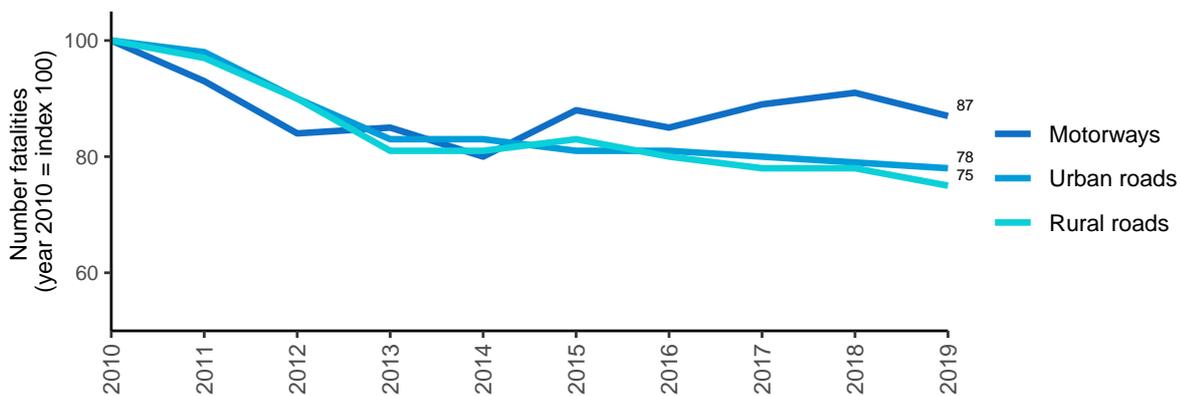


Notes:
 Countries that are not included in the Figure are France, the Netherlands, Ireland, Italy and Estonia due to problems of comparability, missing data or a break in the time series
 Germany accounts for a disproportionately high share of 40% of all serious injuries

2.6 Comparison of motorways with other road types

The Figure below shows the total number of fatalities by type of road over the time period 2010-2019. The number of fatalities on rural roads has decreased the most (-25%) out of all road types. Although the number of fatalities on motorways initially decreased more rapidly compared to rural and urban roads, the number of fatalities on this type of road has decreased the least in the last 10 years (-13%).

Figure 7. Trend of fatalities on motorways, rural and urban roads in the EU27 (2010-2019). Source: CARE



Note: countries that are not included in the Figure are Estonia, Latvia and Malta because these countries have missing values in the time series 2010–2019

3 Road user

3.1 Gender

77% of all road fatalities in 2019 are male compared to 78% of fatalities on motorways. Large differences can be observed between EU Member States. The proportion of female fatalities on motorways ranges between 38% and 17%.

Figure 8. Distribution of fatalities on motorways and all fatalities by gender in the EU27 (2017-2019). Source: CARE

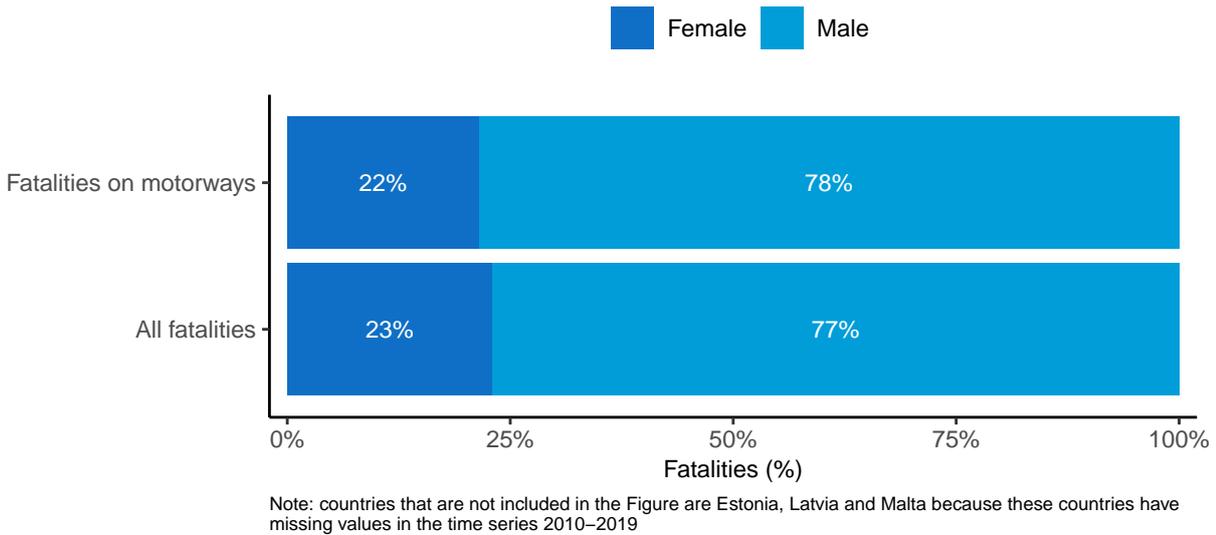
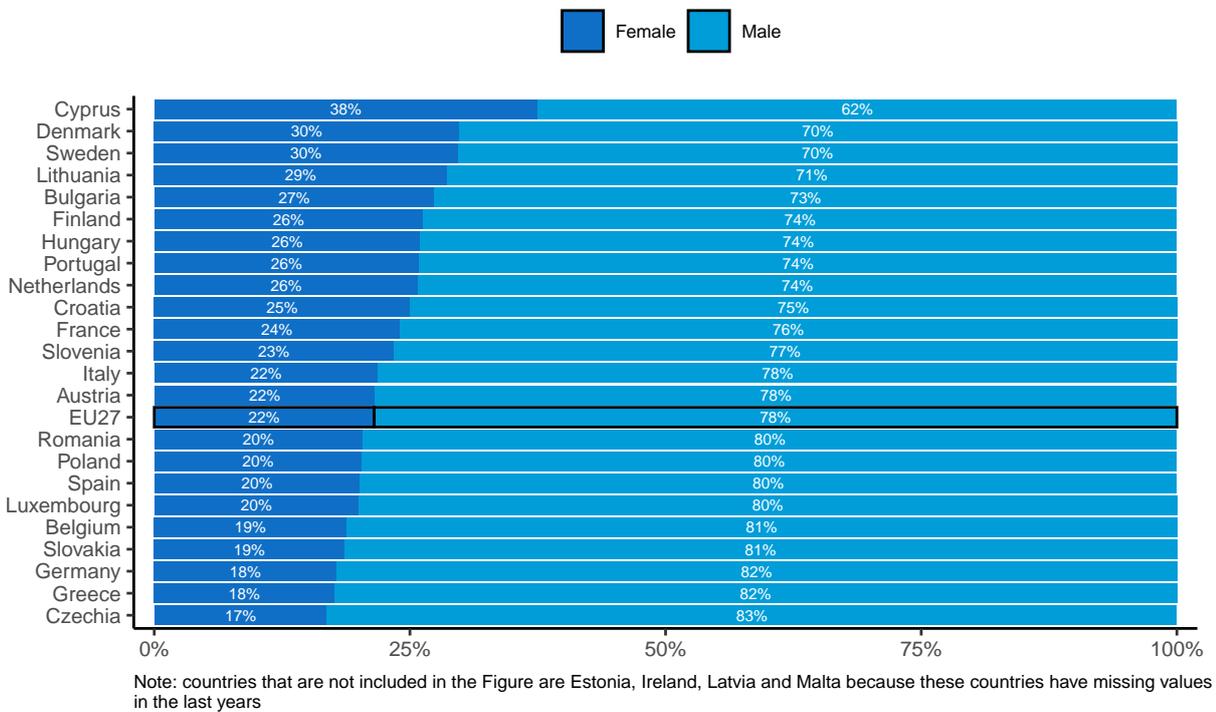


Figure 9. Distribution of motorway fatalities by gender per country in the EU27 (2017-2019). Source: CARE

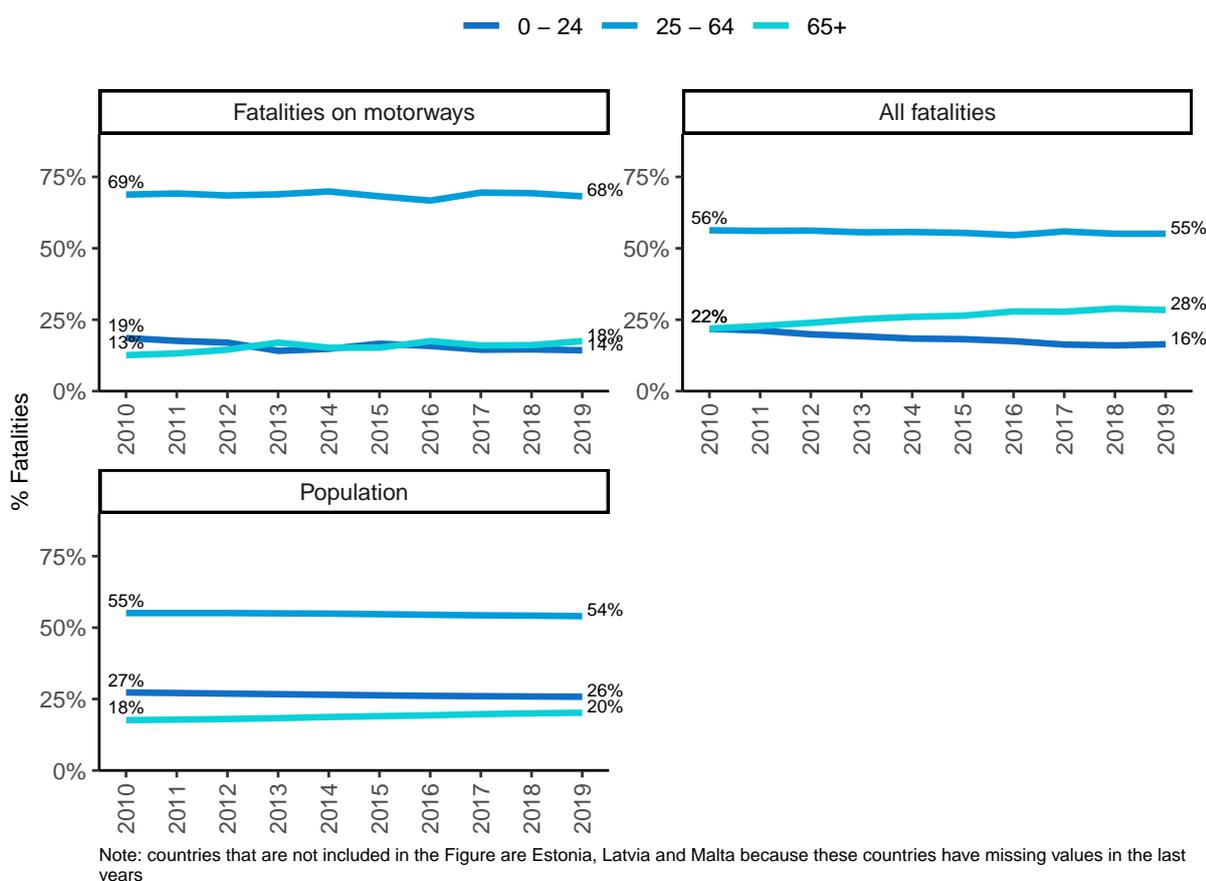


3.2 Age

The age distribution of fatalities on motorways differs slightly from the age distribution of road fatalities generally. **The proportion of 25-64 year old fatalities is higher on motorways than on other roads.** In 2019, 68% of motorway fatalities are between 25 and 64 years old, compared to 55% of all fatalities.

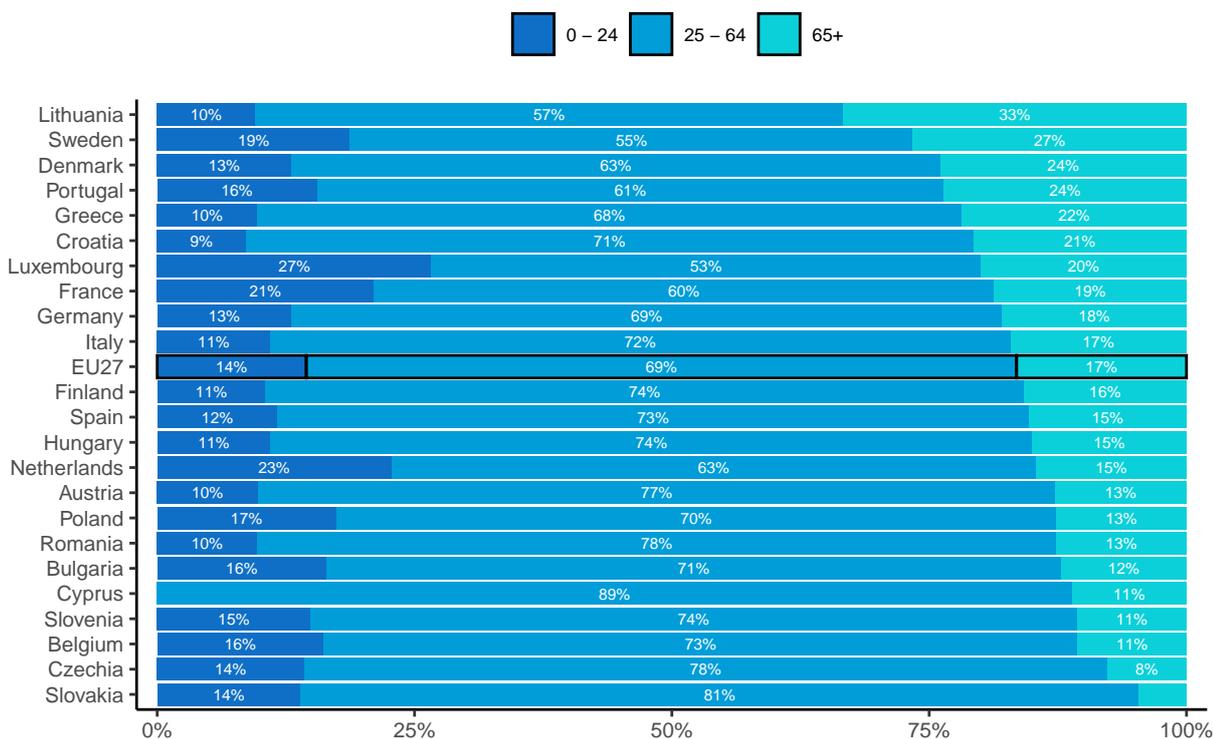
The proportion of people over 65 among fatalities on motorways is lower compared to all fatalities, although the proportion of such people on motorways steadily increased since 2010.

Figure 10. Distribution of fatalities on motorways and all fatalities by age group in the EU27 (2010-2019). Source: CARE & EUROSTAT



There are of course differences between the Member States. The proportion of fatalities in the age group 25 to 49 years olds is the highest in all countries, but this proportion ranges between 53% and 89%. In some countries, such as Sweden, 65+ year olds make up almost one third of fatalities on motorways, although the mortality rate on motorways in Sweden is relatively low. The proportion of fatalities on motorways in the age group 0-24 years is higher than the proportion of 65+ year olds in other countries, for example the Netherlands and France.

Figure 11. Distribution of fatalities on motorways by age groups per country in the EU27 (2019). Source: CARE



Notes:
 Countries that are not included in the Figure are Ireland, Malta, Netherlands and Slovenia because these countries have missing values in the last years

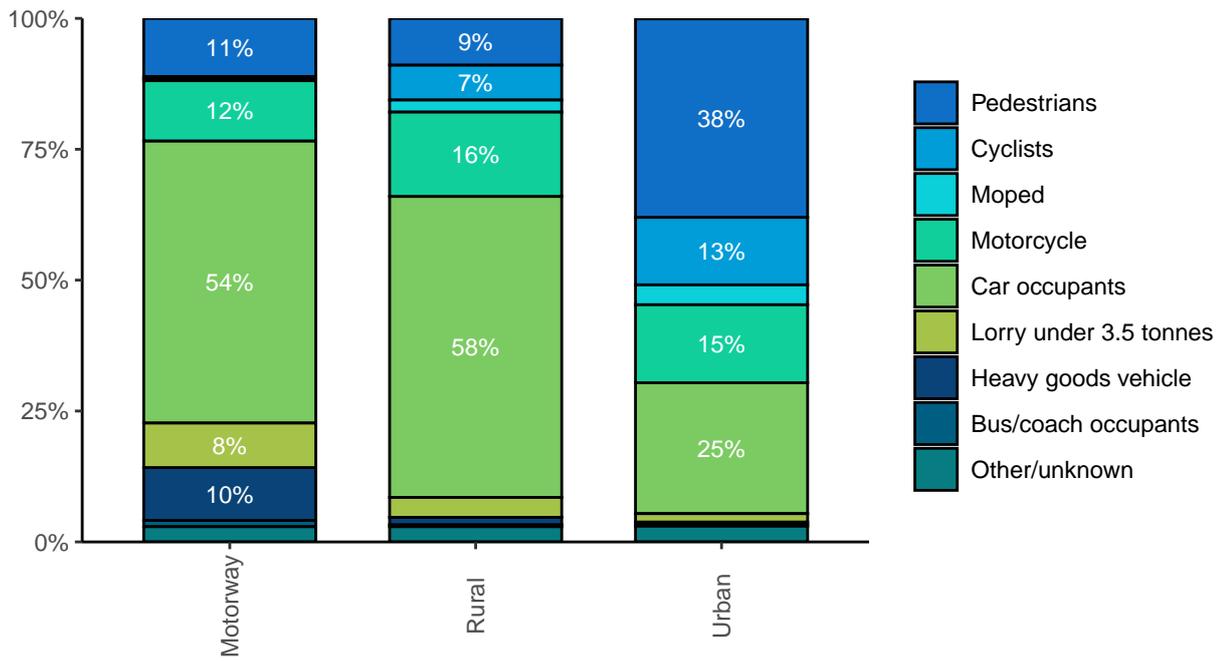
3.3 Transport modes

The Figure below shows the distribution of fatalities by transport mode, for different types of roads.

Car occupants make up more than half of all fatalities on both motorways and rural roads. The proportion of fatalities in heavy goods vehicles and lorries is highest on motorways, while the proportion of fatalities among vulnerable road users (pedestrians, cyclists, mopeds) is lower on motorways.

This can be explained by the fact that certain types of road user, such as cyclists and mopeds, are prohibited from using motorways. The proportion of pedestrian among fatalities on motorways however is 11%, even though they are not allowed on this type of road. Some of those counted as pedestrians are drivers and passengers of vehicles who have left their vehicles on the motorway.

Figure 12. Distribution of fatalities by transport mode and type of road in the EU27 (2017-2019). Source: CARE

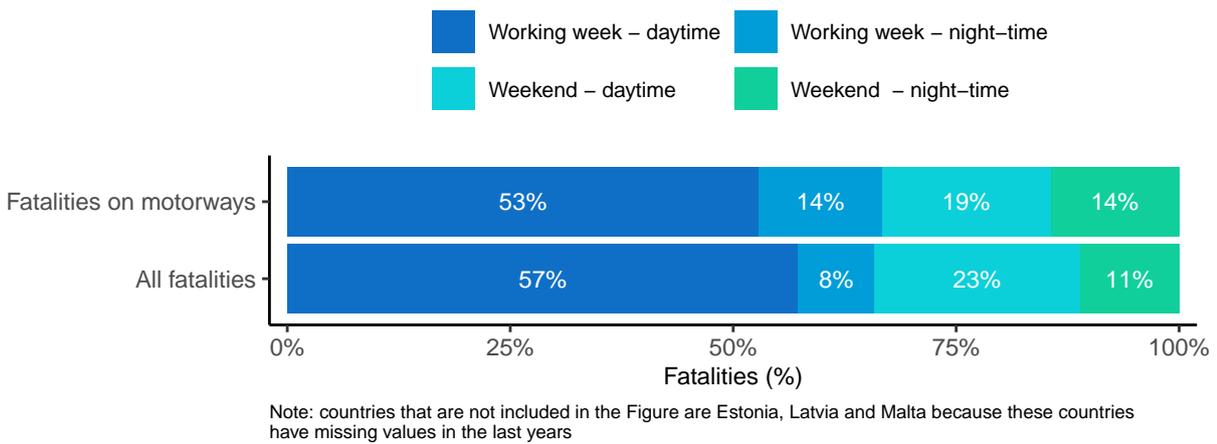


4 Time

4.1 Period of the week

The distribution of fatalities on motorways according to period of the week differs slightly from the distribution of all road user fatalities over the week. **The share of fatalities on motorways is proportionally lower during daytime in the working week and higher during night-time both in the working-week and at the weekend.**

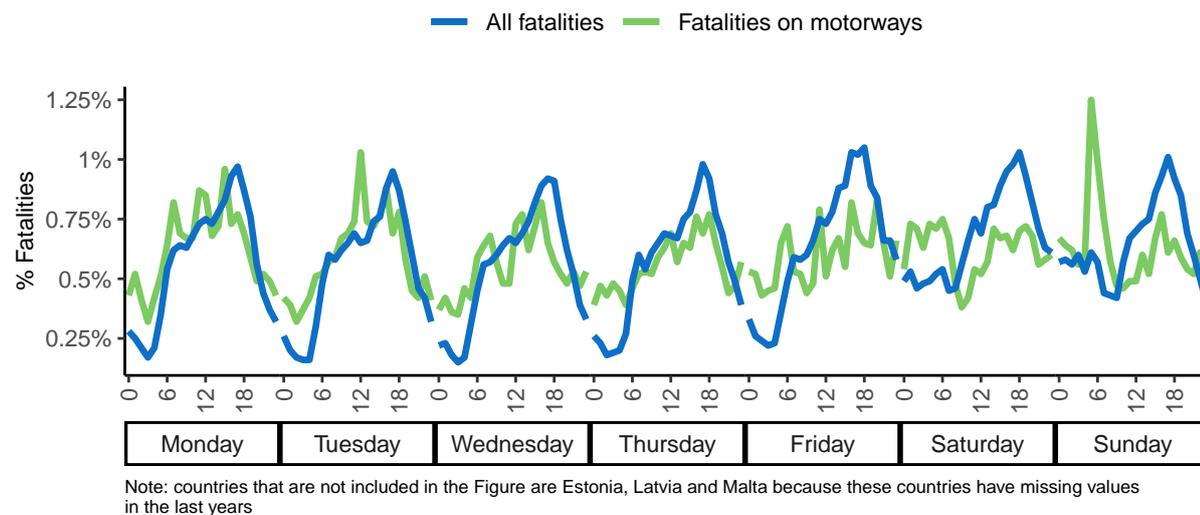
Figure 13. Distribution of fatalities among car occupants and all fatalities according to period of the week in the EU27 (2017-2019). Source: CARE



4.2 Day of the week and hour

The Figure below on fatalities on motorways confirms the above finding that **proportionately more fatalities occur on motorways at night-time**. There is a large peak in fatalities during the night from Saturday to Sunday.

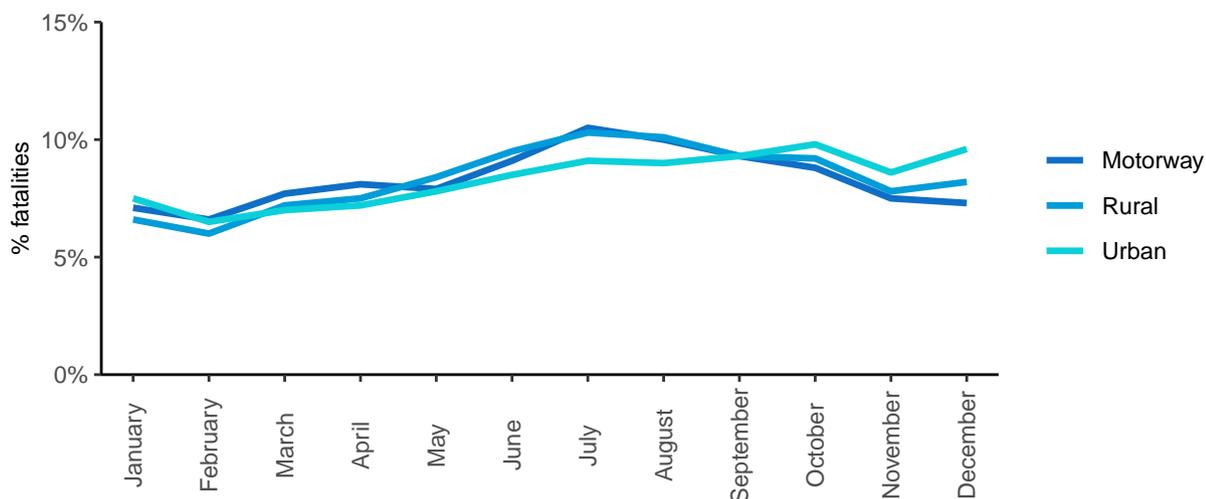
Figure 14. Distribution of fatalities on motorways and all fatalities by day of the week and hour in the EU27 (2014-2019). Source: CARE



4.3 Month

The Figure below shows the distribution of fatalities by type of road over the months of the year. The peak period for fatalities on motorways is July/August, and the same is true for fatalities on rural roads. The peak for fatalities on urban roads is September/October.

Figure 15. Monthly distribution of fatalities by transport mode, in the EU27 (2017-2019). Source: CARE



Note: countries that are not included in the Figure are Estonia, Latvia and Malta because these countries have missing values in the last years

5 Location

5.1 Surface

Surface conditions were dry in the case of 76% of all road fatalities and wet for 20% of those fatalities. For only 2% of fatalities were the surface conditions snowy, frosty, or icy. The same applies to fatalities on motorways.

5.2 Light conditions

50% of all road fatalities occur during daylight, and 28% of all fatalities occur in darkness. The proportions are slightly different for fatalities on motorways: the proportion of fatalities that occurred during darkness is higher at 32%, and the proportion of fatalities during daylight is lower at 44%.

6 Notes

6.1 Definitions

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

CADAS Glossary: https://ec.europa.eu/transport/road_safety/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.

Fatalities

Definition: 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.

Victims

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

Motorway

Public road with dual carriageways and at least two lanes each way. Entrance and exit signposted. Road with grade separated interchanges. Road with a central barrier or central reservation. No crossing permitted. No stopping permitted unless in an emergency. Entry prohibited for pedestrians, animals, bicycles, mopeds, agricultural vehicles.

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.

6.2 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 September 2021. 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.

6.3 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.

6.4 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.

