



European  
Commission



Facts & Figures:  
**New forms of mobility**



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](https://road-safety.transport.ec.europa.eu/statistics-and-analysis/data-and-analysis/facts-and-figures_en)).

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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: May 2024

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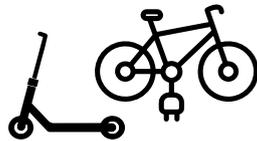
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# 1. Key facts

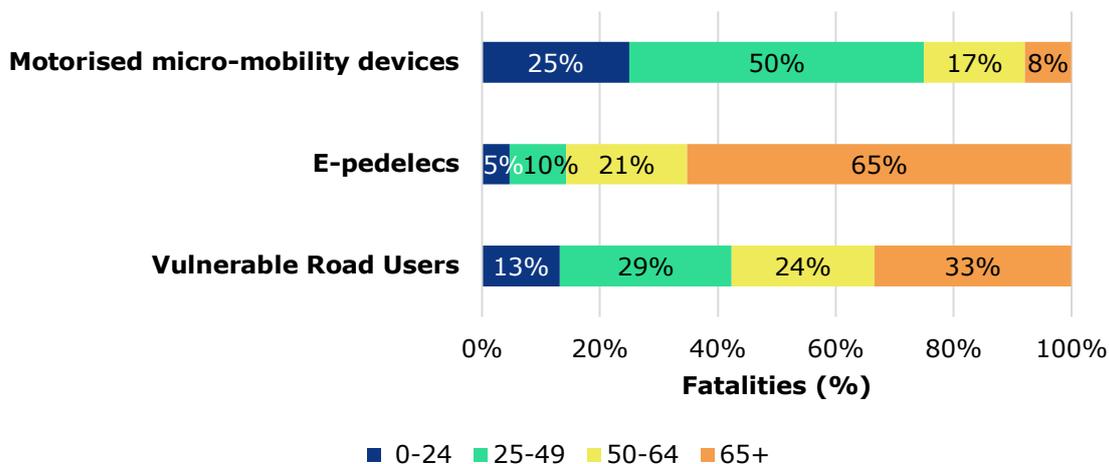
This Facts and Figures report looks at fatalities of users of motorised micro-mobility devices and pedelecs on European roads. All observations reported were derived from the available data. The statistical significance of differences or relations between values has not been tested. As not all EU Member States provide crash and fatality data on such new forms of mobility pedelec, this F&F report is limited to 15 EU countries.

## Fatalities among users of new transport modes fatalities in EU countries in 2022

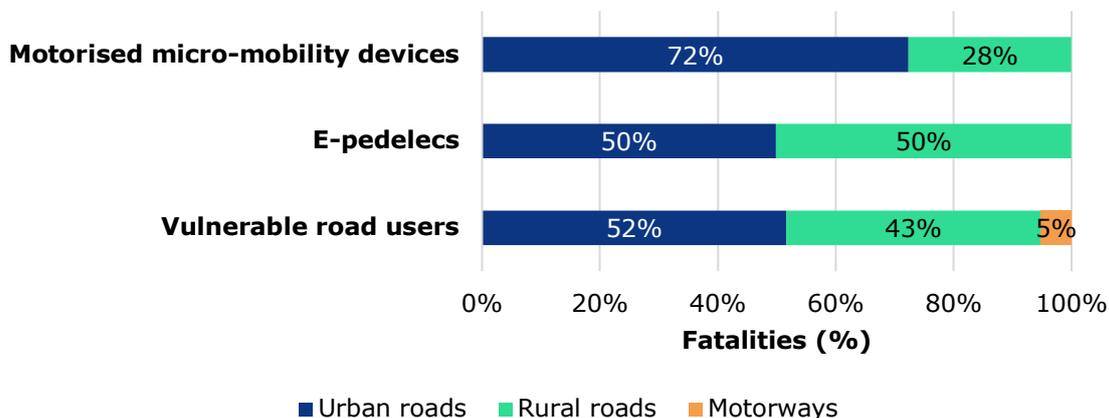


- 76 Motorised micro-mobility device fatalities reported in 9 countries
- 385 Pedelec fatalities reported in 11 countries

### Age



### Road type



## 2. Summary

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New forms of mobility such as e-scooters, segways, monowheels or self-balancing unicycles and pedelecs are now an established trend in Europe. Unfortunately, the data available on crashes, injuries and fatalities involving motorised micro-mobility devices or pedelecs is not yet as comprehensive as data on other transport modes. This is due to the fact that several countries do not yet collect such data or have only recently begun to making analysis of trends very difficult.

In 2022, **76 motorised micro-mobility device fatalities and 385 pedelec fatalities** were recorded in the 15 European countries reporting data on these transport modes.

**82% of reported fatalities on motorised micro-mobility devices were male**, whereas for **pedelec fatalities this share is slightly lower amounting to 74%, in 2022**. In comparison, for all other vulnerable road users, the share of male fatalities is 79% on average.

Among **motorised micro-mobility devices, the most affected age groups are between 15-39 years old**. For **pedelecs, it is from 54 years old**, when the number of fatalities increases rapidly.

**More than half (52%) of the fatalities on motorised micro-mobility device** occur in the **darkness**, whereas for **pedelecs the share is 16%**.

Furthermore, the share of fatalities on **motorised micro-mobility devices on urban roads**, where all transport modes are represented, amounts to **72%** in 2022, while fatalities on **pedelecs** are lower with a share of **50%** on urban roads.

## 3. Main trends – number of fatalities

### 3.1 Absolute number of motorised micro-mobility device fatalities

**Table 1.** Motorised micro-mobility device fatalities per country (2020-2022). Source: CARE

Country	2020	2021	2022
Belgium	-	-	1
Denmark	-	-	-
Germany	-	5	10
Estonia	-	-	1
Ireland	-	-	-
Spain	8	9	8
France	7	24	35
Italy	1	9	16
Lithuania	2	1	-
Luxembourg	-	-	-
Malta	-	-	-
Poland	-	-	3
Slovenia	-	-	2
<b>Total</b>	<b>18</b>	<b>48</b>	<b>76</b>
Iceland	-	1	1

Notes:

- All rows containing a - indicate that there are no delivered data in the respective country in this year.
- The total is the total number in those EU countries reporting fatalities for that specific transport mode.
- Countries which never recorded a single victim in this special group (micro-mobility devices) are completely excluded from the analysis.

### 3.2 Absolute number of pedelec fatalities

**Table 2.** Pedelec fatalities per country (2020-2022). Source: CARE

Country	2020	2021	2022
Belgium	2	1	2
Denmark	8	3	9
Germany	-	131	208
France	16	25	43
Italy	6	13	20
Lithuania	-	1	-
Luxembourg	-	-	1
Netherlands	-	-	77
Austria	21	24	24
Slovenia	-	-	1
<b>Total</b>	<b>53</b>	<b>198</b>	<b>385</b>
Iceland	-	-	-
Switzerland	-	-	23

Notes:

- All rows containing a - indicate that there are no delivered data in the respective country in this year.
- The total is the total number in those EU countries reporting fatalities for that specific transport mode.
- Countries which never recorded a single victim in this special group (pedelecs) are completely excluded from the analysis.

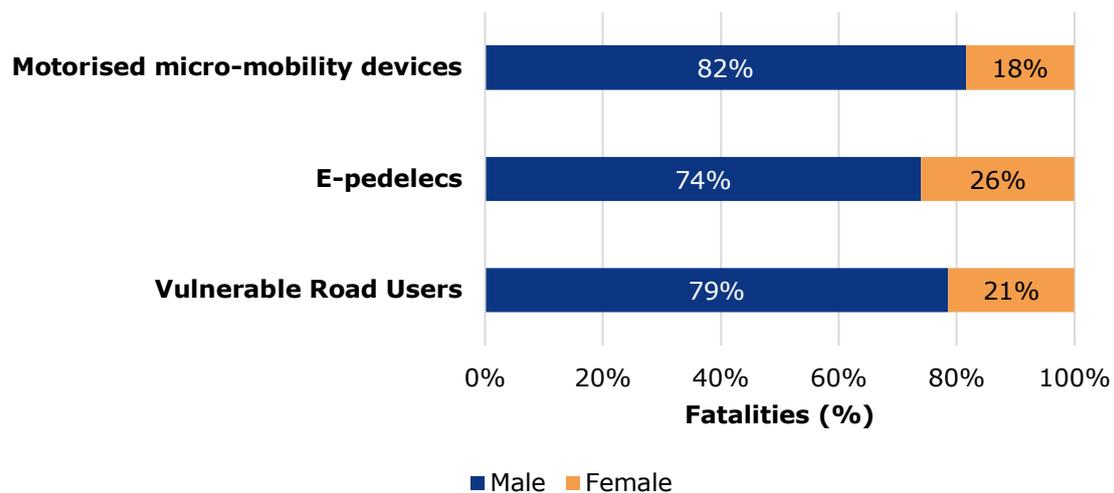
## 4. Road user

### 4.1 Gender

Figure 1 shows that for motorised micro-mobility devices, pedelecs and at other vulnerable road users (pedestrians, cyclists, mopeds and motorcycles), far more men were killed than women in 2022.

**In 2022, 82% out of all reported motorised micro-mobility devices fatalities were male, whereas for pedelec fatalities this was the case for 74%. In comparison, the share for other vulnerable road users was 79%.**

**Figure 1.** Distribution of motorised micro-mobility device, pedelec and VRU fatalities by gender in EU countries providing data (last available year/2022). Source: CARE



## 4.2 Age

Figures 2 & 3 below provide a more detailed picture of the age distribution of motorised micro-mobility device and pedelec fatalities as well as VRU fatalities.

**Among motorised micro-mobility devices, a first peak in fatalities is reached at the age 15-19.** After that, the number of fatalities hits a plateau at **30-39** and then decreases sharply. Looking at **pedelecs, it is from 54 years of age** when the number of fatalities increases rapidly.

**Figure 2.** Distribution of fatalities over 5-year age categories for motorised micro-mobility devices, pedelecs and VRUs in EU countries reporting data (2022). Source: CARE

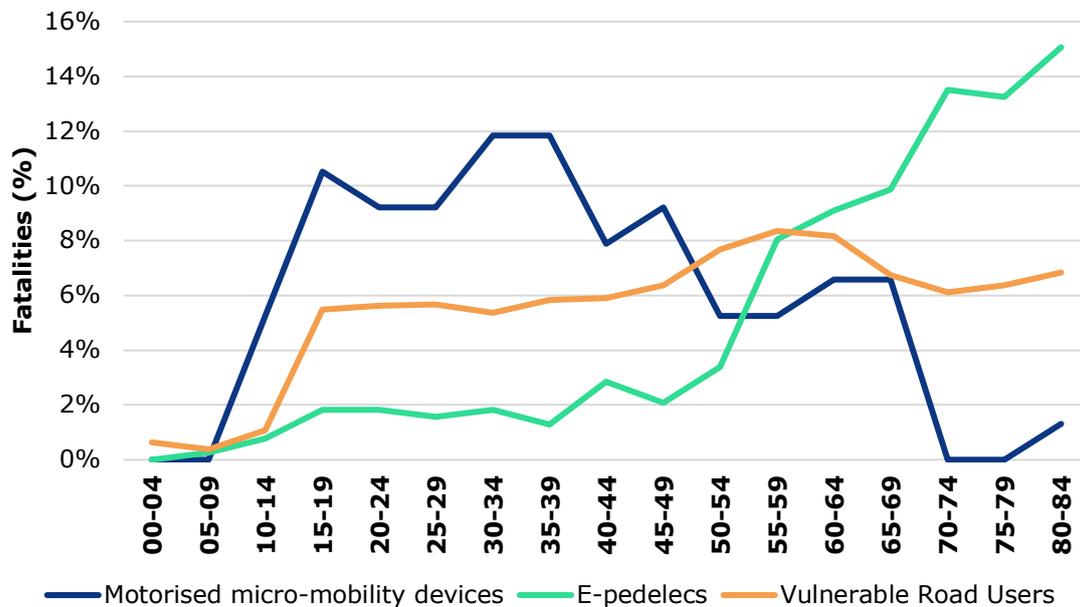
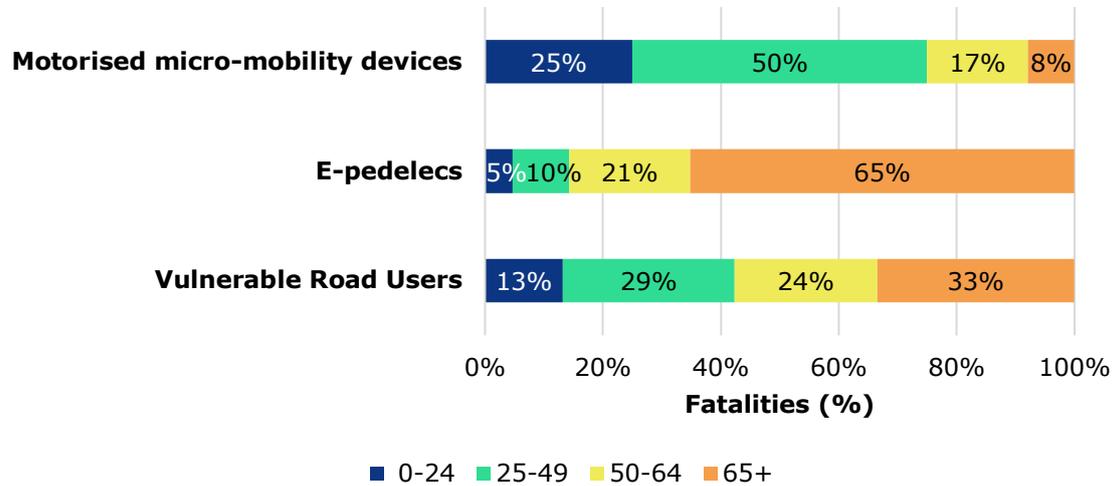


Figure 3 below illustrates once again the differences in fatalities per age group, depending on the mode of transport.

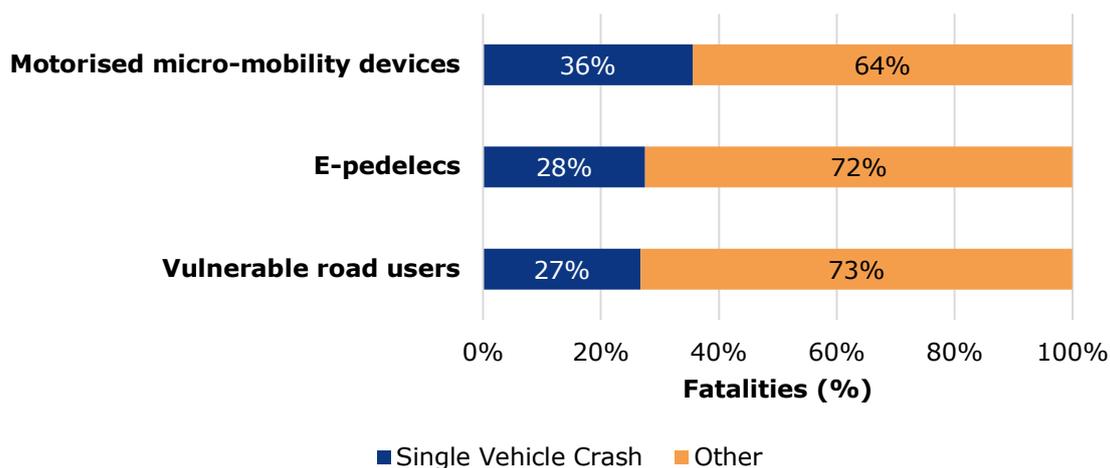
**Figure 3.** Distribution of fatalities in age categories for motorised micro-mobility devices, pedelecs and VRUs (2022). Source: CARE



### 4.3 Single vehicle crashes

Motorised micro-mobility device fatalities result more often from single vehicle crashes (no crash opponent) than fatalities of pedelecs or other vulnerable road users. **In 2022, 36% of the fatally injured motorised micro-mobility device users were involved in single vehicle crashes.** However, the share of single vehicle crashes of pedelec or all other vulnerable road user fatalities is also about a third, 28% and 27%. As is the case with pedal cyclists, the number of single vehicle crashes among users of these two road user groups is likely to be under-reported in police statistics.

**Figure 4.** Distribution of motorised micro-mobility device, pedelec and VRU fatalities by type of collision in some EU countries (2022). Source: CARE

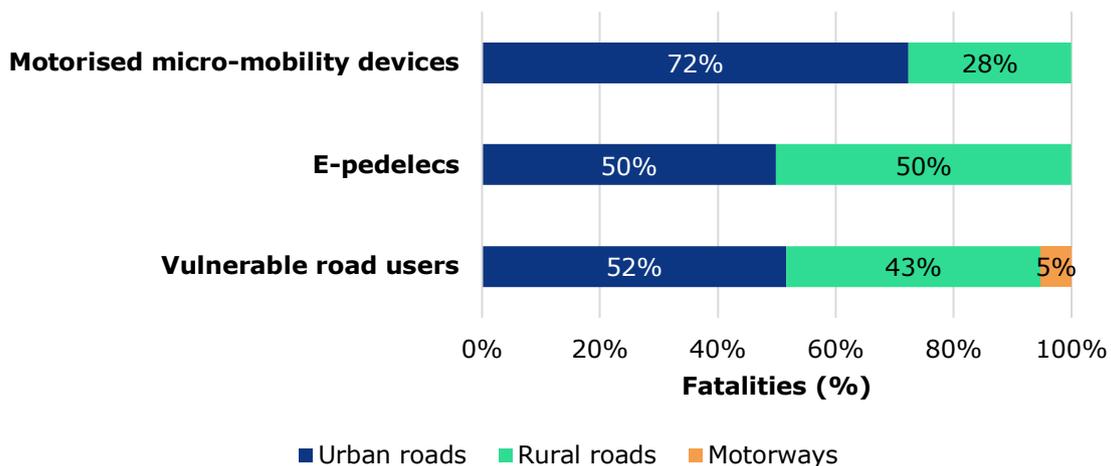


## 5. Location

### 5.1 Road type

Figure 5 shows the distribution of fatalities by road type. On **urban roads**, where all modes of transport are represented, **the share of killed motorised micro-mobility device users amounts to 72%** in 2022. More than half of other VRU fatalities occurred in crashes on urban roads (52%). **Fatalities of pedelec riders are evenly distributed between urban (50%) and rural roads (50%).**

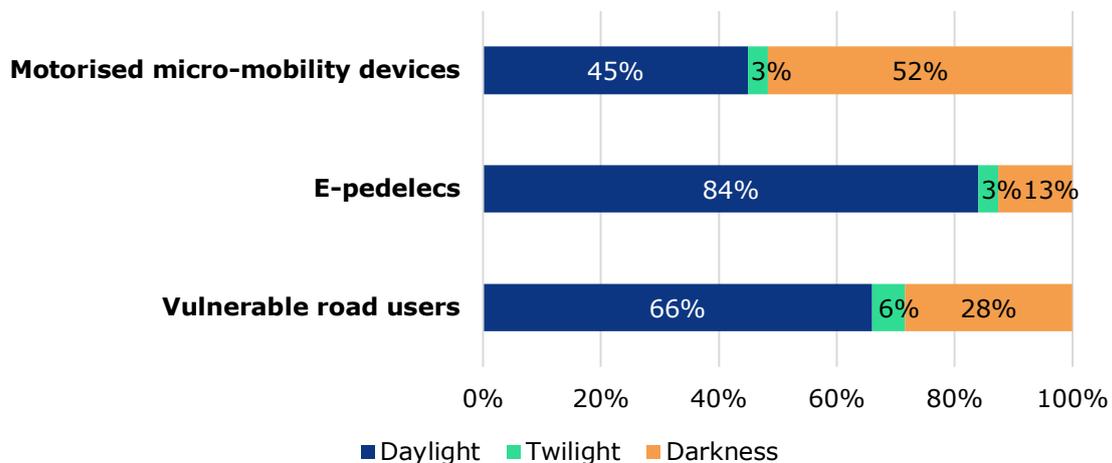
**Figure 5.** Distribution of motorised micro-mobility device, pedelec and other VRU fatalities by road type in some EU countries (2022). Source: CARE



## 5.2 Light conditions

**More than half (52%) of the motorised micro-mobility device fatalities occur in the darkness, compared to pedelecs, where 84% of fatalities occur during daylight.**

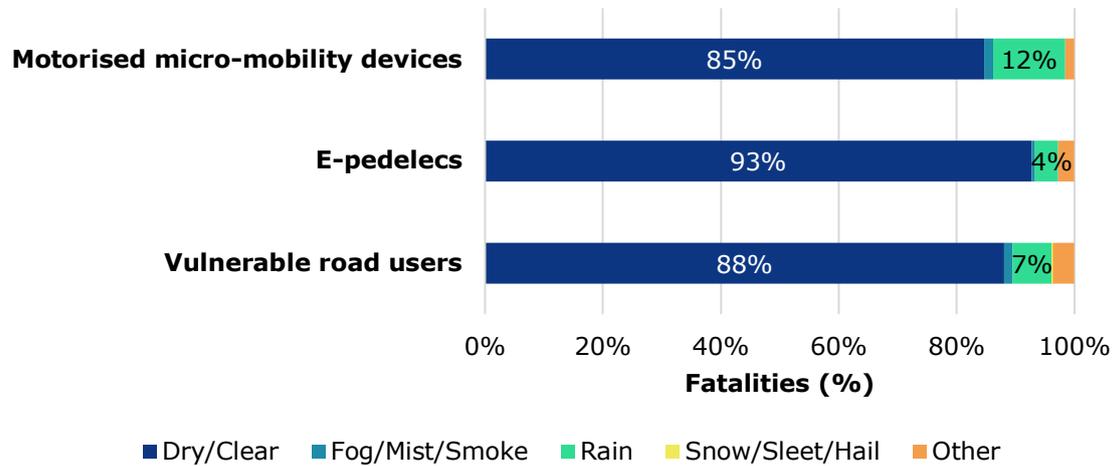
**Figure 6.** Distribution of motorised micro-mobility device, pedelec and other VRU fatalities by light conditions in some EU countries (2022). Source: CARE



## 5.3 Weather conditions

In terms of weather conditions, there are hardly any differences between the transport modes compared. Approximately **8 out of 10 fatalities among motorised micro-mobility devices** occur during **dry and clear weather conditions** and **1 out of 10 during rain**. Looking at pedelec fatalities and other vulnerable road users, around 9 out of 10 fatal crashes occur during dry and clear weather conditions.

**Figure 7.** Distribution of motorised micro-mobility device, pedelec and VRU fatalities according to weather conditions during the crash in some EU countries (2022). Source: CARE

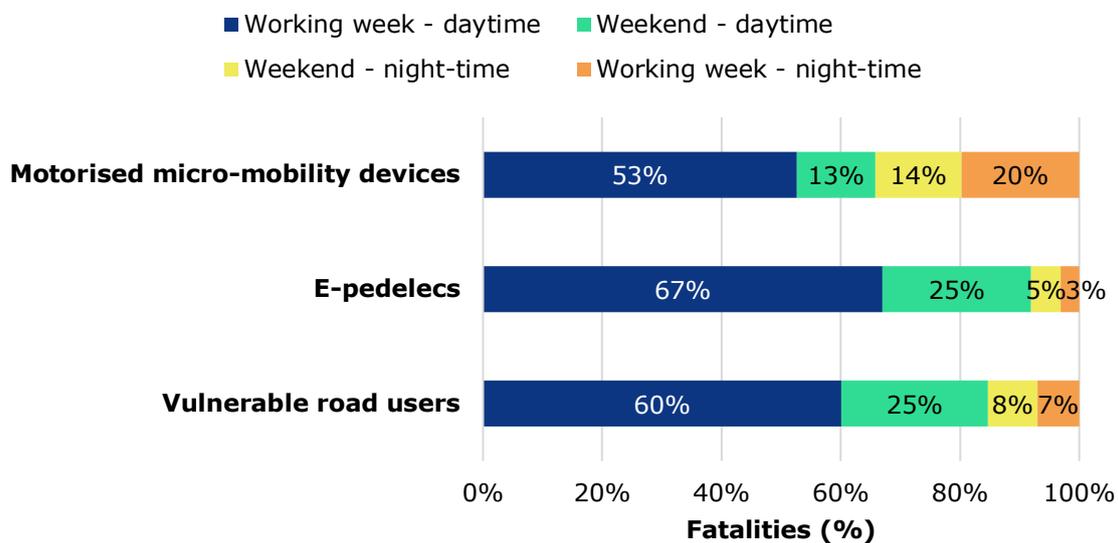


## 6. Time

### 6.1 Period of the week

Motorised micro-mobility device fatalities are distributed differently over the course of the week in comparison to pedelec and other VRU fatalities. The share of **motorised micro-mobility device fatalities is comparatively lower during daytime hours on weekdays and at weekends** and **higher at night during the week and at weekends**.

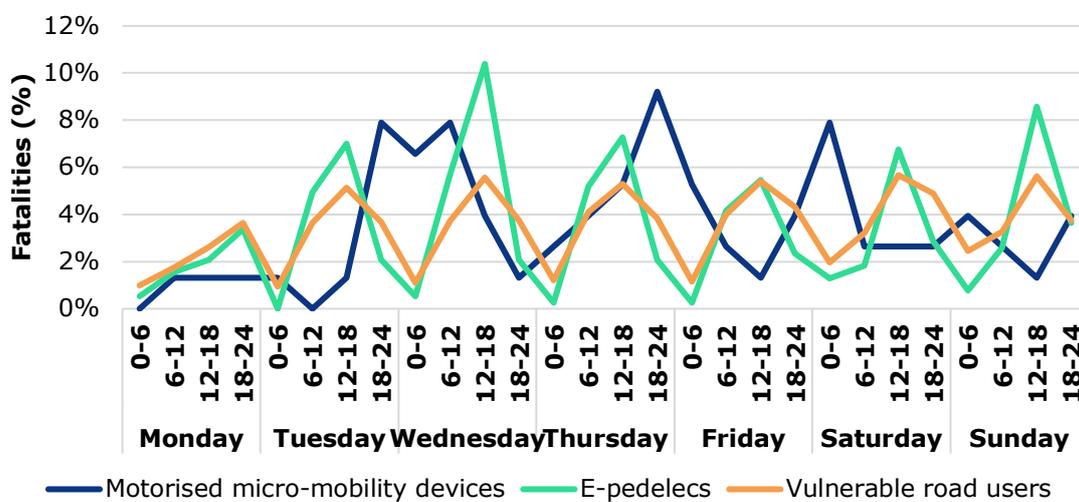
**Figure 8.** Distribution of motorised micro-mobility device, pedelec and VRU fatalities according to period of the week in some EU countries (2022). Source: CARE



## 6.2 Day of the week, time of the day and hour

What is noticeable looking at Figure 9, is that fatalities of pedelecs resemble the pattern of other VRUs, even though peaks of VRUs are higher, while motorised micro-mobility device fatalities have peaks at times when fatalities of VRUs and pedelecs are relatively low.

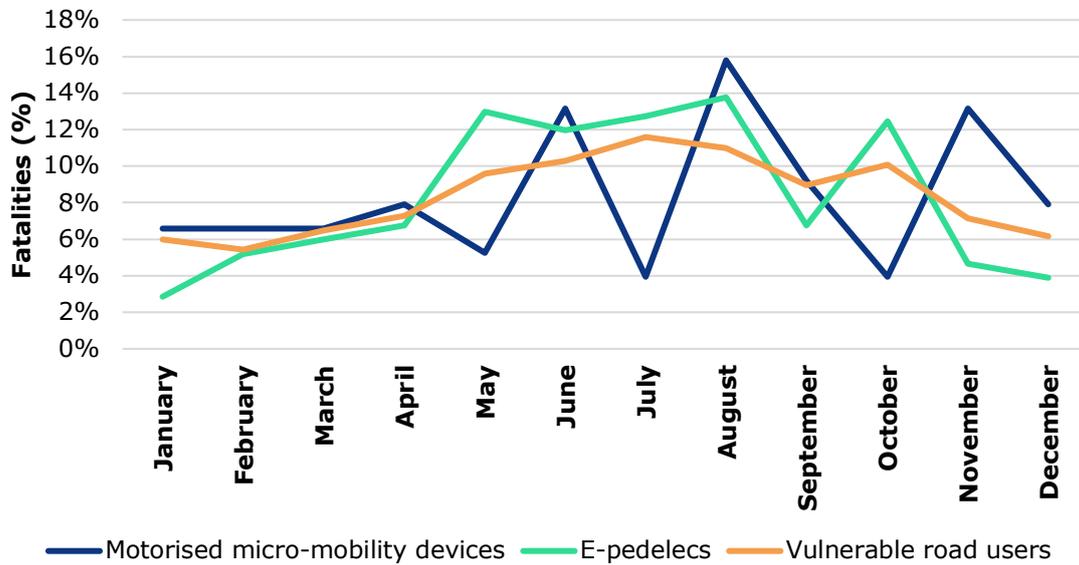
**Figure 9.** Distribution of motorised micro-mobility device, pedelec and VRU fatalities by day of the week and hour (2022). Source: CARE



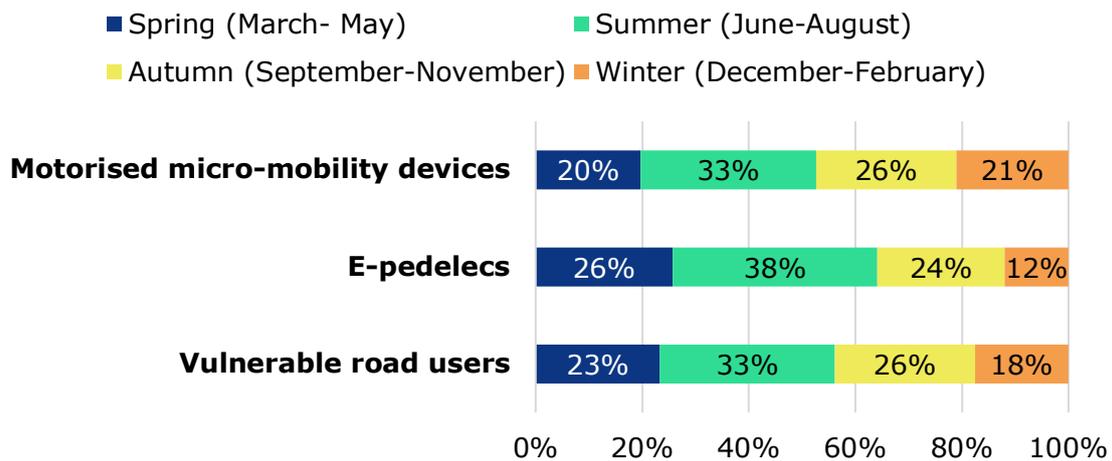
## 6.3 Month

The share of motorised micro-mobility device, pedelec and VRUs fatalities is highest in the summer months, i.e., from June to August, and lowest during the winter months, i.e., from December until February/March.

**Figure 10.** Monthly distribution of motorised micro-mobility device, pedelec and VRU fatalities in some EU countries (2022). Source: CARE



**Figure 11.** Distribution of motorised micro-mobility device, pedelec and VRU fatalities by time of the year (2022). Source: CARE



## 7. Notes

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### 7.1 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](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.

#### **Comparisons with other groups**

Please note that both groups (motorised micro-mobility devices and pedelec) are compared with vulnerable road users (VRUs – pedestrians, cyclists, mopeds and motorcycles)

#### **Pedelec**

Vehicle with at least two wheels with pedal assistance which is equipped with an auxiliary electric motor having a maximum continuous rated power of 0.25 kW, of which the output is progressively reduced and finally cut off as the vehicle reaches a speed of 25 km/h, or sooner, if the cyclist stops pedalling. Speed pedelecs are not included as they are deemed to be equivalent to mopeds.

#### **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.

#### **Motorised micro-mobility device**

A motorised, micro-mobility device such as an e-micro-scooter, a segway, a monowheel or a self-balancing unicycle. The device should

have at least one wheel, be designed for one person, and have an electric motor that can achieve a maximum speed of up to 25 km/h.

**Motorway**

Public road with dual carriageways and at least two lanes each way. Entrance and exit sign posted. 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.

**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.

**Vulnerable road users**

Non-motorised road users, such as pedestrians and cyclists as well as mopeds and motorcyclists

**Victims**

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

**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.

**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.

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

## 7.3 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.

## 7.4 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.

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.

## 7.5 Data cleaning / limitations

It is not possible to draw conclusions on EU totals or an average for

the EU 27 countries. Furthermore, the data has only been collected for the past 1-3 years, which is why time series and comparisons over time have been omitted. The data on VRUs was used as a comparison group, but only from the 15 European countries that also provide data for new forms of mobility fatalities and crashes.

Countries which never recorded a single victim in these special groups (micro-mobility devices & pedelecs) are completely excluded from the analysis and this F&F.

15 EU countries are included: Belgium, Denmark, Germany, Estonia, Ireland, Spain, France, Italy, Lithuania, Luxembourg, Malta, Netherlands, Austria, Poland, Slovenia

## 7.6 COVID-19 pandemic

It is clear that the global COVID-19 pandemic had an impact on the CARE data for 2020 and 2021 and, to a lesser extent, also 2022 for some countries. 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.

## 7.7 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.

