OTI Fact Sheet 2/2023

Fatal fatigue accidents in 2012–2021

The report is based on fatal road accidents caused by a motor vehicle driver that occurred in 2012–2021 and were in-depth investigated by Finnish road accident investigation teams.

Limitations: suicides and fatalities due to natural causes (not collision injuries) are not included in this report.

The main observations

1. Motor vehicle driver's fatigue influenced on 21% of fatal road accidents.

2. More than one-third (37%) of drivers causing fatal fatigue accidents were intoxicated.

3. Fatal fatigue accidents took typically place in the summer and during daylight hours.

Recognizing driver's fatigue in accident investigation

Identifying fatigue and assessing the effect of fatigue or drowsiness in accident investigation is often difficult. Fatigue cannot be measured, such as blood alcohol levels. The formation of fatigue and its effect is also individual. An additional challenge to the accident investigation is caused by the fact that the driver who caused the accident has often been alone in a vehicle and has died in an accident. Therefore, in most cases the accident investigation teams have to assess the driver's fatigue with help of the other information available from the accident.

When assessing fatigue and drowsiness, the accident investigators search information on the driver's general driving condition and motives for driving. The investigation teams can assess driver's fatigue for example by interviewing other people and collecting information on the driver's driving and sleeping times before the accident. In addition, information on the driver's illnesses, physical exertion and meals are important. Eyewitness accounts of the vehicle from wandering in the lane or crashing without braking provide a reason to suspect driver's fatigue as a possible risk factor.

The accident investigation aims, for example, to find out whether some other factor than drowsiness took the driver's attention away from driving or what effect the prevailing weather and road conditions had on the occurrence of the accident.

Typically, information used for assessing driver's fatigue is often associated with uncertainties or information is very scarce. Professional drivers are an exception because tachographs provide mostly accurate information about driving times and breaks. Uncertainties should also be taken into account in the results of this report, and individual numerical values should not be overemphasized.

Classification of the accidents

In this report the accidents were classified in three groups:

- Drowsiness as an immediate risk factor
  - Driver fell asleep while driving or the driver was very tired

- Fatigue as a background risk factor
  - Driver's fatigue contributed the accident together with other background risks. The driver didn't fell asleep (see immediate risk factor)

- Driver was fatigued but no influence on accident
  - The investigation team assessed the driver fatigued, but the fatigue didn't influence on accident.

Driver's fatigue or drowsiness influenced on 21% (n=316) (immediate risk factor + background risk factor) of fatal road accidents. Overall, driver's fatigue or drowsiness was observed in 33% (n=497) of all 1,533 fatal road accidents investigated during years 2012–2021. (Figure 1)

Presence of fatigue and drowsiness in fatal road accidents during years 2012–2021:

- Drowsiness was an immediate risk factor in 7% (n=108) of fatal road accidents
- Fatigue was a background risk factor in 14% (n=208) of fatal road accidents
- Driver was fatigued but the fatigue didn't influence on accident: 12% (n=181).

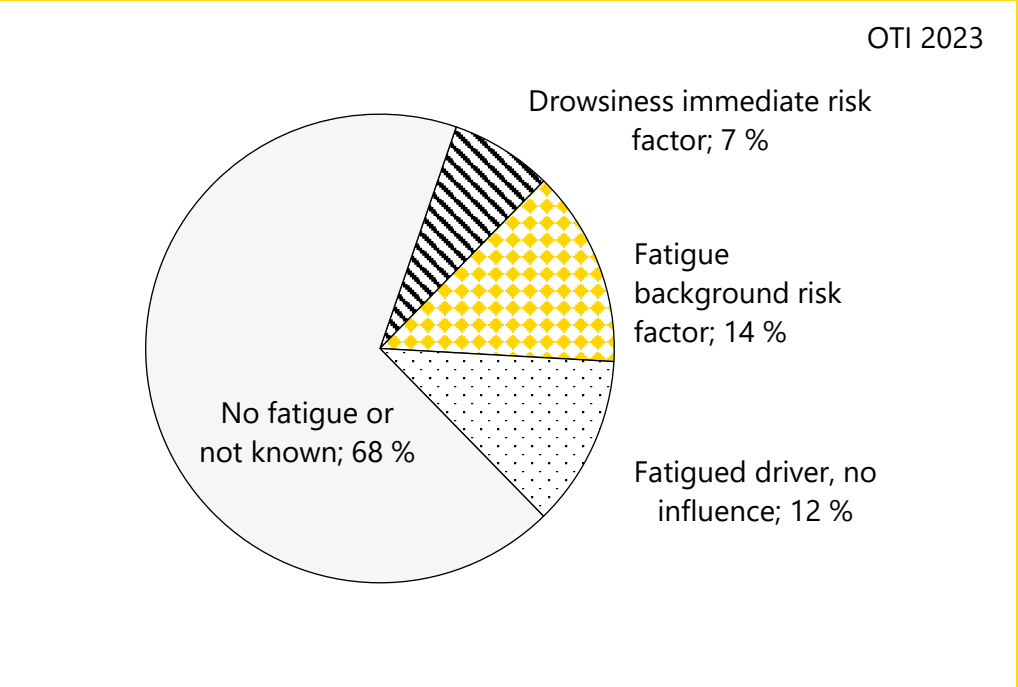

Figure 1. Appearance of motor vehicle drivers' fatigue in fatal road accidents. OTI's accident data 2012–2021.

Numbers of accidents and victims

A total of 316 fatal road accidents that took place in 2012 and 2021 were caused by fatigued or drowsy drivers (immediate risk and background risk presented on the previous page). In the last years of the review period, the number of accidents decreased where driver's drowsiness was an immediate risk factor. (Figure 2)

A total of 358 people died in 316 fatigue accidents. Of the victims, 233 were drivers causing the accidents and 60 were their passengers. 44 people died in other vehicles. A total of 21 cyclists and pedestrians lost their lives in accidents caused by fatigued driver.

In addition to fatigued drivers causing the accidents, the fatigue of the other drivers (B-parties) was estimated to have influenced on 20 accidents over the ten years period. Those 20 accidents are not included in reviews of the report.

Figure 3 shows the age distribution of drivers causing fatigue accidents (n=316). The age distribution of drivers causing other than fatigue accidents (n=1,240) is presented as a comparison. The shape of distributions are very close to each other.

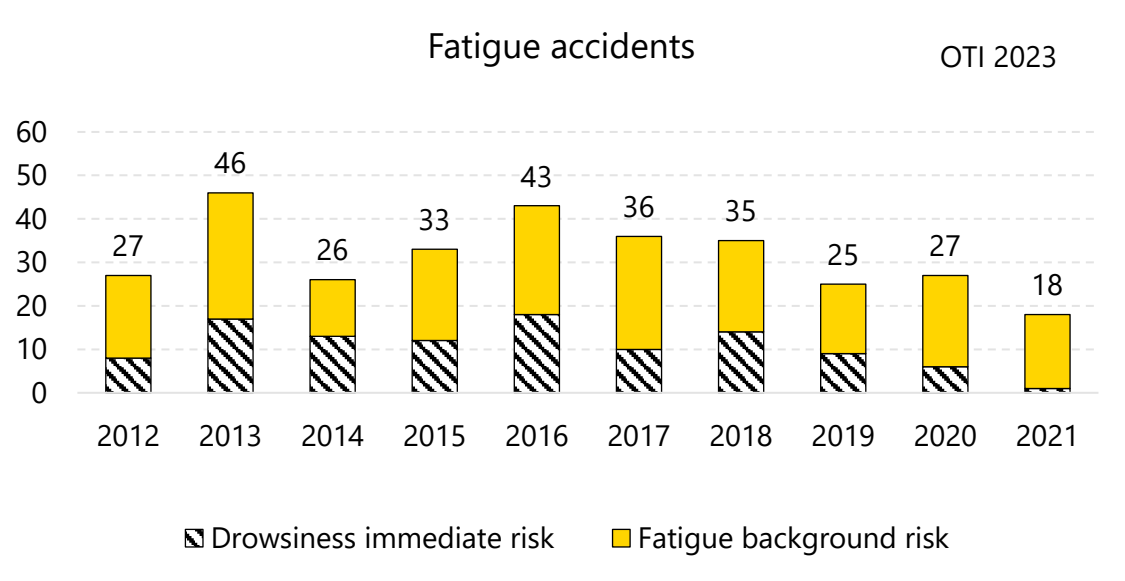

Figure 2. Annual numbers of fatal fatigue accidents. OTI's accident data 2012–2021.

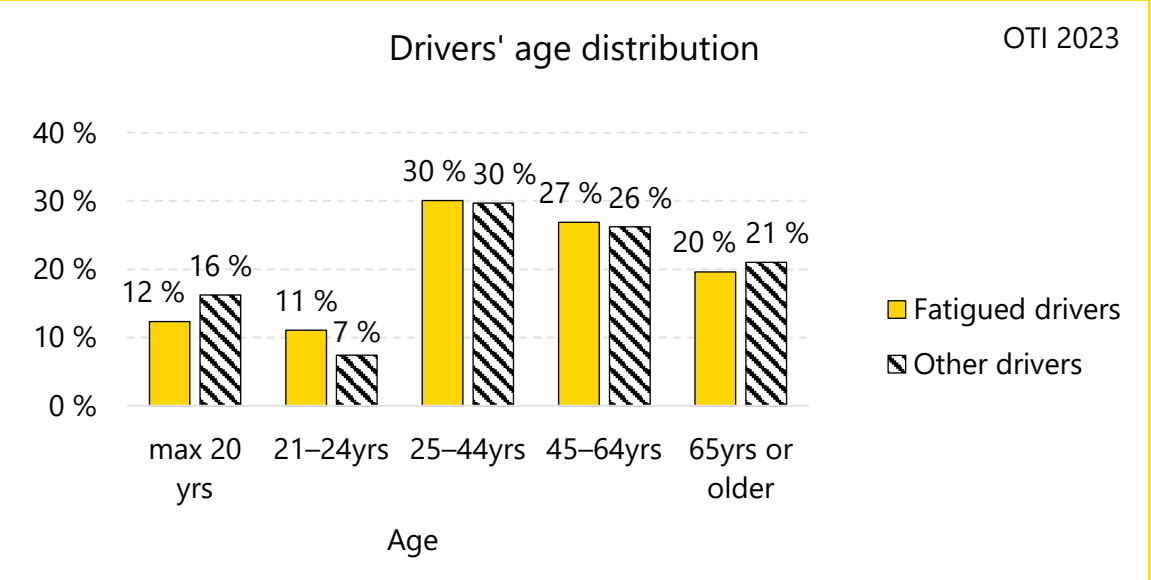

Figure 3. Age distribution of drivers causing fatal fatigue accidents. Age distribution of drivers causing other than fatigue accidents is presented as a comparison. OTI's accident data 2012–2021.

Characteristics of fatigue accidents

Of the fatigue accidents caused by motor vehicle drivers, 52% (n=163) were collisions (Figure 4). Of the collisions, 142 involved two or more motor vehicles and 21 involved a pedestrian or a cyclist. Of the fatigue accidents, 48% (n=153) were single vehicle accidents with no other participants.

54% (n=172) of fatigue accidents occurred in daylight.

Of the drivers causing fatigue accidents

- 82% (n=260) drove a car or a van
- 76% (n=213) were at the time of the accident on a trip related to leisure or personal business. The purpose of 37 drivers' trip is unknown.
- 37% (n=118) were intoxicated*.

* Drivers who could have been under the influence of one or more substances. Drivers could have been under the influence of alcohol at the time of the accident (at least 0.5 per mille), under the influence of a drug or under the influence of a medicine that may have affected the ability to drive.

Characteristics of fatal fatigue accidents

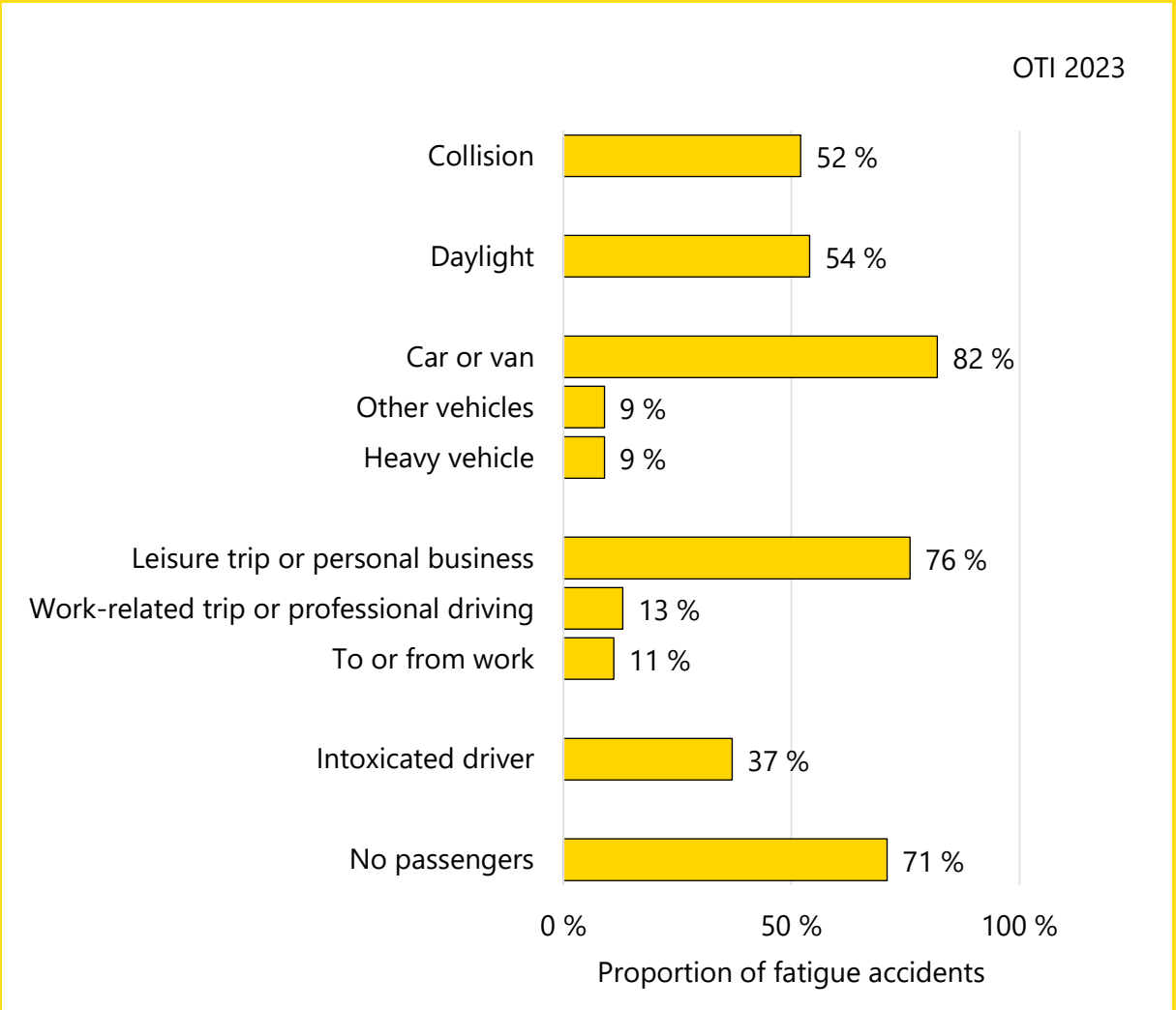

Figure 4. Characteristics of fatal fatigue accidents. OTI's accident data 2012–2021.

Month and time of day of fatigue accidents

Fatigue accidents occurred in all seasons, but most in the summer. 39% of accidents (n=122) occurred in June–August (Figure 5). In the summer the number of fatigue accidents was highest for both sober and intoxicated drivers.

Fatigue accidents occurred in all times of the day (Figure 6). However, fatigue accidents caused by sober drivers were concentrated for the period between 12 and 18 o'clock, while the period between the midnight and six in the morning was the most typical for intoxicated drivers.

Information on intoxication of ten drivers is missing, and they are not included in the analyses of this page.

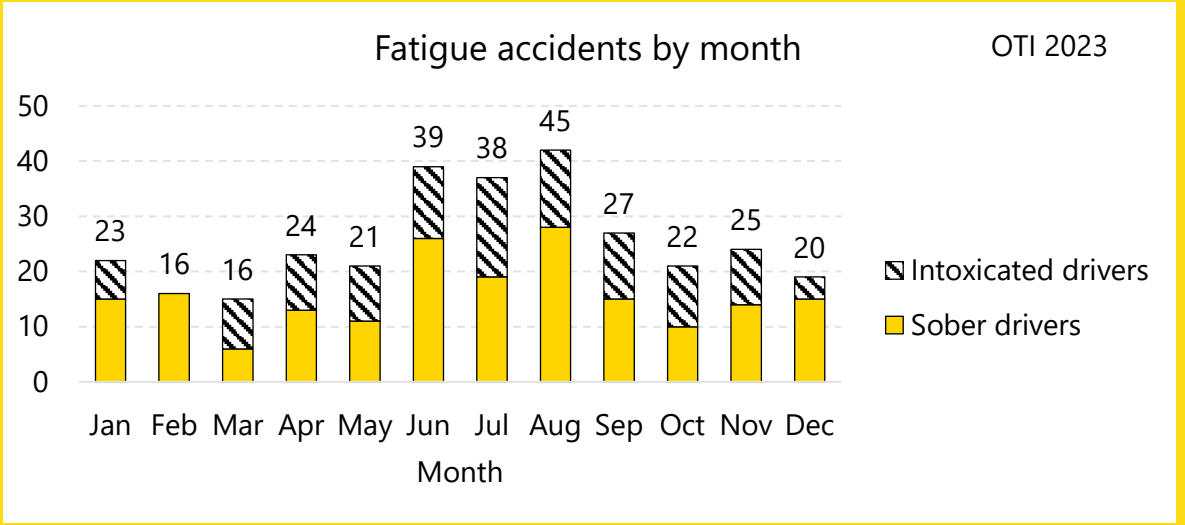

Figure 5. Fatal fatigue accidents by month. OTI's accident data 2012–2021.

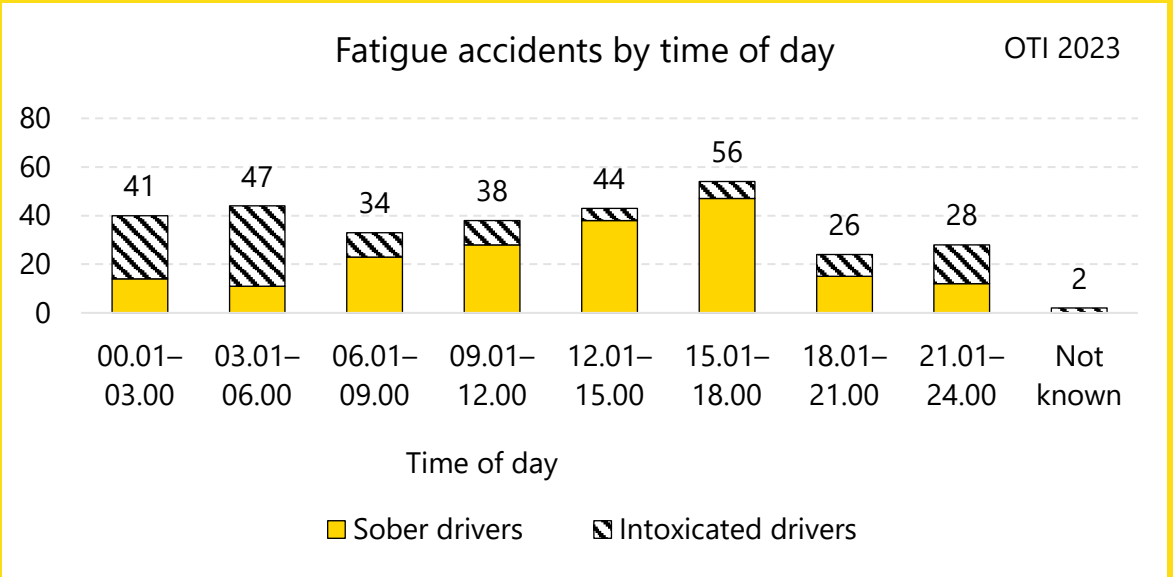

Figure 6. Fatal fatigue accidents by time of day. OTI's accident data 2012–2021.

Typical characteristics and risk factors of fatigue accidents'

As in fatal traffic accidents in general, also in fatigue accidents, there were typically several different risk factors that influenced the occurrence of accidents and the severity of their consequences. As it was stated, a majority of fatigue accidents occurred during leisure trips, and on the other hand for car or van drivers. Daylight and the midsummer months were also prominent. More than one third of the fatigue accidents were caused by intoxicated drivers.

Typical risk factors the investigation teams identified in fatigue accidents:

- A driver was using a car that was not equipped with driver's alertness monitoring system or a lane keeping assistant
- Drifting into the oncoming lane was possible because the driving directions were not physically separated
- Long driving distances and insufficient breaks
- Different physical and mental health diseases
- Being alone in a car was also identified as a risk factor in some cases, as the passenger could have possibly helped the driver to stay awake or drive part of the journey. On the other hand, sleeping passengers were also found to have contributed to the driver's drowsiness in some cases.

Recommendations for preventing driver's drowsiness and fatigue accidents

The most essential thing in the prevention of fatigue accidents is to identify factors that increase fatigue and cause drowsiness. Taking care of general health, rest and adequate recovery are also closely related to combating fatigue.

Fatigue accidents could be prevented by increasing the drivers' and employers' awareness about fatigue and its effect on traffic safety. For example, the importance of illnesses, driving breaks and nutrition on fatigue should be emphasized. In addition the employers can choose safe traffic modes for work-related travel for employees.

Police enforcement on driving behaviour and intoxication, as well as the control of driving and rest times of professional drivers, are also important means of preventing fatigue accidents.

Fatigue accidents can also be prevented with vehicle technology. According to the investigation teams, there should be more vehicles in use that can warn of low alertness and the risk of collision. With lane keeping systems, it is possible to prevent vehicles from unintentionally moving out of the lane. Alcolock is an effective way to prevent drunken driving, which is often associated with fatigue accidents.

Among the road engineering methods, the investigation teams highlighted, for example, vibration alarms that warn of drifting out of the lane and physical separation of the driving directions, important for preventing the fatigue accidents.

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Figure data in Excel

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The Finnish Crash Data Institute (OTI) works to prevent road accidents in Finland. OTI coordinates the operations of road accident investigation teams and administers the data collected in the investigations, in addition to its other traffic accident statistics. The amount and quality of the statistical data are unique by international standards. OTI provides important information that can be used to improve traffic safety at both legislative and practical levels. The institute operates as an independent unit within the Finnish Motor Insurers' Centre. **www.oti.fi**