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A large circular image showing a blurred view from a car's perspective, suggesting high speed. The background is a bright, hazy sky with light rays.

Safety Performance Indicator (SPI) **Subjective safety**



The purpose of the Safety Performance Indicator reports is to provide an overview of recent statistics on road safety performance indicators that are linked to traffic safety.

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1. Summary

Information on road users' subjectively experienced level of safety when participating in traffic is a valuable addition to objective road safety indicators. This ERSO report provides an overview of traffic participants' feeling of safety for different transportation modes in EU Member States and EFTA countries.

In general, data on subjective safety are scarce and (largely) limited to self-reported data, since largescale observational or statistical data can only serve as a proxy. For this report, data from the ESRA project (survey data) are used.

The SPI subjective safety is defined as: *Mean of subjective safety as [a passenger car driver / PTW driver / cyclist / pedestrian], indicated on a 11-point scale, ranging from 0 (very unsafe) to 10 (very safe).*

Based on these data sources the following can be concluded:

1. The subjective level of safety when driving a passenger car ranges from 5.9 to 8.3.
2. Scores for the subjective feeling of safety as a motorcyclist range from 4.5 to 6.5. Driving a PTW is perceived as the least safe mode.
3. Cyclists perceived level of safety lies between 4.5 and 7.3.
4. Pedestrians report on average the highest levels of safety, with scores from 6.7 to 8.8.
5. For all the modes, females show lower levels of perceived safety and there is the tendency of older road users feeling safer than younger ones when driving a car or riding a motorcycle.

2. Introduction

2.1 Safety Performance Indicators (SPIs)

The most common indicators used for evaluating traffic safety are the number of traffic crashes, or the number of fatal/serious injuries due to a traffic crash. However, these numbers insufficiently reflect the actual problem and the underlying factors that lead to the crash. Moreover, crashes are relatively rare events, and are under-registered. Therefore, alternative proactive approaches have been adopted to evaluate road safety. For example, events/behaviors/attitudes which have a recognized relationship with crash frequency, and that are sensitive to policy measures, can be used as a proactive approach to evaluate safety. Since the 90's these so-called safety performance indicators (SPIs) are increasingly used to develop traffic safety policies.

The following *SPIs* are detailed in ERSO SPI reports:

- Speeding
- Distraction
- Fatigue
- Driving under the influence of alcohol and drugs
- Protection – the use of seat belts, helmets, and child restraint systems
- Support for policy measures
- Subjective safety and risk perception

Speeding, distracted driving, and using protective equipment are behaviours which can be observed through roadside observations or measurements. For the SPI driving under the influence of alcohol and/or drugs, police-assisted random breath testing during roadside alcohol checks provides potentially the best data.

On the other hand, fatigued driving, support for policy measures, or subjective risk perception are (practically) not observable. For these aspects, well-designed questionnaire surveys may provide valuable data on road safety performance.

2.2 Aim of the ERSO SPI reports

The ERSO SPI reports provide an overview of the available data in the EU Member States as well as EFTA countries for each listed SPI. The reports aim to give insight into the differences between (groups of) countries regarding their road user behaviour or attitude. Where feasible, the reports look at whether SPIs are related to existing policies and regulations, providing possible effective interventions to increase

safe behaviour or discourage unsafe behaviour. In addition to identifying relevant interventions, SPI data can be used to evaluate these measures and interventions.

For most SPI topics an ERSO thematic report exists as well. In these reports background information of risks, effects and causes are provided (see: [Thematic reports \(europa.eu\)](https://europa.eu)).

2.3 SPI Subjective safety

This report focuses on the subjective experience of feeling safe or unsafe in road traffic using the following modes:

- Car driving
- Riding a Powered Two-Wheeler (moped or motorcycle)
- Cycling
- As a pedestrian

The **SPI Subjective safety as a car driver** is defined as:

Mean of subjective safety as a passenger car driver (indicated on a 11-point scale, ranging from 0 (very unsafe) to 10 (very safe))

The **SPI Subjective safety as a PTW driver** is defined as:

Mean of subjective safety as a rider of a PTW (indicated on a 11-point scale, ranging from 0 (very unsafe) to 10 (very safe))

The **SPI Subjective safety as a cyclist** is defined as:

Mean of subjective safety as a cyclist (indicated on a 11-point scale, ranging from 0 (very unsafe) to 10 (very safe))

The **SPI Subjective safety as a pedestrian** is defined as:

Mean of subjective safety as a pedestrian (indicated on a 11-point scale, ranging from 0 (very unsafe) to 10 (very safe))

2.4 Data Source

Presented data on the perceived level of safety in this report are based on the ESRA survey (E-Survey of Road users' Attitudes).

Within ESRA (www.esranet.eu) a joint international initiative of road safety institutes, research centres, public services, and private sponsors, comparable data on road safety performance, in particular on aspects of road safety culture and behaviour of road users worldwide, have been collected and analysed.

ESRA data are collected by means of online panel surveys, providing a representative sample of the national adult population in each

participating country (at least $N = 1,000$ per country). The extensive survey was conducted in 68 participating countries, covering six continents. Data on the subjective levels of safety were collected between 2018 and 2019 across 24 European countries, 22 of which are among the European Union and/or EFTA countries. In this report, the ESRA data for these 22 European countries are presented, i.e., Austria, Belgium, Bulgaria, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, Slovenia, Spain, Sweden, and Switzerland. For details on the methodology of the data collection and analysis see: Achermann Stürmer, Meesmann, and Berbatovci (2019); Meesmann, Torfs, Wardenier, and Van den Berghe (2023).

3. The level of perceived safety in Europe

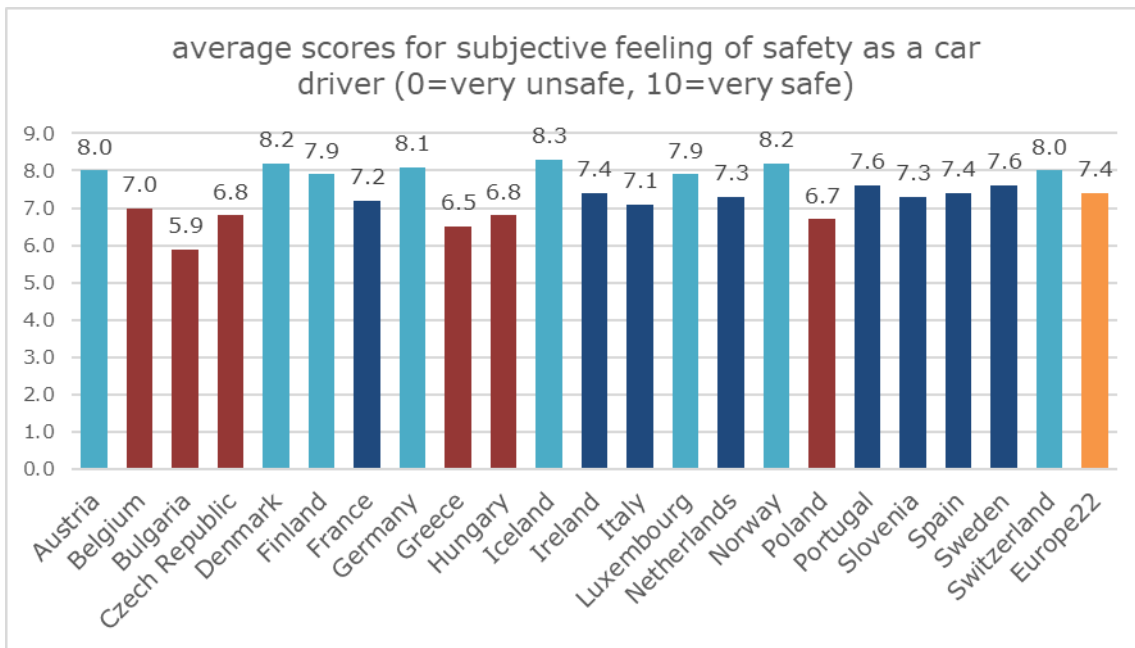
3.1 Subjective safety as a car driver

To measure the safety level of European car drivers, ESRA respondents who drove a car in the past 12 months at least once were asked: 'How safe or unsafe do you feel when using the following transport mode in your country? Car as a driver'. Answer options were ranging from 0 ('very unsafe') to 10 ('very safe'). Average values were calculated at country level and are shown in Figure 1.

The mean value for the 22 European countries is 7.4, with a range of 5.9 in Bulgaria and 8.3 in Iceland, where car drivers feel the safest when participating in traffic. There are two more countries with a score of 8.2 (second highest score): Denmark and Norway. Compared to the other modalities presented in this report (see following chapters), the European mean is the second highest value, with only pedestrians feeling safer, while PTW riders and cyclists feel less safe. Male car drivers indicated to feel slightly safer on average than female car drivers and older people feel safer than younger people when driving a car (Furian et al., 2021).

Figure 1. Average scores for the perceived level of safety as a car driver in EU and EFTA countries. Deviations of 5% or more from the average are indicated in red and light blue bars. (Source:

<https://www.esranet.eu/>



3.2 Subjective safety as a PTW rider

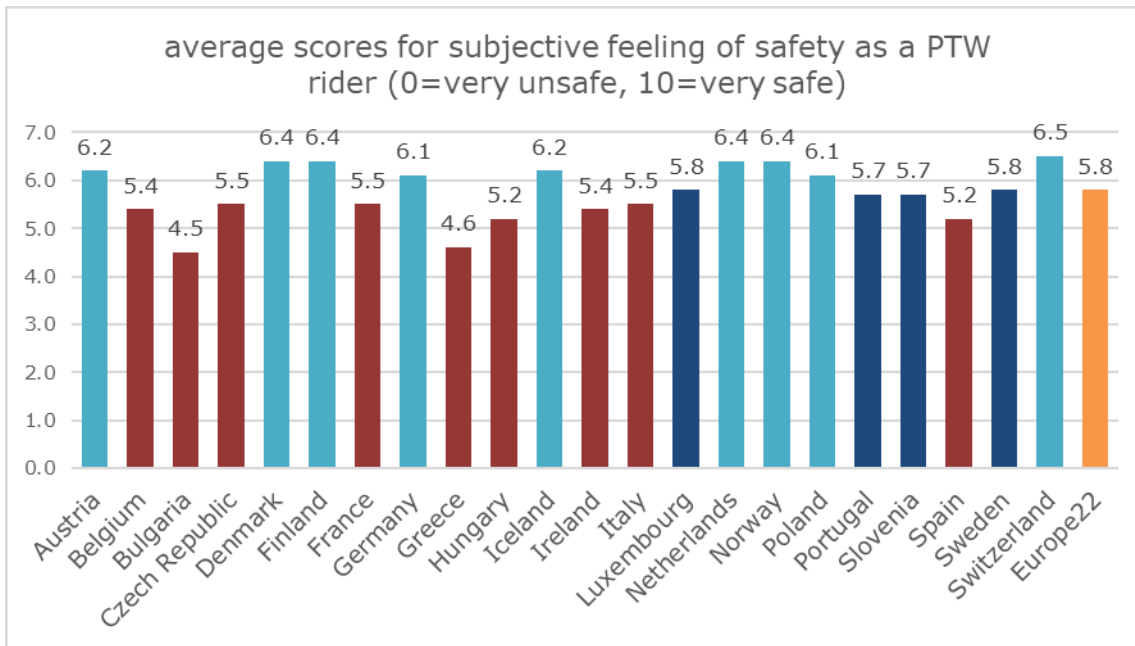
To measure the safety level of European PTW riders, ESRA respondents who rode a moped or motorcycle in the past 12 months at least once where asked: 'How safe or unsafe do you feel when using the following transport mode in your country? Moped rider/motorcyclist'. Answer options were ranging from 0 ('very unsafe') to 10 ('very safe'). Average values at country level are shown in Figure 2.

Riding a PTW is perceived as the least safe mode, with an European average of 5.8. Furthermore, the range of country values is the smallest for the safety level of PTW, with the lowest scores in Bulgaria (4.5) and Greece (4.6), and the highest score in Switzerland (6.5), where PTW riders feel the safest among the included countries. Four more countries show a similar subjective level of safety (6.4): Denmark, Finland, the Netherlands, and Norway. On average PTW feel less safe than car drivers, cyclists, and pedestrians.

Female riders indicate lower levels of perceived safety (0.4 points difference compared to males) and older riders tend to feel safer than younger riders, whereby the age group of 55 to 64 exceed the group 65+ (Furian et al., 2021).

Figure 2. Average scores for the perceived level of safety as a PTW rider in EU and EFTA countries. Deviations of 5% or more from the

average are indicated in red and light blue bars. (Source: <https://www.esranet.eu/>)



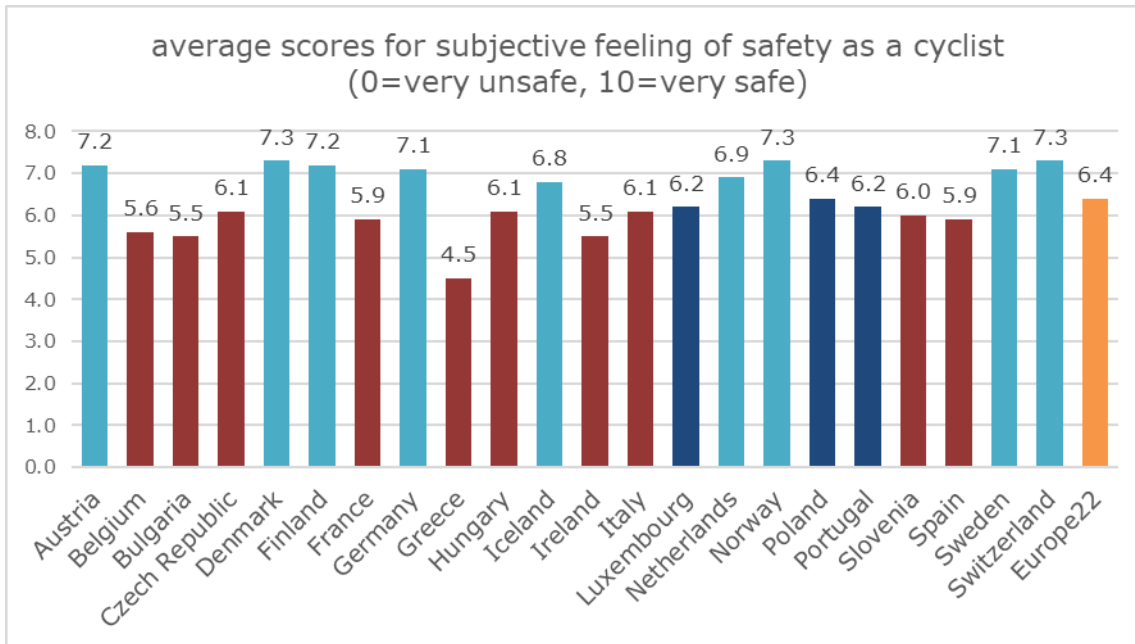
3.3 Subjective safety as a cyclist

To measure the safety level of European cyclists, ESRA respondents were asked: 'How safe or unsafe do you feel when using the following transport mode in your country? Cyclist', with answer options ranging from 0 ('very unsafe') to 10 ('very safe'). All survey respondents who rode a bicycle in the past 12 months at least once were included. See Figure 3 for the country averages.

The highest scores for cycling safety are perceived in Denmark, Norway and Switzerland (7.3 each), the lowest score in Greece (4.5), with an European average of 6.4. Another two countries score high with 7.2: Austria and Finland. The subjective safety of cyclists, on average, is lower than subjective safety of car drivers and pedestrians but higher than the one of PTW riders. E-bike riders indicate a slightly lower level of safety (-0.3 points on average). Male and female riders differ by 0.2 points, with males feeling safer. Also, the values for the age groups are very close to each other with no clear overall trend (Furian et al., 2021).

Figure 3. Average scores for the perceived level of safety as a cyclist in EU and EFTA countries. Deviations of 5% or more from the average are indicated in red and light blue bars. (Source:

<https://www.esranet.eu/>



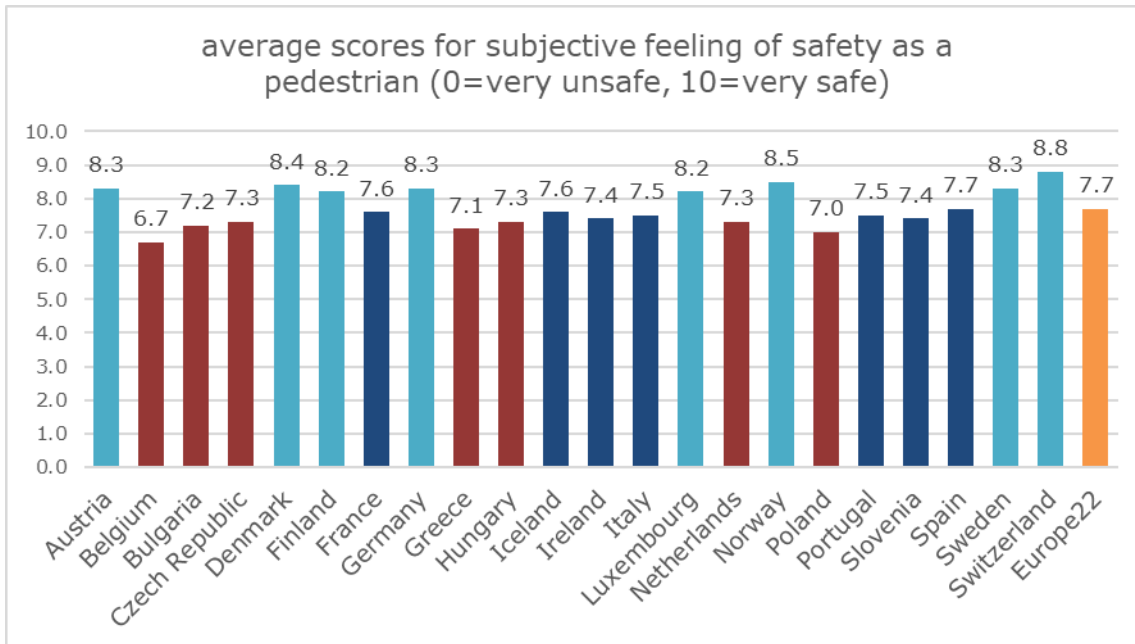
3.4 Subjective safety as a pedestrian

ESRA respondents were also asked: 'How safe or unsafe do you feel when using the following transport mode in your country? Pedestrian', with answer options ranging from 0 ('very unsafe') to 10 ('very safe'). Results are shown in Figure 4.

As expected, pedestrians' perceived level of safety is higher, on average, than that of car drivers, PTW riders, and cyclists, with a mean score of 7.7. Swiss pedestrians indicate the highest level of feeling safe (8.8) and Belgian pedestrians the lowest (6.7) among the countries included in this report. Therefore, the range of country scores is rather low. Information on gender and age differences is not available for pedestrians.

Figure 4. Average scores for the perceived level of safety as a pedestrian in EU and EFTA countries. Deviations of 5% or more from the average are indicated in red and light blue bars. (Source:

<https://www.esranet.eu/>



4. The level of perceived safety and road safety

The subjective level of safety in road traffic refers to feeling safe or unsafe as a traffic participant or to the anxiety related to anticipating whether oneself or others will be safe in traffic (SWOV, 2012). Many different factors shape this feeling and the link with objective road safety outcomes is moderate. A high subjective level of safety can even have a detrimental impact on the care that is being taken when participating in traffic. Nevertheless, these indicators serve as a valuable addition to objective road safety measures. The levels of safety can influence mode choice, above-average changes can reveal hot topics which need follow up investigation, and comparison gives individual countries a chance to better understand their position (Furian et al., 2021).

5. Limitations

Data sources on the perceived level of safety using different transport modes are rare and methodologically limited to surveying. Hence, there are also limitations regarding the data source used. The ESRA data, based on self-reported data, can have disadvantages, such as social desirability bias (the tendency of respondents to provide answers which present a favourable image of themselves), non-accurate recall,

misunderstanding of questions, or selective non-response bias (occurring when subjects who refuse to take part in a study, or who drop out before the study can be completed, are systematically different from those who participate). Furthermore, while asking respondents about concrete behaviours within a certain time frame is straightforward, asking about a construct such as a 'feeling' is based on subjective and might have different connotations for different people.

6. References

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