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E-Survey of Road users' Attitudes

Subjective Safety and Risk Perception

ESRA3 Thematic report Nr. 2

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Subjective Safety and Risk Perception

ESRA3 Thematic report Nr. 2

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List of abbreviations

Country codes (in accordance with ISO 3166-1 alpha-2 (International Organization for Standardization (ISO), 2024))

AM	Armenia	KG	Kyrgyzstan
AU	Australia	LV	Latvia
AT	Austria	LU	Luxembourg
BE	Belgium	MX	Mexico
BA	Bosnia and Herzegovina	NL	Netherlands
BR	Brazil	PA	Panama
CA	Canada	PE	Peru
CL	Chile	PL	Poland
CO	Colombia	PT	Portugal
CZ	Czech Republic	RS	Republic of Serbia
DK	Denmark	SI	Slovenia
FI	Finland	ES	Spain
FR	France	SE	Sweden
DE	Germany	CH	Switzerland
EL	Greece	TH	Thailand
IE	Ireland	TR	Türkiye
IL	Israel	UK	United Kingdom
IT	Italy	US	United States
JP	Japan	UZ	Uzbekistan
KZ	Kazakhstan		

Other abbreviations

ESRA	E-Survey of Road users' Attitudes
EU	European Union
ICW	Individual country weight used in ESRA3
HIC	High income countries based on World Bank classification 2023 (The World Bank Group, 2023)
UMIC	Upper-middle income countries based on World Bank classification 2023 (The World Bank Group, 2023)
LMIC	Lower-middle income countries based on World Bank classification 2023 (The World Bank Group, 2023)

Executive summary

Objective and methodology

ESRA (E-Survey of Road users' Attitudes) is a joint initiative of road safety institutes, research centres, public services, and private sponsors from all over the world. The aim is to collect and analyse comparable data on road safety performance and road safety culture. The ESRA data are used as a basis for a large set of road safety indicators. These provide scientific evidence for policy making at national and international levels.

Vias institute in Brussels (Belgium) initiated and coordinates ESRA, in cooperation with ten steering group partners (BASt (Germany), DTU (Denmark), IATSS (Japan), ITS (Poland), KFV (Austria), NTUA (Greece), PRP (Portugal), SWOV (the Netherlands), TIRF (Canada), University Gustave Eiffel (France)). At the heart of ESRA is a jointly developed questionnaire survey, which is translated into national language versions. The themes covered include self-declared behaviour, attitudes and opinions on unsafe traffic behaviour, enforcement experiences and support for policy measures. The survey addresses different road safety topics (e.g., driving under the influence of alcohol, drugs and medicines, speeding, distraction) and targets car occupants, moped riders and motorcyclists, cyclists, pedestrians, and riders of e-scooters. In ESRA3 the questions related to vulnerable road uses (moped riders and motorcyclists, cyclists, pedestrians, and riders of e-scooters) have been expanded and questions on e-scooters and infrastructure have been added.

The present report is based on the third edition of this global survey, which was conducted simultaneously in 39 countries in 2023. In total this survey collected data from more than 37000 road users in 39 countries across five continents. An overview of the ESRA initiative and the project results is available on: www.esranet.eu.

This thematic ESRA3 report on subjective safety and risk perception describes the perceived levels of safety when using different transport modes and the assessment of various risk factors in traffic (e.g. alcohol, speed, fatigue) regarding their contribution to crashes amongst road users in 39 countries across Europe, America and AsiaOceania. It includes comparisons amongst the participating countries as well as results in relation to age and gender. The association between the perceived level of safety in different transport modes – i.e. using a car, using a motorcycle, using a bicycle and walking – and road fatalities is studied for European countries and described in the section 'advanced analysis'. For this purpose, the survey data were put into relation to national crash data as reported in 'CARE', the European Union's road accident database.

Key results

Below for each research question the major findings are presented.

How safe or unsafe do you feel when using the following transport modes?

- Respondents in all regions consider the e-scooter and the motorcycle as the least safe transport modes. Additionally, in America, bicycles were also regarded as one of the least safe modes of transport. In contrast, walking was considered the safest transport mode in Europe and AsiaOceania. In America, driving a hybrid or electric car was considered the safest.

- Especially in Europe women tend to feel less safe when using the various transport modes, in particular driving a car, cycling, and walking, than men.

- For driving a car in Europe, and for driving a hybrid or electric car in Europe and in AsiaOceania, the subjective level of safety tends to increase with age. In contrast, this age pattern was mostly not found in America or even reversed.

- Regarding the interrelation of subjective safety and road fatalities, car drivers tend to feel safer when there are less fatal road crashes in their countries. The same pattern was found for

motorcyclists and pedestrians. This association pattern tends to be strongest for motorcyclists and pedestrians, but was not as strong for car drivers.

- For cyclists the pattern is different, the association between subjective safety and fatalities seems to be positively related. When adding exposure as further dimension to the picture, it showed that cyclists in countries with higher cycling exposure tend to feel safer.

Which factors or behaviours are perceived as frequent causes of crashes?

- In Europe and America respondents considered driving after drinking alcohol as the riskiest of the sampled factor. In AsiaOceania, speeding was considered the riskiest of all the factors; in Europe and America this is perceived as the second riskiest factor.

- Especially in Europe a high percentage of respondents also considered using a hand-held phone while driving as risky. In contrast, using a hands-free phone while driving was the behaviour least risky in all regions.

- In all regions, but particularly in Europe, women considered most dangerous driving behaviours to be riskier than men.

- In Europe and America risk perception of different behaviours increased with age, in AsiaOceania this age pattern was not found.

The ESRA initiative has demonstrated the feasibility and the added value of joint data collection on road safety performance by partner organizations all over the world. The intention is to repeat this survey every three to four years, retaining a core set of questions in every edition. In this way, ESRA produces consistent and comparable road safety performance indicators that can serve as an input for national road safety policies and for international monitoring systems on road safety performance.

1. Introduction

The prevalence of crashes in road traffic and the harm caused is the most objective and immediate indicator of road safety. Objective risk in road safety is commonly understood as the probability of road crashes, injuries or fatalities per unit of road traffic exposure. Quantifying the relative risk for a crash when certain (risk) factors are present – especially road user related risk factors – is challenging as the presence or absence of some risk factors is not absolute but rather a state on a continuum which can vary over time (e.g. fatigue). Moreover, some risk factors (e.g. impairment due to alcohol consumption) are not directly observable nor absolute (either present or not). Therefore, the presence and extent of such risk factors need to be inferred based on indicators which are (more or less) stable over time, such as the blood alcohol concentration (unstable even in the short term) or outcomes of psychometric tests (stable, at least in the medium term; Aigner-Breuss et al., 2017).

The objective level of safety (or objective risk) overall does not necessarily correspond to how people feel about traffic participation or how they subjectively assess crash risk, also known as subjective safety (Sørensen & Mosslemi, 2009). The relationship between objective and subjective traffic safety is assumed to be only minor (SWOV, 2012). At the same time, it is not agreed upon which level of subjective safety even is desirable, given that 'feeling too safe' might result in decreased caution of traffic participants and therefore in reduced traffic safety. On the other hand, not feeling safe might affect mode choice or even whether to participate in traffic at all.

The concept of subjective safety in traffic refers to feeling safe/unsafe in traffic or to the anticipation of being safe or unsafe in traffic for oneself or others, respectively (SWOV, 2012) and is tangent o people's fear of being involved in a crash (Hyden, 2016). This individual assessment is shaped by a variety of internal and external factors like personal experience, observation and interpretation of traffic situations, social norms, personality traits, accuracy of information, the built environment, infrastructure, traffic volume etc. Subjective safety has furthermore common ground with the concept of 'risk perception'. However, it is important to note that there is also no agreed-upon standard definition of risk perception (Shinar, 2017). Risk perception is different from 'risk tolerance' and 'risk taking'. It is a complex construct like subjective safety and is very sensitive to perceptive biases such as heuristics (De Blaeij & Van Vuuren, 2003), leading to over- or underestimation of the actual risk. Furthermore, there is a difference between perceived risk in a given situation which affects the decision to take a risk and perceived risk on an abstract level or for a hypothetical situation.

Research on subjective safety is mostly carried out by surveying road users and asking them directly about their personal experience when participating in traffic.

In a study of Backer-Grøndahl et al. (2007) in Norway for example, between 568 and 833 road users were asked how much they worry about crashes and unpleasant incidents (on a scale from one to five) for nine different means of transport. Respondents reported to worry most about crashes when travelling with the motorcycle (mean=3.85), followed by the car (mean=2.58) and the bicycle (mean=2.55), whereas respondents did not worry much about crashes when walking (mean=1.88). However, worrying about unpleasant incidents was higher for walking (2.14) than for cycling (mean=1.59) or driving a car (mean=1.29).

However, as described, the relationship between objective and subjective safety is only minor: whereas an analysis of the US-national fatal motor-vehicle crash data bank revealed that among young drivers, the group most at risk for a fatal crash were male drivers traveling with young (16-20 years old) passengers (Ouimet et al., 2010), in one American survey among 3,574 teen drivers most consider themselves as 'safe drivers' (Hedlund & Compton, 2005).

For Germany, the Sinus Institute (2023) analysed the subjective safety of bicyclists using a representative survey with more than 2,000 participants in the years 2019, 2021 and 2023. The results are relatively constant over time: Between 57% and 63% of the participants feel very safe or often safe when cycling in road traffic, while the percentage of respondents feeling not safe at all when cycling lies between 7% and 9% (Sinus Institute, 2023).

Similarly, the Vienna Mobility Agency (2019) surveyed pedestrians and cyclists about their safety feeling when walking and cycling in the city. Pedestrians were surveyed in the year 2017 and 2019 and results

show that the percentage of respondents who indicate feeling safe as pedestrians in Vienna increased from 75% in 2017 to 83% in 2019. Bicyclists were surveyed in the years 2012, 2014, 2016 and 2019 and results also show an increase in the percentage of respondents who feel safe as a cyclist in Vienna, from 52% in 2012 to 76% in 2019 (City of Vienna, 2019).

McKown-Dawson et al. (2024) surveyed 1,000 US citizens about their perceived safety using various transport modes like walking, riding a bicycle or scooter, driving a car, riding on a bus and riding on a train. Results show, that walking and driving a car were considered as the safest transport modes: 77% of the respondents stated that walking is very or somewhat safe and for driving a car this percentage was 74%. In contrast, riding a bicycle or scooter was considered as the least safe transport mode: only 51% of the participants stated that riding a bicycle or scooter is very or somewhat safe and 35% of the respondents considered riding a bicycle or scooter as very or somewhat dangerous.

In the first addition of ESRA in 2015, respondents from 17 European countries were asked about feeling (un)safe when using different transport modes, estimation of contributing factors to road crashes and perceived risky behaviours of other road users (Furian et al., 2016). The results showed that overall respondents felt by far safest using public transport and least safe when motorcycling and cycling. In addition, generally, men tended to feel slightly safer than women and older drivers tended to feel safer than the younger age groups when driving a car and when using public transport. Regarding the perceived contribution of certain behaviours in traffic to the occurrence of crashes, driving under the influence of alcohol clearly spearheaded the list of risk factors followed by inattention and driving under the influence of drugs, whereas tiredness behind the wheel and taking psychoactive medication scored lower across the respondents of all countries. Moreover, in all age groups respondents perceived driving under the influence of alcohol and driving too fast as the main causes for road crashes. In addition, women generally tended to estimate the contribution of the various risk factors to crashes to be higher than men.

In the second edition of ESRA in 2018, data on the perceived safety when using different transport modes and on perceived contributing factors to road crashes were gathered by a survey from more than 35,000 road users across 32 countries in Europe, North America, Asia-Oceania and Africa (Furian et al., 2021). The results also showed that respondents considered the motorcycle, but also the electric bicycle as the least safe transport modes, while the aeroplane, public transport and the car were amongst the safest transport modes. Especially for Europe and Africa the subjective level of safety tended to increase with age and women tended to feel less safe across all modes. With regard to the perception of contributing factors to road crashes, respondents considered driving after drinking alcohol and speeding as the riskiest factors, while using a hands-free phone while driving was the behaviour assessed least risky in all regions. Especially for Europe, women considered dangerous driving behaviour riskier than men and risk perception of different behaviours increased with age.

Building on these aspects this thematic ESRA3 report aims at describing subjective safety and risk perception of all kinds of road users – and also the role of gender and age – for road users of 39 countries from three regions of the world (Europe, America and AsiaOceania). For this purpose, road users were asked about how safe or unsafe they feel when using various transport modes and how many crashes they thought were caused by a particular risk factor or risk behaviour. Further analyses, moreover, investigate the association between feeling (un)safe using different transport modes, i.e. car, motorcycle, bicycle and walking, and road fatalities on European roads.

2. Methodology

ESRA (E-Survey of Road users' Attitudes) is a joint initiative of road safety institutes, research centres, public services, and private sponsors from all over the world. The aim is to collect and analyse comparable data on road safety performance, in particular road safety culture and behaviour of road users. The ESRA data are used as a basis for a large set of road safety indicators. These provide scientific evidence for policy making at national and international levels.

ESRA data are collected through online panel surveys, using a representative sample of the national adult populations in each participating country (aiming at n=1000 per country). A few exceptions exist. In four countries (Armenia, Kyrgyzstan, Luxembourg, and Uzbekistan) the targeted sample size was reduced to 500 respondents, as sample sizes of 1000 respondents were not feasible due to limitations of the national panel or too high costs.

At the heart of this survey is a jointly developed questionnaire, which was translated into 49 national language versions in ESRA3. The themes covered include self-declared behaviour, attitudes and opinions on unsafe traffic behaviour, enforcement experiences and support for policy measures. The survey addresses different road safety topics (e.g., driving under the influence of alcohol, drugs and medicines, speeding, distraction) and targets car occupants, moped riders and motorcyclists, cyclists, pedestrians, and riders of e-scooters. In ESRA3 the questions related to vulnerable road users (moped riders and motorcyclists, cyclists, pedestrians, and riders of e-scooters) have been expanded and questions on e-scooters and infrastructure have been added. The present report is based on the third edition of this global survey, which was conducted simultaneously in 39 countries in 2023. In total this survey collected data from more than 37000 road users in 39 countries, across five continents.

The participating countries in ESRA3 were:

- Europe: Austria, Belgium, Bosnia and Herzegovina, Czech Republic, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Luxembourg, Netherlands, Poland, Portugal, Republic of Serbia, Slovenia, Spain, Sweden, Switzerland, United Kingdom;
- America: Brazil, Canada, Chile, Colombia, Mexico, Panama, Peru, USA;
- Asia and Oceania: Armenia, Australia, Israel, Japan, Kazakhstan, Kyrgyzstan, Thailand, Türkiye, Uzbekistan.

Vias institute in Brussels (Belgium) initiated and coordinates ESRA, in cooperation with ten steering group partners (BASt (Germany), DTU (Denmark), IATSS (Japan), ITS (Poland), KFV (Austria), NTUA (Greece), PRP (Portugal), SWOV (the Netherlands), TIRF (Canada), and University Gustave Eiffel (France)). The common results of the ESRA3 survey are published in a Main Report, a Methodology Report and 13 Thematic Reports (Table 1). Furthermore, 39 country fact sheets, including different language versions, have been produced in which national key results are compared to a regional mean (benchmark). Scientific articles, national reports and many conference presentations are currently in progress. All common ESRA3 reports have been peer-reviewed within the consortium, following a pre-defined quality control procedure. An overview of the results and news on the ESRA initiative is available on: www.esranet.eu. On this website one can also subscribe to the ESRA newsletter.

Table 1: ESRA3 Thematic Reports

Driving under influence of alcohol, drugs and medication	Support for policy measures and enforcement	Pedestrians	Young and aging road users
Speeding	Subjective safety and risk perception	Cyclists	Male and female road users
Distraction (mobile phone use) and fatigue	Infrastructure	Riders of e-scooters	
Seat belt & child restraint systems		Moped riders and motorcyclists	

The present report summarizes the ESRA3 results with respect to subjective safety and risk perception. A more detailed overview of the data collection method and the sample per country can be found in the ESRA3 methodology report (Meesmann & Wardenier, 2024). The report describes the perceived levels of safety when using different transport modes and the assessment of various risk factors in traffic (e.g. alcohol, speed, fatigue) regarding their contribution to crashes. Further analyses, moreover, investigate the association between feeling (un)safe when using different transport modes, i.e. car, motorcycle, bicycle and walking, and road fatalities.

Note that a weighting of the data was applied in the analyses. This weighting took into account small corrections with respect to national representativeness of the sample based on gender and six age groups: 18-24y, 25-34y, 35-44y, 45-54y, 55-64y, 65-74y (United Nations Statistics Division, 2023). For the regional means, the weighting also took into account the relative size of the population of each country within the total set of countries from this region. SPSS 26.0 and R 4.3.1 was used for all analyses.

3. Results

3.1. Descriptive analysis

This section presents the descriptive statistics on questions about the topic subjective safety and risk perception. Within the ESRA3 survey, the essential questions on subjective safety and risk perception are the following:

- How safe or unsafe do you feel when using the following transport modes? (For list of queried modes see section 3.1.1) – Q18
- How often do you think each of the following factors is the cause of a road crash involving a car? (For list of queried risk factors see section 3.1.2) – Q19

In the following, the results are presented for each thematic topic, i.e., subjective safety/safety feeling and risk perception, in a similar way: first basic results per region in an overview graph, then results are further split out in various graphs first by region and country, then by age, and by gender.

Statistical tests of differences between regions, gender and age groups have been performed: a Chi^2 Test for Independence was used to assess if the answers depend significantly on the region, on the gender and on the age group, respectively. Pairwise comparisons were performed to identify the pairs of groups (region, gender, age groups) that differ significantly. The strength of the association between variables was assessed through the Eta-squared coefficient and the Cramer's V coefficient. The classification of strength of associations expressed by the coefficients are found in Table 2 (Cohen, 1988).

Table 2: Thresholds used to indicate the strength of coefficients.

	Small strength	Medium strength	Large strength
Eta-squared	0.01	0.06	0.14
Cramer's V (association with region: 2 deg. of freedom)	0.07	0.21	0.35
Cramer's V (association with gender: 1 deg. of freedom)	0.10	0.30	0.50
Cramer's V (association with age: 5 deg. of freedom)	0.05	0.13	0.22

3.1.1. Feeling (un)safe: How safe or unsafe do you feel when using the following transport modes?

For the assessment of subjective safety feeling, in total 19 different transport modes were rated by the respondents. The scale of answers ranged from 0 (very unsafe) to 10 (very safe) – the mean scores of the answers are presented in the results. For the sake of brevity, results are not presented for all 19 different transport modes, but highlight the most relevant transport modes with regard to their frequency of use and their importance for road safety, including:

- drive a car (non-electric or non-hybrid)
- drive a hybrid or electric car
- be a passenger in a car
- cycle (non-electric)
- drive a motorcycle (>50 cc or > 4kW)
- cycle on an electric bicycle / e-bike / pedelec
- walk or run minimum 200m down the street
- ride an e-scooter (electric-kick style scooter)

In addition to traditional transport modes like 'drive a car (non-electric or non-hybrid)', 'be a passenger in a car', 'cycle (non-electric)', 'drive a motorcycle (>50 cc or > 4kW)' and 'walk or run minimum 200m down the street' also the transport modes 'drive a hybrid or electric car', 'cycle on an electric bicycle / e-bike / pedelec' and 'ride an e-scooter (electric-kick style scooter)' were included as they became very widespread in recent years and are used more often in road transport lately.

Comparison of regions and countries

Figure 1 gives an overview of the assessment of the perceived level of safety when using the different transport modes in the three regions Europe22, America8 and AsiaOceania6.

It shows that road users consider the e-scooter and motorcycle as the least safe transport modes in all regions. This is the case in particular in Europe22 and AsiaOceania6 where – compared to America8 – the lowest mean scores (6 or lower) are observable. In America8 road users consider the e-scooter and motorcycle a bit safer (mean score of 6.8 and 6.6, respectively), but in contrast to the other regions in America8 the bicycle (besides the e-scooter) is also considered as the least safe transport mode (mean score of 6.6), although it is perceived comparably less safer in Europe22 and AsiaOceania6 (mean score of 6.4 and 6.3, respectively).

Walking and driving a hybrid or electric car, as well as driving a car and walking are considered the safest transport modes among the three regions. While walking is considered the safest transport mode in Europe22 and AsiaOceania6 (mean score of 7.5 and 7.1, respectively), driving a hybrid or electric car is considered the safest mode in America8 (mean score of 7.6).

The association with the regions was highest for riding an e-scooter (Eta-squared of 0.03) and lowest for cycling (Eta-squared of 0.00).

Overall, the perceived level of safety of road users regarding different transport modes is highest in Europe22 and America8 (highest mean scores), whereas it is lowest in AsiaOceania6, except for walking

which is perceived least safe in America8 and riding an e-scooter and driving a motorcycle which are perceived least safe in Europe22.

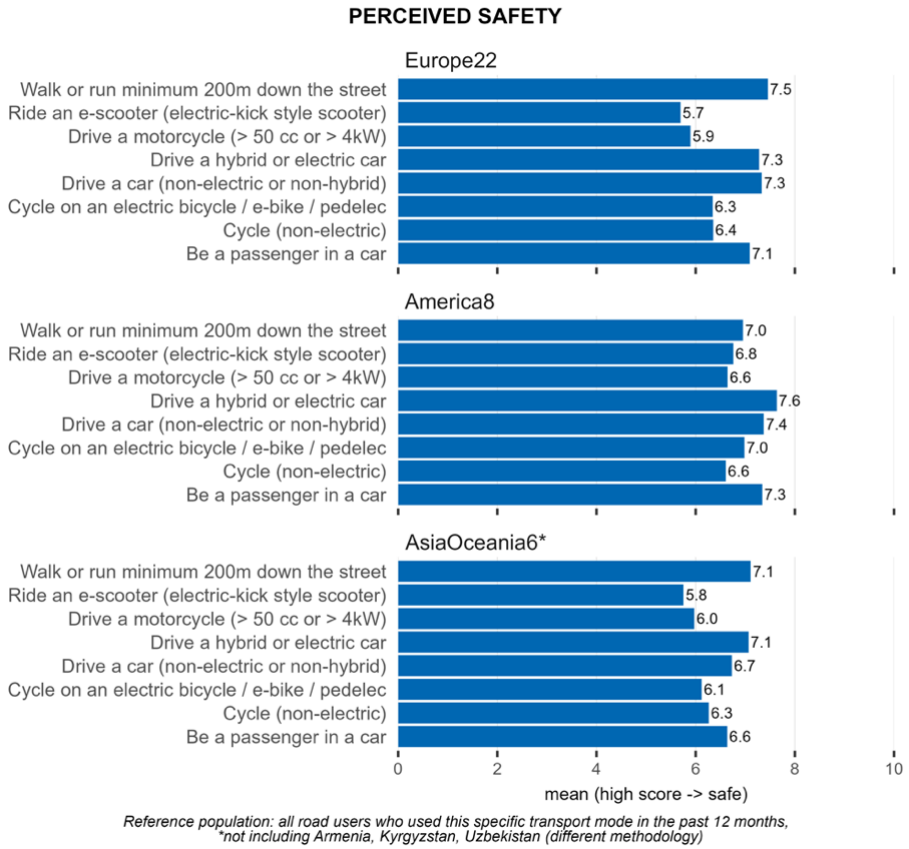
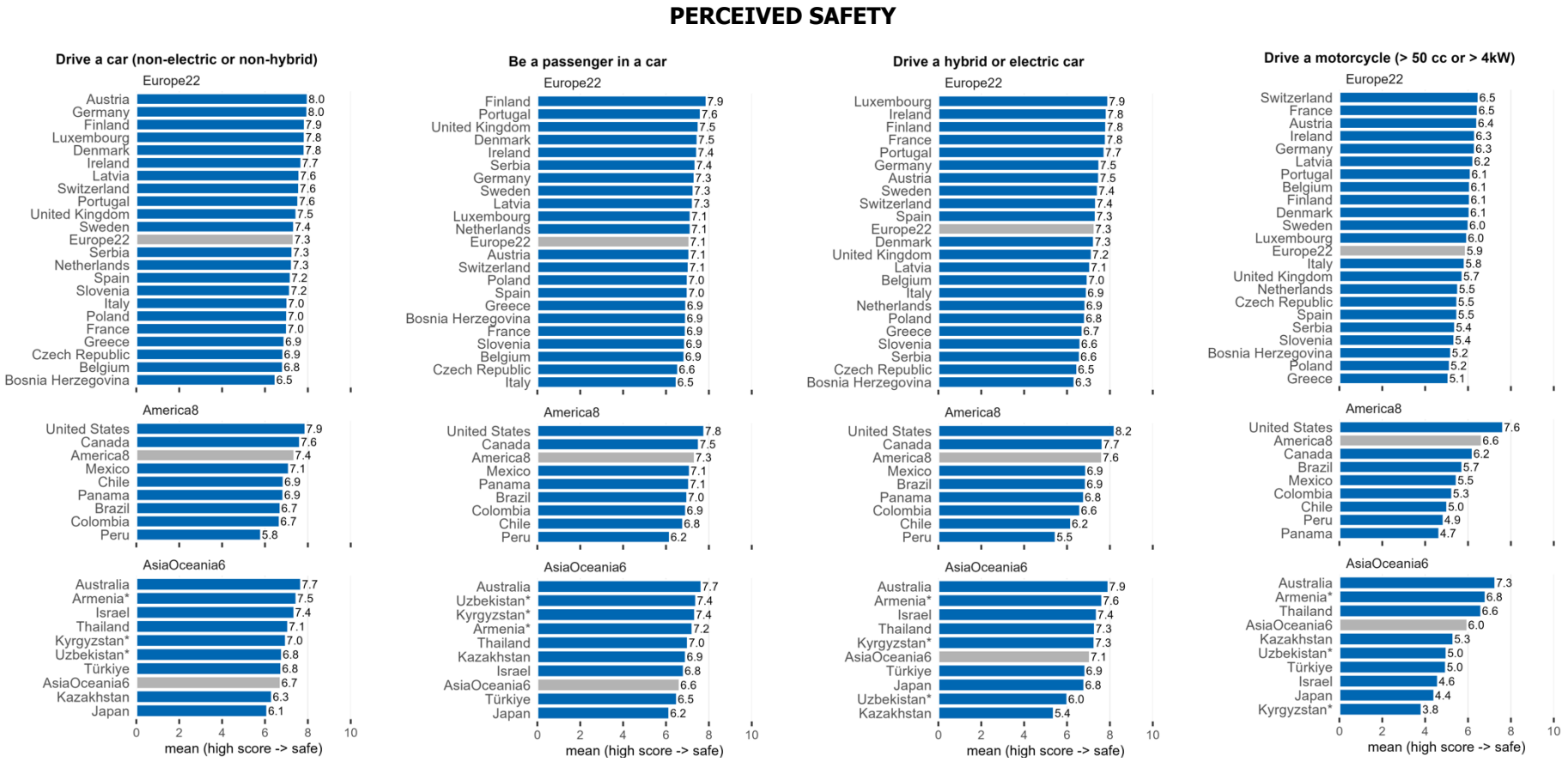


Figure 1: Level of subjective safety using different transport modes by region.

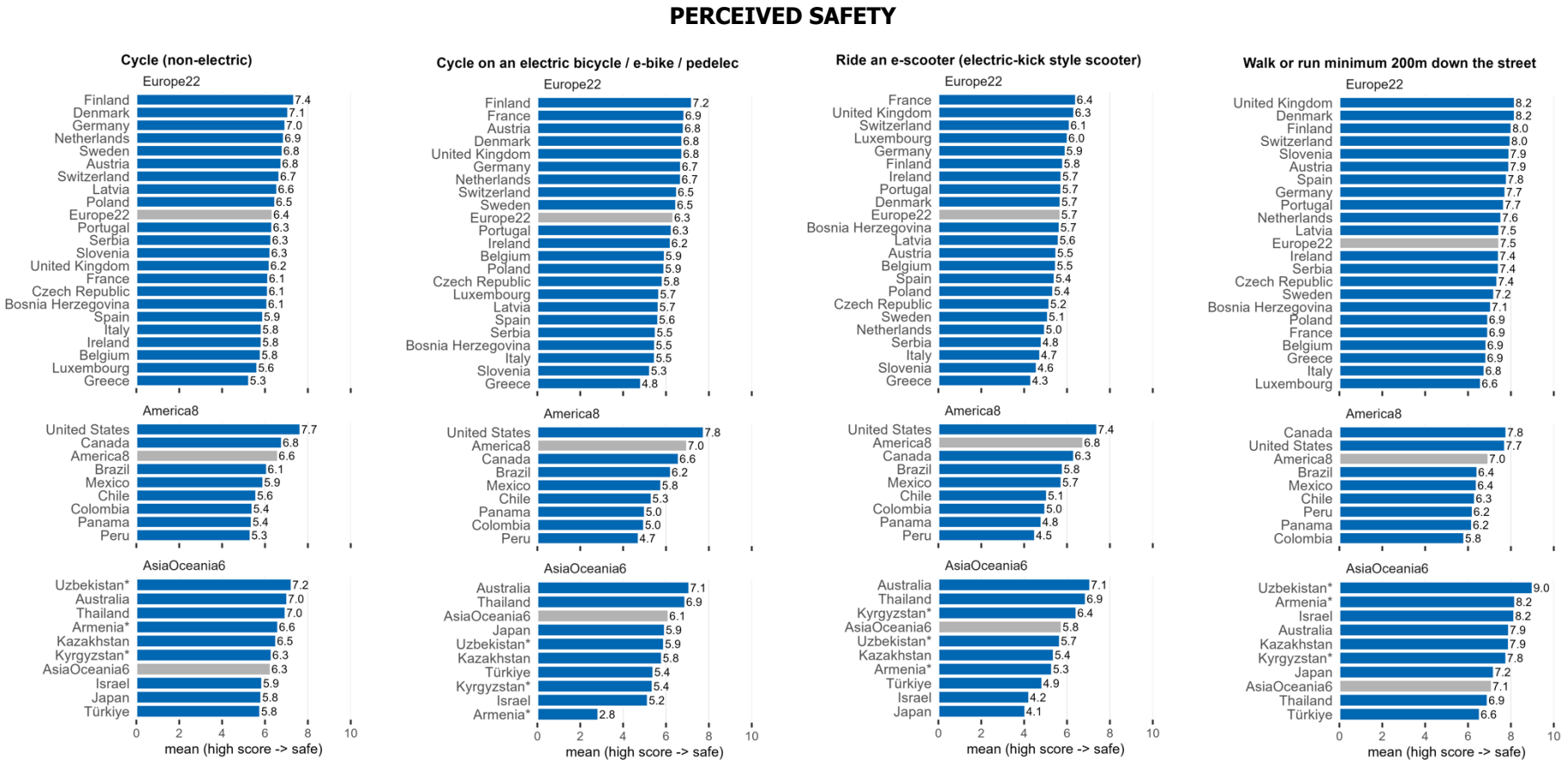
When looking at the single countries of the regions in detail (Figure 2 and 3), it becomes observable that the e-scooter was considered least safe especially in Greece, Slovenia, and Italy (Europe22), in Peru and Panama (America8), and in Japan and Israel (AsiaOceania6), whereas it was considered safest in France and the United Kingdom (Europe22), in the United States (America8) and Australia (AsiaOceania6). For the motorcycle, a similar pattern is observable especially for America8 and AsiaOceania6, where driving the motorcycle is considered also safest in the United States (America8) and Australia (AsiaOceania6) and least safe in Peru and Panama (America8) and Israel, Japan, and Kyrgyzstan (AsiaOceania6). In Europe driving a motorcycle is considered least safe in Greece, but also in Poland and Bosnia Herzegovina, and safest in France, but also in Switzerland and Austria.

Among all of the countries the car was considered the least safe in Bosnia Herzegovina and Belgium (Europe22), in Japan (AsiaOceania6) and in Peru (America8), with the latter having the lowest mean score (<6) among all countries of all regions. Higher mean scores for the car (≥8) are observable only in Austria and Germany. Walking was considered least safe in Luxembourg (Europe22), Colombia (America8) and Türkiye (AsiaOceania6), while for the United Kingdom, Denmark, Finland, and Switzerland (Europe22) as well as Uzbekistan (AsiaOceania6) high mean scores (≥8) are observable.



Reference population: all road users who used this specific transport mode in the past 12 months
**not in the regional mean (different methodology)*

Figure 2: Level of subjective safety using different transport modes by region and country (1).

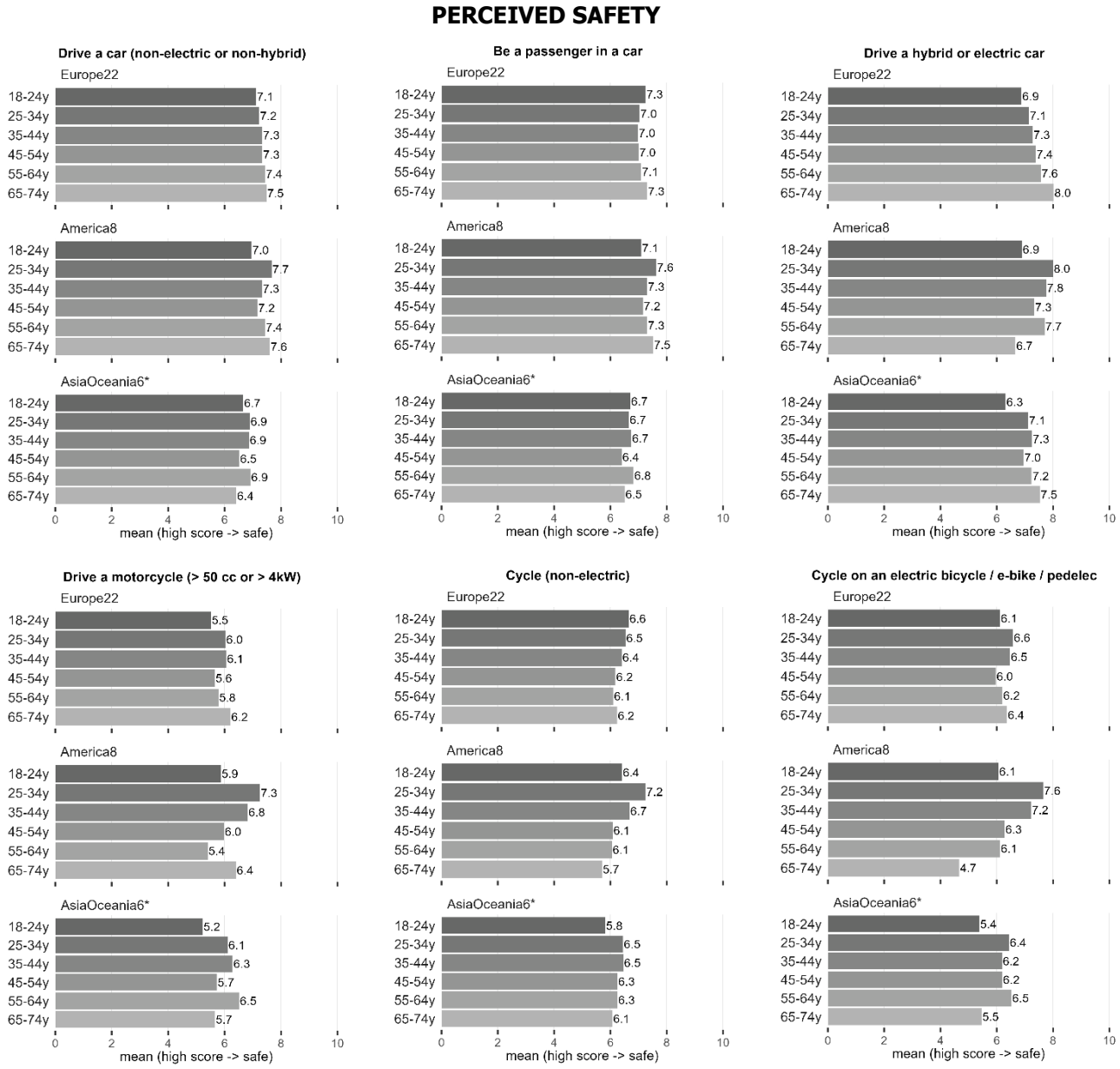


Reference population: all road users who used this specific transport mode in the past 12 months
**not in the regional mean (different methodology)*

Figure 3: Level of subjective safety using different transport modes by region and country (2).

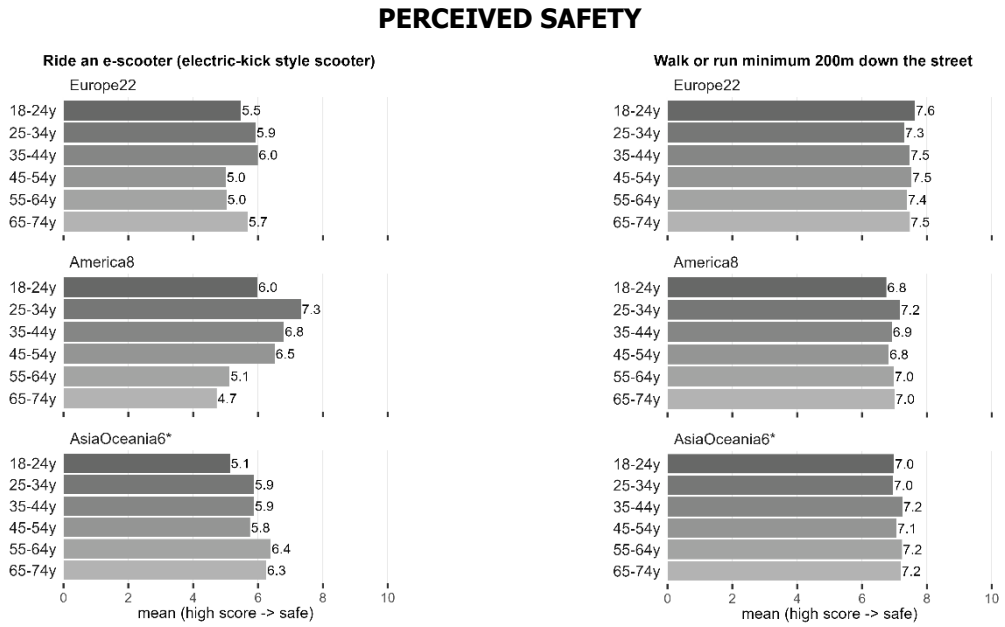
Comparison of age groups

With regard to the association of subjective safety with age, Figures 4 and 5 show that for some transport modes the level of safety increases with age (e.g. for driving a car in Europe22 or for driving a hybrid or electric car in Europe22 and AsiaOceania6), whereas for other transport modes no such trend is observable, or even an opposite trend (e.g. for cycling in Europe22 or for cycling an electric bike in America8). For the increase of subjective safety with age, mostly associations with low strength (Eta-squared<0.06) are observable. Only for the decrease of subjective safety with age for cycling on an electric bicycle for America8 an association of medium strength (Eta-squared=0.06) and of statistical significance (p<0.01) is observable.



Reference population: all road users who used this specific transport mode in the past 12 months
**not including Armenia, Kyrgyzstan, Uzbekistan (different methodology)*

Figure 4: Level of subjective safety using different transport modes by region and age group (1).

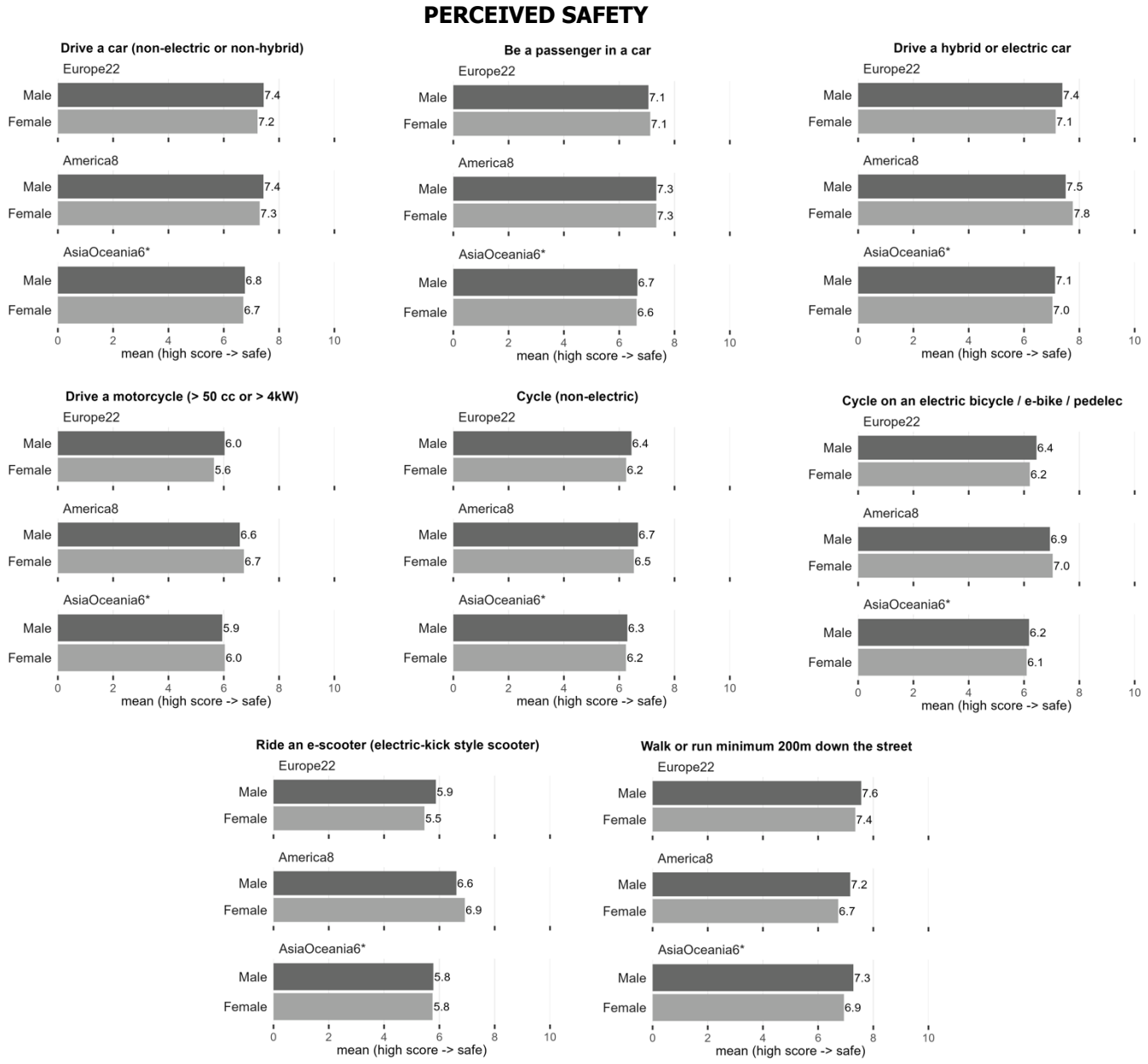


Reference population: all road users who used this specific transport mode in the past 12 months
**not including Armenia, Kyrgyzstan, Uzbekistan (different methodology)*

Figure 5: Level of subjective safety using different transport modes by region and age group (2).

Gender comparisons

The association of subjective safety and gender was predominantly small across the regions (Eta-squared≤0.01). Compared to men, women overall – and especially for Europe22 – mostly consider the presented transport modes, in particular driving a car, cycling, and walking less safe (Figure 6). For the latter, mean scores of females in all three regions were statistically significantly lower ($p<0.01$). This was also the case for driving a car, driving a motorcycle, cycling and for riding an e-scooter for the Europe22 countries. However, some transport modes were also considered safer by men than women, especially for America8, although no statistically significant difference in mean scores between females and males was found ($p>0.01$): For America8, men consider driving a hybrid or electric car, driving a motorcycle, cycling on an electric bicycle and riding an e-scooter less safe than women, for AsiaOcenia6 lower mean scores for men than for women are observable only for driving a motorcycle.



Reference population: all road users who used this specific transport mode in the past 12 months
**not including Armenia, Kyrgyzstan, Uzbekistan (different methodology)*

Figure 6: Level of subjective safety using different transport modes by region and gender.

3.1.2. Risk perception: How often do you think each of the following factors is the cause of a road crash involving a car?

For assessing the risk perception of factors that potentially contribute to crashes, participants were asked 'How often do you think each of the following factors is the cause of a road crash involving a car?'. Seven items related to risky behaviours driving a car were included:

- Driving after drinking alcohol
- Driving within 1 hour after taking drugs (other than prescribed or over the counter medication)
- Driving faster than the speed limit
- Using a hand-held mobile phone while driving
- Using a hands-free mobile phone while driving
- Inattentiveness or daydreaming while driving
- Driving while tired

The scale to answer this question ranged from never (1) to (almost) always (6). In the following Figures 7-12 the percentages presented represent the answers scaled 4 to 6 (often/frequently). This assessment of risk does not refer to concrete situations that a person might have experienced but to a more global level and to the general driving population.

Comparisons of regions and countries

Figure 7 shows that road users consider driving after drinking alcohol as the riskiest of all presented risk factors in Europe22 and America8. In Europe22 69.7% of respondents considered that driving after drinking alcohol is frequently to often the cause of a road crash involving a car, while this percentage was only 55.5% in America8. In contrast, in AsiaOceania6 driving faster than the speed limit was considered as the riskiest of all presented factors. Moreover, driving faster than the speed limit was considered as the second riskiest factor in Europe22 and America8.

Besides driving after drinking alcohol and driving faster than the speed limit, a factor that was also considered as risky by the respondents is using a hand-held phone while driving, especially in Europe22 and America8: 65.3% of the respondents in Europe22 and 53.2% of the respondents in America8 considered that talking on a hand-held mobile phone while driving is often or frequently the cause of a road crash involving a car.

The behaviour considered least risky among all the seven factors in all regions was using a hands-free mobile phone while driving. While the proportion was 43.7% in America8 and 41.8% in Europe22, it was significantly lower (31.2%) in AsiaOceania6 ($p<0.01$).

The association with the regions was highest for driving after drinking alcohol and using a hand-held mobile phone while driving (Cramer's V of 0.26 and 0.23) and lowest for using a hands-free mobile phone while driving (Cramer's V of 0.09).

Overall, it is noticeable that in Europe22 the percentages of respondents who consider that the different factors are often or frequently the cause of a road crash involving a car are highest (except for using a hands-free mobile phone while driving), whereas these percentages were rather low in AsiaOceania6.

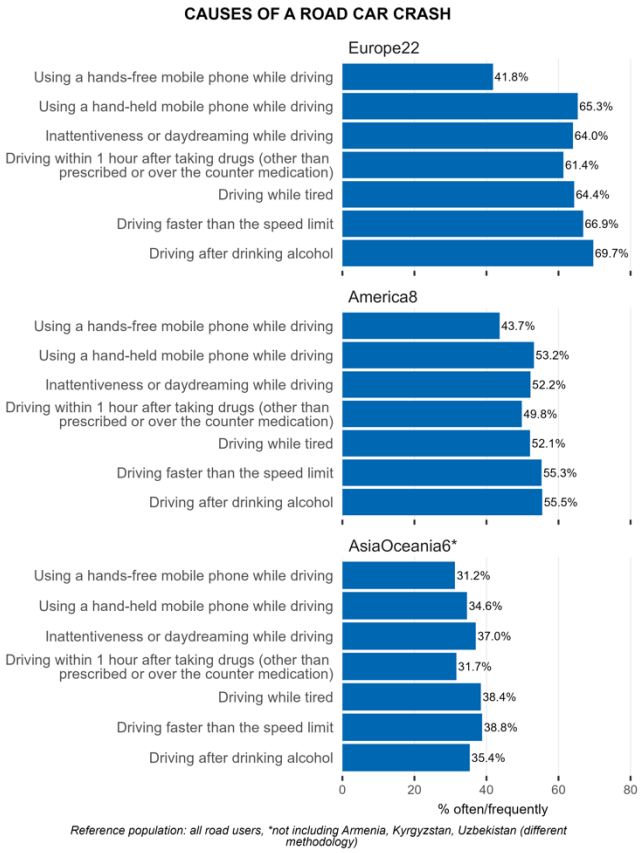


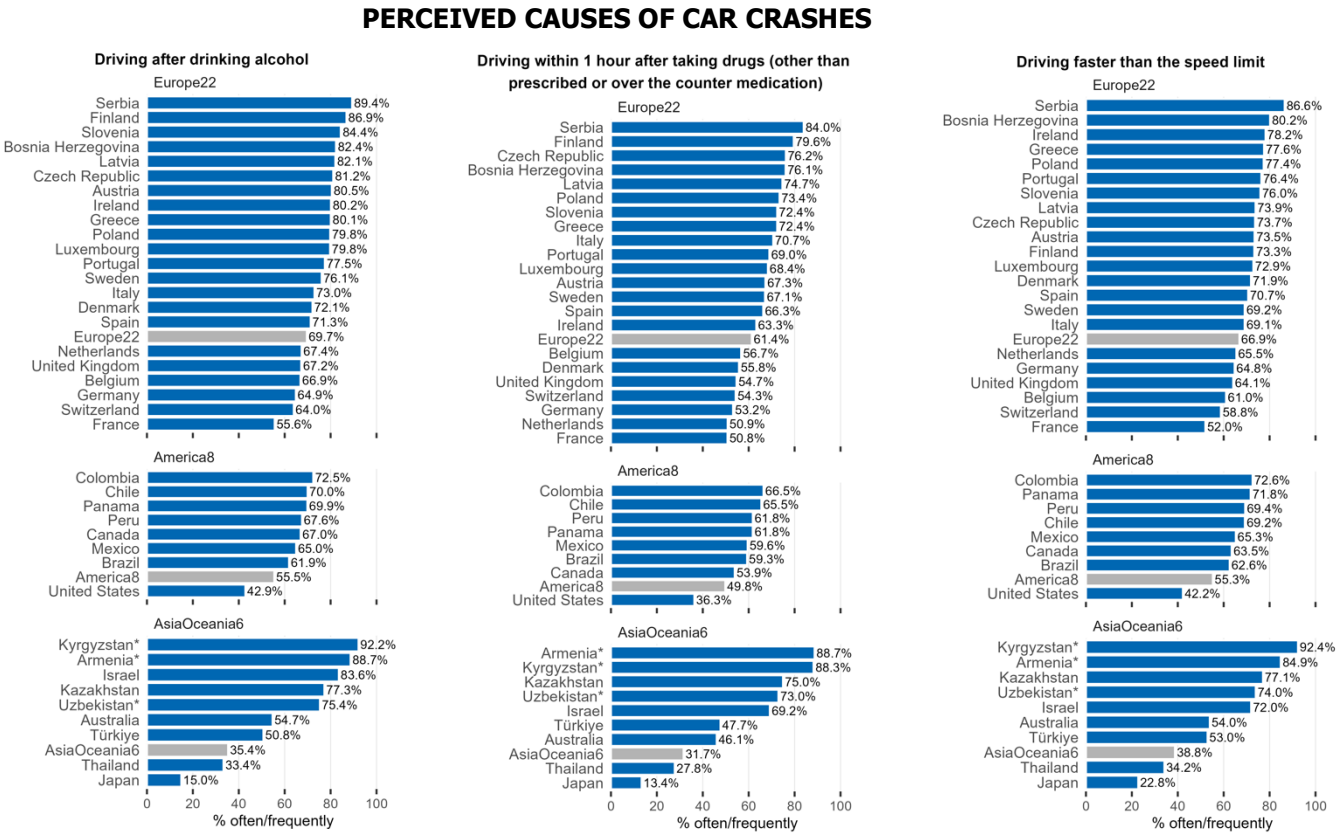
Figure 7: Perceived frequency of behaviours contributing to crashes by region.

When looking at the individual countries of each of the three regions in detail (Figures 8 and 9), it becomes observable that driving after drinking alcohol was considered especially risky in Serbia and Finland (Europe22), Colombia and Chile (America8) and in Kyrgyzstan and Armenia (AsiaOceania6). By comparison, the percentage of participants who consider that driving after drinking alcohol while driving is often/frequently the cause of a road crash involving a car was overall higher in countries in Europe22 than in America8.

Driving faster than the speed limit was considered risky especially in Serbia, Bosnia Herzegovina and Ireland (Europe22), in Colombia and Panama (America8) and in Kyrgyzstan and Armenia (AsiaOceania6).

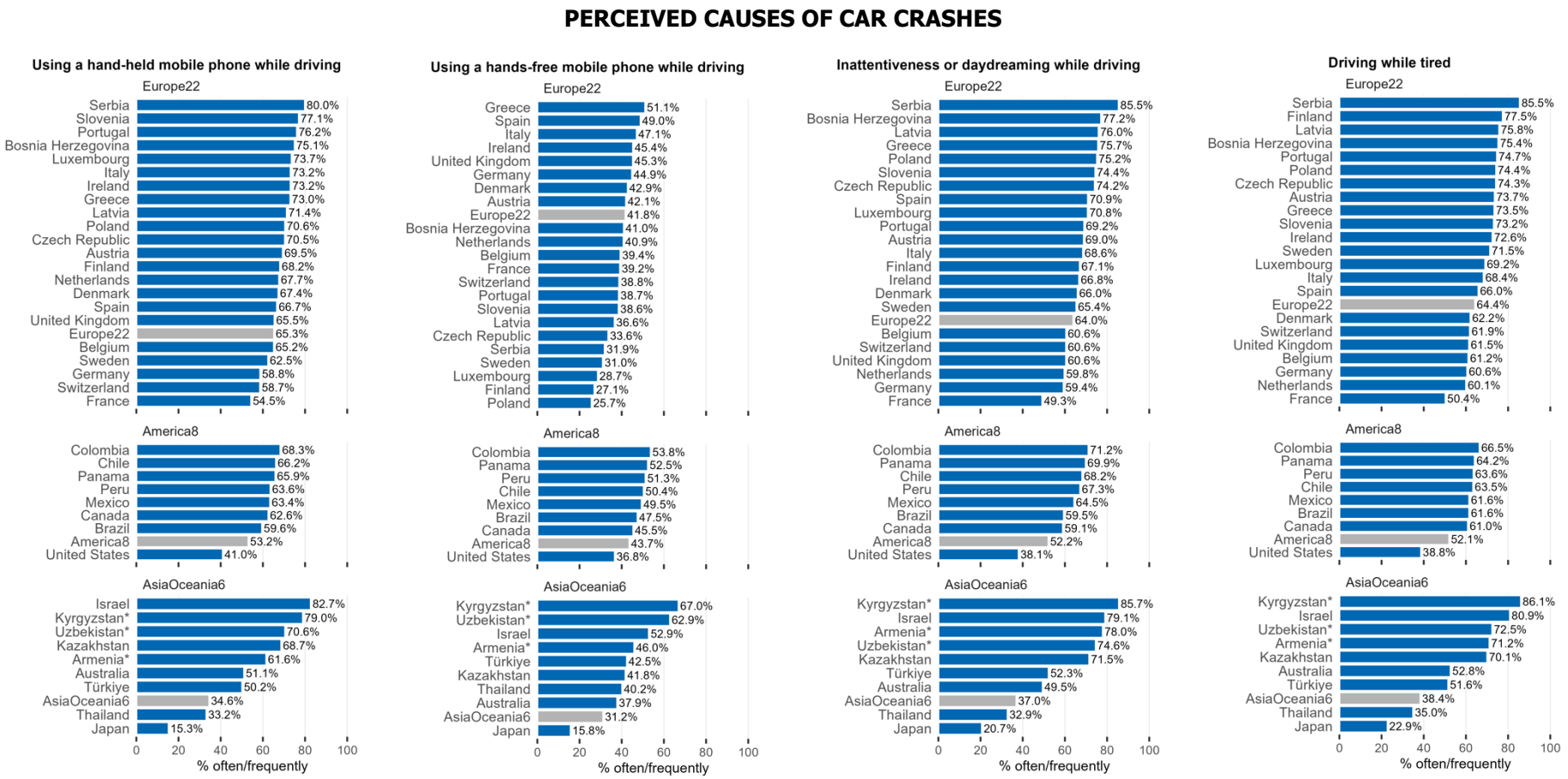
Regarding using a hand-held phone while driving, on the country level, it was especially high in Serbia and Slovenia (Europe22), Colombia and Chile (America8) and Israel and Kyrgyzstan (AsiaOceania6). In contrast, using a hands-free mobile phone while driving was overall considered less risky. Only participants in Kyrgyzstan and Uzbekistan considered this behaviour as rather risky.

While Serbia (Europe22), Colombia (America8) and Kyrgyzstan, Armenia or Israel (AsiaOceania6) are the countries in which respondents considered all of the different risk factors riskiest, France (Europe22), the United States (America8) and Japan (AsiaOceania6) are the countries in which respondents considered all of the different risk factors as least risky, an exception is using a hands-free mobile phone while driving which was considered riskiest in Greece and least risky in Poland (Europe22).



Reference population: all road users
**not in regional mean (different methodology)*

Figure 8: Perceived frequency of behaviours contributing to crashes by region and country (1).

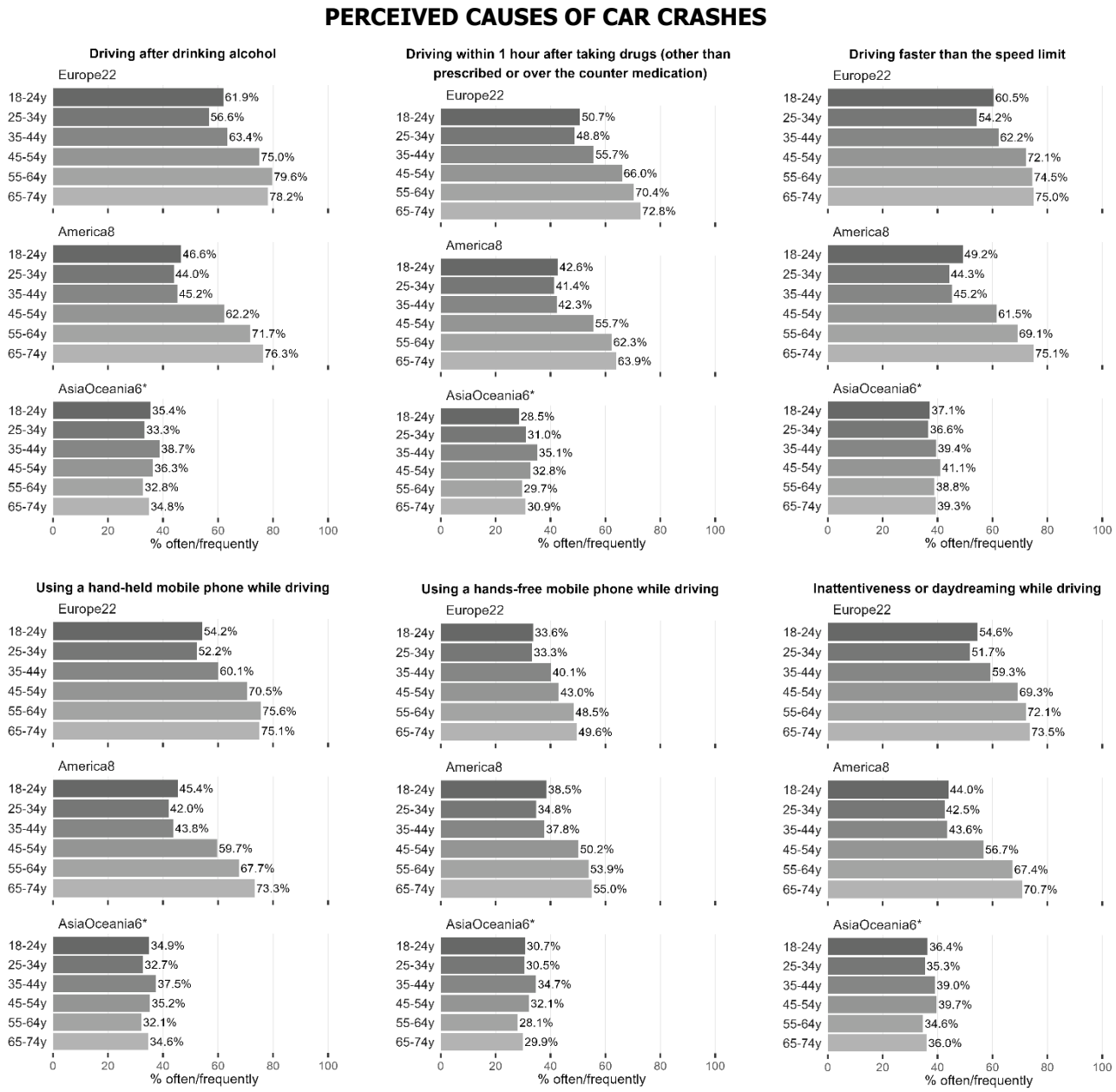


Reference population: all road users
**not in regional mean (different methodology)*

Figure 9: Perceived frequency of behaviours contributing to crashes by region and country (2).

Comparisons of age groups

Figures 10 and 11 show that the risk perception increases with increased age in Europe22 and America8. The associations are of low (e.g. using a hands-free mobile phone while driving) to high strength (e.g. driving after drinking alcohol) with Cramer's V ranging from 0.12 to 0.25 and statistically significant ($p<0.01$). However, the data do not show this trend for AsiaOceania6.



Reference population: all road users
**not including Armenia, Kyrgyzstan, Uzbekistan (different methodology)*

Figure 10: Perceived frequency of behaviours contributing to crashes by region and age group (1).

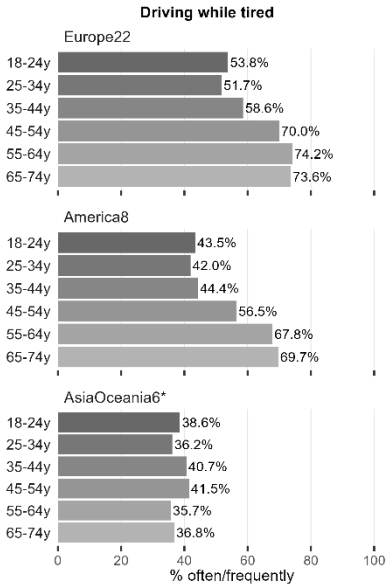
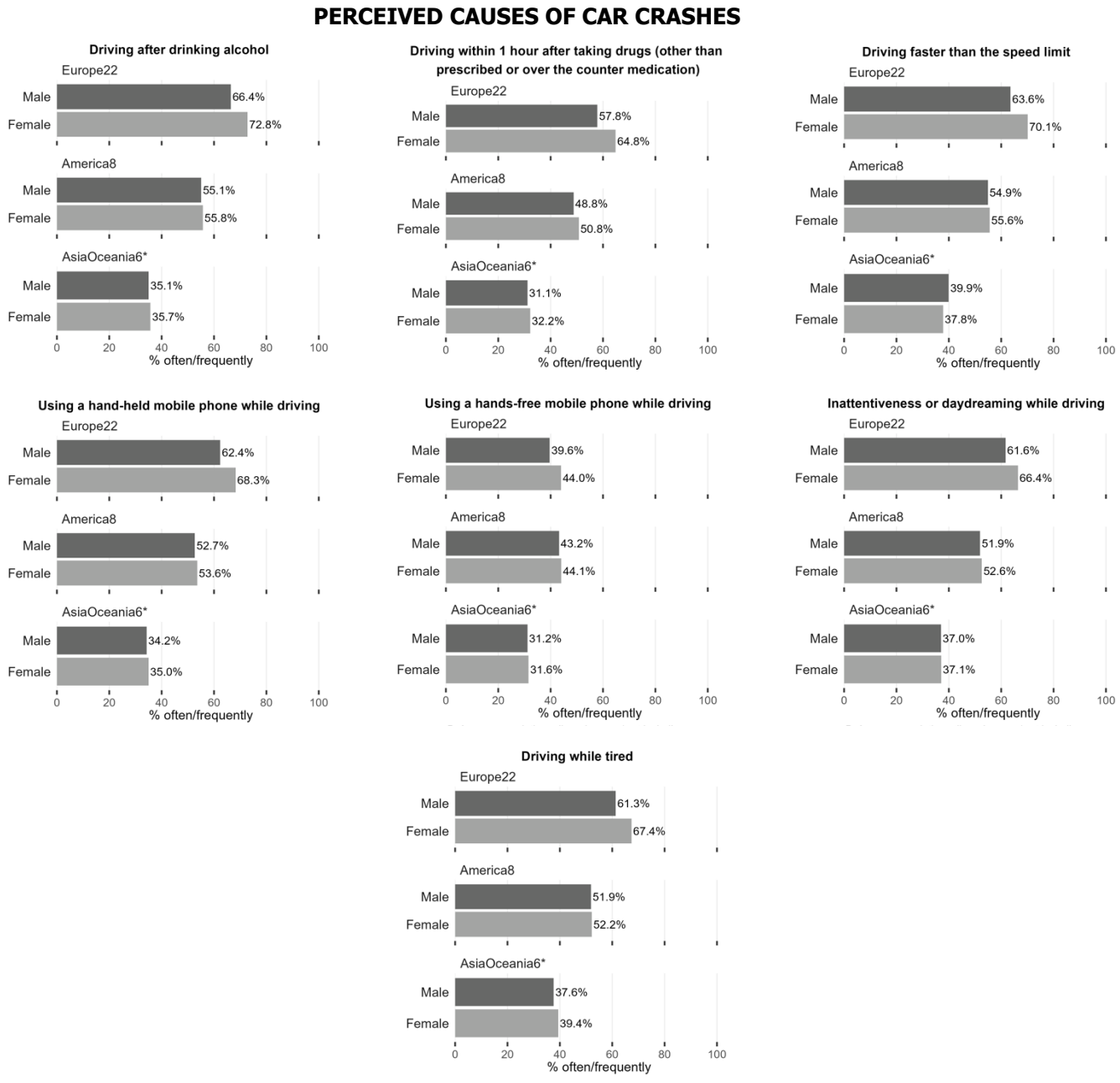


Figure 11: Perceived frequency of behaviours contributing to crashes by region and age group (2).

Gender comparisons

Overall, the association of risk factor assessment and gender was predominantly small in all regions (Cramer's V ≤ 0.10). Compared to men, women overall consider all the seven presented factors as riskier (Figure 12), except for driving faster than the speed limit in AsiaOceania6. This was found especially for Europe22, where percentages of females for all risk factors were statistically significantly higher ($p < 0.01$). However, for America8 and AsiaOceania6, no statistically significant differences were observable ($p > 0.01$) for none of the seven presented risk factors.



Reference population: all road users
**not including Armenia, Kyrgyzstan, Uzbekistan (different methodology)*

Figure 12: Perceived frequency of behaviours contributing to crashes by region and gender.

3.2. Advanced analyses

For further analysis of the topic subjective safety feeling, ESRA3 survey data concerning subjective safety for European countries were combined with crash data from the CARE database provided by the European Commission. This was done by visualizing the mean scores of subjective safety, separately for each country, in combination with a measure for the crash rate in the corresponding country for different modes, i.e., car drivers, motorcyclists, cyclists and pedestrians, using a descriptive, graphical analysis. A regression analysis, i.e., to identify variables that influence subjective safety and risk perception, was not carried out, as subjective safety and risk perception (also based on the results of the ESRA2 results on subjective safety and risk perception) depend on and are directly and indirectly influenced by various factors, of which not all could be accounted for in the survey (see also Furian et al., 2021).

3.2.1. Interrelation of subjective safety and road fatalities

In Figure 3 up to Figure 6 the weighted mean scores of subjective safety for different transport modes, separately for the European countries are already plotted. Here, we relate the mean scores to mode specific road fatalities in 2022 per million inhabitants. Bosnia Herzegovina and Serbia do not provide accident data in the CARE database, thus those countries were excluded from this analysis. For Greece, data on road fatalities from 2021 and for Ireland and Latvia, data on road fatalities from 2020 was considered for the analysis, because this was the latest available data on road fatalities in the CARE database. The analysis was done separately for car drivers, motorcyclists, cyclists and pedestrians. The line in the plots indicates a regression line when regressing the mean of subjective safety onto road fatalities for the 19 country dots in the plot. It should be noted that 'subjective safety' cannot be regarded as a predictor of fatal road crashes, therefore the following figures serve as a descriptive statement.

Figure 13 shows the association between the subjective safety of car drivers and road fatalities in a car per million inhabitants. Overall, car drivers tend to feel safer when there are less fatal road crashes: Countries like Switzerland (10.0 road fatalities in a car per million inhabitants) and Denmark (11.6 road fatalities in a car per million inhabitants) have a rather low number of road fatalities per million inhabitants with mean scores of 7.6 and 7.8, respectively, feel very safe as a car driver. In contrast, road fatalities in the Czech Republic and Greece are very high with 26.4 and 21.2, respectively, while the safety feeling is rather low (mean score of 6.9). However, the association seems not to be as strong, mainly because of the two outliers Latvia and Luxembourg with a rather high number of road fatalities and similarly high mean scores of subjective safety as a car driver. The countries where car drivers feel the safest are Austria, Germany, and Finland.

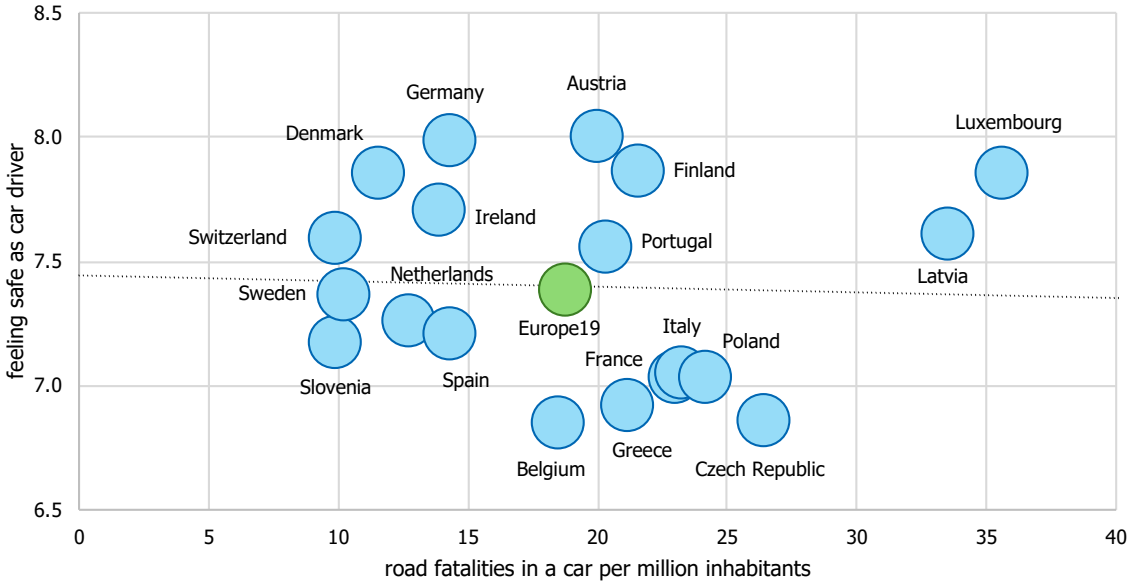


Figure 13: Subjective safety of car drivers and road fatalities.

For motorcyclists (Figure 14) the same pattern as for the car drivers is observable and the association between the safety feeling of motorcyclists and motorcyclists fatalities per million inhabitants seems to be stronger than for car drivers: countries with a comparably high safety feeling like Switzerland, Austria and Ireland have a small number of road fatalities between 3.0 and 6.1, whereas countries with a lower safety feeling like Italy or Spain (mean score below 6.0) have a higher number of road fatalities per million inhabitants. Greek motorcyclists feel very unsafe with a mean score of only 5.1 and there are 20 people killed as motorcyclists per million inhabitants in Greece. Greece – with the highest number of motorcyclist fatalities per million inhabitants and similarly the lowest mean score of subjective safety as a motorcyclist among all countries – is an outlier leading to a stronger association than for car drivers. The high number of fatal road crashes might be connected to the motorcycle tourism and low helmet wearing rates in Greece.

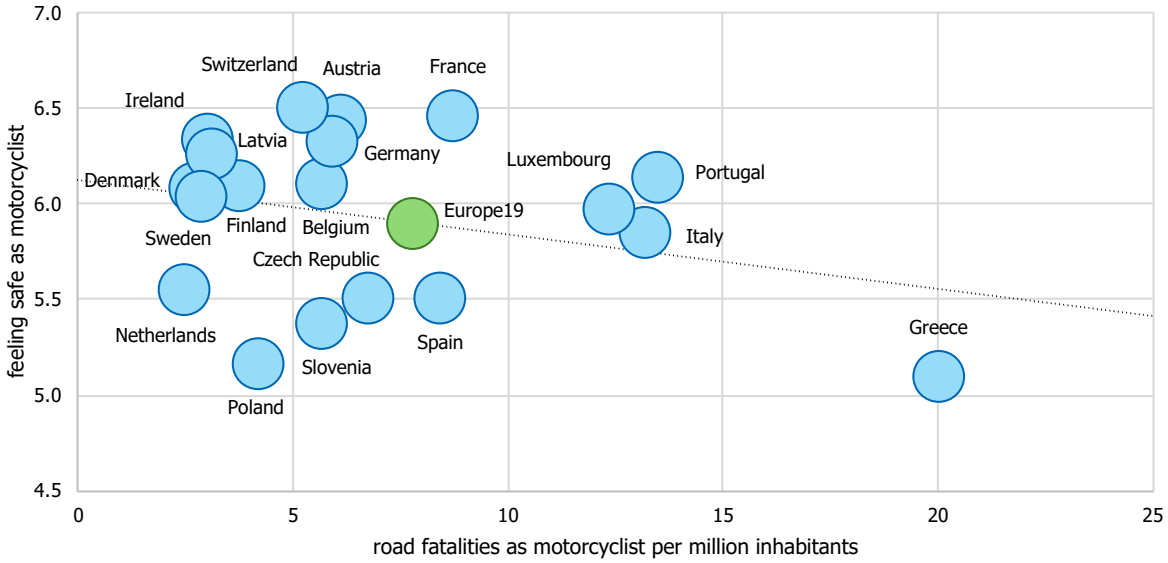
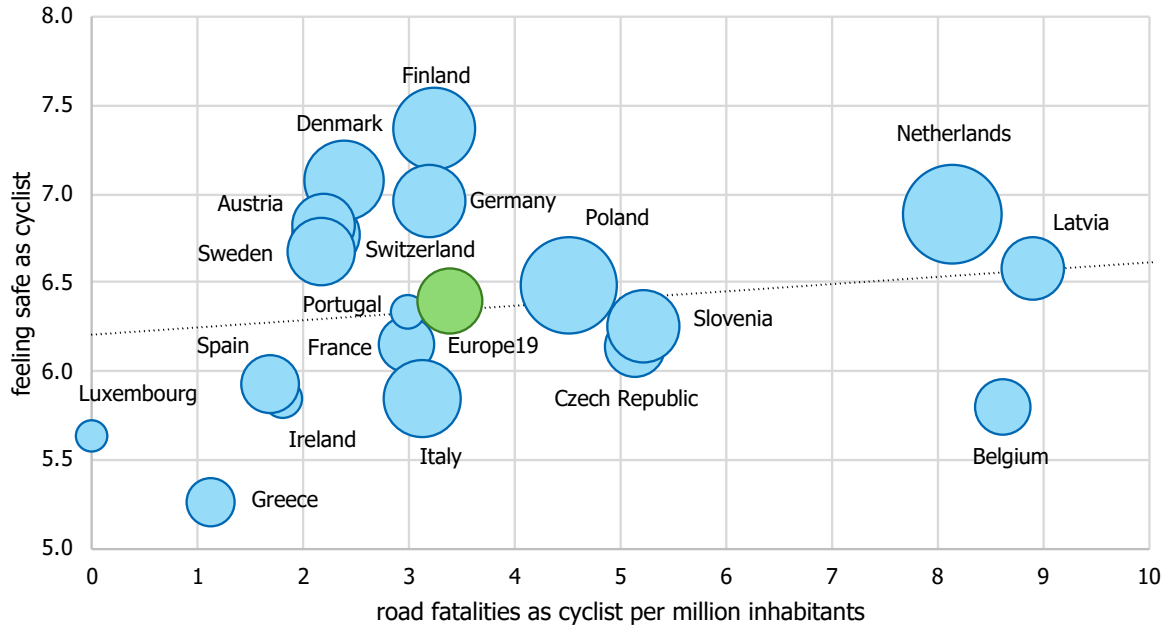


Figure 14: Subjective safety of motorcyclists and road fatalities.

The pattern for the association between the subjective safety of cyclists and cyclist fatalities per million inhabitants (Figure 15) is different, as the association between subjective safety and fatalities seems to be positively related. To add a further dimension to the picture exposure as bubble diameter was integrated. The bubble diameter is proportional to the fraction of frequent cyclists – who cycle at least a few days a month – among all the cyclists in a country, as indicated in the ESRA3 survey. The bubble diameter is largest for the Netherlands and smallest for Portugal and Luxembourg. Countries with larger diameters tend to feel safer as cyclists, i.e., Netherlands, Finland, and Denmark; on the other side of the spectrum (with low exposure) are for example Ireland, Luxembourg, and Greece.



bubble diameter: proportional to the percentage of regular cyclists (at least a few days a month)

Figure 15: Subjective safety of cyclists and road fatalities.

A negative relation (like seen for car drivers and motorcyclists) persists also for the association between the subjective safety of pedestrians and pedestrian fatalities per million inhabitants, i.e., the more pedestrians per million inhabitants are killed, the less safe people feel when walking (Figure 16). Poland and Italy are amongst the countries with the highest number of road fatalities as pedestrians with 12.2 and 8.2 and have a relatively low mean score for subjective safety of 6.9 and 6.8, respectively. Pedestrians in Denmark, Finland and Switzerland feel safe and have a road fatality rate per million inhabitants below 5.0. Latvia seems to be an outlier with the highest number of pedestrian fatalities, but a comparably high mean score of feeling safe as pedestrian of 7.5.

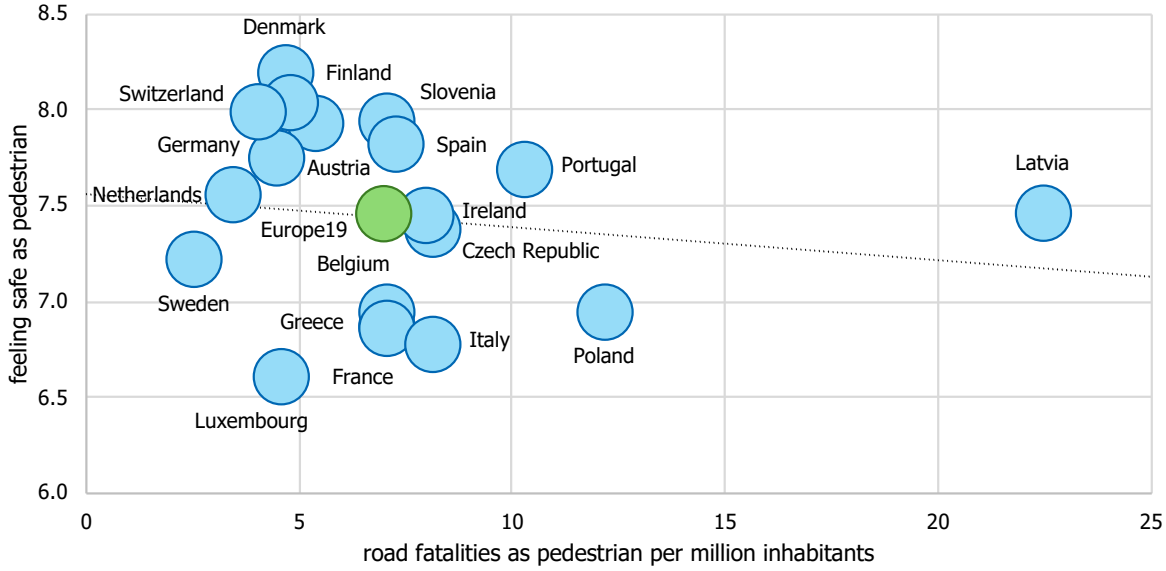


Figure 16: Subjective safety of pedestrians and road fatalities.

3.3. Comparisons over time (ESRA2-ESRA3)

This chapter compares ESRA3 results with ESRA2 results. The ESRA2 results that are shown in this chapter are different from the results published in ESRA2 publications. Because of methodological differences the ESRA2 results were recalculated in order to be comparable with the ESRA3 results. Between ESRA2 and ESRA3 there are differences on sample level and on question/item level. On sample level there is a difference in population between ESRA2 and ESRA3: in ESRA2 the population consisted out of adults aged 18 years and older, while in ESRA3 the population was adults between 18 and 74 years old. In ESRA3 we also applied a stricter data cleaning compared to ESRA2 (for more information see also the methodology reports (Meesmann et al., 2022; Meesmann & Wardenier, 2024)). To take these two differences into account, ESRA2 results were reweighted and recalculated so that the population is the same as in ESRA3 and consequently the results are comparable. On question and item level there are also differences between ESRA2 and ESRA3. For some questions, there is a difference in reference population, e.g., in ESRA2 attitudes towards safe and unsafe traffic behaviour were surveyed for all road users while in ESRA3 they were only surveyed for car drivers. This means that the results do not have the same reference, for example 30% of all road users or 30% of all car drivers does not have the same meaning. Differences in reference populations can often be recalculated and so these were also taken into account in the recalculated ESRA2 results. Furthermore, some questions and/or items of questions have a different formulation between ESRA2 and ESRA3. For some questions/items we considered the formulation between the two editions too different to be compared, therefore these questions/items are not included in the comparisons. Lastly, comparisons only focus on country level as the countries included in the according regional means are also too different between ESRA2 and ESRA3 (e.g., in ESRA2 the region America includes three countries, while in ESRA3 this region includes eight countries).

Despite the efforts of the ESRA initiative to make the presented ESRA2 and ESRA3 results as comparable as possible, these comparisons have limitations and should be interpreted with caution. There can still be potential methodological effects that can explain differences in the results. It concerns elements on which we have little to no control due to various reasons. Examples of such kind of methodological differences are changes in the characteristics or composition of the sample (e.g., level of education, rural vs. urban population or number of moped riders in the mixed group of moped riders and motorcyclists) and changes in answer patters due to different presentation of the question (e.g., matrix questions with many items vs. single item questions). Secondly, when comparing the results between ESRA2 and ESRA3, the presented confidence intervals should also be considered. A difference in the percentage between ESRA2 and ESRA3 can seem large, while in fact the confidence intervals overlap or are not far apart. Because of these reasons, differences between ESRA2 and ESRA3 should not always be interpreted as actual changes in the population.

This chapter presents a comparison between results of ESRA3 and ESRA2 regarding subjective safety and risk perception while focussing on only individual, selected topics/items and countries. In 2025 the ESRA initiative plans to publish a dedicated report on 10 years of ESRA. This report will offer deeper insights into the evolution of ESRA and compare results over time since its start in 2015.

For a comparison with previous findings of ESRA2 on the topic of subjective safety, data from the ESRA3 survey on subjective safety was compared in an exemplary manner with the respective data of the second edition (2018) of the ESRA survey using the transport modes of driving a car and cycling as examples. Figure 17 shows the mean score of the answers of the participants on the perceived safety when driving a car and cycling for ESRA2 and ESRA3 for countries in Europe (for which data was available). It should be noted that in 2018 these questions were answered by slightly different samples of respondents and also the precise wording of the items differed slightly. Therefore, Figure 17 only serves as a tentative comparison.

ESRA2 results recalculated for comparability

Figure 17: Subjective safety for driving a car (left) and riding a bike (right) by country.

For driving a car, the subjective safety in nearly all countries is lower in ESRA3 than in ESRA2 – in which the perceived safety of driving a car was highest in most countries. The exceptions are Greece, Ireland, Poland and Serbia for which the perceived safety for driving a car increased in ESRA3 compared to ESRA2. Regarding the subjective safety of cycling, again for the majority of countries the highest safety levels for cycling are observable in ESRA2, however, an increase in subjective safety for cycling between ESRA3 and ESRA2 is observable in more countries than for driving a car. Countries like Belgium, Finland, France, Greece, Ireland, Portugal, Slovenia, and United Kingdom have higher safety levels in ESRA3 compared to ESRA2. However, in all countries (except for Denmark) the experienced safety when riding a bicycle is higher in ESRA3 than in ESRA1.

Regarding risk perception the ranking of the different risk factors in ESRA2 and ESRA3 for countries in Europe was compared in an exemplary manner, based on the percentage of the respondents that answered that the respective risk factor is often/frequently a cause of a road crash involving a car, i.e., ranking the respective risk factor with the highest share as 1 and the risk factor with the lowest as 6. The risk factor "driving within 1 hour after taking drugs (other than prescribed or over the counter medication)" was not included in this comparison as this item has changed compared to ESRA2 ("driving after taking drugs (other than medication)" in a manner considered as not comparable. Figure 18 shows the top 3 risk factors for ESRA2 and ESRA3 (for countries in Europe for which data was available) – also Figure 18 serves as a tentative comparison.

Figure 18: Ranking of perceived causes of car crashes by country.

It becomes observable that overall driving after drinking alcohol was considered the riskiest of all factors in nearly all countries (except for Italy and the Netherlands) in ESRA2 as well as in ESRA3. Comparing ESRA2 and ESRA3, there are several countries (e.g., Belgium, Czech Republic, Denmark, Finland, Ireland, Sweden, and the United Kingdom) for which no changes in the assessment/ranking of the different risk factors are noticeable. However, driving faster than the speed limit tends to be considered riskier in ESRA3 compared to ESRA2 in several countries like Austria, France, Italy, and Spain for which speeding was considered the third riskiest factor in ESRA3, while it did not rank in the top 3 factors in ESRA2, as well as in countries like Germany and Serbia – here speeding is considered the second riskiest factor in ESRA3, while it was only considered as the third riskiest factor in ESRA2. In addition, in the Netherlands, Portugal, and Slovenia using a hand-held mobile phone while driving was considered riskier among the different factors than in ESRA2.

As stated above, the observed changes between ESRA2 and ESRA3 should be interpreted with caution, as they could be influenced by methodological differences in the surveys, or for example, by the COVID-19 pandemic (Lyon et al., 2024). Future measurements (ESRA4 in 2026) should be used to confirm changes over time (trends). If possible, other national monitoring data that assess the same (or similar) variables over time could also be used for external validation of the observed national trends/changes.

3.4. Limitations of the data

The results give insights on the perceived levels of safety when using different transport modes and the impact assessment of various risk factors in traffic, however, some limitations have to be acknowledged (see also Meesmann & Wardenier, 2024).

Although ESRA3 aimed at a standardised methodology and sampling procedure in all participating countries to obtain fully and comparable data, in countries like Armenia, Kyrgyzstan, Uzbekistan, and Luxembourg a sample size of at least 1,000 respondents could not be reached. In these countries (except for Luxembourg) no online panels were available and more expensive face to face recruitment had to be used. This led to the sample size being reduced to 500 respondents. Therefore, the results of these three countries were not included in regional means. In addition, the share of the oldest age group (65-75 years) is underrepresented in the sample of some countries in Europe (Bosnia and Herzegovina), America (Brazil, Colombia, Peru, Panama), and Asia-Oceania (Thailand, Kazakhstan, Türkiye).

In particular cross-national surveys are prone to general response tendencies and biases (Tellis & Chandrasekaran, 2010). Road users of countries from the three different regions Europe, America, and Asia-Oceania may have culturally influenced interpretations of the questions in the survey. Road users' responses may therefore also be influenced by factors like social values, capabilities, personality, the role or status of a person, laws, road safety culture, and infrastructural differences that vary among the different countries (Van den Berghe et al., 2020) – which in particular applies for perceived safety and risk perception, with a multitude of factors that directly or indirectly influence those constructs.

Lastly, self-declared data is associated with other limitations, like the tendency of respondents to provide answers which present a favourable image of themselves (desirability bias), the misunderstanding of questions (e.g., questions with difficult words or long questions), or unintentional faulty answers due to memory errors (recall error; Krosnick & Presser, 2010).

4. Summary and discussion

4.1. Major findings

Subjective Safety

How safe or unsafe do you feel when using the following transport modes?

- Respondents in all regions considered the e-scooter and the motorcycle as the least safe transport modes. Additionally, in America, bicycles were also regarded as one of the least safe modes of transport. In contrast, walking was considered the safest transport mode in Europe and AsiaOceania. In America, driving a hybrid or electric car was considered safest.

- Especially in Europe women tend to feel less safe when using all of the presented transport modes, in particular driving a car, cycling, and walking, compared to men.

- For driving a car in Europe, and for driving a hybrid or electric car in Europe and in AsiaOceania, the subjective level of safety tends to increase with age. In contrast, this age pattern was mostly not found in America or even reversed.

- Regarding the interrelation of subjective safety and road fatalities car drivers tend to feel safer when there are less fatal road crashes in their countries. The same pattern was found for motorcyclists and pedestrians. This association pattern was found to tend to be strongest for motorcyclists and pedestrians but was not as strong for car drivers.

- For cyclists the pattern is different, the association between subjective safety and fatalities seems to be positively related. When adding exposure as further dimension to the picture, it showed that cyclists in countries with higher cycling exposure tend to feel safer.

Risk Perception

Which factors or behaviours are perceived as frequent causes of crashes?

- In Europe and America respondents considered driving after drinking alcohol as the riskiest factor. In AsiaOceania, speeding was considered the riskiest of all factors; in Europe and America this is perceived as the second riskiest factor.

- Especially in Europe a high percentage of respondents also considered using a hand-held phone while driving as risky. In contrast, using a hands-free phone while driving was the behaviour least risky in all regions.

- In all regions, but particularly in Europe, women considered most dangerous driving behaviours to be riskier than men.

- In Europe and America risk perception of different behaviours increased with increasing age, in AsiaOceania this age pattern was not found.

4.2. Discussion

Most of the existing studies on subjective safety of road users so far were carried out only for single countries (e.g., Backer-Grøndahl et al., 2007, McKown-Dawson et al., 2024) or focused on specific modes of transport (e.g., Sinus Institute, 2023). Within the ESRA initiative, with Furian et al. (2016) using ESRA1 survey data and Furian et al. (2021) using ESRA2 survey data, for the first time the subjective safety for different road users was analyzed for several countries in Europe (Furian et al., 2016) and besides Europe also for countries in North America, Asia-Oceania and Africa (Furian et al.,

2021). The present ESRA3 survey continues this assessment of subjective safety for different road users and across different regions of the world, as it focused on the perceived levels of safety when using different modes of transport (including new modes like the e-scooter) and the assessment of various risk factors in traffic (e.g. alcohol, speed, fatigue) regarding their contribution to crashes amongst road users in 39 countries in Europe, America, and Asia-Oceania.

Overall, results of ESRA3 show that the e-scooter and the motorcycle are considered as the least safe transport modes in all regions, while in America also the bicycle was considered as the least safe transport mode. This is in line with previous research (e.g. Furian et al., 2016) which found that the motorcycle is considered the least safe transport mode for countries in Europe, but also Furian et al. (2021) who found that the motorcycle is considered as the least safe transport mode not only in Europe, but also in North America, Asia-Oceania and Africa. These former studies of the first and second edition of ESRA, however, did not include the e-scooter in the assessment of perceived safety (as the e-scooter is a rather new transport mode). However, other studies (e.g. McKown-Dawson et al., 2024) also showed that the e-scooter is perceived less safe than other means of transport. In contrast, walking is considered the safest transport mode in Europe and Asia-Oceania, and in America driving a hybrid or electric car was considered the safest. This is in line with the results of ESRA1 (Furian et al., 2016) – although ESRA1 only focused on European countries – which also indicated that besides public transport and driving a car, walking was considered as one of the safest transport modes.

The results regarding the association between subjective safety of car drivers, motorcyclists, cyclists, and pedestrian in Europe and the number of road fatalities per million inhabitants for the relevant mode are in line with the results of the previous ESRA editions: In Europe, subjective safety of car drivers, motorcyclists, and pedestrians is negatively associated with the number of road fatalities per million inhabitants for the relevant mode – although especially the association for car drivers is not as strong as in ESRA2. Only for cyclists the association seems to be positive, which probably can be explained by the factor of exposure, however, no regression analysis has been conducted to investigate the influence of this factor on the perceived safety of cycling in detail (see Figure 13 up to Figure 16).

Looking at the latter and the assessment of subjective safety for cycling on country level, in particular the results for Europe show that in countries with low cycling rates (e.g., Greece), cycling is considered less safe than in countries with a high number of cyclists (e.g., Denmark, the Netherlands, Finland). These results for countries in Europe are similar to the results of ESRA1 (Furian et al., 2016) and ESRA2 (Furian et al., 2021) and in line with the 'safety in numbers' effect, which means that when the number of pedestrians and cyclists increases, there is less than proportional increase in the number of crashes involving them (Elvik & Bjørnskau, 2017, Elvik & Goel, 2019), but also could be traced back to the lack of cycling infrastructure in countries like Greece compared to the existence of more advanced cycling infrastructure in countries like Denmark or the Netherlands. However, interestingly – and in contrast to ESRA2 – cycling (but also cycling on an electric bicycle and also the e-scooter) across all countries and regions is considered safest in the US (also safer than in countries like Denmark, the Netherlands, and Finland) – despite the low numbers of cyclists in the US and less cycling infrastructure compared to countries like Denmark or the Netherlands. However, this might be a sample bias, as the US had the highest mean scores on subjective safety across all countries for nearly all different transport modes considered and when only looking at the mean scores on subjective safety for the different transport modes in the US, cycling was considered as one of the least safe transport modes.

Regarding risk perception – similar to the results of ESRA2 (Furian et al., 2021) - respondents considered driving after drinking alcohol as the risk factor with the highest impact in Europe and America, while in Asia-Oceania speeding was considered the riskiest of all factors. The factor considered as the least frequent cause of crashes across all regions is using a hands-free phone while driving – which was also the case in the ESRA2 survey (Furian et al., 2021). In addition, results regarding risk perception show that women generally tend to estimate the different risk factors to be more impactful than men, which, in line with ESRA1 (Furian et al., 2016) and ESRA2 (Furian et al., 2021), is especially true for Europe (Figure 12).

4.3. Closing remarks

The initial aim of ESRA was to develop a system for gathering reliable and comparable information about people's attitudes towards road safety in several European countries. This objective has been achieved

and the initial expectations have even been exceeded. ESRA has become a global initiative which already conducted surveys in more than 60 countries across six continents. The outputs of the ESRA project have become building blocks of national and international road safety monitoring systems.

The ESRA project has also demonstrated the feasibility and the added value of joint data collection on road safety attitudes and performance by partner organizations in a large number of countries. The intention is to repeat this survey every three to four years, retaining a core set of questions in every wave allowing the development of time series of road safety performance indicators.

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Appendix 1: ESRA3 Questionnaire

Introduction

In this questionnaire, we ask you some questions about your experience with, and your attitudes towards traffic and road safety. When responding to a question, please answer in relation to the traffic and road safety situation in [COUNTRY]. There are no right or wrong answers; what matters is your own experience and perception.

Socio-demographic information

Q1) **In which country do you live? _____**

Q2) **Are you …** male – female - other

Q3) **How old are you (in years)?** [Drop down menu]

Q4_1) **Are you currently a student?** yes - no

Q4_2) **What is the highest qualification or educational certificate which you want to achieve?** primary education - secondary education - bachelor's degree or similar - master's degree or higher

Q4_3) **What is the highest qualification or educational certificate that you have obtained?** none - primary education - secondary education - bachelor's degree or similar - master's degree or higher

Q5) **Which of the descriptions comes closest to how you feel about your household's income nowadays?** living comfortably on present income - coping on present income - finding it difficult on present income - finding it very difficult on present income

Q6a) **Is the car you regularly drive equipped with seatbelts in the front seat?** yes – no
Only asked to LMIC countries.

Q6b) **Is the car you regularly drive equipped with seatbelts in the back seat?** yes - no
Only asked to LMIC countries.

Q7) **Are you using a carsharing organization (e.g., poppy or cambio[1])?** yes – no
Only asked to HIC/UMIC countries.

Q8) **Do you have to drive or ride a vehicle during your main professional activity?** yes, I transport mainly other person(s) (e.g., taxi, bus, rickshaw, …) - yes, I transport mainly goods (e.g., truck, courier, food delivery,…) - yes, I transport mainly myself (e.g., visiting patients, salesperson,…) - no, I drive or ride a vehicle only for commuting or private reasons

Q9) **Which phrase best describes the area where you live?** a farm or home in the countryside - a country village - a town or a small city - the suburbs or outskirts of a big city - a big city

Q10) **In which region do you live?** [List of regions per country]

Q11a) **How far do you live from the nearest stop of public transport?** less than 500 metres - between 500 metres and 1 kilometre - more than 1 kilometre

Q11b) **What is the frequency of your nearest public transport?** at least 3 times per hour - 1 or 2 times per hour - less than 1 time per hour

Mobility & exposure

[1] *The examples in brackets were adapted to national context.*

Q12) **During the past 12 months, how often did you use each of the following transport modes in [country]? How often did you ...?** at least 4 days a week - 1 to 3 days a week - a few days a month - a few days a year - never

Items_(random order): take the train - take the bus or minibus - take the tram/streetcar - take the subway, underground, metro - take a plane - take a ship/boat or ferry - be a passenger on non-motorized individual public transport mode (e.g., bike taxi, animal carriages,…) - be a passenger on motorized individual public transport mode (e.g., car-taxi, moto-taxi, tuk-tuk, auto rickshaw, songthaew,…) - walk or run minimum 200m down the street - cycle (non-electric) - cycle on an electric bicycle / e-bike / pedelec - drive a moped (≤ 50 cc or ≤ 4 kW) - drive a motorcycle (> 50 cc or > 4kW) - ride an e-scooter (electric-kick style scooter) - drive a car (non-electric or non-hybrid) - drive a hybrid or electric car - be a passenger in a car - be a passenger on a moped or motorcycle - use another transport mode

Q13) **Over the last 30 days, have you transported a child (<18 years of age) in a car?** yes - no

Items (random order): under 150cm - above 150cm[2]

Self-declared safe and unsafe behaviour in traffic

Q14_1a) **Over the last 30 days, how often did you as a CAR DRIVER ...?** You can indicate your answer on a scale from 1 to 5, where 1 is "never" and 5 is "(almost) always". The numbers in between can be used to refine your response.

Binary variable for most items: at least once (2-5) - never (1); only exception: items on protective systems: always wear/transport (1) – not always wear/transport (2-5)

Items (random order):

- drive when you may have been over the legal limit for drinking and driving
- drive after drinking alcohol
- drive within 1 hour after taking drugs (other than prescribed or over the counter medication)
- drive within 2 hours after taking medication that may affect your driving ability
- drive faster than the speed limit inside built-up areas
- drive faster than the speed limit outside built-up areas (except motorways/freeways)
- drive too fast for the road/traffic conditions at the time (e.g., poor visibility, dense traffic, presence of vulnerable road users)
- drive faster than the speed limit on motorways/freeways
- drive without wearing your seatbelt
- transport children under 150cm[3] without using child restraint systems (e.g., child safety seat, cushion)
- transport children above 150cm[4] without wearing their seat belt
- talk on a hand-held mobile phone while driving
- talk on a hands-free mobile phone while driving
- read a message or check social media/news while driving
- drive when you were so sleepy that you had trouble keeping your eyes open

Q14_1b_1) **You said that you have driven a car when you may have been over the legal limit for drinking and driving. Was this ...?** **You can indicate multiple answers:** in the week during daytime - in the week during night-time - in the weekend during daytime - in the weekend during night-time - on motorways - on urban roads - on rural roads

Only asked to HIC/UMIC countries.

Q14_1b_2) **You said that you have driven a car within 1 hour after taking drugs (other than prescribed or over the counter medication). Was this ...?** **You can indicate multiple answers:** cannabis - cocaine - amphetamines (e.g., speed, extasy) - illicit opiates (e.g., morphine, codeine; not prescribed as medication) - other

Q14_1b_3) **You said that you have driven a car within 2 hours after taking medication that may affect your driving ability. Was this ...?** **You can indicate multiple answers[5]:** antihistamines and/or cough medicines (such as Claritin, Allegra, Benadryl) - antidepressants (such as Prozac, Zoloft, Wellbutrin) - prescription pain medicines (such as Tylenol with codeine, OxyContin, Percocet, Vicodin/ hydrocodone) - muscle relaxants (such as Soma, Flexeril) - sleep aids, Barbiturates, or Benzodiazapines

[2] *This question was adapted to national legal regulation.*
[3] *This question was adapted to national legal regulation.*
[4] *This question was adapted to national legal regulation.*
[5] *The examples in brackets were adapted to national context.*

(such as Ambien, Lunesta, phenobarbital, Xanax, Valium, Ativan) - amphetamines (such as Adderall, Dexedrine, phentermine) - other

Q14_2) **Over the last 30 days, how often did you as a CAR PASSENGER …? You can indicate your answer on a scale from 1 to 5, where 1 is "never" and 5 is "(almost) always". The numbers in between can be used to refine your response.**

Binary variable for most items: always wear/transport (1) – not always wear/transport (2-5)
Items (random order):

- travel without wearing your seatbelt in the back seat
- travel without wearing your seatbelt in the front seat

Q14_3) **Over the last 30 days, how often did you as a MOPED RIDER or MOTORCYCLIST …?** You can indicate your answer on a scale from 1 to 5, where 1 is "never" and 5 is "(almost) always". The numbers in between can be used to refine your response.

Binary variable for most items: at least once (2-5) - never (1); only exception: items on protective systems: always wear/transport (1) – not always wear/transport (2-5)
Items (random order):

- ride when you may have been over the legal limit for drinking and driving
- ride faster than the speed limit outside built-up areas (except motorways/freeways)
- not wear a helmet on a moped or motorcycle
- read a message or check social media/news while riding
- ride within 1 hour after taking drugs (other than prescribed or over the counter medication)
- ride too fast for the road/traffic conditions at the time (e.g., poor visibility, dense traffic, presence of vulnerable road users) - Only asked to LMIC countries.
- ride a motorcycle with more than 1 passenger

Q14_4) **Over the last 30 days, how often did you as a CYCLIST …?** You can indicate your answer on a scale from 1 to 5, where 1 is "never" and 5 is "(almost) always". The numbers in between can be used to refine your response.

Binary variable for most items: at least once (2-5) - never (1); only exception: items on protective systems: always wear/transport (1) – not always wear/transport (2-5)
Items (random order):

- cycle when you think you may have had too much to drink
- cycle without a helmet
- cycle while listening to music through headphones
- read a message or check social media/news while cycling
- cycle within 1 hour after taking drugs (other than prescribed or over the counter medication)
- cross the road when a traffic light is red

Q14_5) **Over the last 30 days, how often did you as a PEDESTRIAN …?** You can indicate your answer on a scale from 1 to 5, where 1 is "never" and 5 is "(almost) always". The numbers in between can be used to refine your response.

Binary variable for most items: at least once (2-5) - never (1); only exception: items on protective systems: always wear/transport (1) – not always wear/transport (2-5)
Items (random order):

- listen to music through headphones while walking down the street
- walk down the street when you think you may have had too much to drink
- read a message or check social media/news while walking down the street
- text a message while walking down the street
- cross the road when a pedestrian light is red
- cross the road at places other than at a nearby (distance less than 30m[6]) pedestrian crossing

Q14_6) **Over the last 30 days, how often did you as RIDER OF AN E-SCOOTER (electric-kick style scooter) …?** You can indicate your answer on a scale from 1 to 5, where 1 is "never" and 5 is "(almost) always". The numbers in between can be used to refine your response.

Binary variable for most items: at least once (2-5) - never (1); only exception: items on protective systems: always wear/transport (1) – not always wear/transport (2-5)
Only asked to HIC/UMIC countries.

[6] *This question was adapted to national legal regulation.*

Items (random order):

- ride with more than 1 person on board
- ride when you think you may have had too much to drink
- cross the road when a traffic light is red
- ride on pedestrian pavement/sidewalk
- ride without a helmet

Acceptability of safe and unsafe traffic behaviour

Q15) **Where you live, how acceptable would most other people say it is for a CAR DRIVER to ….?** You can indicate your answer on a scale from 1 to 5, where 1 is "unacceptable" and 5 is "acceptable". The numbers in between can be used to refine your response.

Binary variable: acceptable (4-5) – unacceptable/neutral (1-3)
Items (random order):

- drive when he/she may be over the legal limit for drinking and driving
- drive faster than the speed limit outside built-up areas (except motorways/freeways)
- drive without wearing the seatbelt
- talk on a hand-held mobile phone while driving
- read a message or check social media/news while driving

Q16_1) **How acceptable do you, personally, feel it is for a CAR DRIVER to …?** You can indicate your answer on a scale from 1 to 5, where 1 is "unacceptable" and 5 is "acceptable". The numbers in between can be used to refine your response.

Binary variable: acceptable (4-5) – unacceptable/neutral (1-3)
Items (random order; instructed response item (trick item) as last item):

- drive when he/she may be over the legal limit for drinking and driving
- drive within 1 hour after taking drugs (other than prescribed or over the counter medication)
- drive within 2 hours after taking a medication that may affect the driving ability
- drive faster than the speed limit inside built-up areas
- drive faster than the speed limit outside built-up areas (except motorways/freeways)
- drive too fast for the road/traffic conditions at the time (e.g., poor visibility, dense traffic, presence of vulnerable road users)
- drive faster than the speed limit on motorways/freeways
- drive without wearing the seatbelt
- transport children in the car without securing them (child's car seat, seatbelt, etc.)
- talk on a hand-held mobile phone while driving
- talk on a hands-free mobile phone while driving
- read a message or check social media/news while driving
- drive when he/she is so sleepy that he/she has trouble keeping their eyes open
- Please, select the answer option number 5 "acceptable". (Instructed response item (trick item))

Q16_2) **How acceptable do you, personally, feel it is for a MOPED RIDER or MOTORCYCLIST to …?** You can indicate your answer on a scale from 1 to 5, where 1 is "unacceptable" and 5 is "acceptable". The numbers in between can be used to refine your response.

Binary variable: acceptable (4-5) – unacceptable/neutral (1-3)
Items (random order):

- ride when he/she may have been over the legal limit for drinking and driving
- ride faster than the speed limit outside built-up areas (except motorways/freeways)
- not wear a helmet on a moped or motorcycle
- read a message or check social media/news while riding
- ride a motorcycle with more than 1 passenger - Only asked to LMIC countries.

Q16_3) **How acceptable do you, personally, feel it is for a CYCLIST to …?** You can indicate your answer on a scale from 1 to 5, where 1 is "unacceptable" and 5 is "acceptable". The numbers in between can be used to refine your response.

Binary variable: acceptable (4-5) – unacceptable/neutral (1-3)
Items (random order):

- cycle when he/she may have had too much to drink
- cycle without a helmet
- read a message or check social media/news while cycling
- cross the road when a traffic light is red

Q16_4) **How acceptable do you, personally, feel it is for a PEDESTRIAN to …?** You can indicate your answer on a scale from 1 to 5, where 1 is "unacceptable" and 5 is "acceptable". The numbers in between can be used to refine your response.

Binary variable: acceptable (4-5) – unacceptable/neutral (1-3)
Items (random order):

- walk down the street when he/she may have had too much to drink
- read a message or check social media/news while walking down the street
- cross the road when a pedestrian light is red

Attitudes towards safe and unsafe behaviour in traffic

Q17) **To what extent do you agree with each of the following statements?** You can indicate your answer on a scale from 1 to 5, where 1 is "disagree" and 5 is "agree". The numbers in between can be used to refine your response.

Binary variable: agree (4-5) – disagree/neutral (1-3)
Items (random order):
Behaviour believes & attitudes

- For short trips, one can risk driving under the influence of alcohol.
- I have to drive fast; otherwise, I have the impression of losing time.
- Respecting speed limits is boring or dull.
- Motorized vehicles should always give way to pedestrians or cyclists.
- I use a mobile phone while driving, because I always want to be available.
- To save time, I often use a mobile phone while driving.

Perceived behaviour control = self-efficacy

- I trust myself to drive after drinking a small amount of alcohol (e.g., one glass of wine or one pint of beer).
- I have the ability to drive when I am a little drunk after a party.
- I am able to drive after drinking a large amount of alcohol (e.g., a bottle of wine).
- I trust myself when I drive significantly faster than the speed limit.
- I have the ability to drive significantly faster than the speed limit.
- I am able to drive fast through a sharp curve.
- I trust myself when I check messages on the mobile phone while driving.
- I have the ability to write a message on the mobile phone while driving.
- I am able to talk on a hand-held mobile phone while driving.

Habits

- I often drive after drinking alcohol.
- I often drive faster than the speed limit.
- I often use my mobile phone while driving.

Intention

- I intend not to drive after drinking alcohol in the next 30 days.
- I intend to respect speed limits in the next 30 days.
- I intend not to use my mobile phone while driving in the next 30 days.

Subjective safety & risk perception

Q18) **How safe or unsafe do you feel when using the following transport modes in [country]?** You can indicate your answer on a scale from 0 to 10, where 0 is "very unsafe" and 10 is "very safe". The numbers in between can be used to refine your response.

Items (random) = Items indicated by the respondent in Q12 are displayed.

Q19) **How often do you think each of the following factors is the cause of a road crash involving a car**? You can indicate your answer on a scale from 1 to 6, where 1 is "never" and 6 is "(almost) always". The numbers in between can be used to refine your response.

Binary variable: often/frequently (4-6) - not that often/not frequently (1-3)
Items (random order):

- driving after drinking alcohol
- driving within 1 hour after taking drugs (other than prescribed or over the counter medication)
- driving faster than the speed limit
- using a hand-held mobile phone while driving
- using a hands-free mobile phone while driving
- inattentiveness or daydreaming while driving
- driving while tired

Support for policy measures

Q20) **Do you oppose or support a legal obligation …?** You can indicate your answer on a scale from 1 to 5, where 1 is "oppose" and 5 is "support". The numbers in between can be used to refine your response.

Binary variable: support (4-5) – oppose/neutral (1-3)
Items for all countries (random order):

- forbidding all drivers of motorized vehicles to drive with a blood alcohol concentration above 0.0 ‰ (zero tolerance)
- forbidding all drivers of motorized vehicles to use a hand-held mobile phone while driving
- limiting the speed limit to 30 km/h in all built-up areas (except on main thoroughfares)
- requiring all cyclists to wear a helmet
- limiting the speed limit to a maximum of 80 km/h on all rural roads without a median strip
- forbidding all novice drivers of motorized vehicles (license obtained less than 2 years ago) to drive with a blood alcohol concentration above 0.0 ‰ (zero tolerance)

Items only for HIC/UMIC countries (random order):

- installing an alcohol 'interlock' for drivers who have been caught drunk driving on more than one occasion (technology that won't let the car start if the driver's alcohol level is over a certain limit)
- requiring cyclists under the age of 12 to wear a helmet
- forbidding all cyclists to ride with a blood alcohol concentration above 0,0‰ (zero tolerance)

Items only for LMIC countries (random order):

- forbidding all professional drivers of motorized vehicles (e.g., taxis, vans, trucks, buses, …) to drive with a blood alcohol concentration above 0.0 ‰ (zero tolerance)
- requiring all moped and motorcycle riders and passengers to wear a helmet
- requiring all car drivers and passengers (front- and back seat) to wear a seatbelt
- making liability insurance mandatory for owners of cars

Q21) **Please think of the policy measure: "…" and indicate if you agree or disagree with the following statements about it. This policy measure would …?** disagree - agree

Random selection of one of the first 4 items in Q20 per respondent. All first 4 items in Q20 are be asked equally often in each country.
Items (random order):

- reduce the number of road crashes and injuries
- increase the safety feeling on the streets
- have negative side effects
- restrict people's individual freedom
- reduce the privacy of people
- limit people's mobility
- lead to discrimination
- be fair
- be expensive for people
- be easy to implement
- be difficult to enforce by the police
- be a burden for people
- be an unjustifiable intervention by the state
- be supported by many of my friends

Enforcement

Q22) **On a typical journey, how likely is it that you (as a car driver) will be checked by the police (including camera's or radars) for …?** You can indicate your answer on a scale from 1 to 7, where 1 is "very unlikely" and 7 is "very likely". The numbers in between can be used to refine your response.

Binary variable: likely (5-7) – unlikely/neutral (1-4)
Items (random order):

- alcohol, in other words, being subjected to a Breathalyser test
- the use of illegal drugs
- respecting the speed limits
- wearing your seatbelt
- the use of hand-held mobile phone to talk or text while driving

Q23_1) **In the past 12 months, how many times have you been checked by the police for using alcohol while driving a car (i.e., being subjected to a Breathalyser test)?** never - 1 time - at least 2 times - Binary variable: at least once - never

Q23_2) **In the past 12 months, how many times have you been checked by the police for using drugs (other than prescribed or over the counter medication) while driving a car?** never - 1 time - at least 2 times - Binary variable: at least once - never

Involvement in road crashes

The following questions focus on road crashes. With road crashes, we mean any collision involving at least one road vehicle (e.g., car, motorcycle, or bicycle) in motion on a public or private road to which the public has right of access. Furthermore, these crashes result in material damage, injury, or death. Collisions include those between road vehicles, road vehicles and pedestrians, road vehicles and animals or fixed obstacles, road and rail vehicles, and one road vehicle alone.

Q24a) **In the past 12 months, have you personally been involved in a road crash where at least one person was injured (light, severe or fatal crashes)?** yes - no

Q24b) **Please indicate the transport mode(s) YOU were using at the time of these crashes.** **You can indicate multiple answers:** as a car driver - as a car passenger - as a moped or motorcycle rider - as a moped or motorcycle passenger - as a cyclist - as a pedestrian - as a rider of an e-scooter (electric-kick style scooter) - other

Infrastructure

Q25_1_a) **As a CAR DRIVER, what type of roads do you regularly use in [country]?** You can indicate multiple answers: inter-city motorways - thoroughfares and high-speed roads within cities - rural roads and roads connecting towns and villages - other streets and roads in urban areas

Q25_1_b) **As a CAR DRIVER, how would you rate the roads that you regularly use in terms of safety?** You can indicate your answer on a scale from 1 to 7, where 1 is "very unsafe" and 7 is "very safe". The numbers in between can be used to refine your response.

Binary variable: safe (5-7) – unsafe/neutral (1-4)
Items (random order):

- inter-city motorways
- thoroughfares and high-speed roads within cities
- rural roads and roads connecting towns and villages
- other streets and roads in urban areas

Q25_2_a) **As a MOPED RIDER or MOTORCYCLIST, what type of roads do you regularly use in [country]?** You can indicate multiple answers: thoroughfares and high-speed roads within cities - rural roads and roads connecting towns and villages - other streets and roads in urban areas

Q25_2_b) **As a MOPED RIDER or MOTORCYCLIST, how would you rate the roads that you regularly use in terms of safety?** You can indicate your answer on a scale from 1 to 7, where 1 is "very unsafe" and 7 is "very safe". The numbers in between can be used to refine your response.

Binary variable: safe (5-7) – unsafe/neutral (1-4)
Items (random order):

- thoroughfares and high-speed roads within cities
- rural roads and roads connecting towns and villages
- other streets and roads in urban areas

Q25_3_a) **As a CYCLIST, what type of roads/cycle lanes do you regularly use in [country]?** You can indicate multiple answers: rural roads and roads connecting towns and villages with cycle lanes - rural roads and roads connecting towns and villages without cycle lanes - streets and roads in urban areas with cycle lanes - streets and roads in urban areas without cycle lanes

Q25_3_b) **As a CYCLIST, how would you rate the roads/cycle lanes that you regularly use in terms of safety?** You can indicate your answer on a scale from 1 to 7, where 1 is "very unsafe" and 7 is "very safe". The numbers in between can be used to refine your response.

Binary variable: safe (5-7) – unsafe/neutral (1-4)
Items (random order):

- rural roads and roads connecting towns and villages with cycle lanes
- rural roads and roads connecting towns and villages without cycle lanes

- streets and roads in urban areas with cycle lanes
- streets and roads in urban areas without cycle lanes

Q25_4_a) **As a PEDESTRIAN, what type of roads/sidewalks do you regularly use in [country]?** You can indicate multiple answers: rural roads and roads connecting towns and villages with sidewalks - rural roads and roads connecting towns and villages without sidewalks - streets and roads in urban areas with sidewalks - streets and roads in urban areas without sidewalks

Q25_4_b) **As a PEDESTRIAN, how would you rate the roads/sidewalks that you regularly use in terms of safety?** You can indicate your answer on a scale from 1 to 7, where 1 is "very unsafe" and 7 is "very safe". The numbers in between can be used to refine your response.

Binary variable: safe (5-7) – unsafe/neutral (1-4)
Items (random order):

- rural roads and roads connecting towns and villages with sidewalks
- rural roads and roads connecting towns and villages without sidewalks
- streets and roads in urban areas with sidewalks
- streets and roads in urban areas without sidewalks

Social desirability scale

Introduction: The survey is almost finished. Some of the following questions[7] have nothing to do with road safety, but they are important background information. There are no good or bad answers.

Q26) **To what extent do you agree with each of the following statements?** You can indicate your answer on a scale from 1 to 5, where 1 is "disagree" and 5 is "agree". The numbers in between can be used to refine your response.

Items (random order; instructed response item (trick item) as last item):

- In an argument, I always remain objective and stick to the facts.
- Even if I am feeling stressed, I am always friendly and polite to others.
- When talking to someone, I always listen carefully to what the other person says.
- It has happened that I have taken advantage of someone in the past.
- I have occasionally thrown litter away in the countryside or on to the road.
- Sometimes I only help people if I expect to get something in return.
- Please, select the answer option number 5 "agree". (Instructed response item (trick item))

Closing comment: Thank you for your contribution!

[7] *Q26 is asked together with some last questions on sociodemographic information, which have already been listed in the beginning of the questionnaire.*

Appendix 2: ESRA3 weights

The following weights were used to calculate representative means on national and regional level. They are based on UN population statistics (United Nations Statistics Division, 2023). The weighting took into account small corrections with respect to national representativeness of the sample based on gender and six age groups (18-24y, 25-34y, 35-44y, 45-54y, 55-64y, 65-74y). For the regions, the weighting also took into account the population size of each country in the total set of countries from this region.

Individual country weight	Individual country weight is a weighting factor based on the gender*6 age groups (18-24y, 25-34y, 35-44y, 45-54y, 55-64y, 65-74y) distribution in a country as retrieved from the UN population statistics.
Europe22 weight	European weighting factor based on all 22 European countries participating in ESRA3, considering individual country weight and population size of the country as retrieved from the UN population statistics.
America8 weight	American weighting factor based on all 8 North and Latin American countries participating in ESRA3, considering individual country weight and population size of the country as retrieved from the UN population statistics.
AsiaOceania6 weight	Asian and Oceanian weighting factor based on the 6 Asian and Oceanian countries participating in ESRA3 with data collected through online panel (Australia, Israel, Japan, Kazakhstan, Thailand, Türkiye - Armenia, Kyrgyzstan, and Uzbekistan were not included due to different methodology in data collection – face-to-face CAPI), considering individual country weight and population size of the country as retrieved from the UN population statistics.

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E-Survey of Road users' Attitudes