



# ESRA

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## E-Survey of Road users' Attitudes



### Infrastructure

ESRA3 Thematic report Nr. 8



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# Infrastructure

## ESRA3 Thematic report Nr. 8

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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)
GDP	Gross Domestic Product

## 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 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 37,000 road users in 39 countries across five continents. An overview of the ESRA initiative and the project results is available on: [www.esranet.eu](http://www.esranet.eu).

This thematic ESRA report on infrastructure describes the attitudes and opinions about the safety perception of different types of infrastructure of road users in 39 countries. It includes comparisons amongst the participating countries as well as results in relation to age and gender. The infrastructure aspects analysed in this thematic report cover: the frequency of use of different types of roads and the perceived safety regarding these types of roads by car drivers and vulnerable road users, including moped riders and motorcyclists, cyclists and pedestrians.

### Major findings

#### *Which type of infrastructure do car drivers regularly use?*

- The use of inter-city motorways varies from 50% in Asia-Oceania to 62.9% in Europe. The rate for America is 59.3%.
- Regarding the use of thoroughfares and high-speed roads within cities, the respective rates vary from 52.8% in Asia-Oceania to 69.8% in America. The rate for Europe is 66.5%.
- The percentages of the use of rural roads and roads connecting towns and villages vary from 55.7% in America to 75.2% in Europe. The rate for Asia-Oceania is 62.4%.
- The use of other streets and roads in urban areas varies from 61.4% in America to 68.1% in Asia-Oceania. The rate for Europe is 64.6%.

#### *Which type of infrastructure do mopeds and motorcyclists regularly use?*

- The use of thoroughfares and high-speed roads within cities varies from 36.4% in Asia-Oceania to 64.3% in America, while the rate in Europe is 50.6%.
- Regarding the use of rural roads and roads connecting towns and villages, the respective rates vary from 46.9% in America to 54.7% in Europe, while the rate for Asia-Oceania is 52.3%.

- The percentages of the use of other streets and roads in urban areas vary from 51.8% in Europe to 59.8% in Asia-Oceania. The rate for America is 54.5%.

*Which type of infrastructure do cyclists regularly use?*

- The use of rural roads and roads connecting towns and villages with cycle lanes varies from 36.5% in America to 44.5% in Europe. The rate for Asia-Oceania is 43.5%.
- The percentages of the use of rural roads and roads connecting towns and villages without cycle lanes vary from 25.4% in America to 36.4% in Asia-Oceania. The rate for Europe is 33.5%.
- The use of streets and roads in urban areas with cycle lanes varies from 56.2% in Asia-Oceania to 71.6% in Europe. The rate for America is 70.3%.
- Regarding the use of streets and roads in urban areas without cycle lanes, the respective rates vary from 36.5% in America to 47.2% in Europe. The rate for Asia-Oceania is 40.1%.

*Which type of infrastructure do pedestrians regularly use?*

- The use of rural roads and roads connecting towns and villages with sidewalks varies from 34.2% in America to 47.2% in Asia-Oceania. The rate for Europe is 37.7%.
- Regarding the use of rural roads and roads connecting towns and villages without sidewalks, the rates vary from 22.1% in America to 32.1% in Asia-Oceania. The rate for Europe is 22.8%.
- The results of pedestrians using streets and roads in urban areas with sidewalks vary from 75.8% in Asia-Oceania to 88.9% in Europe. The rate for America is 84.3%.
- The percentages of the use of streets and roads in urban areas without sidewalks vary from 34.7% in America to 36.5% in Europe. The rate for Asia-Oceania is 36.1%.

*What is the safety perception for car drivers using infrastructure?*

- The results of safety perception using inter-city motorways vary from 57.4% in America to 66.1% in Europe. The rate for Asia-Oceania is 64.3%.
- The safety perception of thoroughfares and high-speed roads within cities varies from 53.0% in Asia-Oceania to 59.8% in Europe and America.
- The perceived safety of using rural roads and roads connecting towns and villages varies from 49.6% in Asia-Oceania to 55.8% in America. The rate for Europe is 50.8%.
- Regarding the safety perception for using other streets and roads in urban areas, the percentages vary from 47.5% in Asia-Oceania to 55.3% in America. The rate for Europe is 51.4%.

*What is the safety perception for moped riders and motorcyclists using infrastructure?*

- The results of moped riders and motorcyclists considering it safe to use thoroughfares and high-speed roads within cities vary from 52.1% in Asia-Oceania to 68.0% in America. The rate for Europe is 61.1%.
- The perceived safety regarding rural roads and roads connecting towns and villages varies from 47.9% in Europe to 60.1% in America. The rate for Asia-Oceania is 58.7%.
- The safety perception of other streets and roads in urban areas varies from 45.5% in Europe to 58.8% in America. The rate for Asia-Oceania is 50.5%.

*What is the safety perception for cyclists using infrastructure?*

- The perceived safety regarding rural roads and roads connecting towns and villages with cycle lanes varies from 54.7% in Asia-Oceania to 62.7% in America. The rate for Europe is 62.6%.
- Regarding the safety perception of rural roads and roads connecting towns and villages without cycle lanes, the respective percentages vary from 27.7% in Europe to 45.8% in America. The rate for Asia-Oceania is 28.9%.
- The safety perception of streets and roads in urban areas with cycle lanes varies from 55.6% in Asia-Oceania to 64.5% in Europe. The rate for America is 61%.
- The percentages of safety feeling regarding streets and roads in urban areas without cycle lanes vary from 19.8% in Asia-Oceania to 32.9% in America. The rate for Europe is 25.3%.

*What is the safety perception for pedestrians using infrastructure?*

- The perceived safety regarding rural roads and roads connecting towns and villages with sidewalks varies from 53.6% in Asia-Oceania to 64.7% in Europe. The rate for America is 60.8%.
- Regarding the safety perception of rural roads and roads connecting towns and villages without sidewalks, the respective percentages vary from 28.7% in Europe to 47.9% in America. The rate for Asia-Oceania is 30.3%.
- The safety perception of streets and roads in urban areas with sidewalks varies from 60.4% in Asia-Oceania to 71.9% in Europe. The rate for America is 60.6%.
- The percentages of safety feeling regarding streets and roads in urban areas without sidewalks vary from 25.6% in Asia-Oceania to 32.6% in America. The rate for Europe is 29.4%.

*What is the correlation between road fatalities and perceived safety for using infrastructure?*

- The safety feeling of respondents is reflected in countries' road crash statistics.
- As the road fatality rate per transport mode and road type increases, the safety perception of using the respective road type is reduced.
- For car drivers, the highest coefficient of determination ( $R^2$ ) is recorded for the dependent variable of the perceived safety of other streets and roads in urban areas ( $R^2=0.34$ ), while the lowest for the safety perception of intercity motorways ( $R^2= 0.24$ ).
- The highest coefficient of determination ( $R^2$ ) for mopeds and motorcyclists is recorded for the dependent variable of the perceived safety of other streets and roads in urban areas ( $R^2=0.53$ ), while the lowest for the safety perception of thoroughfares and high-speed roads within cities ( $R^2= 0.17$ ).
- Regarding the coefficient of determination ( $R^2$ ) for pedestrians, the highest value is recorded for the dependent variable of the perceived safety of streets and roads in urban areas without sidewalks ( $R^2=0.46$ ), while the lowest for the safety perception of rural roads and roads connecting towns and villages with sidewalks ( $R^2= 0.28$ ).

*What is the correlation between Gross Domestic Product (GDP) per capita and perceived safety for using infrastructure?*

- There is a positive linear relationship between countries' GDP per capita and car drivers' perceived safety responses.

- The highest coefficient of determination ( $R^2$ ) is recorded for the dependent variable of the perceived safety of thoroughfares and high-speed roads within cities ( $R^2=0.35$ ), while the lowest for the safety perception of intercity motorways ( $R^2= 0.24$ ).

## Key recommendations

### Inter-city Motorways:

- Ensure regular maintenance and upkeep of inter-city motorways to reduce road crashes caused by poor road conditions.
- Implement advanced warning systems for hazards, weather conditions, and traffic congestion to improve driver awareness and response.

### Thoroughfares and High-Speed Roads within Cities:

- Install speed cameras, enforce speed limits, and design road layouts that discourage speeding.
- Improve street lighting and signage to increase visibility, especially at night or in adverse weather conditions.

### Rural Roads and Roads Connecting Towns and Villages:

- Develop and upgrade roads to accommodate safer speeds and separate vulnerable road users from motorized traffic where feasible.
- Increase awareness campaigns on rural road safety and encourage defensive driving techniques.

### Other Streets and Roads in Urban Areas:

- Designate lanes for cyclists to reduce conflicts with motor vehicles and improve overall safety perceptions.
- Build and maintain sidewalks with adequate space and accessibility features to ensure pedestrian safety.

### Additional Recommendations:

- Foster collaboration between transportation authorities, urban planners, and safety agencies to implement comprehensive safety measures.
- Utilize data analytics and crash statistics to identify high-risk areas and prioritize safety interventions accordingly.
- Regularly evaluate the effectiveness of implemented safety measures and adjust strategies as necessary based on evolving road usage patterns and safety perceptions.
- Integrate technologies like adaptive traffic signals, surveillance cameras, and mobile apps to provide real-time traffic updates and safety alerts. These advancements enhance situational awareness, optimize traffic flow, and improve overall road safety for all users.

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

Road traffic safety depends on numerous factors (Martins & Garcez, 2021; Benlagha & Charfeddine, 2020; Fillina-Dawidowicz et al, 2020). It can be assumed that most road crashes occur due to human errors (Adanu et al, 2017). Therefore, the aspect of the human factor as an element determining the level of road safety is a frequent object of research in the subject literature. However, other factors that should not be ignored are environmental issues (e.g., weather) (Theofilatos, 2017) and the technical environment such as materials and road infrastructure (Papadimitriou et al., 2019). The technical environment affecting the road safety level includes the reliability of means of transport, the location of vehicle diagnostics and repair sites, emergency services, and the condition of the road infrastructure.

Road crashes can occur due to insufficient road infrastructure. Intersection design, road surface condition, lack of guardrails or barriers, inadequate lighting, and absence of traffic signals or signs can cause a road crash. Road infrastructure should be designed and operated to eliminate or reduce risks for all road users (WHO, 2023). In addition to improving safety, road infrastructure can enhance accessibility, including for persons with disabilities, and facilitate transfers from one transport mode to another.

Ensuring maximum safety in infrastructure applies not only to the construction of new roads but also to the upkeep of existing ones. However, most roads continue to be built for the growing motor vehicle fleet. Many new roads being built in low- and middle-income countries fail to meet recognized safety standards (WHO, 2023). Worldwide, reporting countries collectively account for nearly 68 million km of roads, of which 4.5 million km are paved expressway, 47 million km are paved interurban roads and 10 million km are unpaved inter-urban roads. Only 35 countries report on the availability of cycle lanes, which account for a total length of 140,000 km, or roughly 0.2% of the total length of roads reported.

In Europe, over 10,600 people were killed on EU rural roads in 2022, with the highest share of fatalities occurring on rural roads (52%) and the lowest share on motorways (9%). The respective percentage for urban roads is 39% (ETSC, 2024). Remarkable is that 76% of road deaths on rural roads are car passengers or drivers and motorcycle riders and about 50% of all people killed on a rural road were vulnerable road users. Due to the relatively low level of infrastructure safety, high speeds and composition of road users, rural roads are considered to be the most dangerous roads in terms of design compared to urban roads.

The modernization of the road infrastructure both in rural and in urban areas is carried out for several reasons. In addition to individual causes depending on a given section subjected to changes, there are three crucial and recurring factors: improving road safety, increasing the comfort of travellers, and reducing the travel time between the endpoints of the section (Trojanowski et al., 2022).

The implementation of road projects in rural municipal areas has both positive and negative impacts on the environment, society, and the economy (Bryzhko et al., 2019). Environmentally, road expansion is detrimental, while socially, it brings significant benefits. Economically, the effects are mixed, with increased cargo traffic boosting local business opportunities and improving living conditions. However, these benefits come with drawbacks, such as deteriorating agricultural conditions, pollution, and disruptions to local lifestyles (Bryzhko et al., 2019).

Transportation systems are crucial for urban economic growth and social development (Lee & Yoon, 2021). However, urban areas often face challenges like traffic congestion, emissions, and safety issues (Figueiredo et al., 2001). The evolution of car traffic went along with the development of road infrastructure (Taillanter & Barthelemy, 2023). The quality of road infrastructure significantly impacts urban residents' quality of life, including health, safety, and economic opportunities (Hanák et al., 2014). City governments face challenges in planning and prioritizing projects due to budget constraints and the need to satisfy all stakeholders (Marović et al., 2018).

Many nations aim to promote economic growth and improve road infrastructure in disadvantaged regions, recognizing the role of roads in enabling efficient transportation and access to commercial and social activities. Economic growth is higher at lower urbanization levels but declines as urbanization

increases. Additionally, expanding road networks can facilitate export growth, with the greatest impact seen in economically integrated and intermediate rural areas (Ng et al., 2019; Asher & Novosad, 2020).

Given this context, the objective of this Thematic Report is to examine the attitudes and opinions of road users in 39 countries concerning their perceptions of safety regarding various types of infrastructure. The infrastructure aspects analyzed cover the frequency of use of different road types and the perceived safety of these roads by car drivers and vulnerable road users, including moped riders, motorcyclists, cyclists, and pedestrians. It is noted that the concept of perceived (or subjective) safety in traffic refers to feeling safe or unsafe or the anticipation thereof. Many internal and external factors can contribute to the individual perception of safety, such as prior experience, observations and interpretation of traffic situations, social norms, traits as well as the built environment including road infrastructure (Furian et al., 2024). To achieve the outlined objective, the ESRA3 findings are exploited to answer the following research questions:

- Which type of infrastructure do car drivers regularly use?
- Which type of infrastructure do mopeds and motorcyclists regularly use?
- Which type of infrastructure do cyclists regularly use?
- Which type of infrastructure do pedestrians regularly use?
- What is the safety perception for car drivers using infrastructure?
- What is the safety perception for moped riders and motorcyclists using infrastructure?
- What is the safety perception for cyclists using infrastructure?
- What is the safety perception for pedestrians using infrastructure?
- What is the correlation between road fatalities and perceived safety for using infrastructure?
- What is the correlation between Gross Domestic Product (GDP) and perceived safety for using infrastructure?

## 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 37,000 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](http://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	Unsafety feeling 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 drivers and motorcyclists	

The present report summarizes the ESRA3 results with respect to infrastructure. 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).

Note that a weighting of the data was applied in the descriptive 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 were used for all analyses.

### 3 Results

#### 3.1 Descriptive analysis

This section presents the results of ESRA3 questions on road infrastructure. These questions cover the following topics:

- Use of infrastructure (Section 3.1.1). It is noted that the questions concerning the use of infrastructure were answered by respondents who use the examined transport modes at least a few days a year, and the responses are binary (yes or no) to indicate regular use of the respective type of infrastructure.
- Perceived safety regarding the use of infrastructure (Section 3.1.2). It is noted that the questions concerning perceived safety were answered by respondents who use the examined transport modes at least a few days a year and regularly use the associated infrastructure. Responses were given on a scale from 1 to 7, where 1 is 'very unsafe' and 7 is 'very safe.' The responses were then dichotomized into: 0 - unsafe/neutral (1-4) and 1 - safe (5-7).

##### 3.1.1 Use of Infrastructure

#### USE OF INFRASTRUCTURE - CAR DRIVERS

##### Inter-city motorways

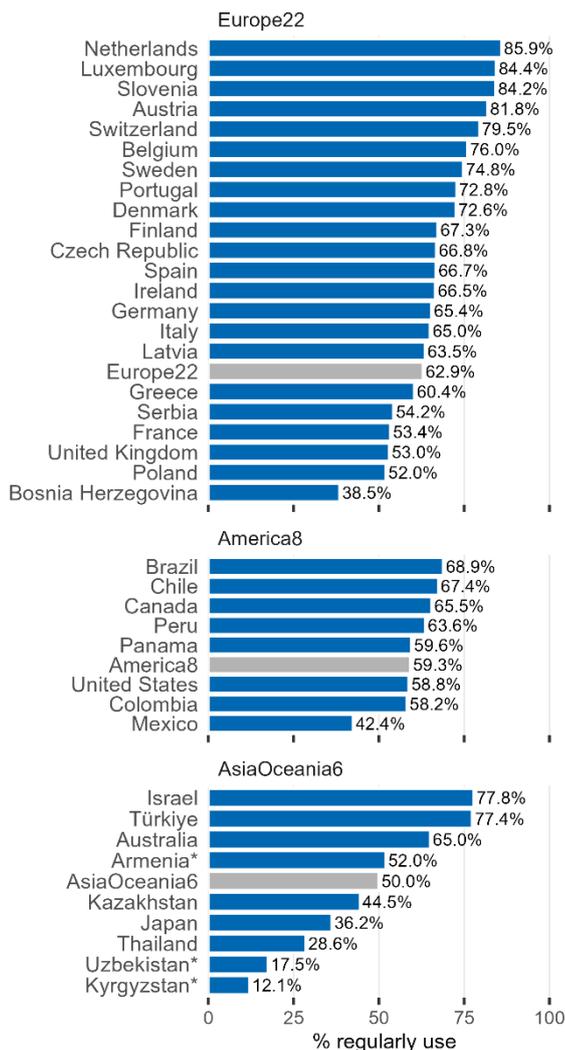


Figure 1 demonstrates that the results of car drivers using inter-city motorways regularly, vary from 50% in Asia-Oceania to 62.9% in Europe. The rate for America is 59.3%.

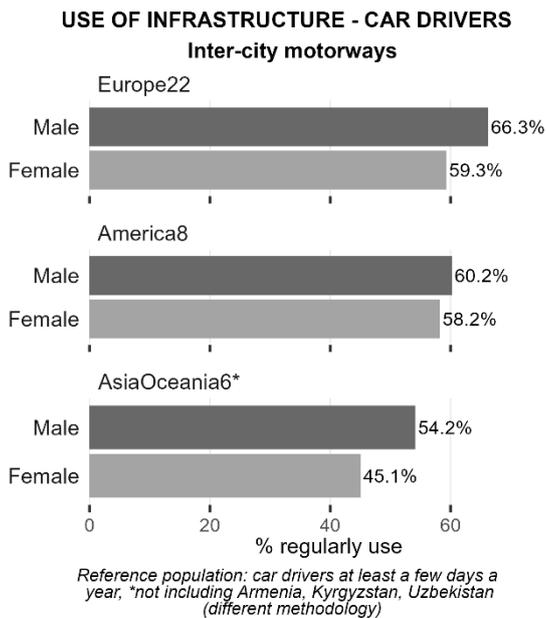
In Europe, the highest rates of using inter-city motorways are recorded in Netherlands and Luxembourg (85.9% and 84.4% respectively). On the other hand, Bosnia and Herzegovina (38.5%) reports the lowest rates.

Among the eight participating countries of America, the highest rates are found in Brazil (68.9%), while the lowest are recorded in Mexico (42.4%).

Regarding the rates of Asian-Oceanian car drivers, the highest rates are found in Israel and Türkiye (77.8% and 77.4% respectively), while the lowest rates are recorded in Kyrgyzstan (12.1%).

Figure 1: Use of inter-city motorways per region and country (% of car drivers that used this infrastructure regularly in the past year).

Reference population: car drivers at least a few days a year, \*not in regional mean (different methodology)



The results are further split out by region and gender in Figure 2. As can be seen in this figure, the usage of inter-city motorways by car drivers in all examined regions is higher for males.

Figure 2: Use of inter-city motorways per region and gender (% of car drivers that used this infrastructure regularly in the past year).

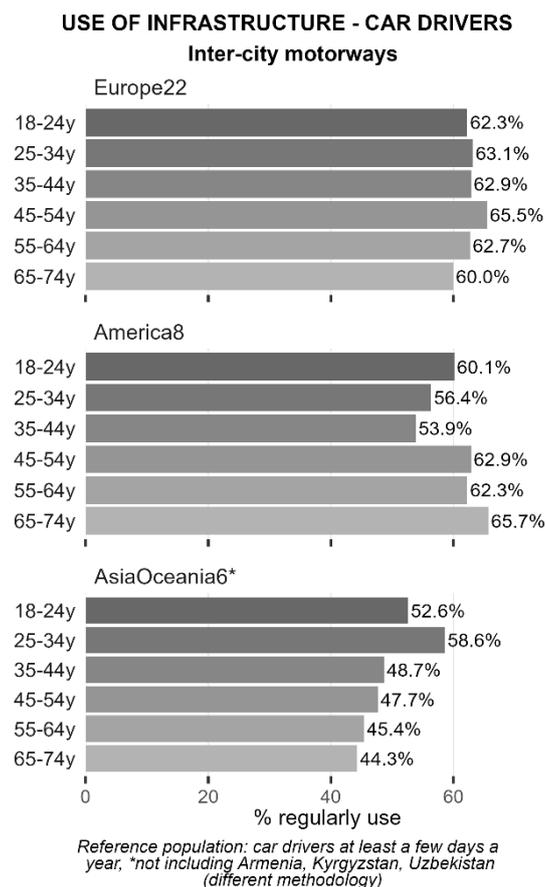


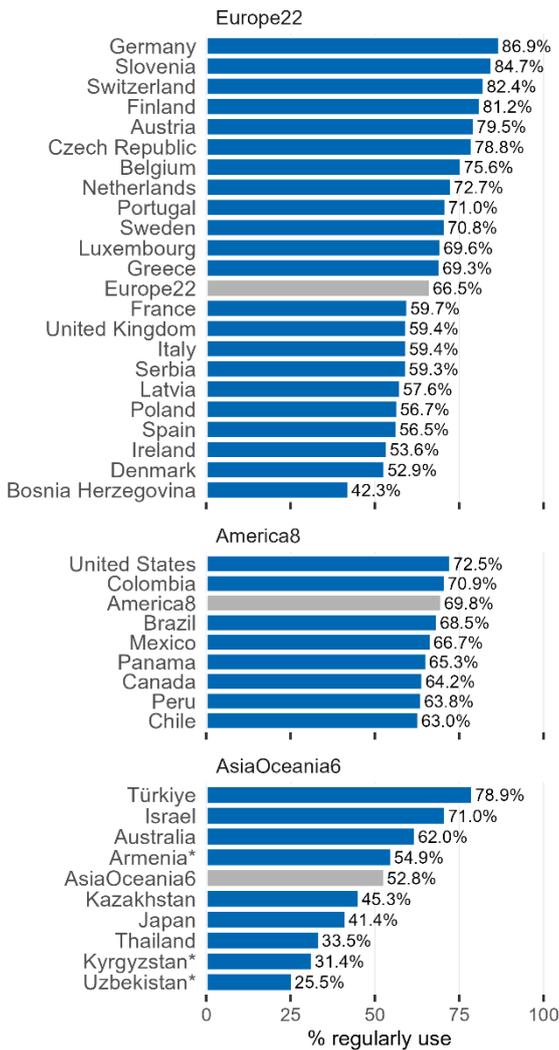
Figure 3 presents the results on self-declared use of inter-city motorways by car drivers by region and age group.

As can be seen in Figure 3, the percentage of car drivers using inter-city motorways varies among the three regions.

In Europe, the percentages are similar for all age groups. On the contrary, in America and Asia-Oceania, the distribution of the self-declared use of inter-city motorways is different among the age groups, with the highest share in America being recorded for car drivers aged 65-74 years old, while in Asia-Oceania people aged 25-34 years old use more frequently this type of roads.

Figure 3: Use of inter-city motorways per region and age group (% of car drivers that used this infrastructure regularly in the past year).

**USE OF INFRASTRUCTURE - CAR DRIVERS**  
**Thoroughfares and high-speed roads within cities**



Reference population: car drivers at least a few days a year, \*not in regional mean (different methodology)

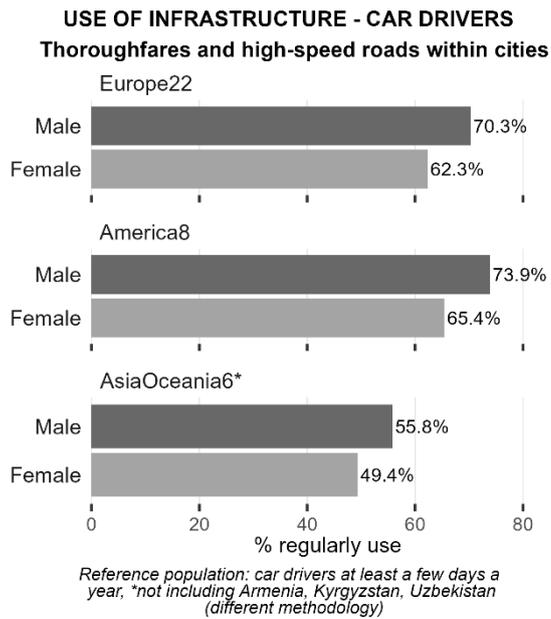
Figure 4 shows that the results of car drivers using thoroughfares and high-speed roads within cities vary from 52.8% in Asia-Oceania to 69.8% in America. The rate for Europe is 66.5%.

In Europe, the highest rates of use of thoroughfares and high-speed roads within cities are recorded in Germany and Slovenia (86.9% and 84.7% respectively). On the other hand, car drivers in Bosnia and Herzegovina (42.3%) report the lowest rates.

In America, over half of car drivers use thoroughfares and high-speed roads within cities. The highest rates are found in the United States (72.5%), while the lowest rates are in Chile (63.0%).

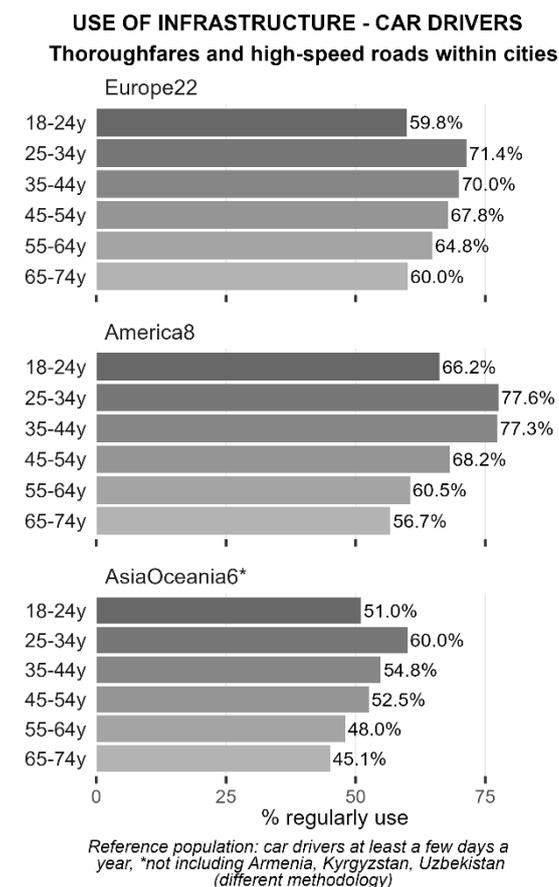
In Asia-Oceania, significant differences are observed between the countries. The highest rates are found in Türkiye (78.9%), while the lowest rates are in Uzbekistan (25.5%).

Figure 4: Use of thoroughfares and high-speed roads within cities per region and country (% of car drivers that used this infrastructure regularly in the past year).



In Figure 5, the results of self-declared use of thoroughfares and high-speed roads within cities by region and gender are presented. As can be seen in this figure, the usage of thoroughfares and high-speed roads within cities by car drivers in all examined regions is higher for males.

Figure 5: Use of thoroughfares and high-speed roads within cities per region and gender (% of car drivers that used this infrastructure regularly in the past year).



The results are further split out by region and age group in Figure 6. As can be seen in this Figure, the use of high-speed roads within cities is higher for people aged 25 to 34 years old in all examined regions.

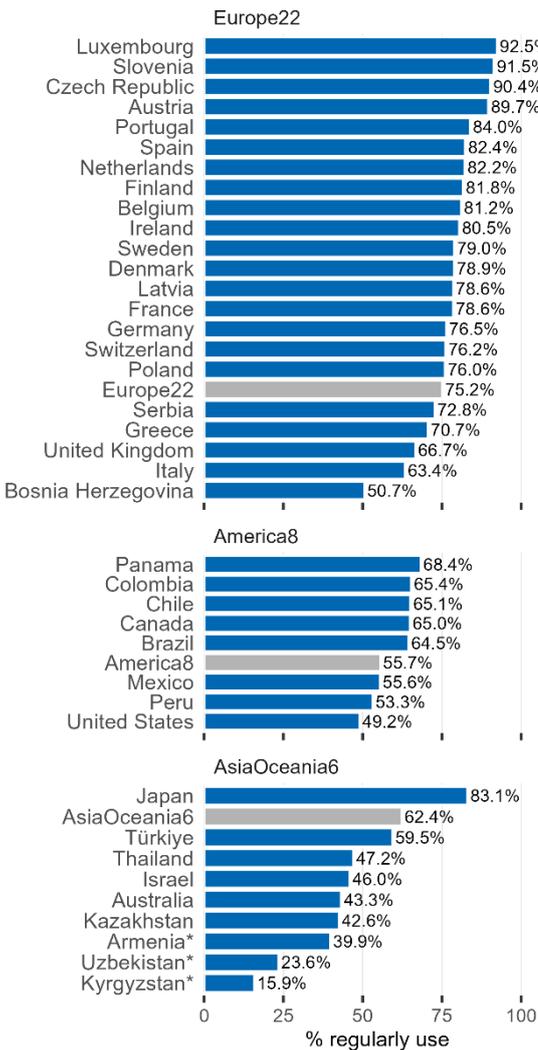
In Europe, car drivers aged 18 to 24 years old record the lowest percentage of using these types of roads.

In America, the distribution towards age groups is similar to that in Europe, with the highest shares of use of this type of road recorded for car drivers aged 25 to 44 years old and the lowest for the age group 65-74.

In Asia-Oceania, the lowest rates are recorded for drivers aged 55 to 74 years old (45.1%).

Figure 6: Use of thoroughfares and high-speed roads within cities per region and age group (% of car drivers that used this infrastructure regularly in the past year).

**USE OF INFRASTRUCTURE - CAR DRIVERS**  
**Rural roads and roads connecting towns and villages**



Reference population: car drivers at least a few days a year,  
 \*not in regional mean (different methodology)

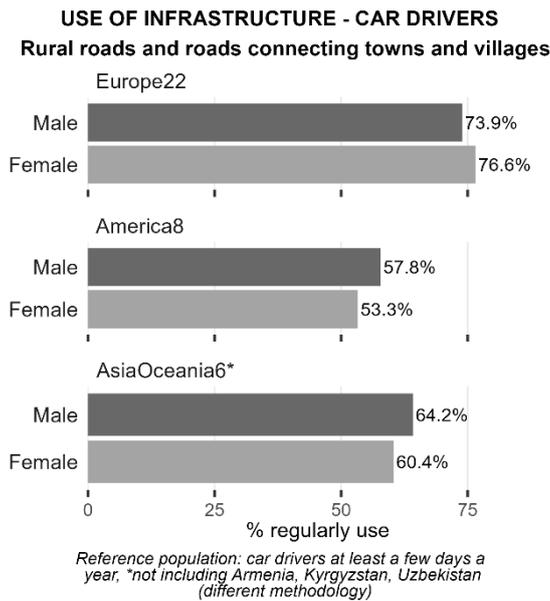
Figure 7 demonstrates that the results of car drivers using rural roads and roads connecting towns and villages vary from 55.7% in America to 75.2% in Europe. The rate for Asia-Oceania is 62.4%.

In Europe, the highest rates are recorded in Luxembourg (92.5%) and Slovenia (91.5%), while the lowest are recorded in Bosnia and Herzegovina (50.7%).

Among the countries of America, over half of car drivers use rural roads and roads connecting towns and villages except for the United States (49.2%).

In Asia-Oceania, the highest rates are found in Japan (83.1%), while the lowest rates are recorded in Kyrgyzstan (15.9%).

Figure 7: Use of rural roads and roads connecting towns and villages per region and country (% of car drivers that used this infrastructure regularly in the past year).



In Figure 8, the results of self-declared use of rural roads and roads connecting towns and villages by region and gender are presented. The percentages of male car drivers using such type of road are slightly higher than the respective rates of female riders in America and Asia-Oceania, while the opposite is the case for Europe.

Figure 8: Use of rural roads and roads connecting towns and villages per region and gender (% of car drivers that used this infrastructure regularly in the past year).

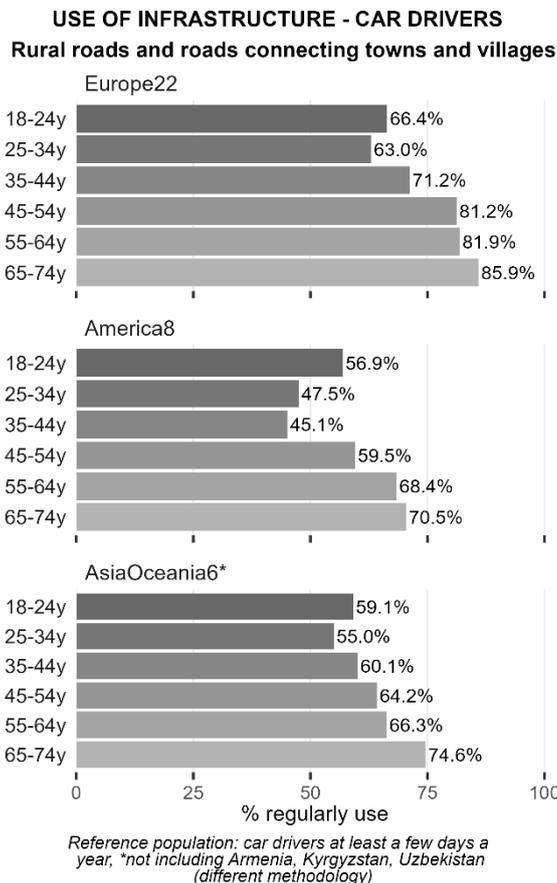


Figure 9 presents the results on self-declared use of rural roads and roads connecting towns and villages by car drivers' age group and region.

In Europe, people aged 65 to 74 years old (85.9%) use more frequently this type of infrastructure than younger car drivers.

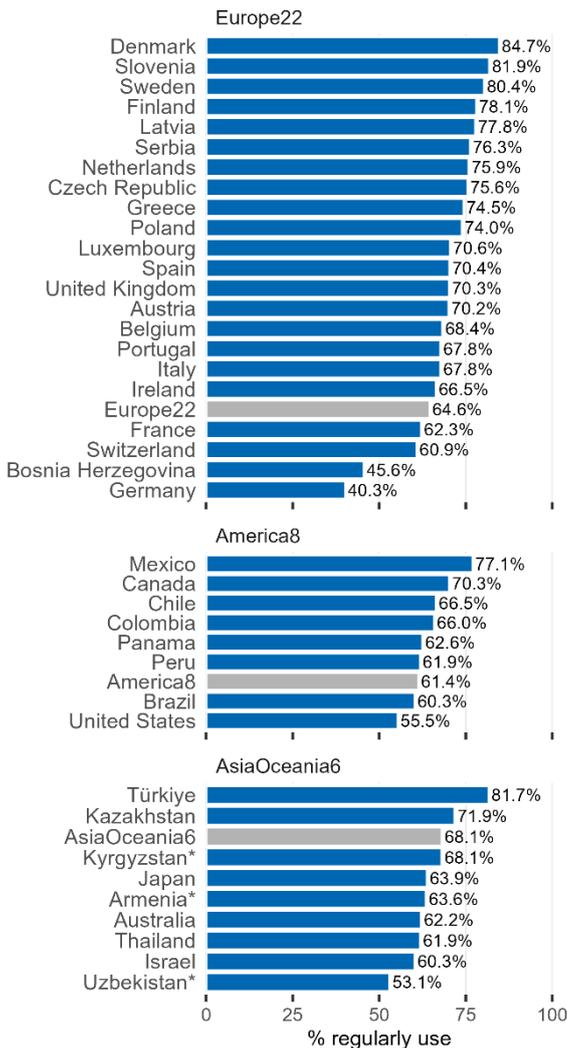
In America, car drivers aged 35 to 44 years old use less rural roads and roads connecting towns and villages (45.1%).

Regarding Asia-Oceania, as in Europe, the highest percentage of using this type of roads is recorded for car drivers aged 65 to 74 years old (74.6%), while the lowest rate is recorded for people aged 25 to 34 years old (55%).

Figure 9: Use of rural roads and roads connecting towns and villages per region and age group (% of car drivers that used this infrastructure regularly in the past year).

**USE OF INFRASTRUCTURE - CAR DRIVERS**

**Other streets and roads in urban areas**



Reference population: car drivers at least a few days a year, \*not in regional mean (different methodology)

Figure 10 demonstrates that the results of car drivers using other streets and roads in urban areas vary from 61.4% in America to 81.7% in Asia-Oceania. The rate for Europe is 64.6%.

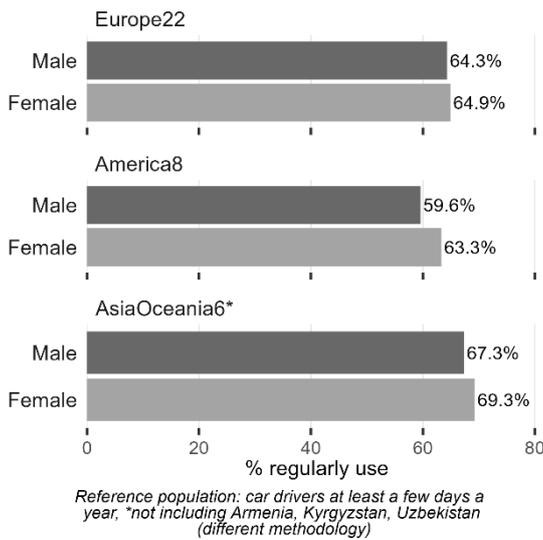
In Europe, the highest rates are recorded in Denmark (84.7%), Slovenia (81.9%) and Sweden (80.4%), while the lowest are recorded in Germany (40.3%) and Bosnia and Herzegovina (45.6%).

Among the countries of America, over half of car drivers use other streets and roads in urban areas in all participating countries. The highest rates correspond to Mexico (77.1%), whereas the lowest rates are recorded in the United States (55.5%)

In Asia-Oceania, the highest rates are found in Türkiye (81.7%) and Kazakhstan (71.9%), while the lowest rates are recorded in Uzbekistan (53.1%).

Figure 10: Use of other streets and roads in urban areas per region and country (% of car drivers that used this infrastructure regularly in the past year).

**USE OF INFRASTRUCTURE - CAR DRIVERS**  
**Other streets and roads in urban areas**



In Figure 11, the results of self-declared use of other streets and roads in urban areas by region and gender are presented. The percentages of male car drivers using such types of roads are slightly lower than the respective rates of female riders in all examined regions.

Figure 11: Use of other streets and roads in urban areas per region and gender (% of car drivers that used this infrastructure regularly in the past year).

**USE OF INFRASTRUCTURE - CAR DRIVERS**  
**Other streets and roads in urban areas**

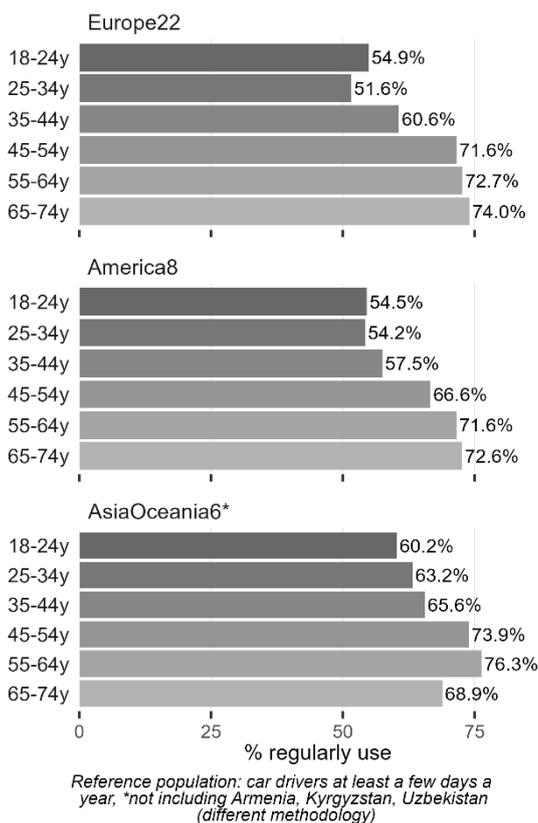


Figure 12 presents the results on self-declared use of other streets and roads in urban areas by car drivers' age group and region. The distribution is similar in all examined regions, with a higher share of older car drivers and a lower share of younger people.

In Europe, people aged 65 to 74 years old (74%) use more frequently this type of infrastructure than younger car drivers.

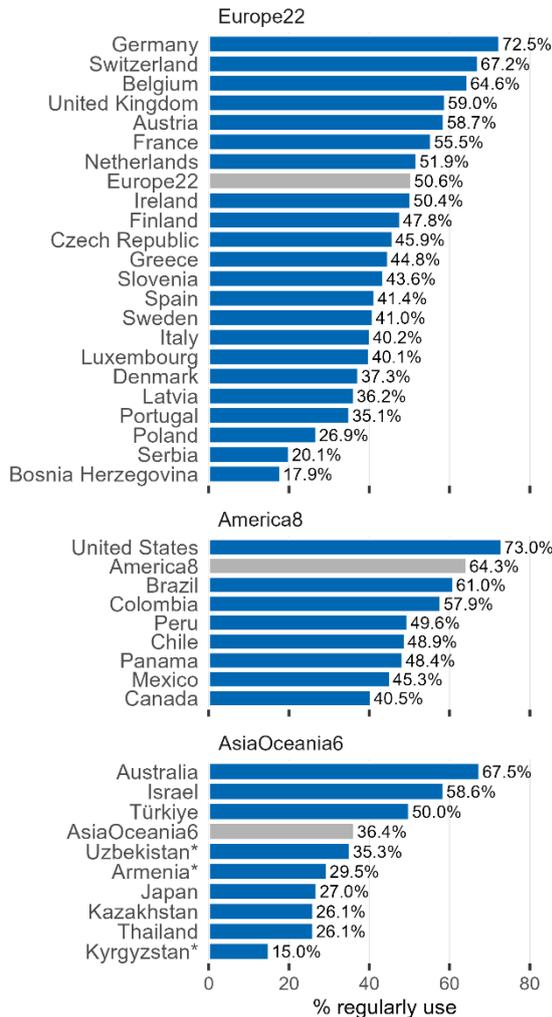
In America, as in Europe, car drivers aged 65 to 74 years old use mostly other streets and roads in urban areas (72.6%).

Contrary to the other regions, in Asia-Oceania the highest percentage of using this type of roads is recorded for car drivers aged 55 to 64 years old (76.3%).

Figure 12: Use of other streets and roads in urban areas per region and age group (% of car drivers that used this infrastructure regularly in the past year).

**USE OF INFRASTRUCTURE - MOTORCYCLISTS OR MOPED RIDERS**

**Thoroughfares and high-speed roads within cities**



Reference population: motorcyclists and moped riders at least a few days a year, \*not in regional mean (different methodology)

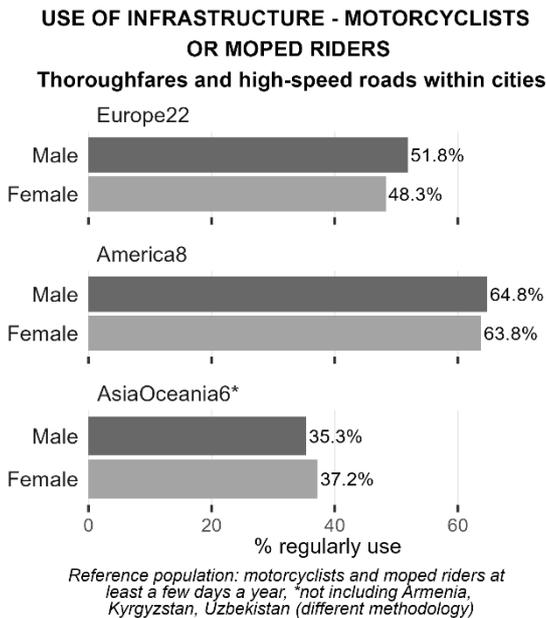
Figure 13 demonstrates that the results of moped riders and motorcyclists using thoroughfares and high-speed roads within cities regularly vary from 36.4% in Asia-Oceania to 64.3% in America. The rate for Europe is 50.6%.

In Europe, the highest rates of using thoroughfares and high-speed roads within cities are recorded in Germany and Switzerland (72.5% and 67.2% respectively). On the other hand, moped riders and motorcyclists in Poland (26.9%), Serbia (20.1%) and Bosnia and Herzegovina (17.9%) report the lowest rates.

Among the eight participating countries of America, the highest rates are found in the United States (73.0%), while the lowest are recorded in Mexico and Canada (45.3% and 40.5% respectively).

Regarding the rates of Asia-Oceanian moped riders and motorcyclists, the highest rates are found in Australia (67.5%), while the lowest rates are recorded in Kyrgyzstan (15.0%).

Figure 13: Use of thoroughfares and high-speed roads within cities per region and country (% of moped riders and motorcyclists that used this infrastructure regularly in the past year).



The results are further split out by region and gender in Figure 14. As can be seen in this figure, the usage of thoroughfares and high-speed roads within cities by moped riders and motorcyclists in all examined regions is similar for females and males.

Figure 14: Use of thoroughfares and high-speed roads within cities per region and gender (% of moped riders and motorcyclists that used this infrastructure regularly in the past year).

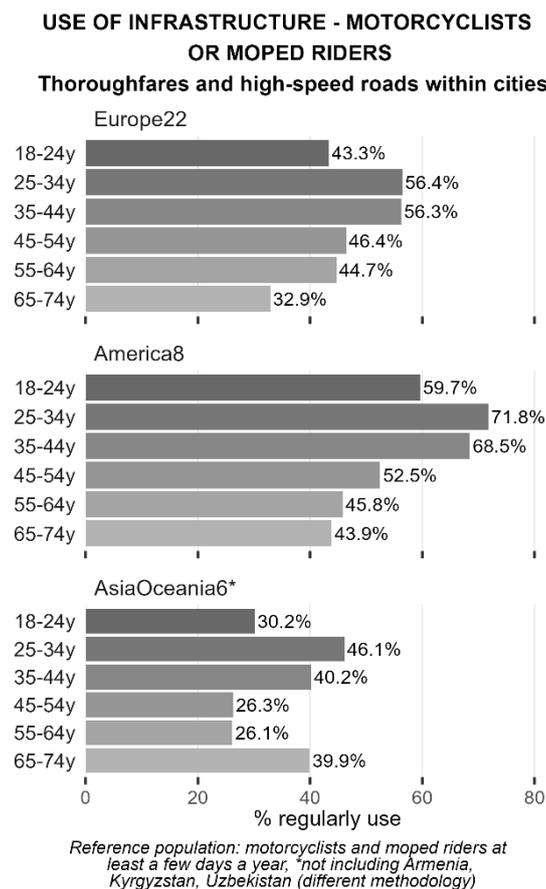


Figure 15 presents the results on the self-declared use of thoroughfares and high-speed roads within cities by moped riders and motorcyclists by region and age group.

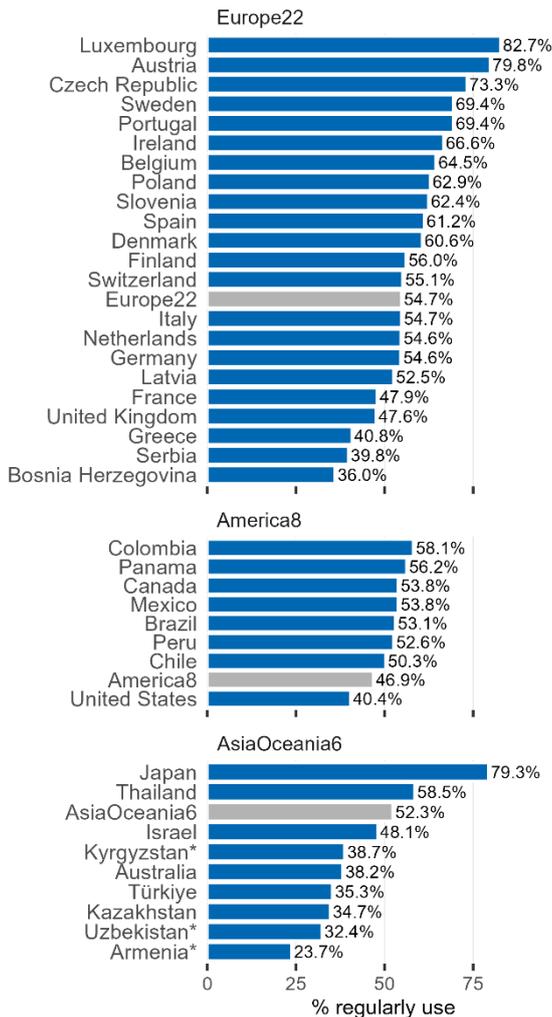
As can be seen in Figure 15, the percentage of moped riders and motorcyclists using thoroughfares and high-speed roads within cities is higher in all regions for people aged 25 to 44 years old.

In Europe and America, the lowest rates are found among the age group 65-74 (32.9% and 43.9% respectively). On the contrary, in Asia-Oceania moped riders and motorcyclists aged 65-74 use more thoroughfares and high-speed roads within cities than people aged 45 to 64 years old.

Figure 15: Use of thoroughfares and high-speed roads within cities per region and age group (% of moped riders and motorcyclists that used this infrastructure regularly in the past year).

**USE OF INFRASTRUCTURE - MOTORCYCLISTS OR MOPED RIDERS**

**Rural roads and roads connecting towns and villages**



Reference population: motorcyclists and moped riders at least a few days a year, \*not in regional mean (different methodology)

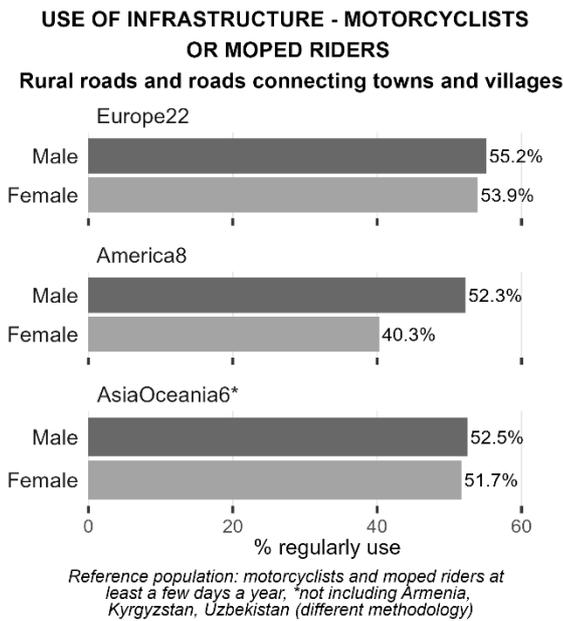
Figure 16 shows that the results of moped riders and motorcyclists using rural roads and roads connecting towns and villages vary from 46.9% in America to 54.7% in Europe. The rate for Asia-Oceania is 52.3%.

In Europe, the highest rates of using rural roads and roads connecting towns and villages are recorded in Luxembourg and Austria (82.7% and 79.8% respectively). On the other hand, moped riders and motorcyclists in Greece (40.8%), Serbia (39.8%) and Bosnia and Herzegovina (36.0%) report the lowest rates.

In America, over half of moped riders and motorcyclists use rural roads and roads connecting towns and villages except for the United States (40.4%).

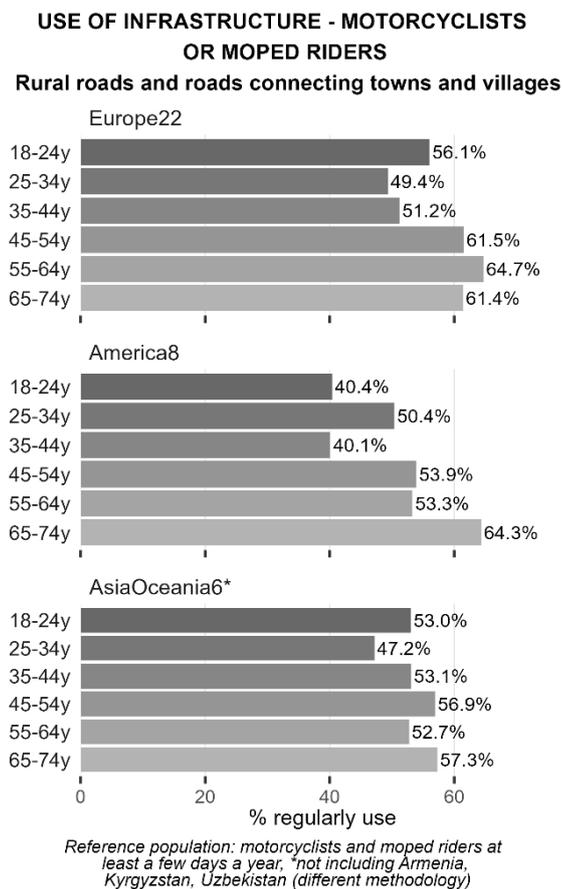
In Asia-Oceania, significant differences are observed between the countries. The highest rates are found in Japan (79.3%), while the lowest rates are in Armenia (23.7%).

Figure 16: Use of rural roads and roads connecting towns and villages per region and country (% of moped riders and motorcyclists that used this infrastructure regularly in the past year).



In Figure 17, the results of self-declared use of rural roads and roads connecting towns and villages by region and gender are presented. The percentages for females and males are similar except for America, where the percentage of female moped riders and motorcyclists is quite lower than the respective percentage of males.

Figure 17: Use of rural roads and roads connecting towns and villages per region and gender (% of moped riders and motorcyclists that used this infrastructure regularly in the past year).



The results are further split out by region and age group in Figure 18. As can be seen in this Figure, the use of rural roads and roads connecting towns and villages is higher for people aged 65 to 74 years old in America and Asia-Oceania.

In Europe, moped riders and motorcyclists aged 25 to 34 years old record the lowest percentage of using these types of roads, while the highest use is for the age group 55-64.

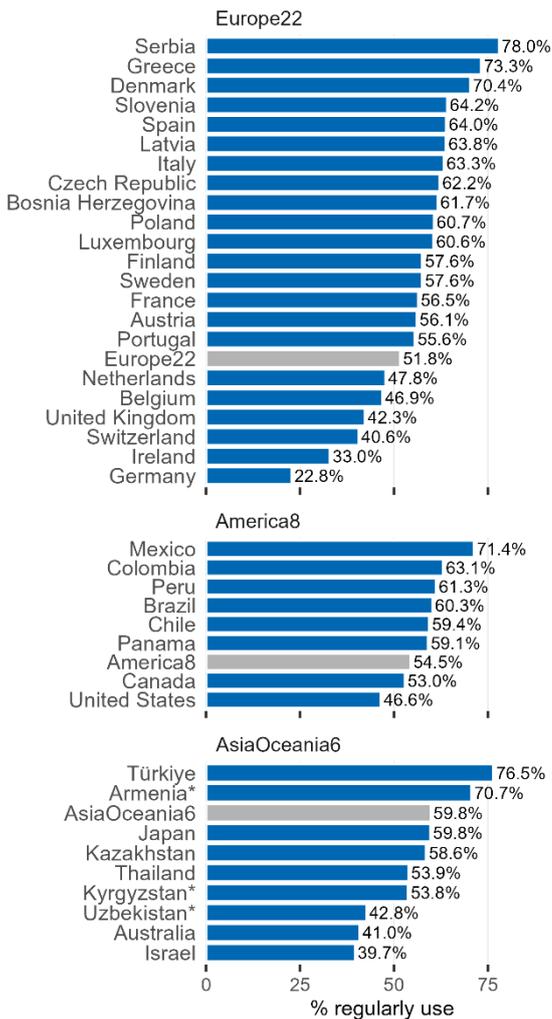
In America, the distribution towards age groups is different than in Europe, with the highest share of use of this type of roads recorded for moped riders and motorcyclists aged 65 to 74 years old and the lowest for the age group 35-44.

Asia-Oceania records higher use of this type of infrastructure for people aged 65 to 74 years old and the lowest use for age group 25-34.

Figure 18: Use of rural roads and roads connecting towns and villages per region and age group (% of moped riders and motorcyclists that used this infrastructure regularly in the past year).

## USE OF INFRASTRUCTURE - MOTORCYCLISTS OR MOPED RIDERS

### Other streets and roads in urban areas



Reference population: motorcyclists and moped riders at least a few days a year, \*not in regional mean (different methodology)

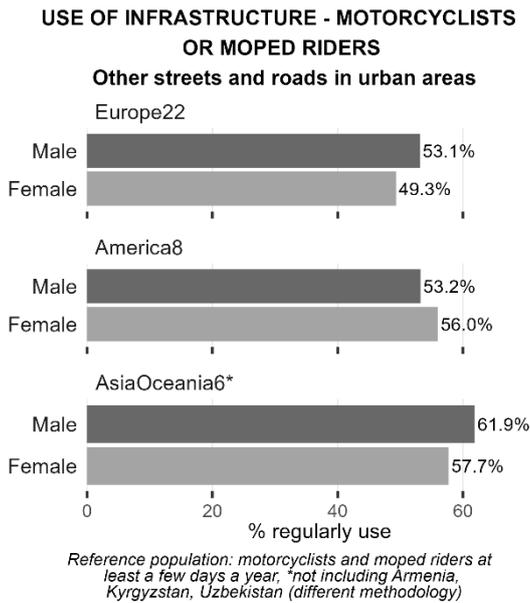
Figure 19 demonstrates that the results of moped riders and motorcyclists using other streets and roads in urban areas vary from 51.8% in Europe to 59.8% in Asia-Oceania. The rate for America is 54.5%.

In Europe, the highest rates are recorded in Serbia (78.0%) and Greece (73.3%), while the lowest are recorded in Ireland (33.0%) and Germany (22.8%).

Among the countries of America, over half of moped riders and motorcyclists use other streets and roads in urban areas except for the United States (46.6%).

In Asia-Oceania, the highest rates are found in Türkiye (76.5%) and Armenia (70.7%), while the lowest rates are recorded in Israel (39.7%).

Figure 19: Use of other streets and roads in urban areas per region and country (% of moped riders and motorcyclists that used this infrastructure regularly in the past year).



In Figure 20, the results of self-declared use of other streets and roads in urban areas by region and gender are presented. The percentages of male moped riders and motorcyclists using such types of roads are slightly higher than the respective rates of female riders in Europe and Asia-Oceania, while the opposite is the case for America.

Figure 20: Use of other streets and roads in urban areas per region and gender (% of moped riders and motorcyclists that used this infrastructure regularly in the past year).

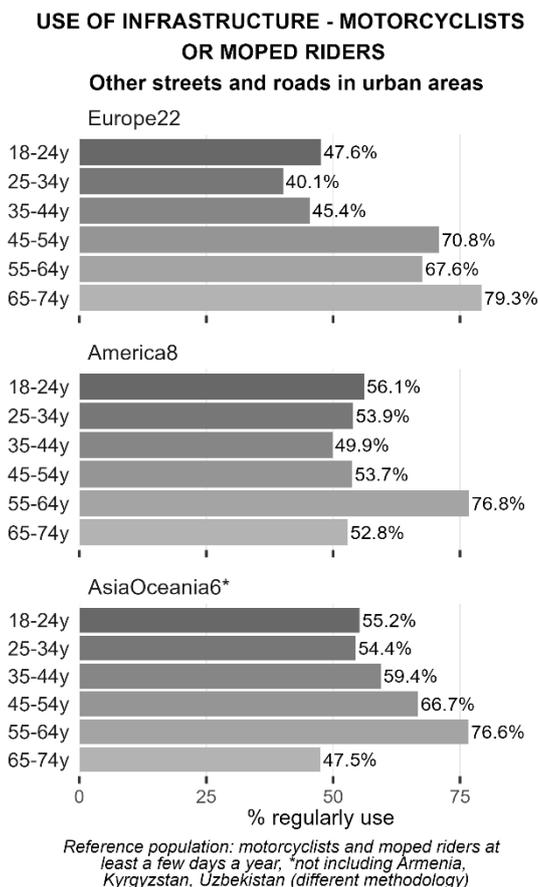


Figure 21 presents the results on self-declared use of other streets and roads in urban areas by moped riders and motorcyclists' age group and region.

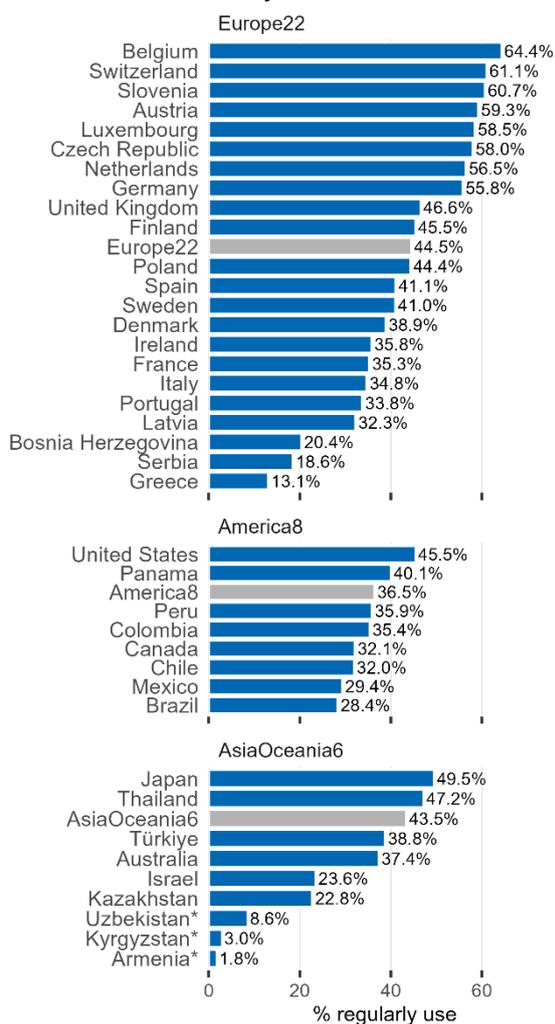
In Europe, people aged 65 to 74 years old (79.3%) use more frequently this type of infrastructure than younger moped riders and motorcyclists.

In America, moped riders and motorcyclists aged 55 to 64 years old use mostly other streets and roads in urban areas (76.8%).

Regarding Asia-Oceania, the highest percentage of using this type of roads is recorded for moped riders and motorcyclists aged 55 to 64 years old (76.6%).

Figure 21: Use of other streets and roads in urban areas per region and age group (% of moped riders and motorcyclists that used this infrastructure regularly in the past year).

**USE OF INFRASTRUCTURE - CYCLISTS**  
**Rural roads and roads connecting towns and villages**  
**with cycle lanes**



Reference population: cyclists at least a few days a year, \*not in regional mean (different methodology)

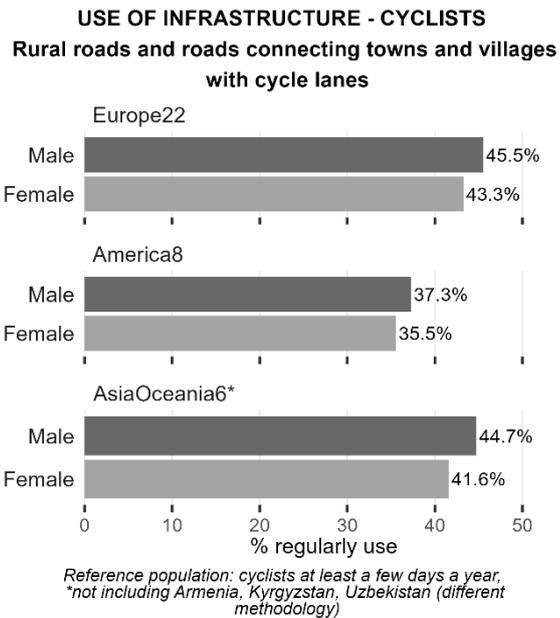
Figure 22 demonstrates that the results of cyclists using rural roads and roads connecting towns and villages with cycle lanes regularly, vary from 36.5% in America to 44.5% in Europe. The rate for Asia-Oceania is 43.5%.

In Europe, the highest rates of using rural roads and roads connecting towns and villages with cycle lanes are recorded in Belgium and Switzerland (64.4% and 61.1% respectively). On the other hand, cyclists in Greece (13.1%), Serbia (18.6%), and Bosnia and Herzegovina (20.4%) report the lowest rates.

Among the eight participating countries of America, the highest rates are found in the United States (45.5%), while the lowest rates are recorded in Brazil and Mexico (28.4% and 29.4% respectively).

Regarding the rates of Asia-Oceanian cyclists, the highest rates are found in Japan (49.5%), while the lowest rates are recorded in Armenia (1.8%).

Figure 22: Use of rural roads and roads connecting towns and villages with cycle lanes per region and country (% of cyclists that used this infrastructure regularly in the past year).



The results are further split out by region and gender in Figure 23. As can be seen in this figure, the usage of rural roads and roads connecting towns and villages with cycle lanes by cyclists in all examined regions is slightly higher for males.

Figure 23: Use of rural roads and roads connecting towns and villages with cycle lanes per region and gender (% of cyclists that used this infrastructure regularly in the past year).

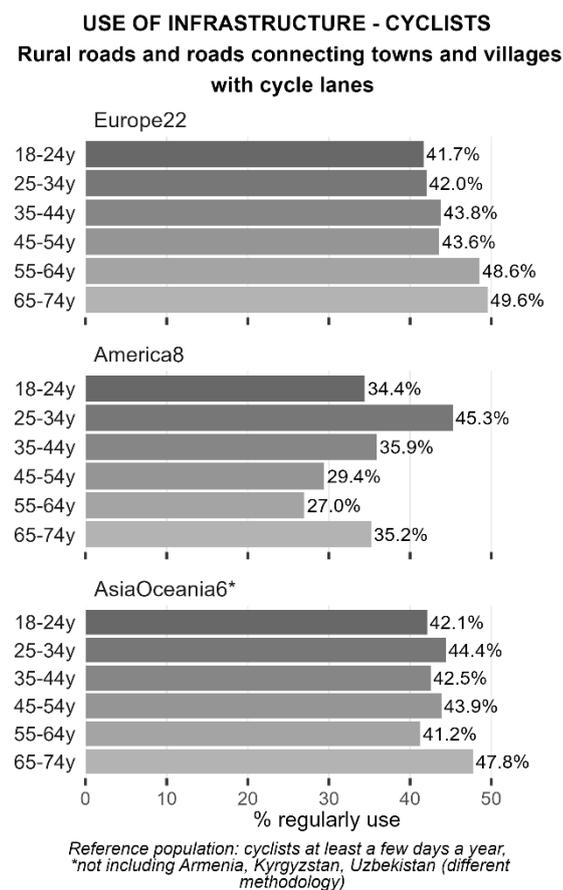


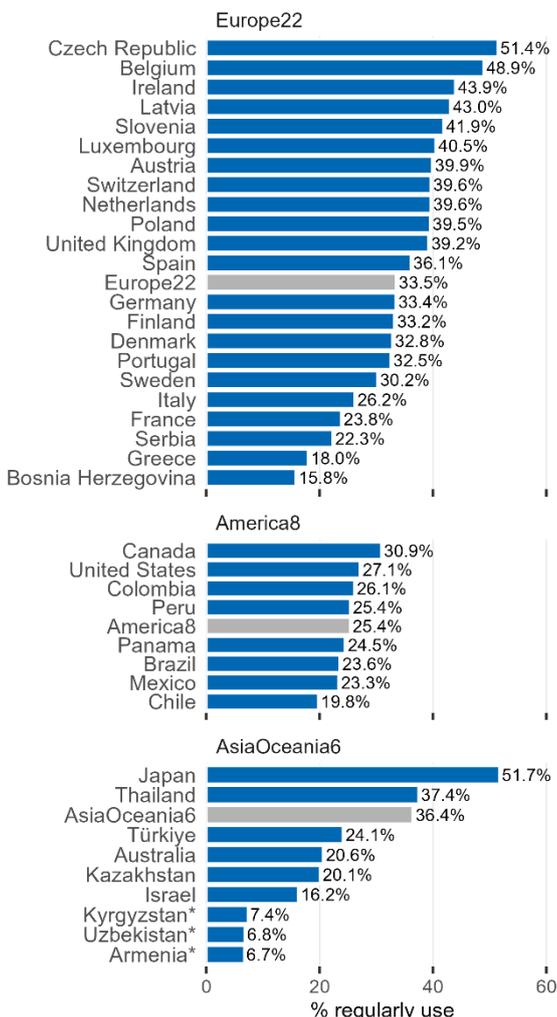
Figure 24 presents the results on the self-declared use of rural roads and roads connecting towns and villages with cycle lanes by cyclists by region and age group.

As can be seen in Figure 24, the percentage of cyclists using rural roads and roads connecting towns and villages with cycle lanes is higher for people aged 65 to 74 years old, except for America, where the highest rates are recorded for younger people.

In America and Asia-Oceania, the lowest rates are found among the age group 55-64 (27% and 41.2% respectively). On the contrary, European cyclists aged 18-24 use rural roads and roads connecting towns and villages with cycle lanes less than older people.

Figure 24: Use of rural roads and roads connecting towns and villages with cycle lanes per region and age group (% of cyclists that used this infrastructure regularly in the past year).

**USE OF INFRASTRUCTURE - CYCLISTS**  
**Rural roads and roads connecting towns and villages**  
**without cycle lanes**



Reference population: cyclists at least a few days a year, \*not in regional mean (different methodology)

Figure 25 shows that the results of cyclists using rural roads and roads connecting towns and villages without cycle lanes vary from 25.4% in America to 36.4% in Asia-Oceania. The rate for Europe is 33.5%.

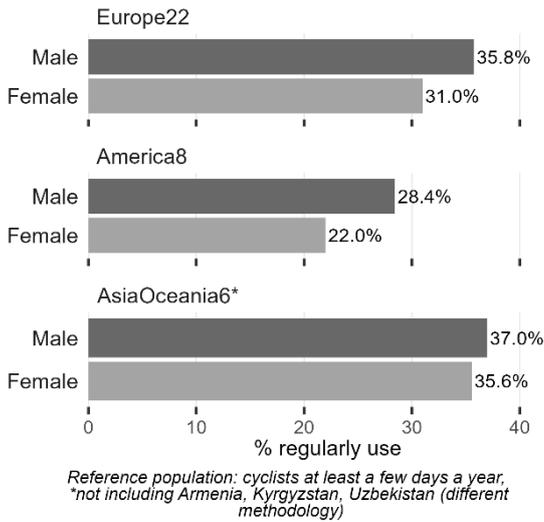
In Europe, the highest rates of using rural roads and roads connecting towns and villages without cycle lanes are recorded in the Czech Republic and Belgium (51.4% and 48.9% respectively). On the other hand, cyclists in Bosnia and Herzegovina (15.8%), Greece (18.0%), and Serbia (22.3%) report the lowest rates.

In America, the highest rates are recorded in Canada (30.9%), while the lowest rates are in Chile (19.8%).

In Asia-Oceania, significant differences are observed between the countries. The highest rates are found in Japan (51.7%), while the lowest rates are in Armenia (6.7%) and Uzbekistan (6.8%).

Figure 25: Use of rural roads and roads connecting towns and villages without cycle lanes per region and country (% of cyclists that used this infrastructure regularly in the past year).

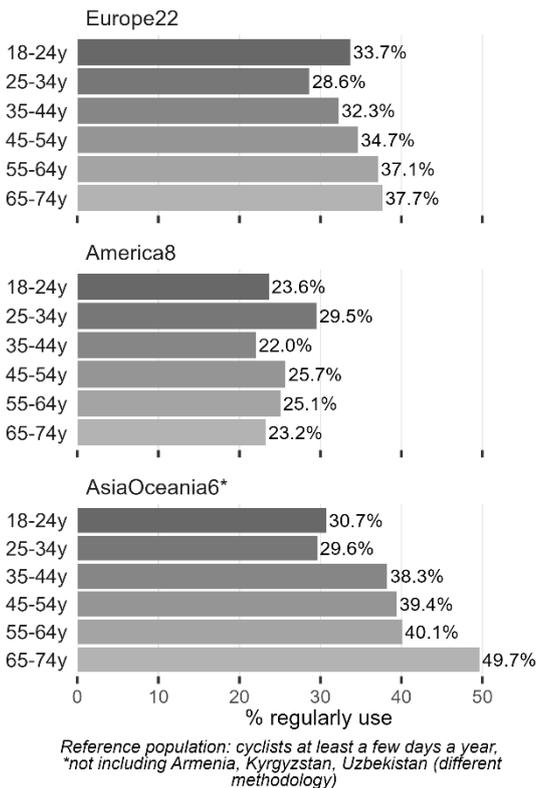
**USE OF INFRASTRUCTURE - CYCLISTS**  
**Rural roads and roads connecting towns and villages**  
**without cycle lanes**



In Figure 26, the results of self-declared use of rural roads and roads connecting towns and villages without cycle lanes by region and gender are presented. The percentages for females and males are quite similar in Asia-Oceania. In Europe and America, the percentages of male cyclists are higher than the respective rates of females.

Figure 26: Use of rural roads and roads connecting towns and villages without cycle lanes per region and gender (% of cyclists that used this infrastructure regularly in the past year).

**USE OF INFRASTRUCTURE - CYCLISTS**  
**Rural roads and roads connecting towns and villages**  
**without cycle lanes**



The results are further split out by region and age group in Figure 27. As can be seen in this Figure, the use of rural roads and roads connecting towns and villages without cycle lanes is higher for people aged 65 to 74 years old in Europe and Asia-Oceania.

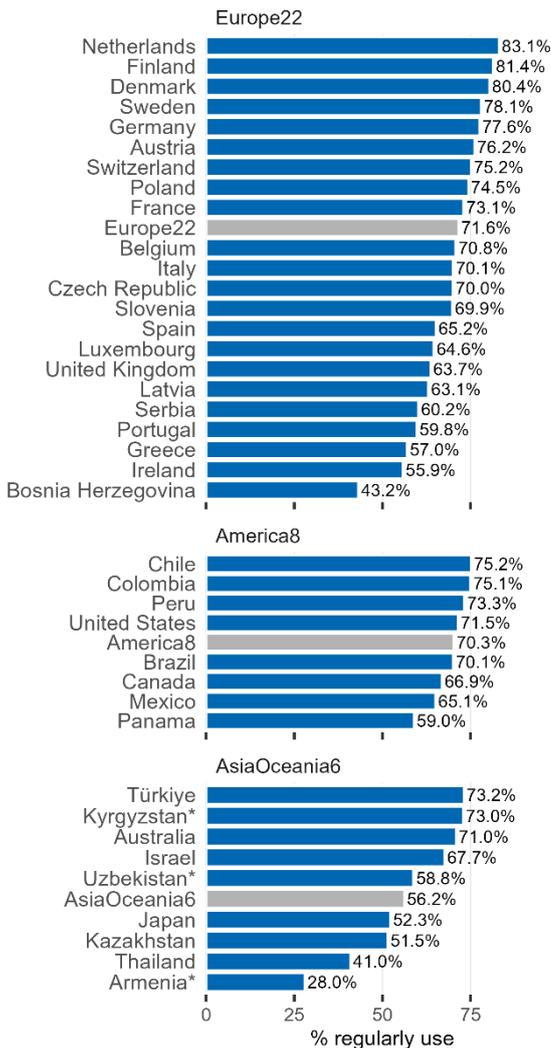
In Europe, cyclists aged 25 to 34 years old record the lowest percentage of using these types of roads (28.6%).

In America, the distribution towards age groups is quite different, with the highest share of use of this type of roads recorded for cyclists aged 25 to 34 years old (29.5%) and the lowest for the age group 35-44 (22%).

Figure 27: Use of rural roads and roads connecting towns and villages without cycle lanes per region and age group (% of cyclists that used this infrastructure regularly in the past year).

**USE OF INFRASTRUCTURE - CYCLISTS**

**Streets and roads in urban areas with cycle lanes**



Reference population: cyclists at least a few days a year, \*not in regional mean (different methodology)

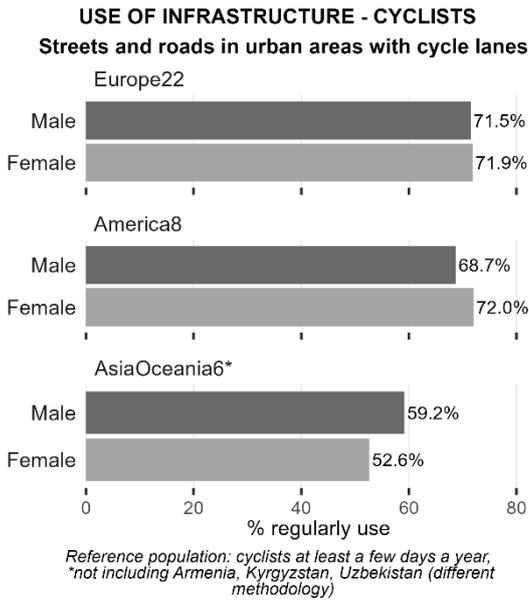
Figure 28 demonstrates that the results of cyclists using streets and roads in urban areas with cycle lanes vary from 56.2% in Asia-Oceania to 71.6% in Europe. The rate for America is 70.3%.

In Europe, the highest rates are recorded in the Netherlands (83.1%) and Finland (81.4%), while the lowest rates are recorded in Bosnia and Herzegovina (43.2%).

Among the countries of America, over half of cyclists use streets and roads in urban areas with cycle lanes.

In Asia-Oceania, the highest rates are found in Türkiye (73.2%) and Kyrgyzstan (73.0%), while the lowest rates are recorded in Armenia (28.0%).

Figure 28: Use of streets and roads in urban areas with cycle lanes per region and country (% of cyclists that used this infrastructure regularly in the past year).



In Figure 29, the results of self-declared use of streets and roads in urban areas with cycle lanes by region and gender are presented. The percentages of male cyclists using such types of roads are slightly lower than the respective rates of female riders in Europe and America, while the opposite is the case for Asia-Oceania.

Figure 29: Use of streets and roads in urban areas with cycle lanes per region and gender (% of cyclists that used this infrastructure regularly in the past year).

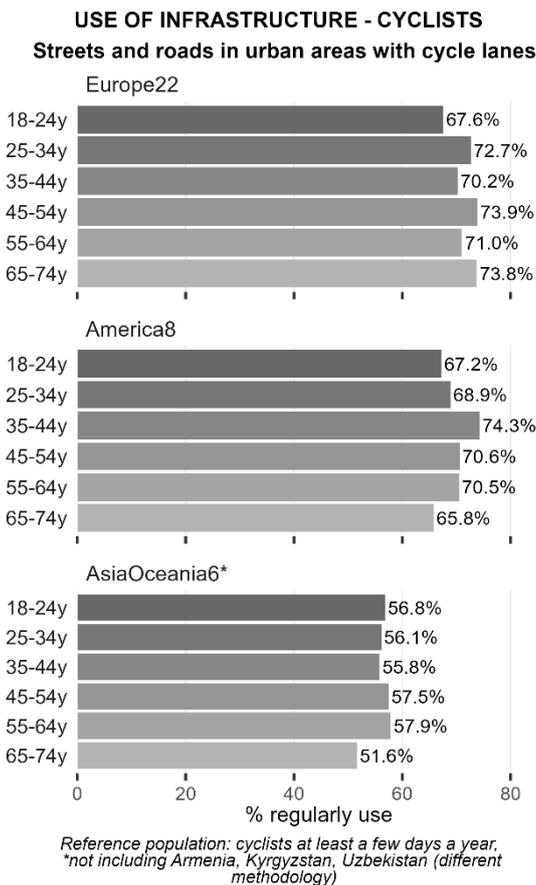


Figure 30 presents the results on the self-declared use of streets and roads in urban areas with cycle lanes by cyclists' age group and region.

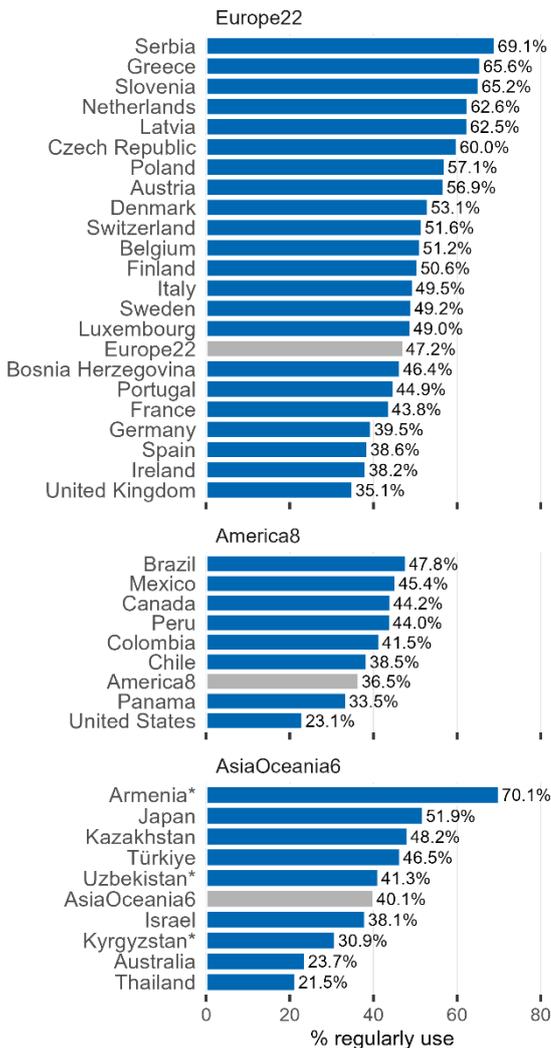
In Europe, people aged 45 to 54 years old (73.9%) use more frequently this type of infrastructure than younger cyclists.

In America, the highest use rates correspond to cyclists aged 35 to 44 years old (74.3%).

Regarding Asia-Oceania, the distribution is similar across all age groups, with the highest percentage of using this type of roads recorded for cyclists aged 55 to 64 years old (57.9%).

Figure 30: Use of streets and roads in urban areas per region and age group (% of cyclists that used this infrastructure regularly in the past year).

**USE OF INFRASTRUCTURE - CYCLISTS**  
**Streets and roads in urban areas without cycle lanes**



Reference population: cyclists at least a few days a year, \*not in regional mean (different methodology)

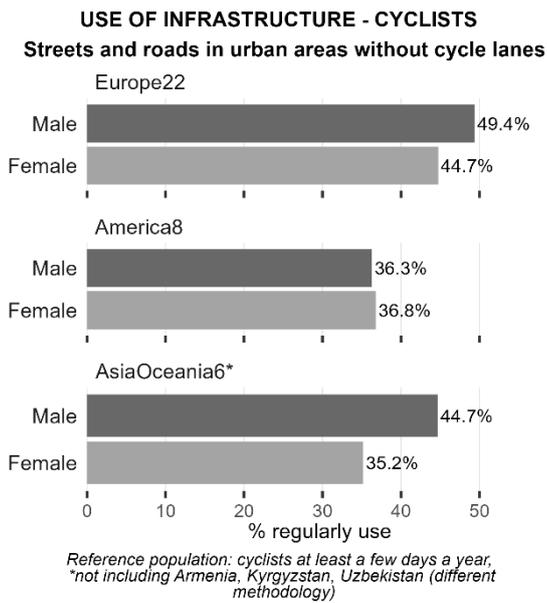
Figure 31 demonstrates that the results of cyclists using streets and roads in urban areas without cycle lanes vary from 36.5% in America to 47.2% in Europe. The rate for Asia-Oceania is 40.1%.

In Europe, the highest rates are recorded in Serbia (69.1%), while the lowest rates are recorded in the United Kingdom (35.1%).

Among the countries of America, below half of cyclists use streets and roads in urban areas without cycle lanes. The highest rates are observed in Brazil (47.8%), while the lowest rates are in the United States (32.1%).

In Asia-Oceania, the highest rates are found in Armenia (70.1%), while the lowest rates are recorded in Thailand (21.5%).

Figure 31: Use of streets and roads in urban areas without cycle lanes per region and country (% of cyclists that used this infrastructure regularly in the past year).



In Figure 32, the results of self-declared use of streets and roads in urban areas without cycle lanes by region and gender are presented. The percentages of male cyclists using such types of roads are higher than the respective rates of female riders in Europe and Asia-Oceania, while the opposite is the case for America where the female rates are slightly higher than the male rates.

Figure 32: Use of streets and roads in urban areas without cycle lanes per region and gender (% of cyclists that used this infrastructure regularly in the past year).

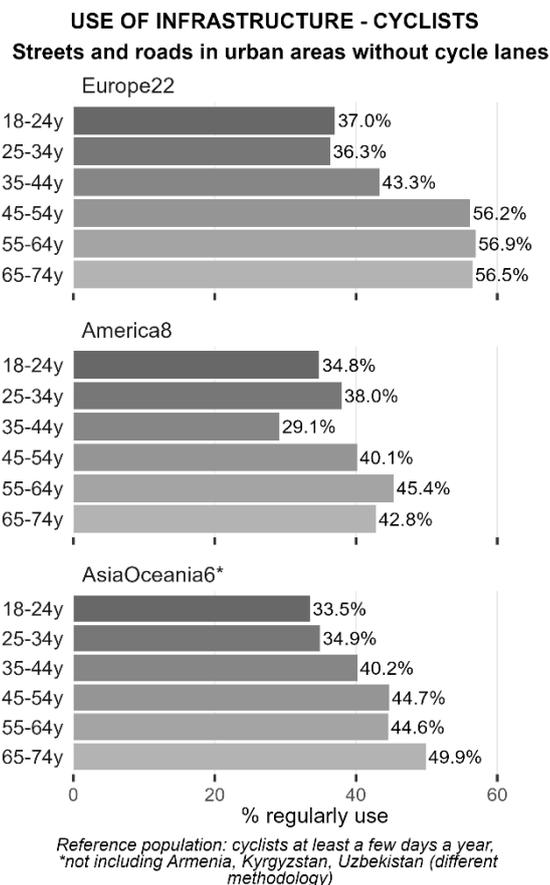


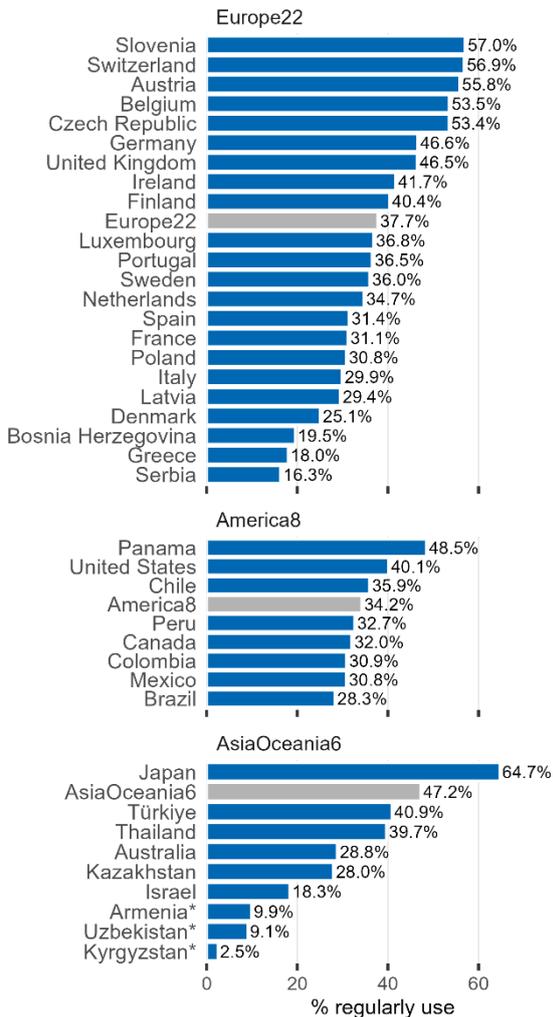
Figure 33 presents the results on self-declared use of streets and roads in urban areas without cycle lanes by cyclists' age group and region.

In Europe and America, people aged 55-64 years old use this type of infrastructure more frequently than younger cyclists (56.9% and 45.4% respectively).

Regarding Asia-Oceania, the highest percentage of using this type of roads is recorded for cyclists aged 65 to 74 years old (49.9%).

Figure 33: Use of streets and roads in urban areas without cycle lanes per region and age group (% of cyclists that used this infrastructure regularly in the past year).

**USE OF INFRASTRUCTURE - PEDESTRIANS**  
**Rural roads and roads connecting towns and villages**  
**with sidewalks**



Reference population: pedestrians at least a few days a year, \*not in regional mean (different methodology)

Figure 34 demonstrates that the results of pedestrians using rural roads and roads connecting towns and villages with sidewalks regularly, vary from 34.2% in America to 47.2% in Asia-Oceania. The rate for Europe is 37.7%.

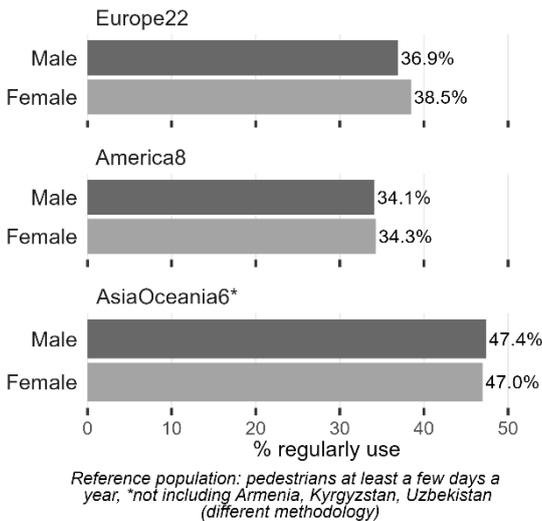
In Europe, the highest rates of using rural roads and roads connecting towns and villages with sidewalks are recorded in Slovenia and Switzerland (57.0% and 56.9% respectively). On the other hand, pedestrians in Serbia (16.3%), Greece (18.0%) and Bosnia and Herzegovina (19.5%) report the lowest rates.

Among the eight participating countries of America, the highest rates are found in Panama (48.5%), while the lowest rates are recorded in Brazil (28.3%).

Regarding the rates of Asia-Oceanian pedestrians, the highest rates are found in Japan (64.7%), while the lowest rates are recorded in Kyrgyzstan (2.5%).

Figure 34: Use of rural roads and roads connecting towns and villages with sidewalks per region and country (% of pedestrians that used this infrastructure regularly in the past year).

**USE OF INFRASTRUCTURE - PEDESTRIANS**  
**Rural roads and roads connecting towns and villages**  
**with sidewalks**



The results are further split out by region and gender in Figure 35. As can be seen in this figure, the usage of rural roads and roads connecting towns and villages with sidewalks by pedestrians in all examined regions is similar for females and males, with a slightly higher share for females except for Asia-Oceania.

Figure 35: Use of rural roads and roads connecting towns and villages with sidewalks per region and gender (% of pedestrians that used this infrastructure regularly in the past year).

**USE OF INFRASTRUCTURE - PEDESTRIANS**  
**Rural roads and roads connecting towns and villages**  
**with sidewalks**

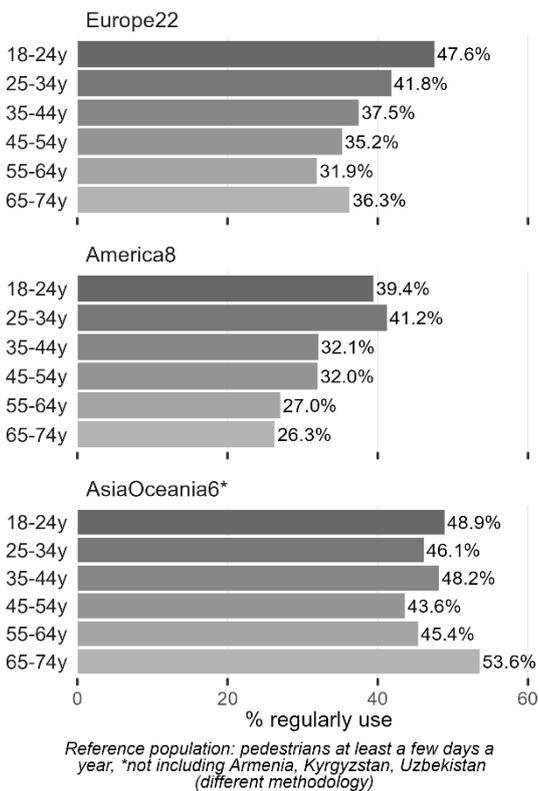


Figure 36 presents the results on self-declared use of rural roads and roads connecting towns and villages with sidewalks by pedestrians by region and age group.

As can be seen in Figure 36, the percentage of pedestrians using rural roads and roads connecting towns and villages with sidewalks is higher in Europe and America for younger people, while in Asia-Oceania the highest rate is recorded for pedestrians aged 65 to 74 years old. In Europe, the lowest rates are found among the age group 55-64 (31.9%), while in America for pedestrians aged 65 to 74 years old (26.3%).

Figure 36: Use of rural roads and roads connecting towns and villages with sidewalks per region and age group (% of pedestrians that used this infrastructure regularly in the past year).

**USE OF INFRASTRUCTURE - PEDESTRIANS**  
**Rural roads and roads connecting towns and villages**  
**without sidewalks**

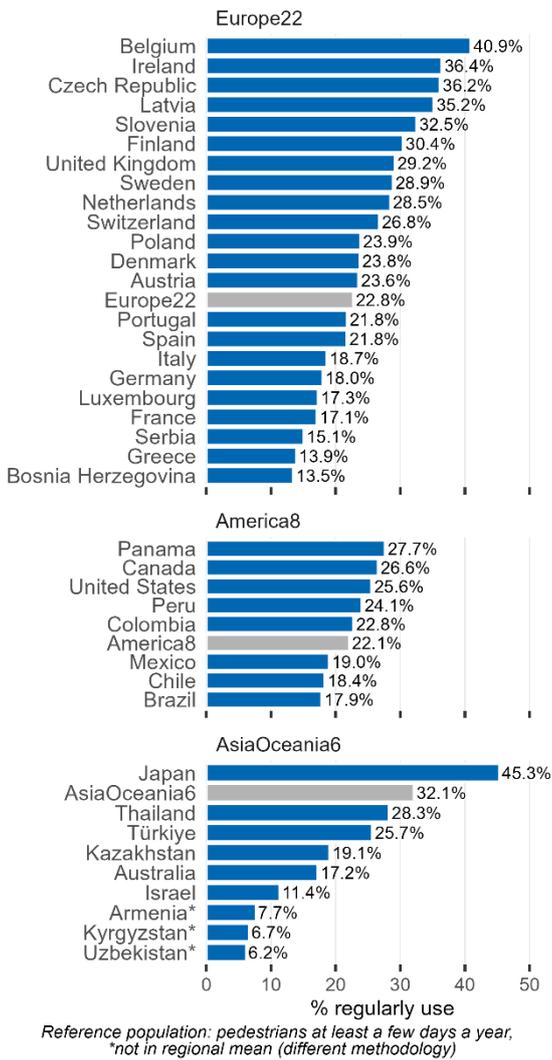


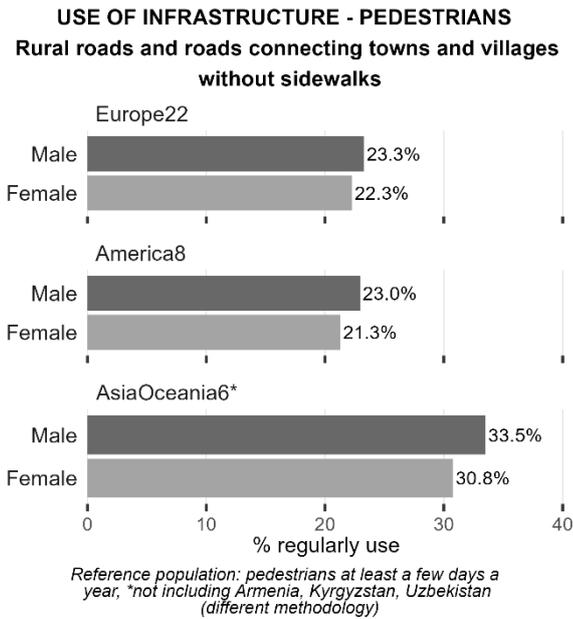
Figure 37 shows that the results of pedestrians using rural roads and roads connecting towns and villages without sidewalks vary from 22.1% in America to 32.1% in Asia-Oceania. The rate for Europe is 22.8%.

In Europe, the highest rates of using rural roads and roads connecting towns and villages without sidewalks are recorded in Belgium (40.9%). On the other hand, pedestrians in Bosnia and Herzegovina (13.5%), Greece (13.9%), and Serbia (15.1%) report the lowest rates.

In America, the distribution is similar among countries, with the highest rates recorded in Panama (27.7%) and the lowest in Brazil (17.9%).

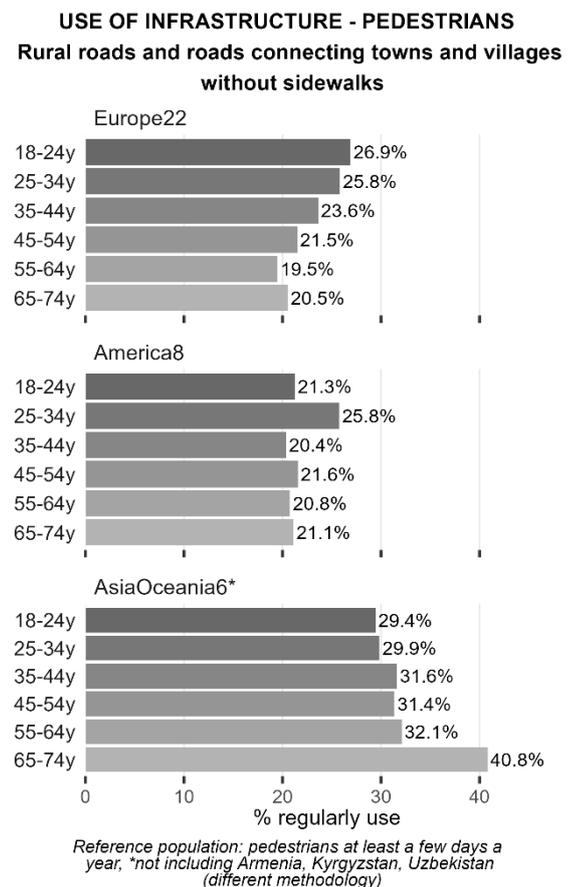
In Asia-Oceania, significant differences are observed between the countries. The highest rates are found in Japan (45.3%), while the lowest rates are in Uzbekistan (6.2%).

Figure 37: Use of rural roads and roads connecting towns and villages without sidewalks per region and country (% of pedestrians that used this infrastructure regularly in the past year).



In Figure 38, the results of self-declared use of rural roads and roads connecting towns and villages without sidewalks by region and gender are presented. The percentages for females and males are similar in all examined regions, with a slightly higher share of males.

Figure 38: Use of rural roads and roads connecting towns and villages without sidewalks per region and gender (% of pedestrians that used this infrastructure regularly in the past year).



The results are further split out by region and age group in Figure 39. As can be seen in this Figure, the distribution of the use of rural roads and roads connecting towns and villages without sidewalks among age groups is different for all examined regions.

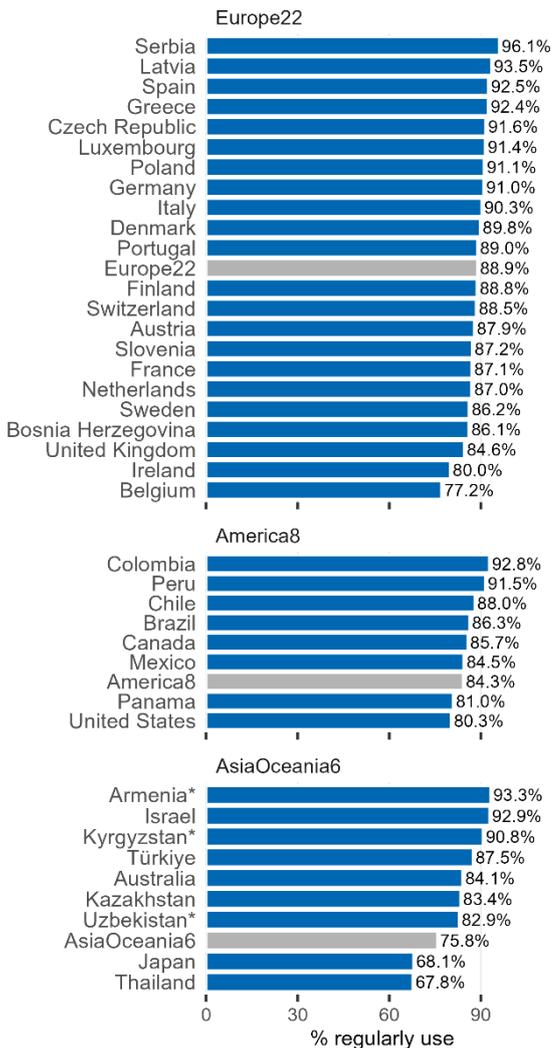
In Europe, pedestrians aged 18 to 24 years old record the highest percentage of using these types of roads, while the lowest use is for the age group 55-64.

In America, the distribution towards age groups is different than in Europe, with the highest share of use of this type of roads recorded for pedestrians aged 25 to 34 years old and the lowest for the age group 35-44.

Asia-Oceania records higher use of this type of infrastructure for people aged 65 to 74 years old and the lowest use for the age group 18-24.

Figure 39: Use of rural roads and roads connecting towns and villages without sidewalks per region and age group (% of pedestrians that used this infrastructure regularly in the past year).

**USE OF INFRASTRUCTURE - PEDESTRIANS**  
**Streets and roads in urban areas with sidewalks**



Reference population: pedestrians at least a few days a year,  
 \*not in regional mean (different methodology)

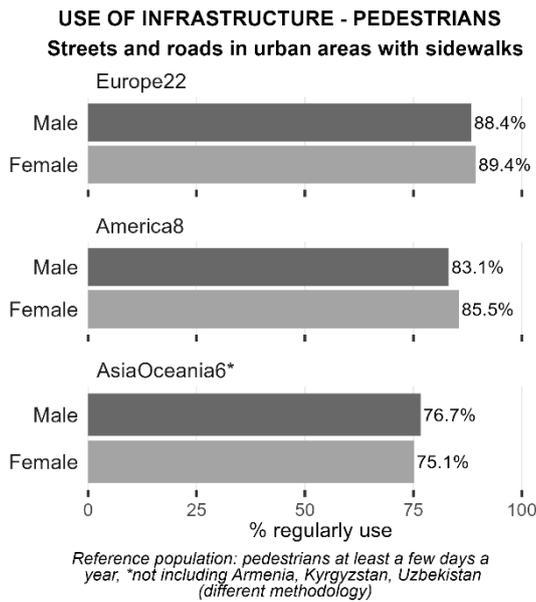
Figure 40 demonstrates that the results of pedestrians using streets and roads in urban areas with sidewalks vary from 75.8% in Asia-Oceania to 88.9% in Europe. The rate for America is 84.3%.

In Europe, the highest rates are recorded in Serbia (96.1%), while the lowest rates are recorded in Belgium (77.2%).

Among the countries of America, the highest rate is recorded in Colombia (92.8%) and the lowest in the United States (80.3%).

In Asia-Oceania, the highest rates are found in Armenia (93.3%) and Israel (92.9%), while the lowest rates are recorded in Thailand (67.8%) and Japan (68.1%).

Figure 40: Use of streets and roads in urban areas with sidewalks per region and country (% of pedestrians that used this infrastructure regularly in the past year).



In Figure 41, the results of self-declared use of streets and roads in urban areas with sidewalks by region and gender are presented. The percentages of male pedestrians using such types of roads are slightly lower than the respective rates of female riders in Europe and America, while the opposite is the case for Asia-Oceania.

Figure 41: Use of streets and roads in urban areas with sidewalks per region and gender (% of pedestrians that used this infrastructure regularly in the past year).

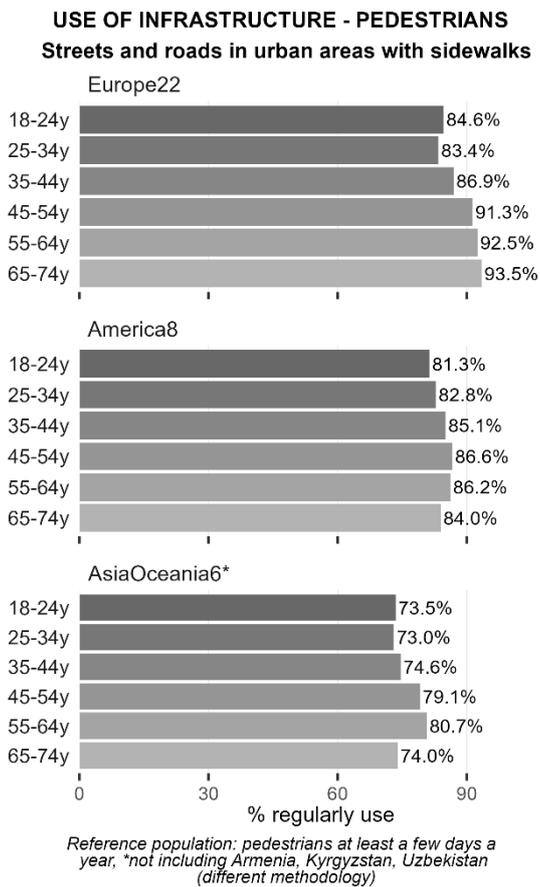


Figure 42 presents the results on self-declared use of streets and roads in urban areas by pedestrians' age group and region.

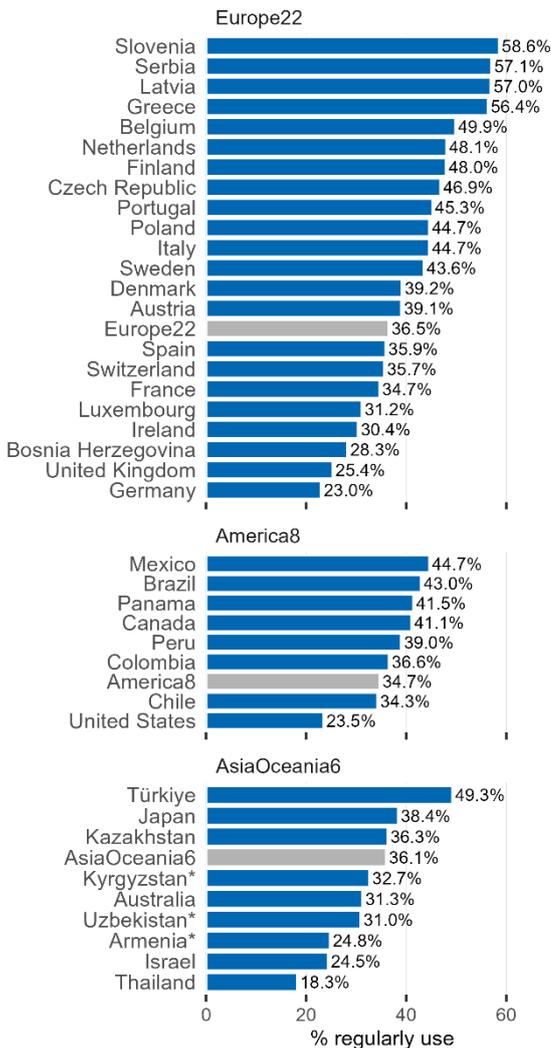
In Europe, people aged 65 to 74 years old (93.5%) use more frequently this type of infrastructure than younger pedestrians.

In America, the highest rates correspond to pedestrians aged 45 to 54 years old (86.6%).

Regarding Asia-Oceania, the highest percentage of using this type of roads is recorded for pedestrians aged 55 to 64 years old (80.7%).

Figure 42: Use of streets and roads in urban areas with sidewalks per region and age group (% of pedestrians that used this infrastructure regularly in the past year).

**USE OF INFRASTRUCTURE - PEDESTRIANS**  
**Streets and roads in urban areas without sidewalks**



Reference population: pedestrians at least a few days a year,  
 \*not in regional mean (different methodology)

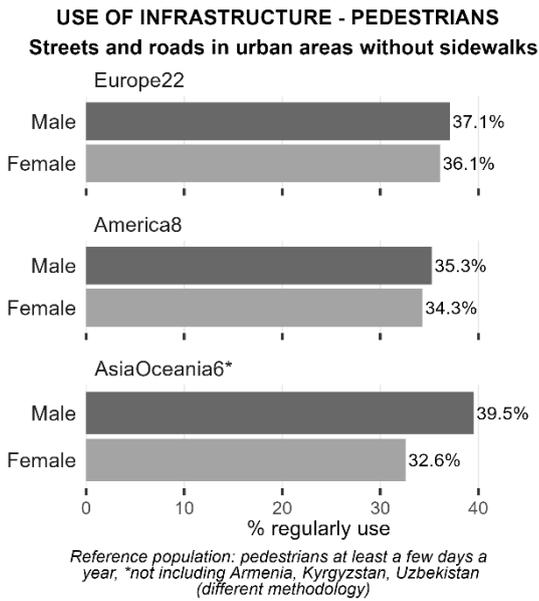
Figure 43 demonstrates that the results of pedestrians using streets and roads in urban areas without sidewalks vary from 34.7% in America to 36.5% in Europe. The rate for Asia-Oceania is 36.1%.

In Europe, the highest rates are recorded in Slovenia (58.6%), while the lowest rates are recorded in Germany (23.0%).

Among the countries of America, below half of pedestrians use streets and roads in urban areas without sidewalks.

In Asia-Oceania, the highest rates are found in Türkiye (49.3%), while the lowest rates are recorded in Thailand (18.3%).

Figure 43: Use of streets and roads in urban areas without sidewalks per region and country (% of pedestrians that used this infrastructure regularly in the past year).



In Figure 44, the results of self-declared use of streets and roads in urban areas without sidewalks by region and gender are presented. The percentages of male pedestrians using such types of roads are slightly higher than the respective rates of female riders in all examined regions.

Figure 44: Use of streets and roads in urban areas without sidewalks per region and gender (% of pedestrians that used this infrastructure regularly in the past year).

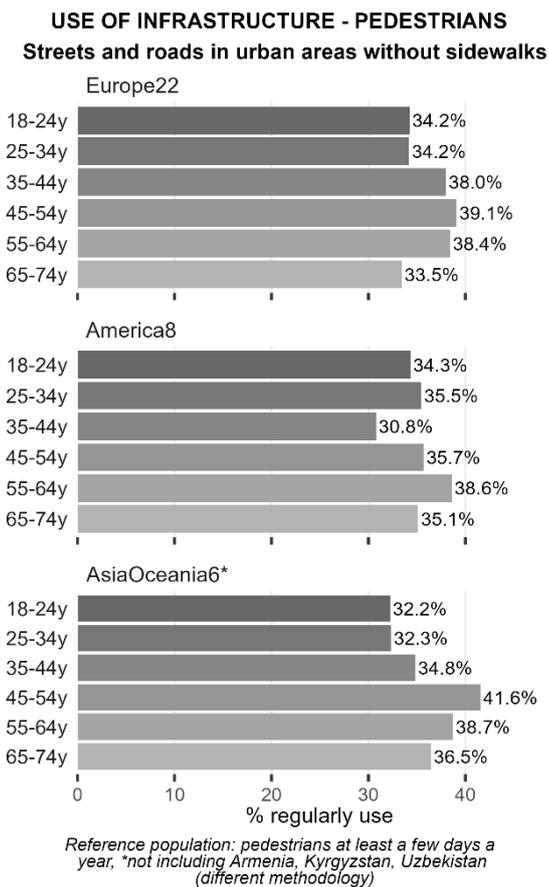


Figure 45 presents the results on self-declared use of streets and roads in urban areas without sidewalks by pedestrians' age group and region.

In Europe, people aged 45 to 54 years old (39.1%) use more frequently this type of infrastructure than the other age groups.

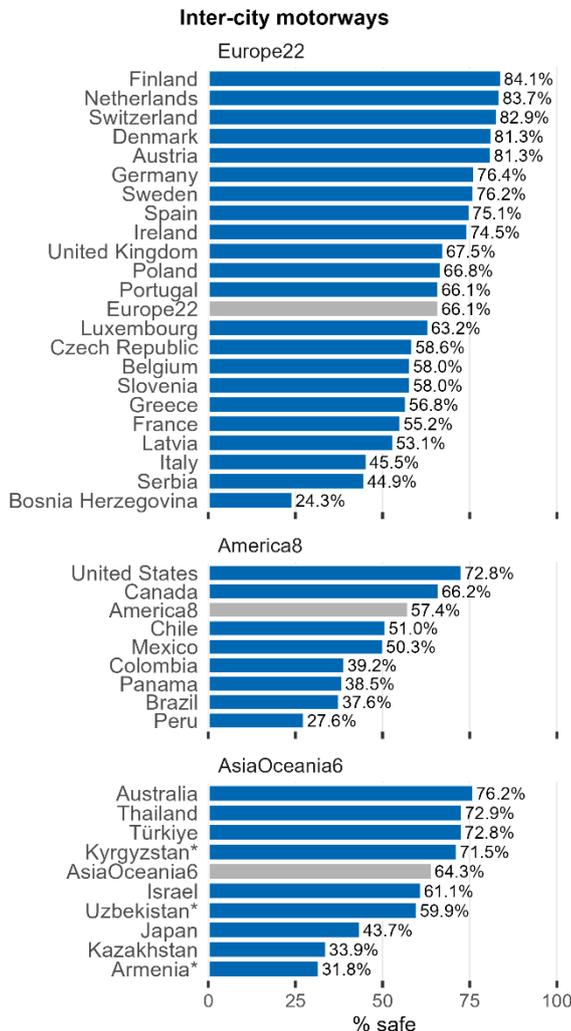
In America, the highest rates are recorded for pedestrians aged 55 to 64 years old (38.6%).

Regarding Asia-Oceania, the highest percentage of using this type of roads is recorded for pedestrians aged 45 to 54 years old (41.6%).

Figure 45: Use of streets and roads in urban areas per region and age group (% of pedestrians that used this infrastructure regularly in the past year).

3.1.2 Perceived Safety of Infrastructure

**PERCEIVED SAFETY OF INFRASTRUCTURE - CAR DRIVERS**



Reference population: car drivers at least a few days a year who regularly use this specific infrastructure. \*not in regional mean (different methodology)

Figure 46 demonstrates that the results of car drivers' safety perception using inter-city motorways, vary from 57.4% in America to 66.1% in Europe. The rate for Asia-Oceania is 64.3%.

In Europe, the highest rates of safety perception using inter-city motorways are recorded in Finland and the Netherlands (84.1% and 83.7% respectively). On the other hand, car drivers in Bosnia and Herzegovina (24.3%) report the lowest rates.

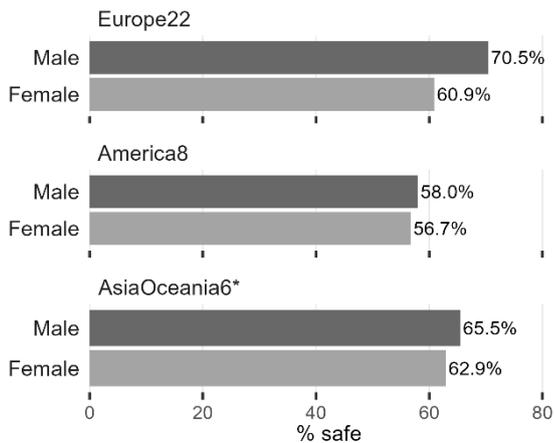
Among the eight participating countries of America, the highest rates are found in the United States (72.8%), while the lowest rates are recorded in Peru (27.6%).

Regarding the rates of Asia-Oceanian car drivers, the highest rates are found in Australia (76.2%), while the lowest rates are recorded in Armenia (31.8%).

Figure 46: Perceived safety of inter-city motorways per region and country (% of car drivers considering them safe).

**PERCEIVED SAFETY OF INFRASTRUCTURE - CAR DRIVERS**

**Inter-city motorways**



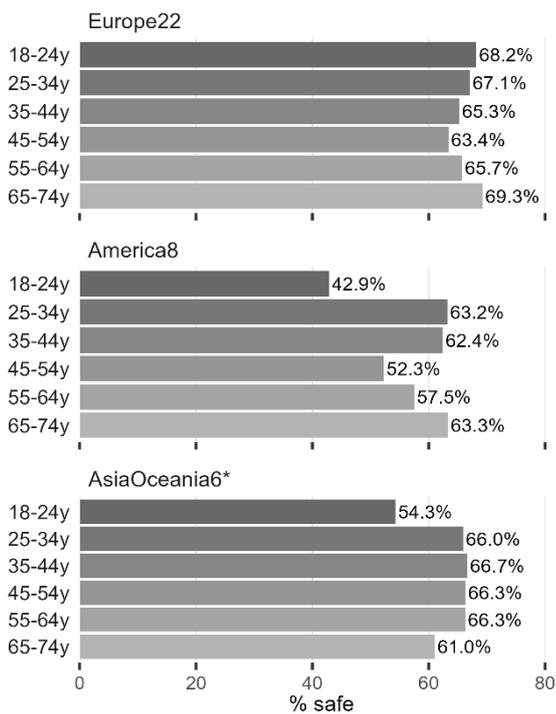
Reference population: car drivers at least a few days a year who regularly use this specific infrastructure, \*not including Armenia, Kyrgyzstan, Uzbekistan (different methodology)

The results are further split out by region and gender in Figure 47. As can be seen in this figure, the perceived safety of inter-city motorways by car drivers in all examined regions is higher for males than females.

Figure 47: Perceived safety of inter-city motorways per region and gender (% of car drivers considering them safe).

**PERCEIVED SAFETY OF INFRASTRUCTURE - CAR DRIVERS**

**Inter-city motorways**



Reference population: car drivers at least a few days a year who regularly use this specific infrastructure, \*not including Armenia, Kyrgyzstan, Uzbekistan (different methodology)

Figure 48 presents the results on safety perception of inter-city motorways by car drivers by region and age group.

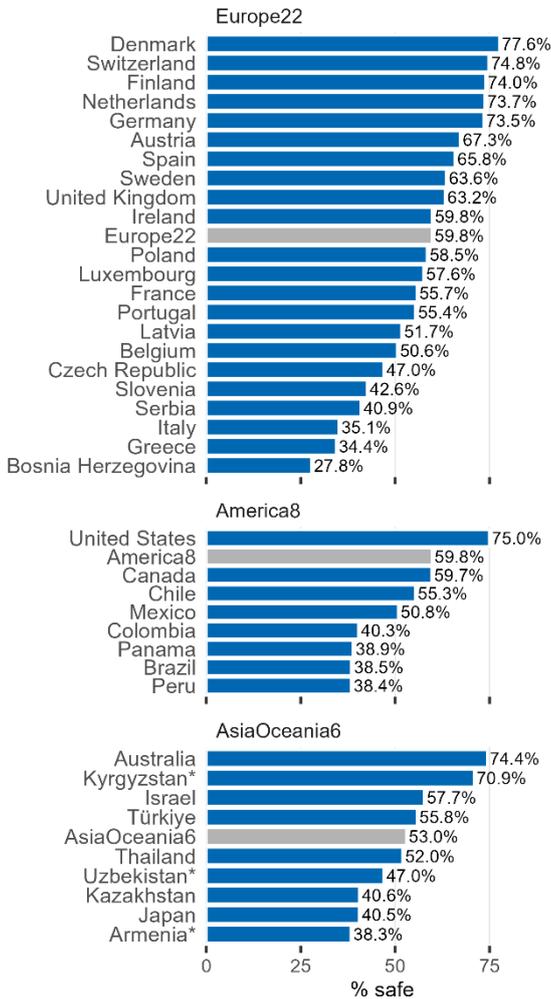
As can be seen in Figure 48, the percentage of car drivers' perceived safety of inter-city motorways is higher in Europe and America for people aged 65 to 74 years old, while the highest rate in Asia-Oceania is for car drivers aged 35-44.

In America and Asia-Oceania, the lowest rates are found among the age group 18-24 (42.9% and 54.3% respectively). On the contrary, in Europe, car drivers aged 45-54 consider inter-city motorways less safe when compared to other age groups.

Figure 48: Perceived safety of inter-city motorways per region and age group (% of car drivers considering them safe).

**PERCEIVED SAFETY OF INFRASTRUCTURE - CAR DRIVERS**

**Thoroughfares and high-speed roads within cities**



Reference population: car drivers at least a few days a year who regularly use this specific infrastructure, \*not in regional mean (different methodology)

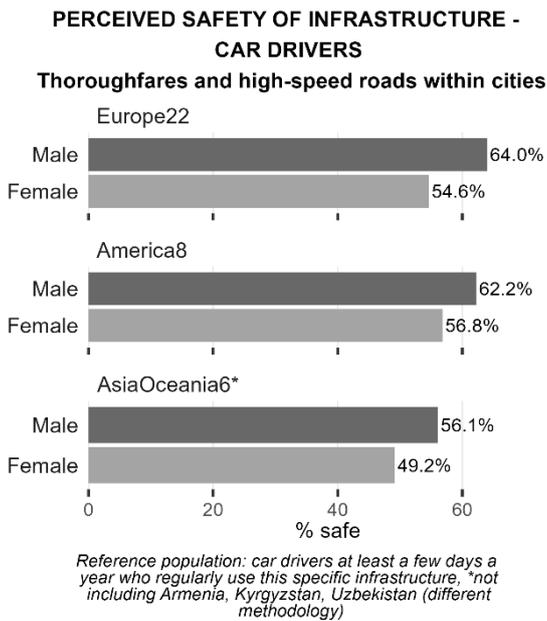
Figure 49 shows that the results of car drivers' safety perception of thoroughfares and high-speed roads within cities vary from 53.0% in Asia-Oceania to 59.8% in Europe and America.

In Europe, the highest rates of perceived safety of thoroughfares and high-speed roads within cities are recorded in Denmark (77.6%). On the other hand, car drivers in Bosnia and Herzegovina (27.8%) report the lowest rates.

In America, the highest rates of car drivers considering safe thoroughfares and high-speed roads within cities are recorded in the United States (75%), while the lowest are recorded in Peru (38.4%).

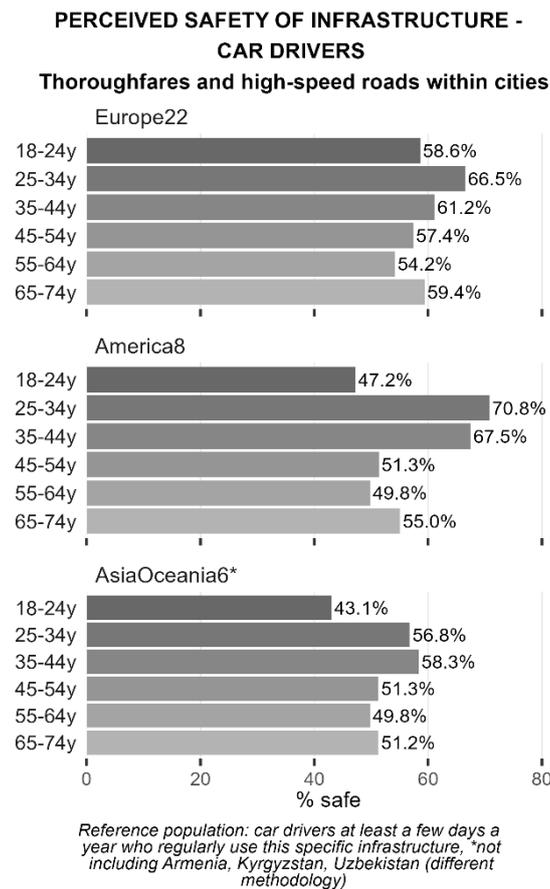
In Asia-Oceania, as in the other regions, significant differences are observed between the countries. The highest rates are found in Australia (74.4%), while the lowest rates in Armenia (38.3%).

Figure 49: Perceived safety of thoroughfares and high-speed roads within cities per region and country (% of car drivers considering them safe).



In Figure 50, the results of self-declared safety perception of thoroughfares and high-speed roads within cities by region and gender are presented. In all examined regions, male car drivers present higher rates than females.

Figure 50: Perceived safety of thoroughfares and high-speed roads within cities per region and gender (% of car drivers considering them safe).



The results are further split out by region and age group in Figure 51. As can be seen in this Figure, the safety perception rates of thoroughfares and high-speed roads within cities are higher for people aged 25 to 34 years old in Europe and America (66.5% and 70.8% respectively).

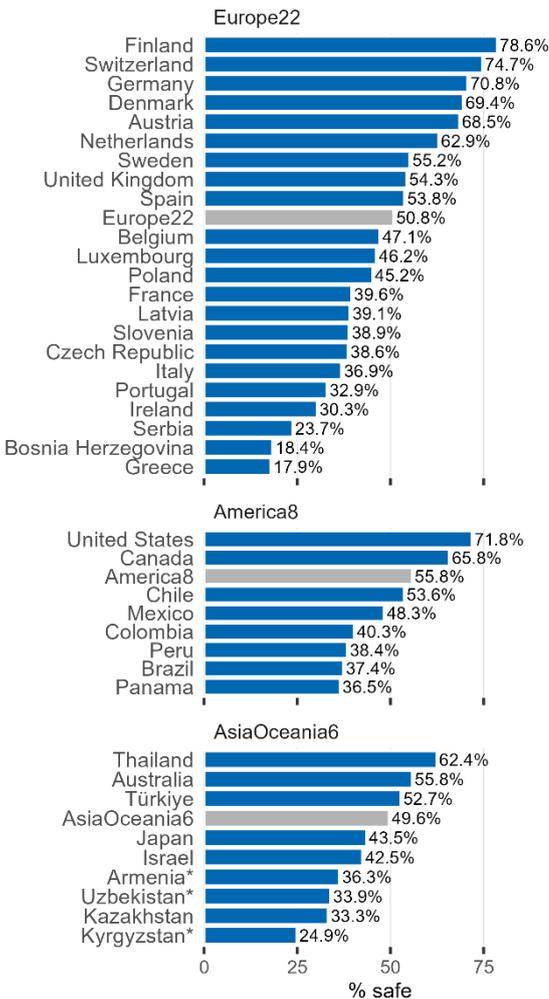
In Europe, car drivers aged 55 to 64 years old record the lowest safety rates (54.2%).

In America, the lowest rate of perceived safety of the use of this type of infrastructure is for the age group 18-24 (47.2%).

Asia-Oceania records the highest perceived safety of the use of this type of infrastructure for people aged 35 to 44 years old (58.3%) and the lowest rate for the youngest age group (43.1%).

Figure 51: Perceived safety of thoroughfares and high-speed roads within cities per region and age group (% of car drivers considering them safe).

**PERCEIVED SAFETY OF INFRASTRUCTURE -  
CAR DRIVERS**  
**Rural roads and roads connecting towns and villages**



Reference population: car drivers at least a few days a year who regularly use this specific infrastructure, \*not in regional mean (different methodology)

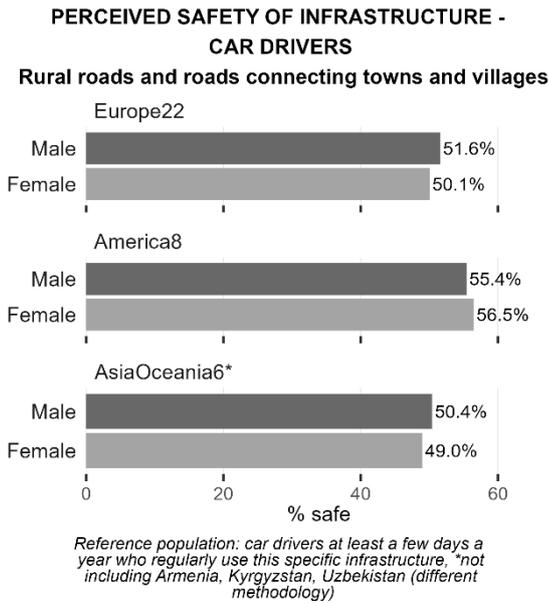
Figure 52 demonstrates that the results of car drivers' perceived safety of using rural roads and roads connecting towns and villages vary from 49.6% in Asia-Oceania to 55.8% in America. The rate for Europe is 50.8%.

In Europe, the highest rates are recorded in Finland (78.6%) and Switzerland (74.7%), while the lowest are recorded in Greece (17.9%) and Bosnia and Herzegovina (18.4%).

Among the countries of America, the highest rates for the perceived safety of the use of rural roads and roads connecting towns and villages are recorded in the United States (71.8%), while in Panama the lowest rates are recorded (36.5%).

In Asia-Oceania, the highest rates are found in Thailand (62.4%) and Australia (55.8%), while the lowest rates are recorded in Kyrgyzstan (24.9%).

Figure 52: Perceived safety of rural roads and roads connecting towns and villages per region and country (% of car drivers considering them safe).



In Figure 53, the results of the perceived safety of the use of rural roads and roads connecting towns and villages by region and gender are presented. The percentages of male car drivers rating as safe such types of roads are slightly higher than the respective rates of female riders in Europe and Asia-Oceania, while the opposite is the case for America.

Figure 53: Perceived safety of rural roads and roads connecting towns and villages per region and gender (% of car drivers considering them safe).

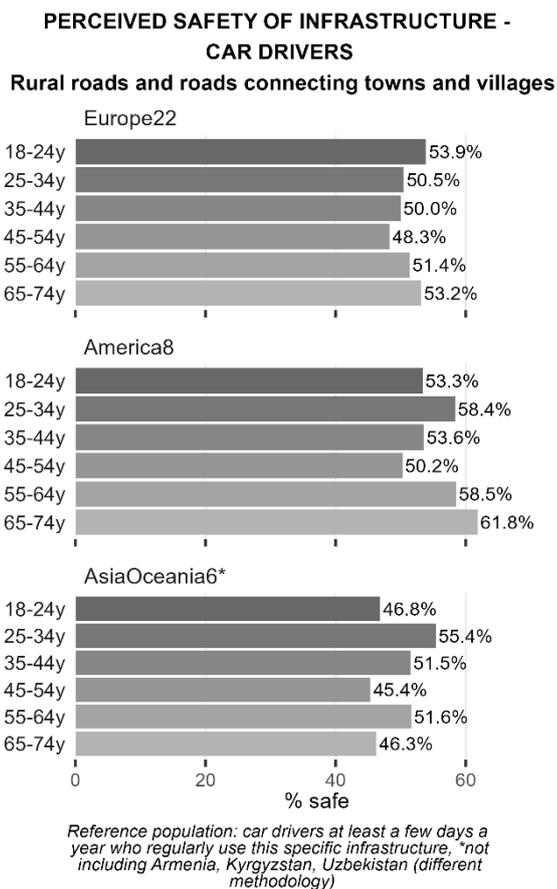


Figure 54 presents the results of self-declared safety perception of the use of rural roads and roads connecting towns and villages by car drivers' age group and region.

In Europe, people aged 18 to 24 years old (53.9%) consider safer this type of infrastructure than older car drivers.

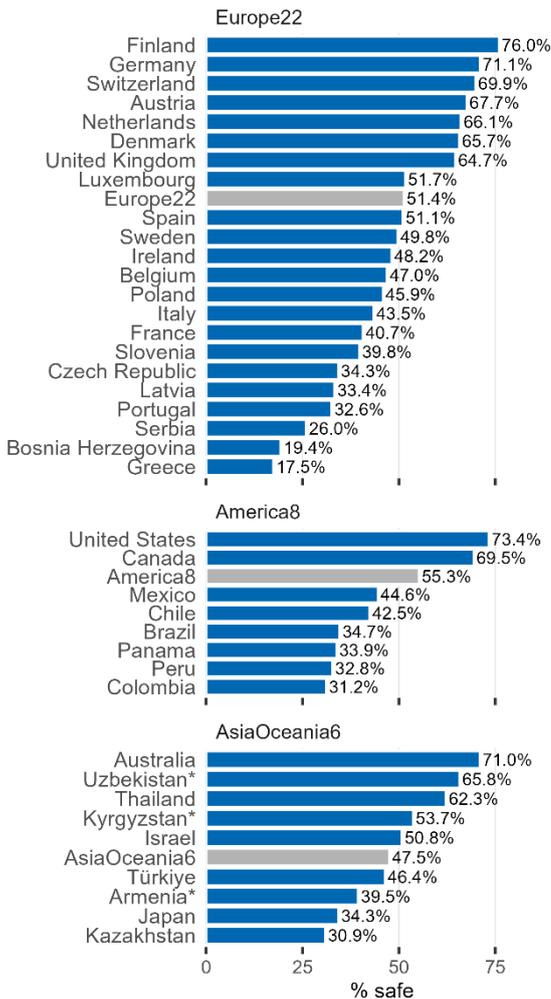
Contrary to Europe, in America car drivers aged 65 to 74 years old consider the use of rural roads and roads connecting towns and villages safer than the remaining age groups (61.8%).

Regarding Asia-Oceania, the highest percentage of safety perception for this type of roads corresponds to car drivers aged 25 to 34 years old (55.4%).

Figure 54: Perceived safety of rural roads and roads connecting towns and villages per region and age group (% of car drivers considering them safe).

**PERCEIVED SAFETY OF INFRASTRUCTURE - CAR DRIVERS**

**Other streets and roads in urban areas**



Reference population: car drivers at least a few days a year who regularly use this specific infrastructure, \*not in regional mean (different methodology)

Figure 55 demonstrates that the results of car drivers' perceived safety for using other streets and roads in urban areas vary from 47.5% in Asia-Oceania to 55.3% in America. The rate for Europe is 51.4%.

In Europe, the highest rates are recorded in Finland (76%) and Germany (71.1%), while the lowest are recorded in Greece (17.5%) and Bosnia and Herzegovina (19.4%).

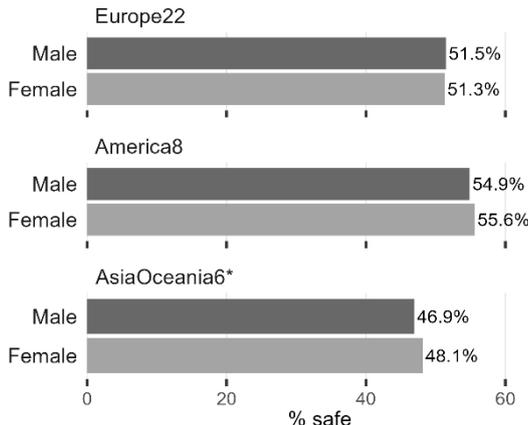
Among the countries of America, below half of car drivers consider it safe to use other streets and roads in urban areas except for the United States (73.4%) and Canada (69.5%).

In Asia-Oceania, the highest rates are found in Australia (71.0%), while the lowest rates are recorded in Kazakhstan (30.9%).

Figure 55: Perceived safety of other streets and roads in urban areas per region and country (% of car drivers considering them safe).

**PERCEIVED SAFETY OF INFRASTRUCTURE - CAR DRIVERS**

**Other streets and roads in urban areas**



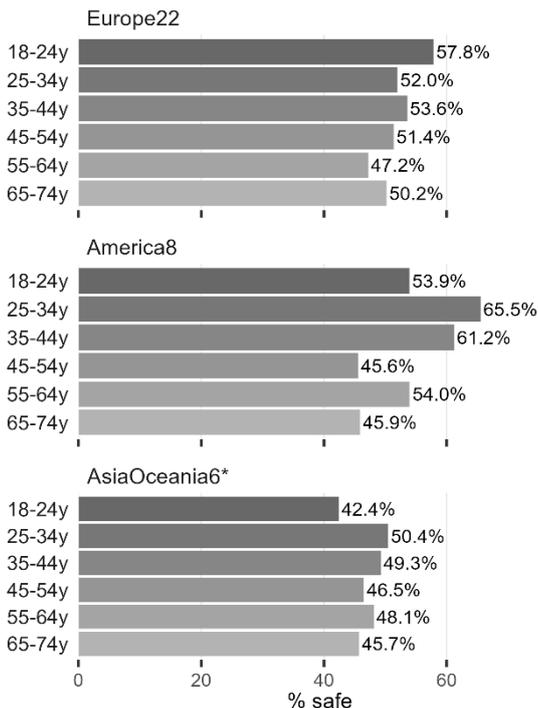
Reference population: car drivers at least a few days a year who regularly use this specific infrastructure. \*not including Armenia, Kyrgyzstan, Uzbekistan (different methodology)

In Figure 56, the results of the perceived safety of the use of other streets and roads in urban areas by region and gender are presented. The percentages of female car drivers considering it safe to use such types of roads are slightly higher than the respective rates of male riders in America and Asia-Oceania, while in Europe the rates are almost equal.

Figure 56: Perceived safety of other streets and roads in urban areas per region and gender (% of car drivers considering them safe).

**PERCEIVED SAFETY OF INFRASTRUCTURE - CAR DRIVERS**

**Other streets and roads in urban areas**



Reference population: car drivers at least a few days a year who regularly use this specific infrastructure. \*not including Armenia, Kyrgyzstan, Uzbekistan (different methodology)

Figure 57 presents the results on perceived safety for using other streets and roads in urban areas by car drivers' age group and region.

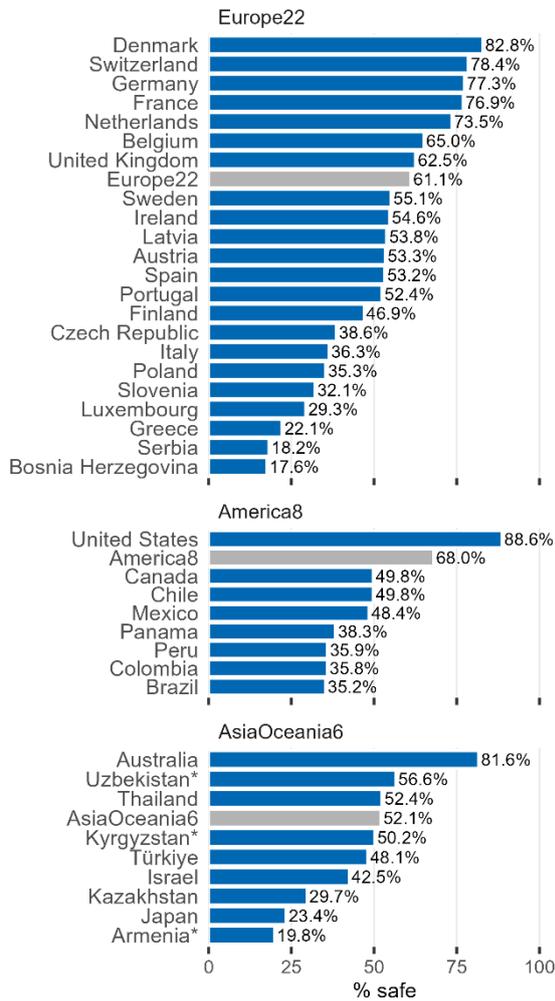
In Europe, people aged 18 to 24 years old (57.8%) consider safer this type of infrastructure than older car drivers.

In America, the highest rates correspond to car drivers aged 25 to 34 years old (65.5%).

Regarding Asia-Oceania, the highest safety perception rates are recorded for car drivers aged 25 to 34 years old (50.4%).

Figure 57: Perceived safety of other streets and roads in urban areas per region and age group (% of car drivers considering them safe).

**PERCEIVED SAFETY OF INFRASTRUCTURE -  
MOTORCYCLIST OR MOPED RIDERS**  
Thoroughfares and high-speed roads within cities



Reference population: motorcyclists and moped riders at least a few days a year who regularly use this specific infrastructure, \*not in regional mean (different methodology)

Figure 58 demonstrates the rates of moped riders and motorcyclists considering it safe to use thoroughfares and high-speed roads within cities. These rates vary from 52.1% in Asia-Oceania to 68% in America. The rate for Europe is 61.1%.

In Europe, the highest rates of the perceived safety of thoroughfares and high-speed roads within cities are recorded in Denmark and Switzerland (82.8% and 78.4% respectively). On the other hand, moped riders and motorcyclists in Bosnia and Herzegovina (17.6%), Serbia (18.2%), and Greece (22.1%) report the lowest rates.

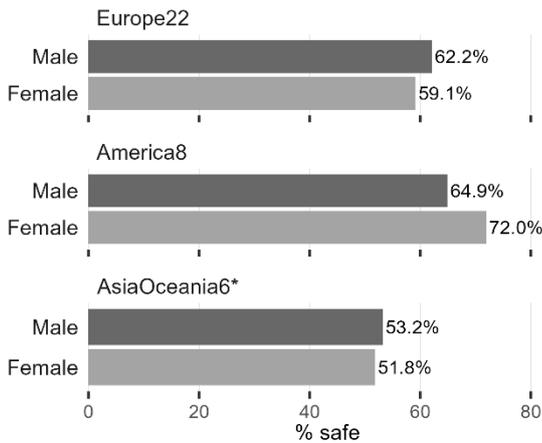
Among the eight participating countries of America, the highest rates are found in the United States (88.6%), while the lowest rates are recorded in Brazil, Columbia, and Peru (35.2%, 35.8% and 35.9% respectively).

Regarding the rates of Asia-Oceanian moped riders and motorcyclists, the highest rates are found in Australia (81.6%), while the lowest rates are recorded in Armenia (19.8%).

Figure 58: Perceived safety of thoroughfares and high-speed roads within cities per region and country (% of moped riders and motorcyclists considering them safe).

**PERCEIVED SAFETY OF INFRASTRUCTURE -  
MOTORCYCLIST OR MOPED RIDERS**

**Thoroughfares and high-speed roads within cities**



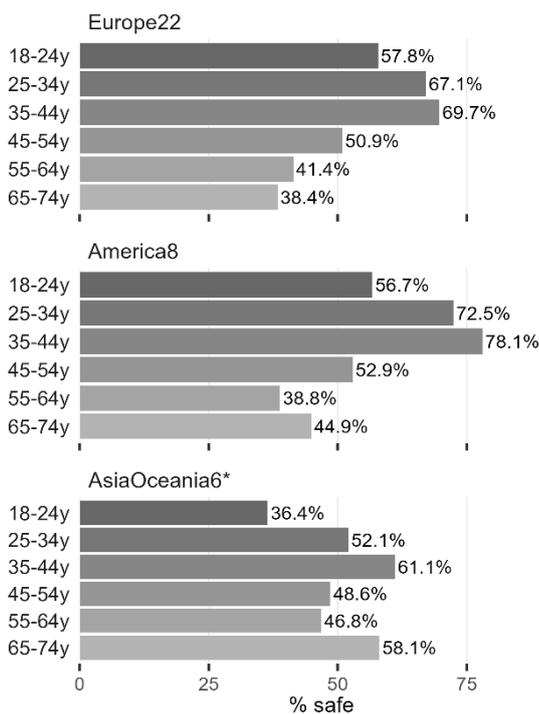
Reference population: motorcyclists and moped riders at least a few days a year who regularly use this specific infrastructure, \*not including Armenia, Kyrgyzstan, Uzbekistan (different methodology)

The results are further split out by region and gender in Figure 59. As can be seen in this figure, the perceived safety of the use of thoroughfares and high-speed roads within cities by moped riders and motorcyclists is slightly higher for male riders in Europe and Asia-Oceania, whereas in America the percentages of females are quite higher than the respective male rates.

Figure 59: Perceived safety of thoroughfares and high-speed roads within cities per region and gender (% of moped riders and motorcyclists considering them safe).

**PERCEIVED SAFETY OF INFRASTRUCTURE -  
MOTORCYCLIST OR MOPED RIDERS**

**Thoroughfares and high-speed roads within cities**



Reference population: motorcyclists and moped riders at least a few days a year who regularly use this specific infrastructure, \*not including Armenia, Kyrgyzstan, Uzbekistan (different methodology)

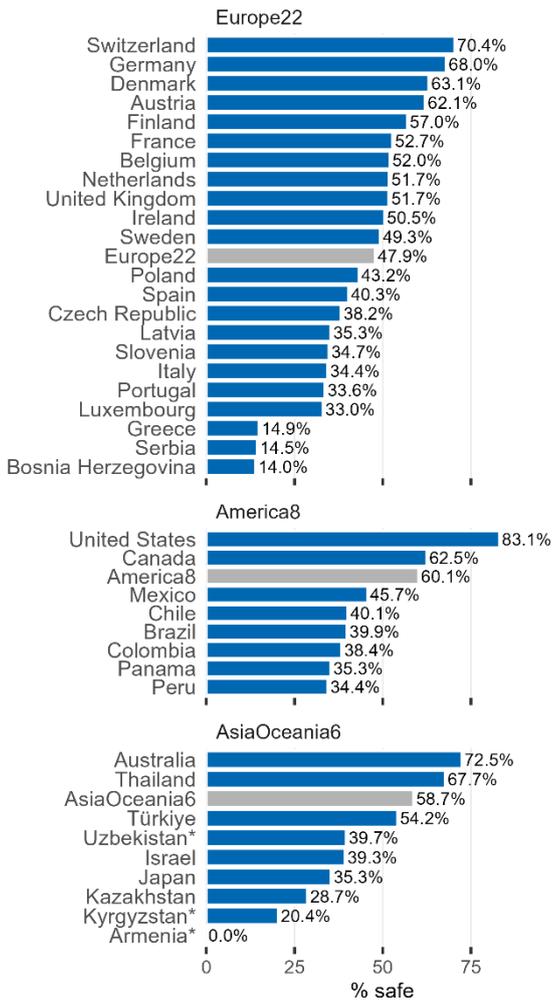
Figure 60 presents the results on self-declared safety perception for the use of thoroughfares and high-speed roads within cities by moped riders and motorcyclists by region and age group.

As can be seen in Figure 60, the percentage of moped riders and motorcyclists considering thoroughfares and high-speed roads within cities as safe is higher in all regions for people aged 35 to 44 years old.

In America, the lowest rates are found among the age group 55-64 (38.8%), while the lowest rate in Europe is for people aged 65 to 74 years old. On the contrary, in Asia-Oceania moped riders and motorcyclists aged 18-24 consider less safe using thoroughfares and high-speed roads within cities than older people.

Figure 60: Perceived safety of thoroughfares and high-speed roads within cities per region and age group (% of moped riders and motorcyclists considering them safe).

**PERCEIVED SAFETY OF INFRASTRUCTURE -  
MOTORCYCLIST OR MOPED RIDERS**  
Rural roads and roads connecting towns and villages



Reference population: motorcyclists and moped riders at least a few days a year who regularly use this specific infrastructure.  
\*not in regional mean (different methodology)

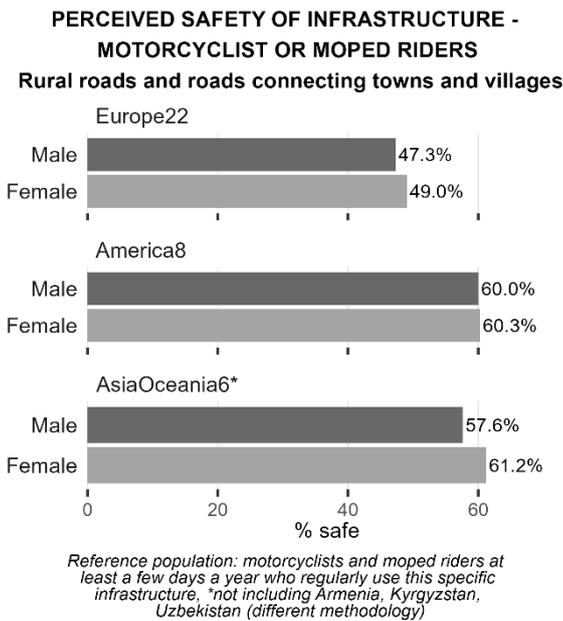
Figure 61 shows that the results of moped riders and motorcyclists' perceived safety regarding rural roads and roads connecting towns and villages vary from 47.9% in Europe to 60.1% in America. The rate for Asia-Oceania is 58.7%.

In Europe, the highest rates of safety perception regarding rural roads and roads connecting towns and villages are recorded in Switzerland and Germany (70.4% and 68.0% respectively). On the other hand, moped riders and motorcyclists in Bosnia and Herzegovina (14.0%), Serbia (14.5%), and Greece (14.9%) report the lowest rates.

In America, the highest rates are recorded in the United States (83.1%) and the lowest in Peru (34.4%).

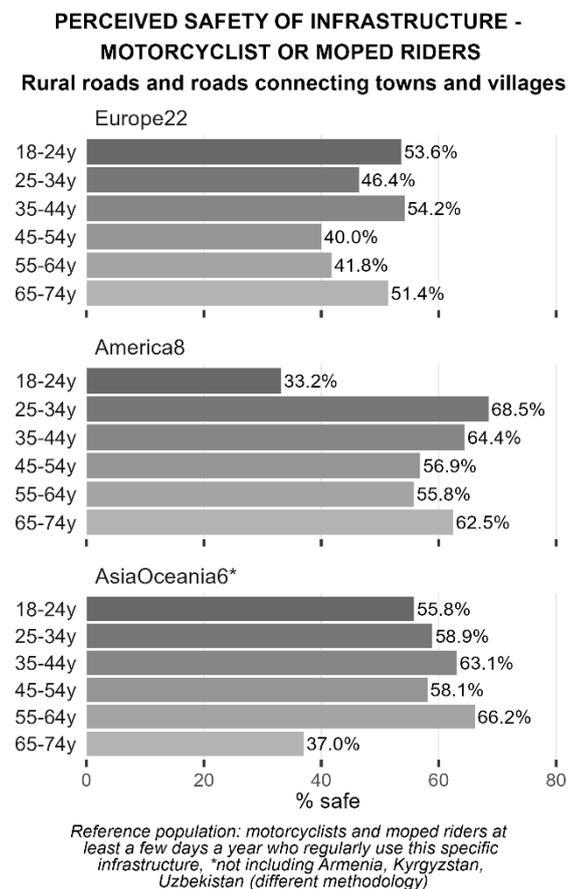
In Asia-Oceania, significant differences are observed between the countries. The highest rates are found in Australia (72.5%), while the lowest rates in Armenia (0.0%).

Figure 61: Perceived safety of rural roads and roads connecting towns and villages per region and country (% of moped riders and motorcyclists considering them safe).



In Figure 62, the results of self-declared safety perception regarding rural roads and roads connecting towns and villages by region and gender are presented. The percentages for females and males are similar among all examined regions, with a slightly higher rate of females in Europe and Asia-Oceania.

Figure 62: Perceived safety of rural roads and roads connecting towns and villages per region and gender (% of moped riders and motorcyclists considering them safe).



The results are further split out by region and age group in Figure 63. As can be seen in this Figure, the distribution of the perceived safety regarding rural roads and roads connecting towns and villages is different among the examined regions.

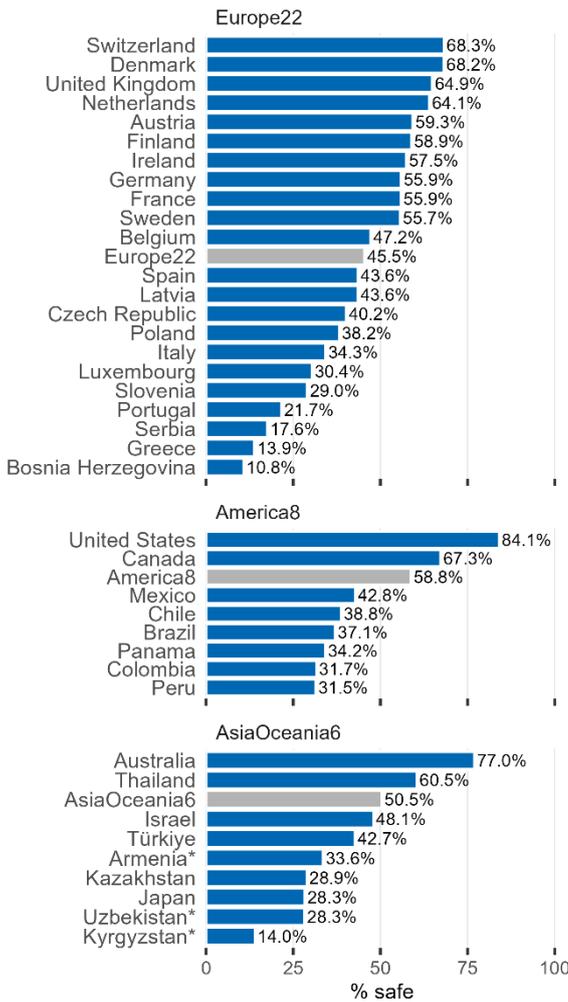
In Europe, moped riders and motorcyclists aged 35 to 44 years old record the highest percentage of considering these types of roads as safe, while the lowest rate corresponds to the age group 45-54.

In America, the distribution towards age groups is different than in Europe, with the highest share of safety perception regarding this type of road being recorded for moped riders and motorcyclists aged 25 to 34 years old and the lowest for the age group 18-24.

In Asia-Oceania, the highest rates correspond to riders aged 55 to 64 years old, while the lowest for the age group 65-74.

Figure 63: Perceived safety of rural roads and roads connecting towns and villages per region and age group (% of moped riders and motorcyclists considering them safe).

**PERCEIVED SAFETY OF INFRASTRUCTURE -  
MOTORCYCLIST OR MOPED RIDERS  
Other streets and roads in urban areas**



Reference population: motorcyclists and moped riders at least a few days a year who regularly use this specific infrastructure, \*not in regional mean (different methodology)

motorcyclists considering them safe).

Figure 64 demonstrates that the results of moped riders and motorcyclists considering it safe to use other streets and roads in urban areas vary from 45.5% in Europe to 58.8% in America. The rate for Asia-Oceania is 50.5%.

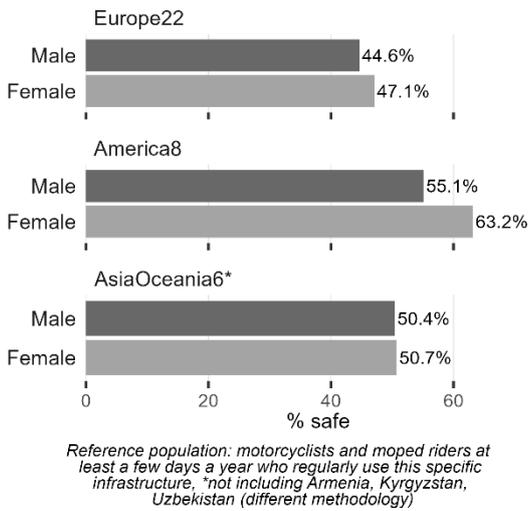
In Europe, the highest rates are recorded in Switzerland (68.3%) and Denmark (68.2%), while the lowest rates are recorded in Bosnia and Herzegovina (10.8%) and Greece (13.9%).

Among the countries of America, below half of moped riders and motorcyclists feel safe using other streets and roads in urban areas except for the United States (84.1%) and Canada (67.3%).

In Asia-Oceania, the highest rates are found in Australia (77.0%), while the lowest rates are recorded in Kyrgyzstan (14.0%).

Figure 64: Perceived safety of other streets and roads in urban areas per region and country (% of moped riders and

**PERCEIVED SAFETY OF INFRASTRUCTURE -  
MOTORCYCLIST OR MOPED RIDERS  
Other streets and roads in urban areas**



In Figure 65, the results of self-declared safety perception of other streets and roads in urban areas by region and gender are presented. The percentages of male moped riders and motorcyclists using such types of roads are lower than the respective rates of female riders in all examined regions.

Figure 65: Perceived safety of other streets and roads in urban areas per region and gender (% of moped riders and motorcyclists considering them safe).

**PERCEIVED SAFETY OF INFRASTRUCTURE -  
MOTORCYCLIST OR MOPED RIDERS  
Other streets and roads in urban areas**

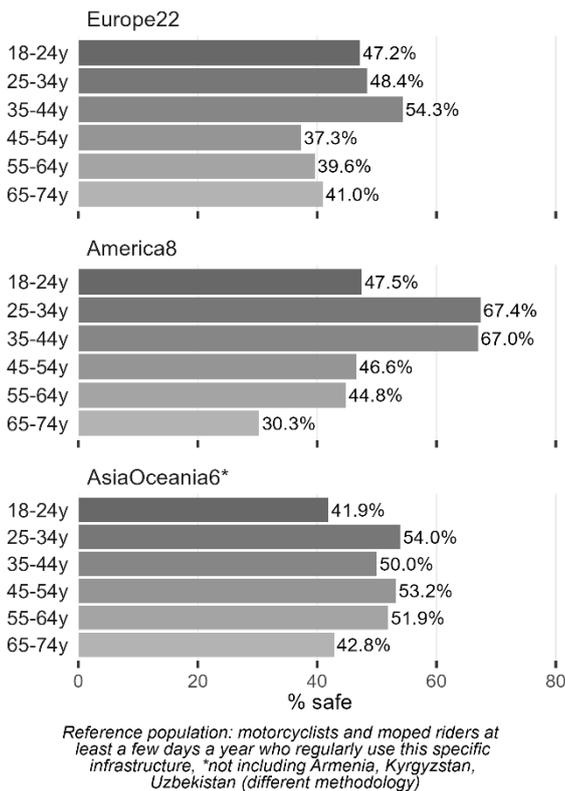


Figure 66 presents the results on perceived safety regarding other streets and roads in urban areas by moped riders and motorcyclists' age group and region.

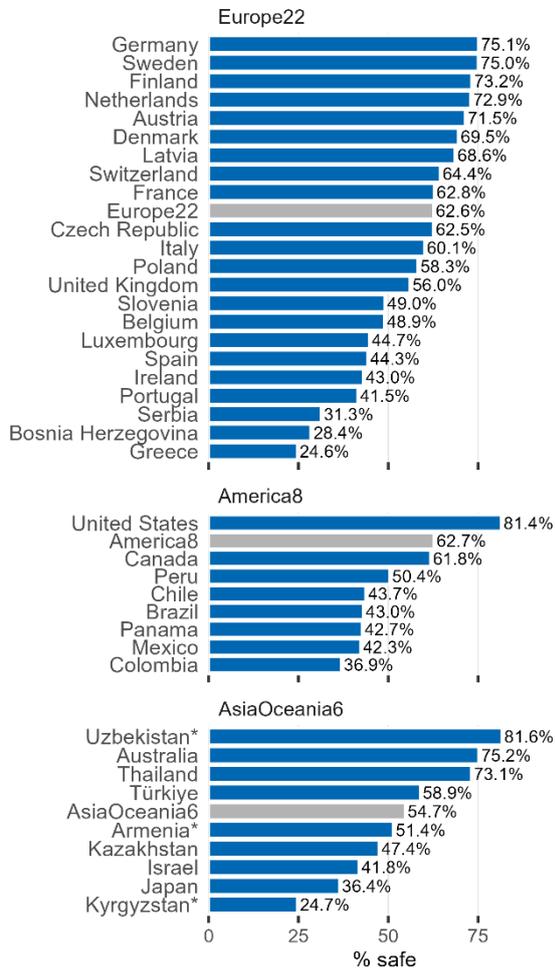
In Europe, riders aged 35 to 44 years old (54.3%) feel safer using this type of infrastructure than the other age groups.

In America, moped riders and motorcyclists aged 25 to 44 years old consider it safer than other age groups to use other streets and roads in urban areas.

Regarding Asia-Oceania, the highest percentage is recorded for moped riders and motorcyclists aged 25 to 34 years old (54.0%).

Figure 66: Perceived safety of other streets and roads in urban areas per region and age group (% of moped riders and motorcyclists considering them safe).

**PERCEIVED SAFETY OF INFRASTRUCTURE - CYCLISTS**  
**Rural roads and roads connecting towns and villages with cycle lanes**



Reference population: cyclists at least a few days a year who regularly use this specific infrastructure. \*not in regional mean (different methodology)

Figure 67 demonstrates that the results of cyclists' perceived safety regarding rural roads and roads connecting towns and villages with cycle lanes, vary from 54.7% in Asia-Oceania to 62.6% in Europe. The rate for America is 62.7%.

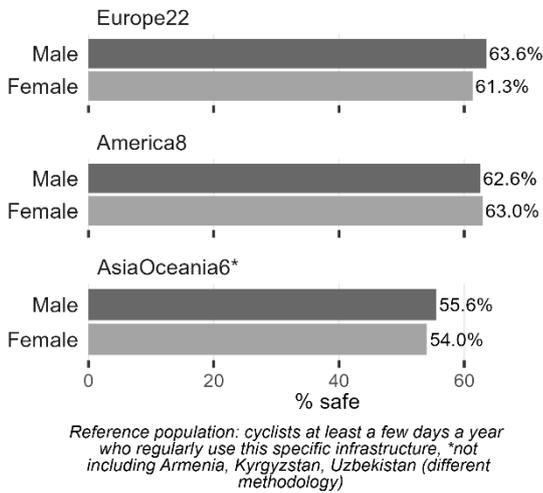
In Europe, the highest rates of safety perception regarding rural roads and roads connecting towns and villages with cycle lanes are recorded in Germany and Sweden (75.1% and 75.0% respectively). On the other hand, cyclists in Greece (24.6%) and Bosnia and Herzegovina (28.4%) report the lowest rates.

Among the eight participating countries of America, the highest rates are found in the United States (81.4%), while the lowest rates are recorded in Colombia and Mexico (36.9% and 42.3% respectively).

Regarding the rates of Asia-Oceanian cyclists, the highest rates are found in Uzbekistan (81.6%), while the lowest rates are recorded in Kyrgyzstan (24.7%).

Figure 67: Perceived safety of rural roads and roads connecting towns and villages with cycle lanes per region and country (% of cyclists considering them safe).

**PERCEIVED SAFETY OF INFRASTRUCTURE - CYCLISTS**  
**Rural roads and roads connecting towns and villages with cycle lanes**



The results are further split out by region and gender in Figure 68. As can be seen in this figure, the perceived safety regarding rural roads and roads connecting towns and villages with cycle lanes by cyclists in all examined regions is quite similar for females and males.

Figure 68: Perceived safety of rural roads and roads connecting towns and villages with cycle lanes per region and gender (% of cyclists considering them safe).

**PERCEIVED SAFETY OF INFRASTRUCTURE - CYCLISTS**  
**Rural roads and roads connecting towns and villages with cycle lanes**

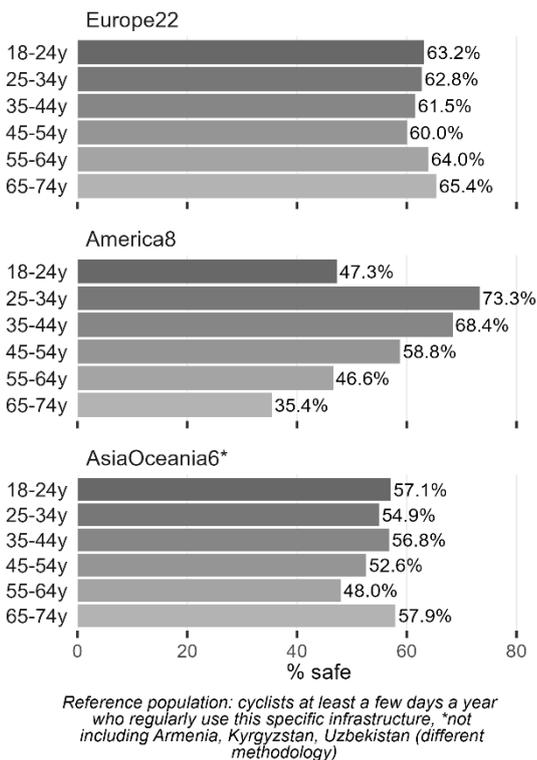


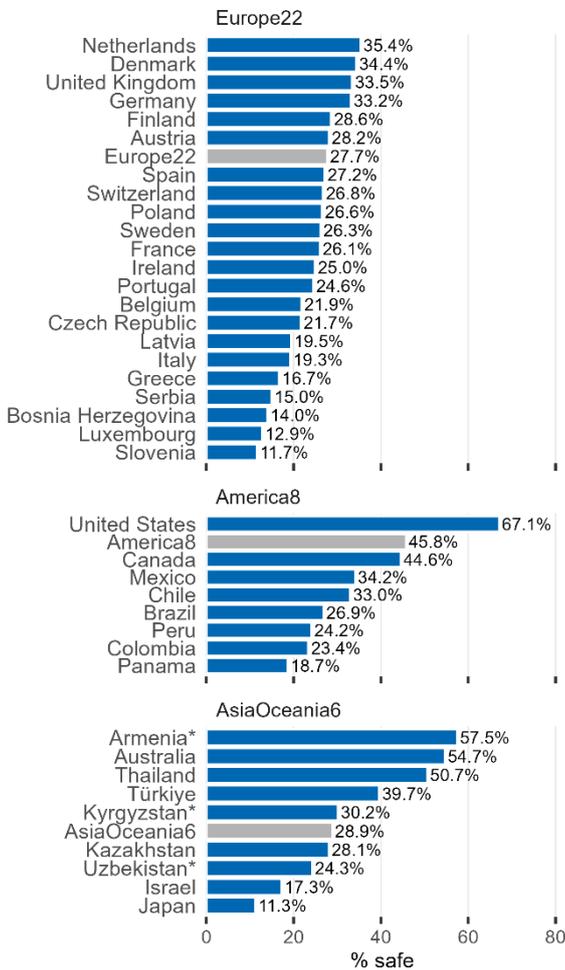
Figure 69 presents the results of self-declared safety perception regarding rural roads and roads connecting towns and villages with cycle lanes by cyclists by region and age group.

As can be seen in Figure 69, the percentage of cyclists considering it safe to use rural roads and roads connecting towns and villages with cycle lanes is higher for people aged 65 to 74 years old in Europe and Asia-Oceania (65.4% and 57.9%).

Contrary to the other regions, in America, the highest rates are found among the age group 25 to 34 years old (73.3%).

Figure 69: Perceived safety of rural roads and roads connecting towns and villages with cycle lanes per region and age group (% of cyclists considering them safe).

**PERCEIVED SAFETY OF INFRASTRUCTURE - CYCLISTS**  
**Rural roads and roads connecting towns and villages without cycle lanes**



Reference population: cyclists at least a few days a year who regularly use this specific infrastructure. \*not in regional mean (different methodology)

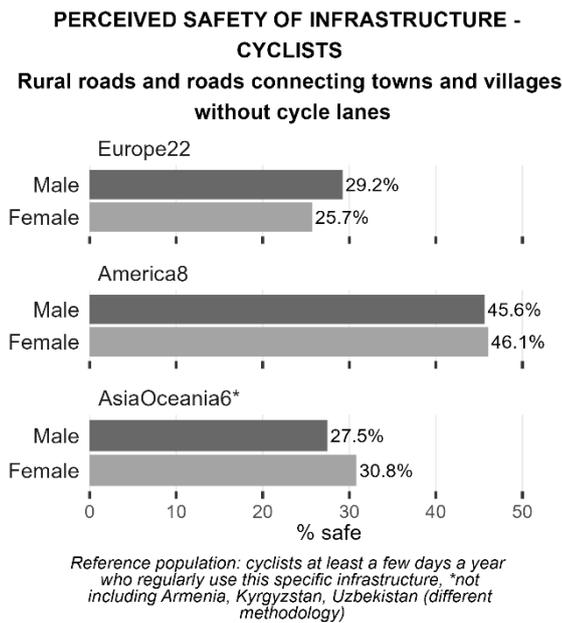
Figure 70 shows that the results of cyclists’ perceived safety regarding rural roads and roads connecting towns and villages without cycle lanes vary from 27.7% in Europe to 45.8% in America. The rate for Asia-Oceania is 28.9%.

In Europe, the highest rates of safety perception regarding rural roads and roads connecting towns and villages without cycle lanes are recorded in the Netherlands and Denmark (35.4% and 34.4% respectively). On the other hand, cyclists in Slovenia (11.7%), Luxembourg (12.9%), and Bosnia and Herzegovina (14%) report the lowest rates.

In America, less than half of cyclists consider it safe to use rural roads and roads connecting towns and villages without cycle lanes except for the United States (67.1%).

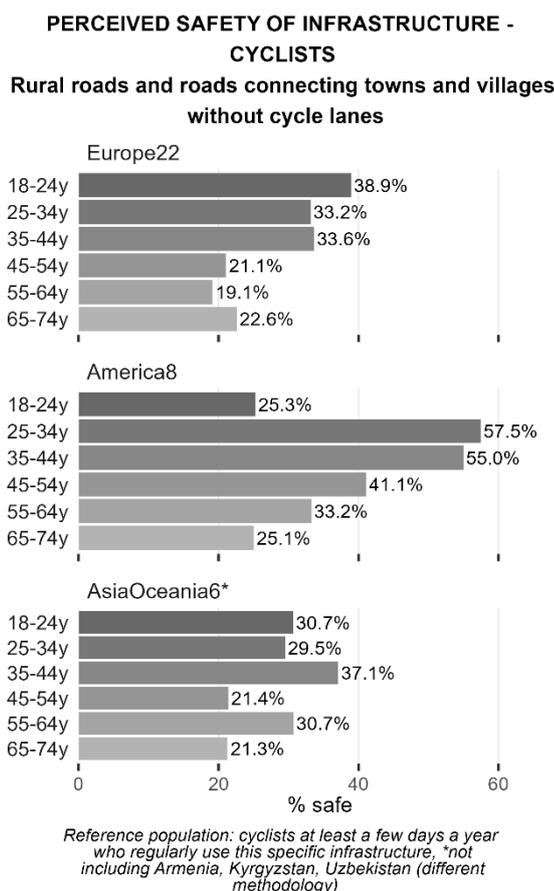
In Asia-Oceania, significant differences are observed between the countries. The highest rates are found in Armenia (57.5%), while the lowest rates correspond to Japan (11.3%).

Figure 70: Perceived safety of rural roads and roads connecting towns and villages without cycle lanes per region and country (% of cyclists considering them safe).



In Figure 71, the results of self-declared use of rural roads and roads connecting towns and villages without cycle lanes by region and gender are presented. The percentages for females are higher in all examined regions except for Europe, where the percentage of female cyclists is lower than the respective percentage of males.

Figure 71: Perceived safety of rural roads and roads connecting towns and villages without cycle lanes per region and gender (% of cyclists considering them safe).



The results are further split out by region and age group in Figure 72. As can be seen in this Figure, the safety perception of rural roads and roads connecting towns and villages without cycle lanes is higher for younger people.

In Europe, cyclists aged 18 to 24 years old record the highest percentage, while the lowest rate is for the age group 55-64.

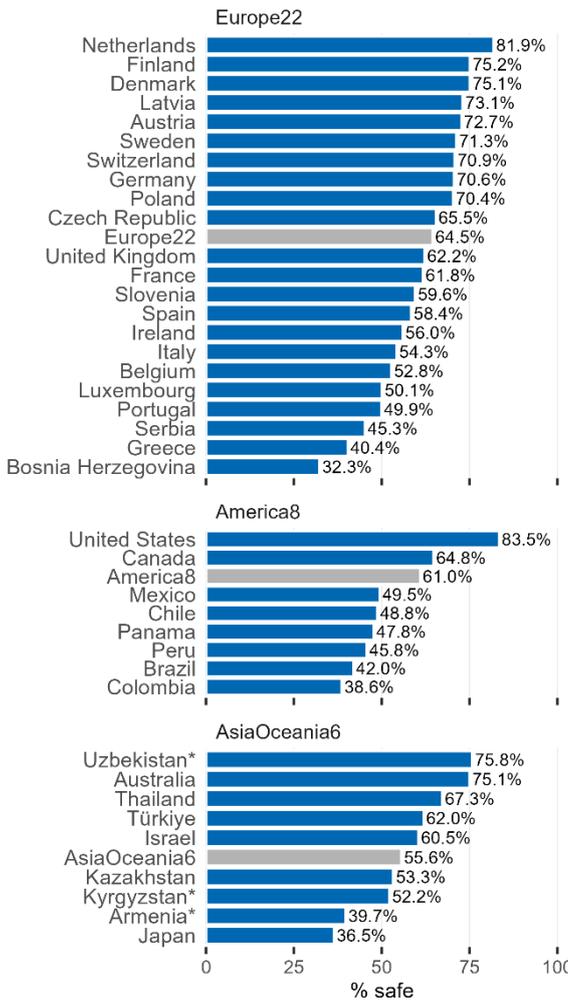
In America, the distribution is different than in Europe, with the highest share of perceived safety regarding this type of roads recorded for cyclists aged 25 to 34 years old and the lowest for the age group 65-74.

In Asia-Oceania, the highest safety perception of this type of infrastructure corresponds to cyclists aged 35 to 44 years old, while the lowest rates are observed in the age group of 65-74 years old.

Figure 72: Perceived safety of rural roads and roads connecting towns and villages without cycle lanes per region and age group (% of cyclists considering them safe).

**PERCEIVED SAFETY OF INFRASTRUCTURE - CYCLISTS**

**Streets and roads in urban areas with cycle lanes**



Reference population: cyclists at least a few days a year who regularly use this specific infrastructure, \*not in regional mean (different methodology)

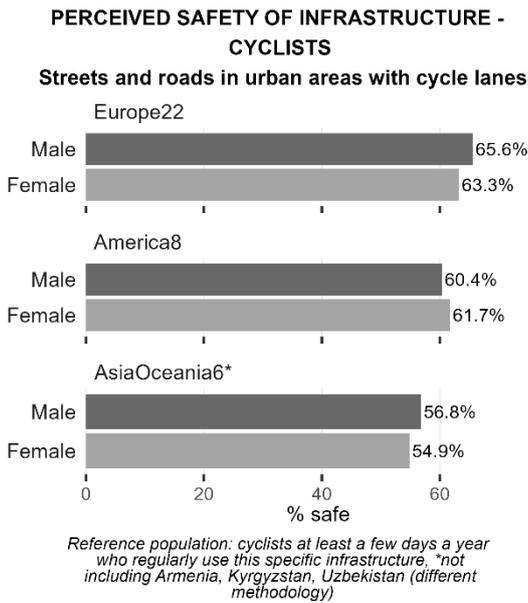
Figure 73 demonstrates that the results of cyclists' safety perception of streets and roads in urban areas with cycle lanes vary from 55.6% in Asia-Oceania to 64.5% in Europe. The rate for America is 61%.

In Europe, the highest rates are recorded in the Netherlands (81.9%) and Finland (75.2%), while the lowest rates are recorded in Bosnia and Herzegovina (32.3%).

Among the countries of America, below half of cyclists consider it safe to use other streets and roads in urban areas except for the United States (83.5%) and Canada (64.8%).

In Asia-Oceania, the highest rates are found in Uzbekistan (75.8%) and Australia (75.1%), while the lowest rates are recorded in Japan (36.5%).

Figure 73: Perceived safety of streets and roads in urban areas per region and country (% of cyclists considering them safe).



In Figure 74, the results of perceived safety regarding streets and roads in urban areas with cycle lanes by region and gender are presented. The percentages of male cyclists regarding safe such types of roads are slightly higher than the respective rates of female riders in Europe and Asia-Oceania, while the opposite is the case for America.

Figure 74: Perceived safety of streets and roads in urban areas per region and gender (% of cyclists considering them safe).

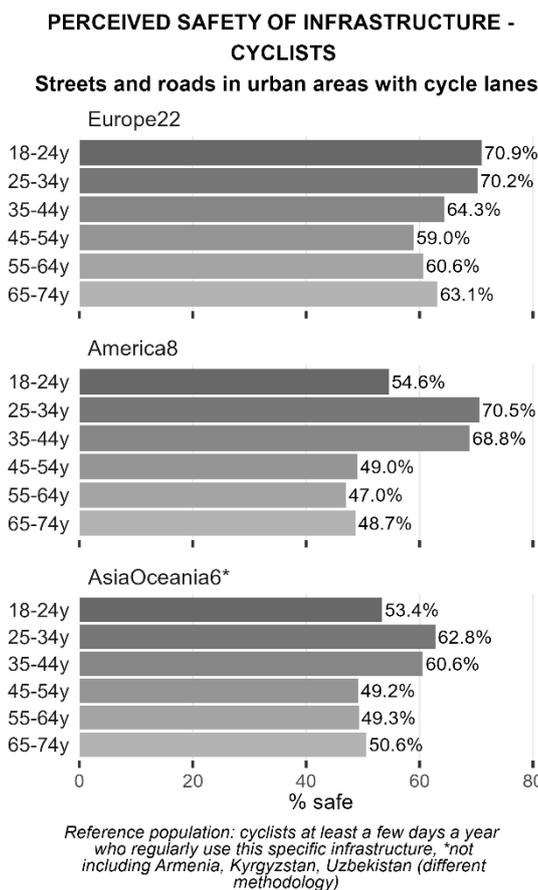


Figure 75 presents the results on self-declared safety perception of streets and roads in urban areas with cycle lanes by cyclists' age group and region.

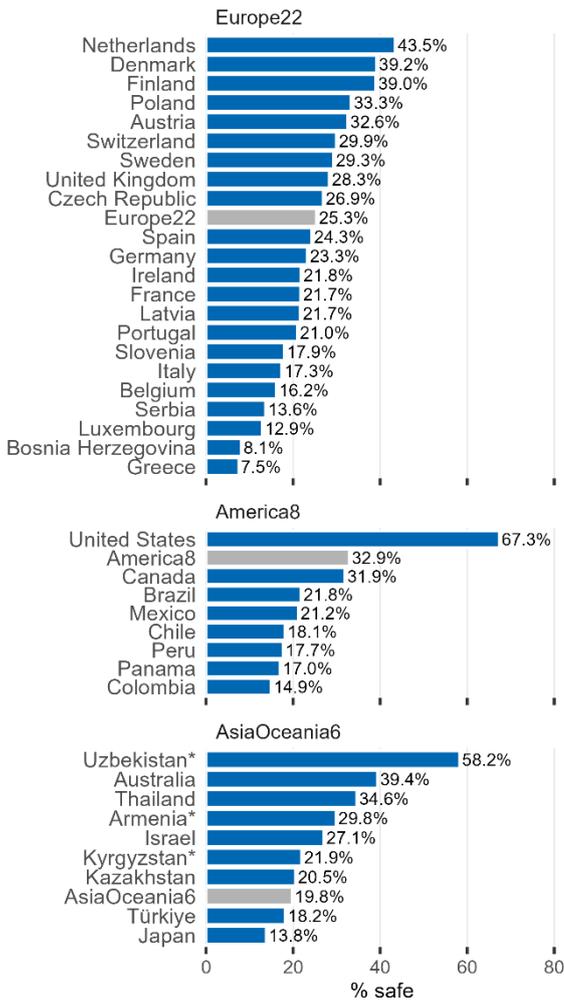
In Europe, cyclists aged 18 to 24 years old (70.9%) present higher safety perception rates than older cyclists.

In America and Asia-Oceania, the highest rates correspond to cyclists aged 25 to 34 years old (70.5% and 62.8% respectively).

Figure 75: Perceived safety of streets and roads in urban areas per region and age group (% of cyclists considering them safe).

**PERCEIVED SAFETY OF INFRASTRUCTURE -  
CYCLISTS**

**Streets and roads in urban areas without cycle lanes**



Reference population: cyclists at least a few days a year who regularly use this specific infrastructure, \*not in regional mean (different methodology)

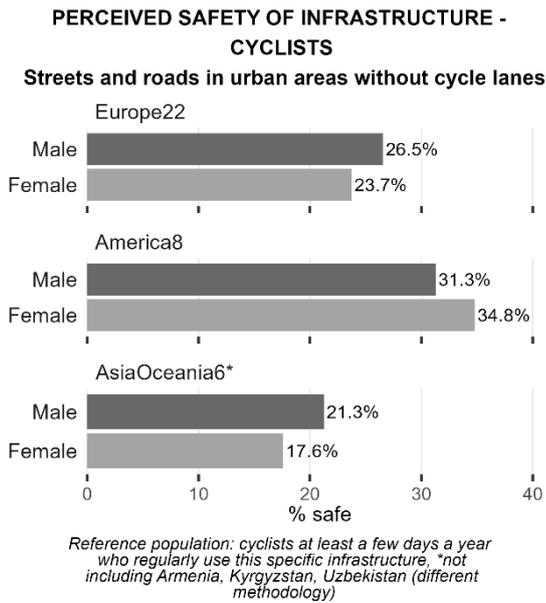
Figure 76 demonstrates that the results of cyclists’ perceived safety of streets and roads in urban areas without cycle lanes vary from 19.8% in Asia-Oceania to 32.9% in America. The rate for Europe is 25.3%.

In Europe, the highest rates are recorded in the Netherlands (43.5%) and Denmark (73%), while the lowest are recorded in Greece (7.5%) and Bosnia and Herzegovina (8.1%).

Among the countries of America, less than half of cyclists consider streets and roads in urban areas without cycle lanes as safe except for the United States (67.3%).

In Asia-Oceania, the highest rates are found in Uzbekistan (58.2%), while the lowest rates are recorded in Japan (13.8%).

Figure 76: Perceived safety of streets and roads in urban areas without cycle lanes per region and country (% of cyclists considering them safe).



In Figure 77, the results of perceived safety regarding streets and roads in urban areas without cycle lanes by region and gender are presented. The percentages of male cyclists who consider it safe to use such types of roads are higher than the respective rates of female riders in Europe and Asia-Oceania, while the opposite is the case for America.

Figure 77: Perceived safety of streets and roads in urban areas per region and gender (% of cyclists considering them safe).

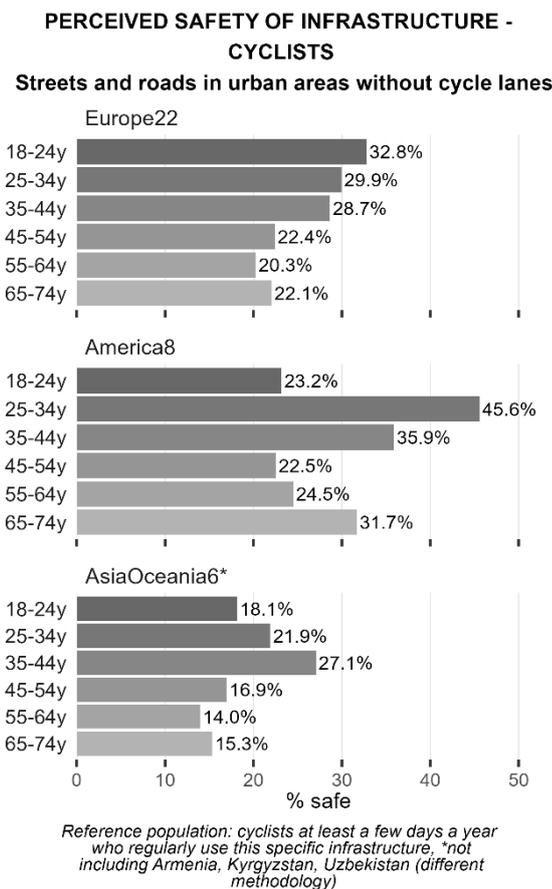


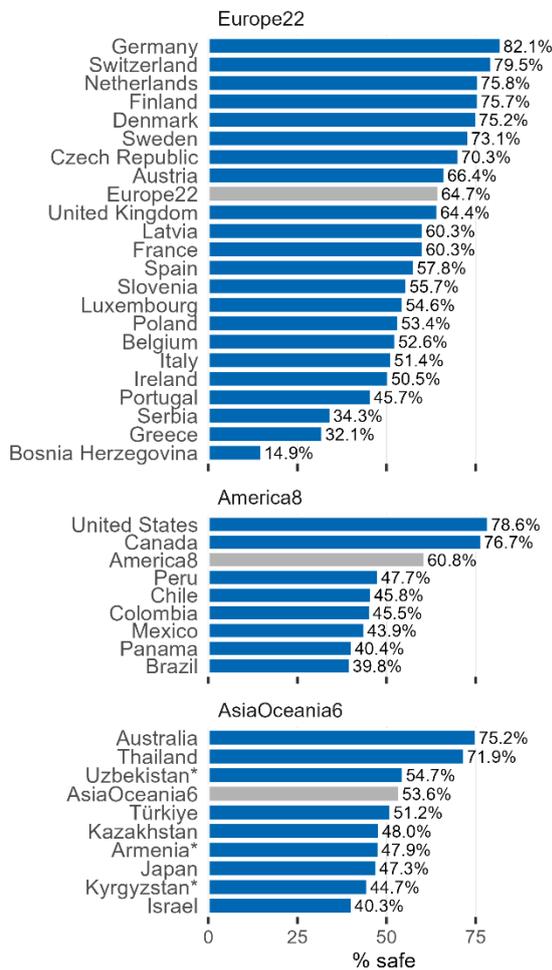
Figure 78 presents the results on perceived safety regarding streets and roads in urban areas without cycle lanes by cyclists' age group and region.

In Europe, people aged 18 to 24 years old (32.8%) feel safer with this type of infrastructure than older cyclists.

In America, cyclists aged 25 to 34 years old present the highest rates (45.6%), while in Asia-Oceania, the highest percentage of perceived safety regarding these types of roads is recorded for cyclists aged 35 to 44 years old (27.1%).

Figure 78: Perceived safety of streets and roads in urban areas per region and age group (% cyclists considering them safe).

**PERCEIVED SAFETY OF INFRASTRUCTURE - PEDESTRIANS**  
**Rural roads and roads connecting towns and villages with sidewalks**



Reference population: pedestrians at least a few days a year who regularly use this specific infrastructure. \*not in regional mean (different methodology)

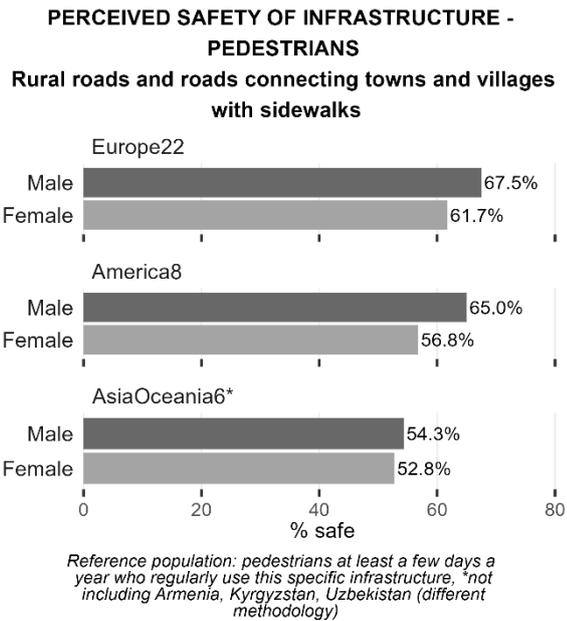
Figure 79 demonstrates that the results of pedestrians who consider it safe to use rural roads and roads connecting towns and villages with sidewalks, vary from 53.6% in Asia-Oceania to 64.7% in Europe. The rate for America is 60.8%.

In Europe, the highest rates of perceived safety regarding rural roads and roads connecting towns and villages with sidewalks are recorded in Germany and Switzerland (82.1% and 79.5% respectively). On the other hand, pedestrians in Bosnia and Herzegovina (14.9%), Greece (32.1%), and Serbia (34.3%) report the lowest rates.

Among the eight participating countries of America, the highest rates are found in the United States (78.6%), while the lowest rates are recorded in Brazil and Panama (39.8% and 40.4% respectively).

Regarding the rates of Asian-Oceanian pedestrians, the highest rates are found in Australia and Thailand (75.2% and 71.9% respectively), while the lowest rates are recorded in Israel (40.3%).

Figure 79: Perceived safety of rural roads and roads connecting towns and villages with sidewalks per region and country (% of pedestrians considering them safe).



The results are further split out by region and gender in Figure 80. As can be seen in this figure, the perceived safety regarding rural roads and roads connecting towns and villages with sidewalks by pedestrians in all examined regions is higher for males than females.

Figure 80: Perceived safety of rural roads and roads connecting towns and villages with sidewalks per region and gender (% of pedestrians considering them safe).

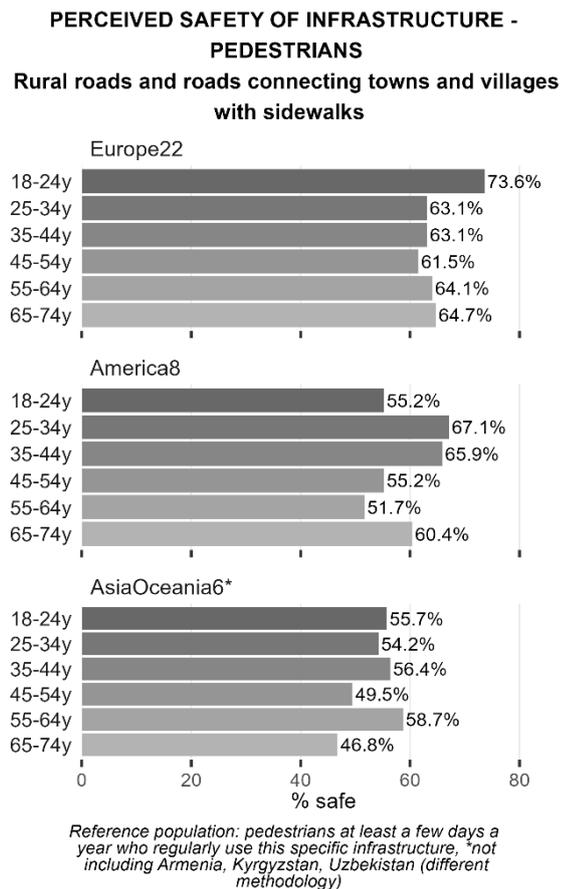


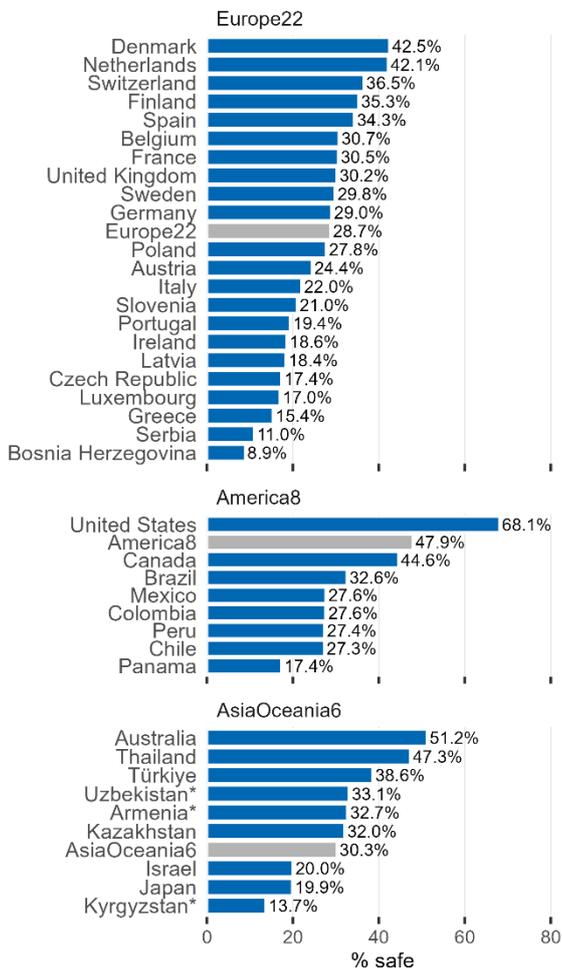
Figure 81 presents the results on self-declared safety perception of rural roads and roads connecting towns and villages with sidewalks by pedestrians' region and age group.

As can be seen in Figure 81, the percentage of pedestrians who consider it safe to use rural roads and roads connecting towns and villages with sidewalks is higher in Europe and America for younger people.

In Europe, the lowest rates are found among the age group 45-54 (61.5%), while in America the lowest rates are recorded for the age group 55-64 (51.7%). On the contrary, in Asia-Oceania pedestrians aged 55-64 feel safer using rural roads and roads connecting towns and villages with sidewalks than younger people.

Figure 81: Perceived safety of rural roads and roads connecting towns and villages with sidewalks per region and age group (% of pedestrians considering them safe).

**PERCEIVED SAFETY OF INFRASTRUCTURE - PEDESTRIANS**  
**Rural roads and roads connecting towns and villages without sidewalks**



Reference population: pedestrians at least a few days a year who regularly use this specific infrastructure, \*not in regional mean (different methodology)

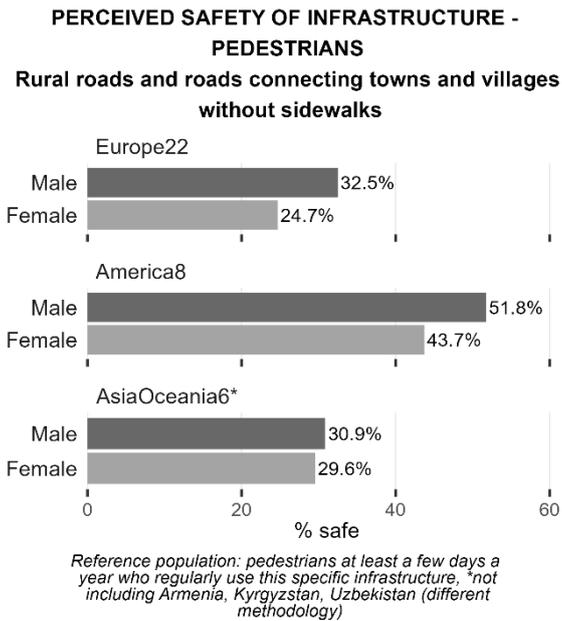
Figure 82 shows that the results of pedestrians considering it safe to use rural roads and roads connecting towns and villages without sidewalks vary from 28.7% in Europe to 47.9% in America. The rate for Asia-Oceania is 30.3%.

In Europe, the highest rates of perceived safety regarding rural roads and roads connecting towns and villages without sidewalks are recorded in Denmark (42.5%) and the Netherlands (42.1%). On the other hand, pedestrians in Bosnia and Herzegovina (8.9%) and Serbia (11.0%) report the lowest rates.

In America, the highest rates of safety perception regarding rural roads and roads connecting towns and villages without sidewalks are recorded in the United States (68.1%), while Panama records the lowest rates (17.4%).

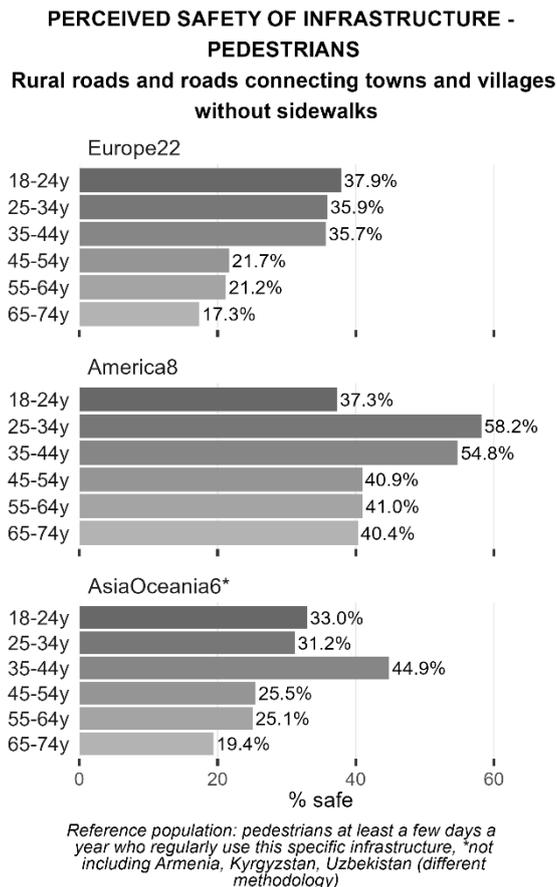
In Asia-Oceania, significant differences are observed between the countries. The highest rates are found in Australia (51.2%), while the lowest are in Kyrgyzstan (13.7%).

Figure 82: Perceived safety of rural roads and roads connecting towns and villages without sidewalks per region and country (% of pedestrians considering them safe).



In Figure 83, the results of perceived safety regarding rural roads and roads connecting towns and villages without sidewalks by region and gender are presented. A higher share of male pedestrians can be observed in all examined regions. This difference is quite marginal in Asia-Oceania.

**Figure 83: Perceived safety of rural roads and roads connecting towns and villages without sidewalks per region and gender (% of pedestrians considering them safe).**



The results are further split out by region and age group in Figure 84. As can be seen in this Figure, the safety perception of rural roads and roads connecting towns and villages without sidewalks is higher for younger people in all examined regions.

In Europe, pedestrians aged 18 to 24 years old record the highest percentage, while the lowest rate is for the age group 65-74.

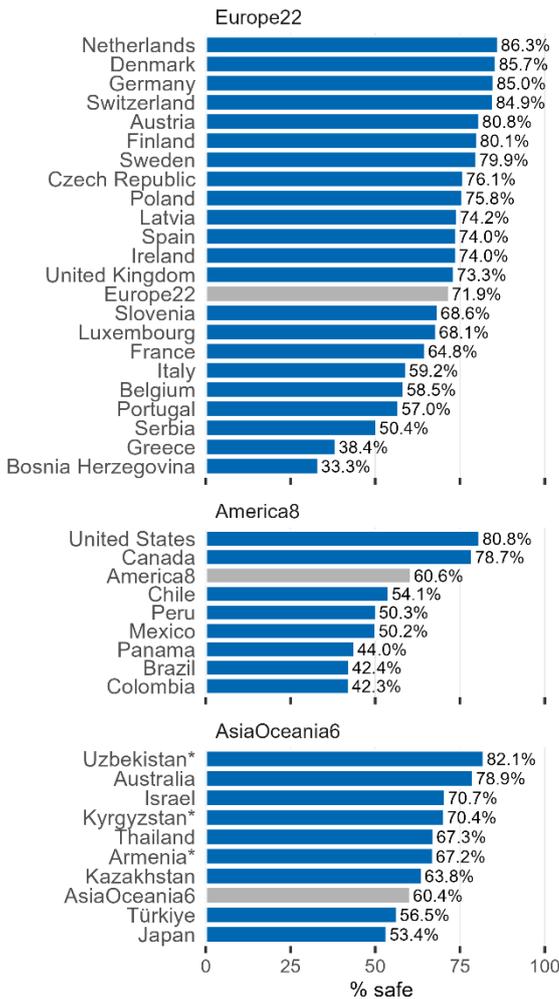
In America, the distribution towards age groups is different than in Europe, with the highest share of perceived safety regarding these types of roads recorded for pedestrians aged 25 to 34 years old and the lowest for the age group 18-24.

Contrary to Europe and America, Asia-Oceania records the highest safety perception regarding this type of infrastructure for people aged 35-44 years old and the lowest for the age group 65-74.

**Figure 84: Perceived safety of rural roads and roads connecting towns and villages per region and age group (% of pedestrians considering them safe).**

**PERCEIVED SAFETY OF INFRASTRUCTURE - PEDESTRIANS**

**Streets and roads in urban areas with sidewalks**



Reference population: pedestrians at least a few days a year who regularly use this specific infrastructure, \*not in regional mean (different methodology)

considering them safe).

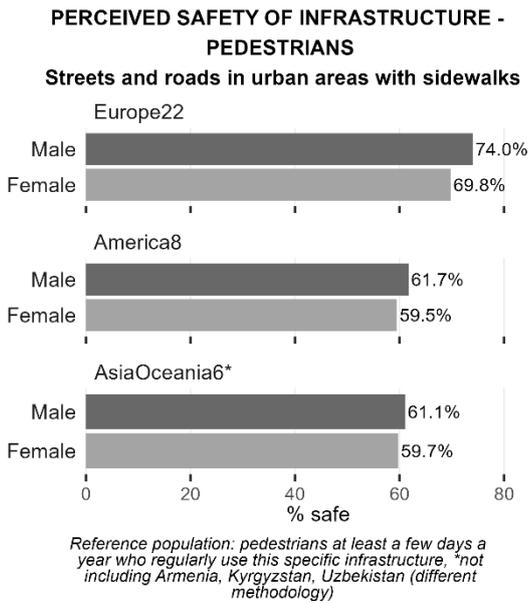
Figure 85 demonstrates that the results of pedestrians considering it safe to use streets and roads in urban areas with sidewalks vary from 60.4% in Asia-Oceania to 71.9% in Europe. The rate for America is 60.6%.

In Europe, the highest rates are recorded in the Netherlands (86.3%) and Denmark (85.7%), while the lowest rates are recorded in Bosnia and Herzegovina (33.3%) and Greece (38.4%).

Among the countries of America, the highest rates are recorded in the United States and Canada (80.8% and 78.7% respectively), while the lowest rates are recorded in Colombia and Brazil (42.3% and 42.4% respectively).

In Asia-Oceania, the highest rates are found in Uzbekistan (82.1%) and Australia (78.9%), while the lowest rates are recorded in Japan (53.4%).

Figure 85: Perceived safety of streets and roads in urban areas with sidewalks per region and country (% of pedestrians



In Figure 86, the results of perceived safety regarding streets and roads in urban areas with sidewalks by region and gender are presented. The percentages of male pedestrians using such types of roads are slightly higher than the respective rates of female pedestrians in all examined regions.

Figure 86: Perceived safety of streets and roads in urban areas with sidewalks per region and gender (% of pedestrians considering them safe).

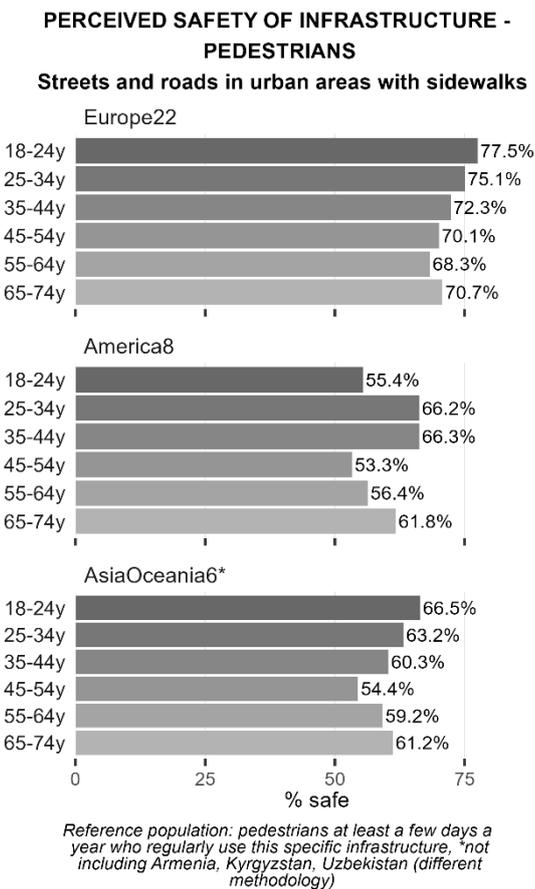


Figure 87 presents the results on self-declared safety perception regarding streets and roads in urban areas with sidewalks by pedestrians' age group and region.

In Europe, people aged 18 to 24 years old (77.5%) consider it safer to use this type of infrastructure than older pedestrians.

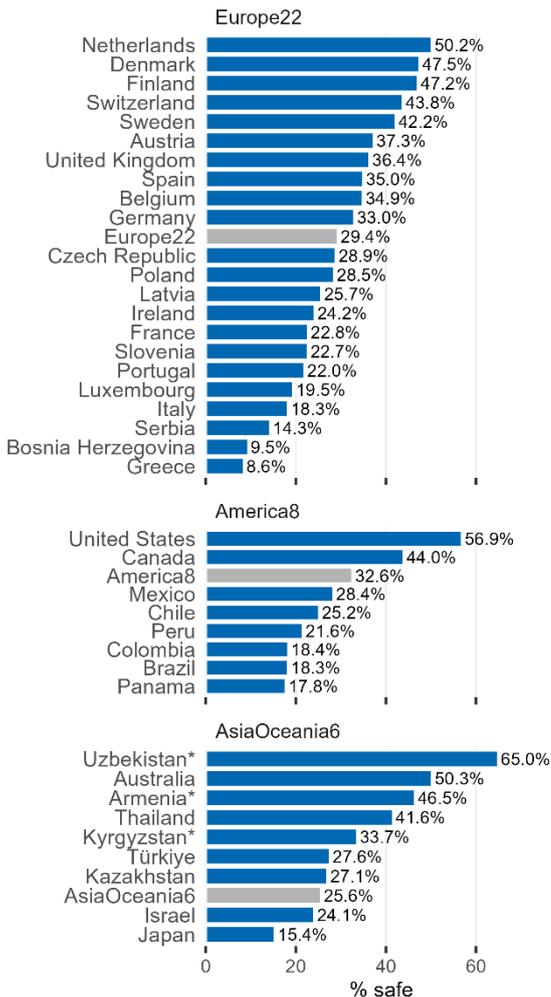
In America, pedestrians aged 35 to 44 years old feel safer using streets and roads in urban areas with sidewalks (66.3%) compared to the remaining age groups.

Regarding Asia-Oceania, as in Europe, the highest percentage of safety perception regarding such types of roads is recorded for pedestrians aged 18 to 24 years old (66.5%).

Figure 87: Perceived safety of streets and roads in urban areas with sidewalks per region and age group (% of pedestrians considering them safe).

**PERCEIVED SAFETY OF INFRASTRUCTURE - PEDESTRIANS**

**Streets and roads in urban areas without sidewalks**



Reference population: pedestrians at least a few days a year who regularly use this specific infrastructure, \*not in regional mean (different methodology)

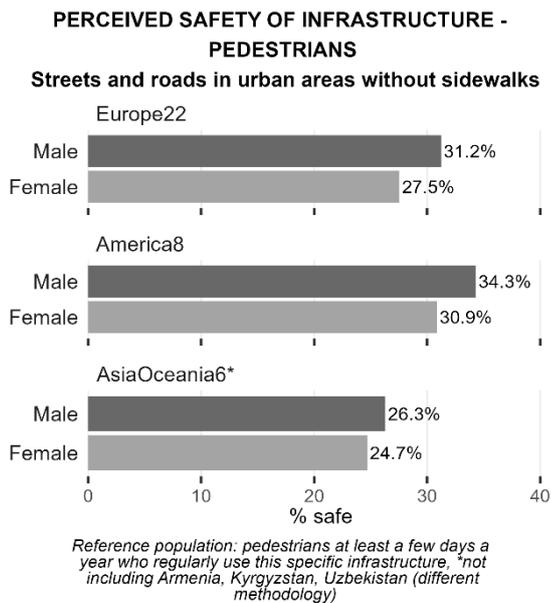
Figure 88 demonstrates that the results of pedestrians considering it safe to use streets and roads in urban areas without sidewalks vary from 25.6% in Asia-Oceania to 32.6% in America. The rate for Europe is 29.4%.

In Europe, the highest rates are recorded in the Netherlands (50.2%), Denmark (47.5%), and Finland (47.2%), while the lowest rates are recorded in Greece (8.6%) and Bosnia and Herzegovina (9.5%).

Among the countries of America, the United States and Canada record the highest rates (56.9% and 44.0% respectively), while the lowest rates are recorded in Panama (17.8%).

In Asia-Oceania, the highest rates are found in Uzbekistan (65.0%), while the lowest rates are recorded in Japan (15.4%).

Figure 88: Perceived safety of streets and roads in urban areas without sidewalks per region and country (% of pedestrians considering them safe).



In Figure 89, the results of perceived safety regarding streets and roads in urban areas without sidewalks by region and gender are presented. The percentages of male pedestrians considering it safe to use such types of roads are slightly higher than the respective rates of female riders in all examined regions.

Figure 89: Perceived safety of streets and roads in urban areas without sidewalks per region and gender (% of pedestrians considering them safe).

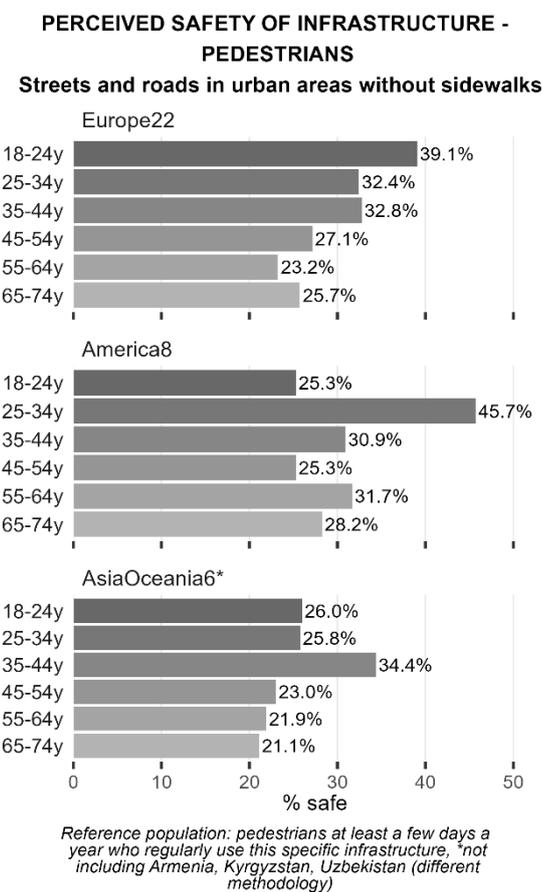


Figure 90 presents the results on self-declared safety perception regarding streets and roads in urban areas without sidewalks by pedestrians' age group and region.

In Europe, people aged 18 to 24 years old (39.1%) consider it safer to use this type of infrastructure than the other pedestrian age groups.

In America, pedestrians aged 25 to 34 years old report the highest rates (45.7%).

Regarding Asia-Oceania, the highest percentage of perceived safety regarding this type of roads is recorded for pedestrians aged 35 to 44 years old (34.4%).

Figure 90: Perceived safety of streets and roads in urban areas without sidewalks per region and age group (% of pedestrians considering them safe).

### 3.2 Advanced Analysis

In this section, an attempt is made to correlate safety perception scores with the latest available data on road traffic fatalities in urban and rural areas. These analyses are limited to European countries that participate in the ESRA3 survey and are included in the CARE database, as road fatalities data per road type were not available for other ESRA3 countries. Additionally, a separate analysis was conducted to correlate the national Gross Domestic Product (GDP) per capita of the 39 ESRA3 participating countries with the safety perception rates of car drivers by road type. The GDP per capita data were retrieved from the World Bank database and pertain to the year 2021.

The following linear function shows the general matrix form of the model employed in the advanced analyses' section:

$$Y = aX + b$$

where  $a$  represents the gradient of the line and  $b$  represents the  $y$ -axis intercept (vertical intercept). The coefficient of determination ( $R^2$ ) is used to measure how well the statistical model predicts the outcome.

This model was applied to correlate safety perception scores with road traffic fatalities data and to analyze the relationship between national GDP per capita and safety perception rates of car drivers by road type.

The following dependent variables were used for further advanced analysis:

- As a CAR DRIVER, how would you rate the roads that you regularly use in terms of safety? inter-city motorways (% safe)
- As a CAR DRIVER, how would you rate the roads that you regularly use in terms of safety? other streets and roads in urban areas (% safe)
- As a CAR DRIVER, how would you rate the roads that you regularly use in terms of safety? thoroughfares and high-speed roads within cities
- As a MOPED RIDER or MOTORCYCLIST, how would you rate the roads that you regularly use in terms of safety? rural roads and roads connecting towns and villages (% safe)
- As a MOPED RIDER or MOTORCYCLIST, how would you rate the roads that you regularly use in terms of safety? other streets and roads in urban areas (% safe)
- As a MOPED RIDER or MOTORCYCLIST, how would you rate the roads that you regularly use in terms of safety? thoroughfares and high-speed roads within cities
- As a PEDESTRIAN, how would you rate the roads/sidewalks that you regularly use in terms of safety? rural roads and roads connecting towns and villages with sidewalks (% safe)
- As a PEDESTRIAN, how would you rate the roads/sidewalks that you regularly use in terms of safety? streets and roads in urban areas with sidewalks (% safe)
- As a PEDESTRIAN, how would you rate the roads/sidewalks that you regularly use in terms of safety? streets and roads in urban areas without sidewalks (% safe)

It is noted that a similar investigation was conducted for cyclists; however, the  $R^2$  values were very low. As a result, these findings are not presented in this section. This could potentially be attributed to the smaller sample size of cyclists, especially compared to car drivers and pedestrians, which might have affected the reliability of the statistical model. Additionally, there may be perception differences; cyclists might experience unique safety concerns that are not as prevalent among other road users, possibly leading to weaker correlations.

3.2.1 Car drivers

Figures 91, 92 and 93 present the correlation between passenger car fatalities per million population in 2022 with the dependent variable of perceived safety of inter-city motorways, thoroughfares and high-speed roads within cities, and other streets and roads in urban areas respectively.

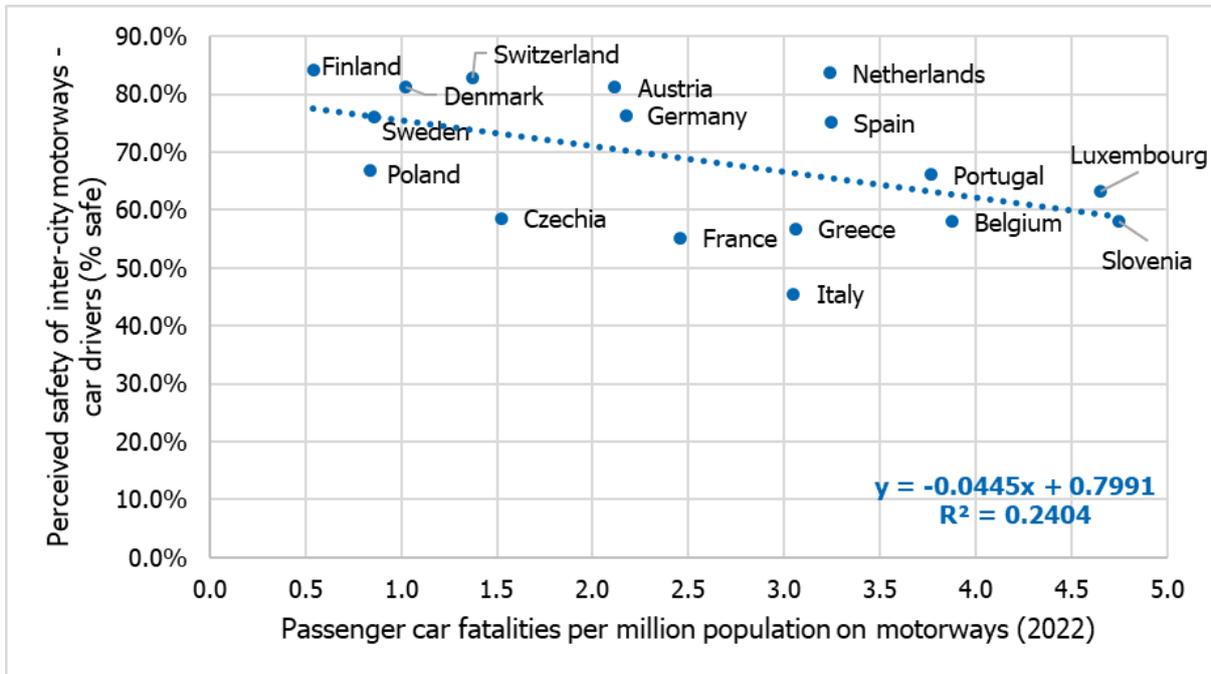


Figure 91: Linear relationship between car drivers’ perceived safety of inter-city motorways and passenger car fatalities per million population on motorways (2022)

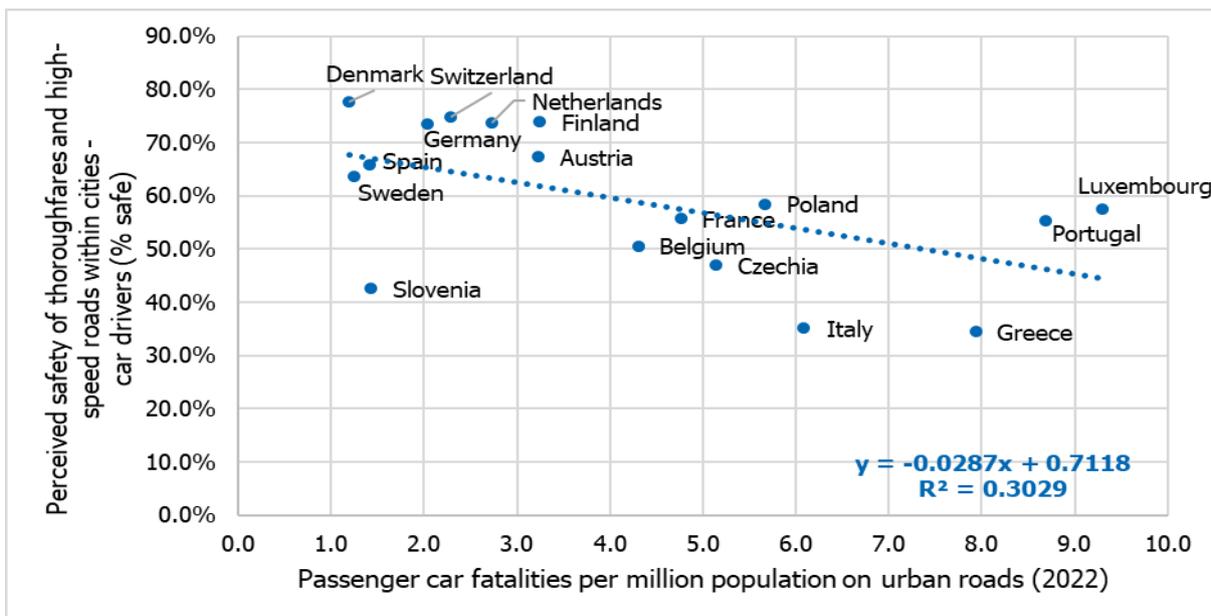


Figure 92: Linear relationship between car drivers’ perceived safety of thoroughfares and high-speed roads within cities and passenger car fatalities per million population on urban roads (2022)

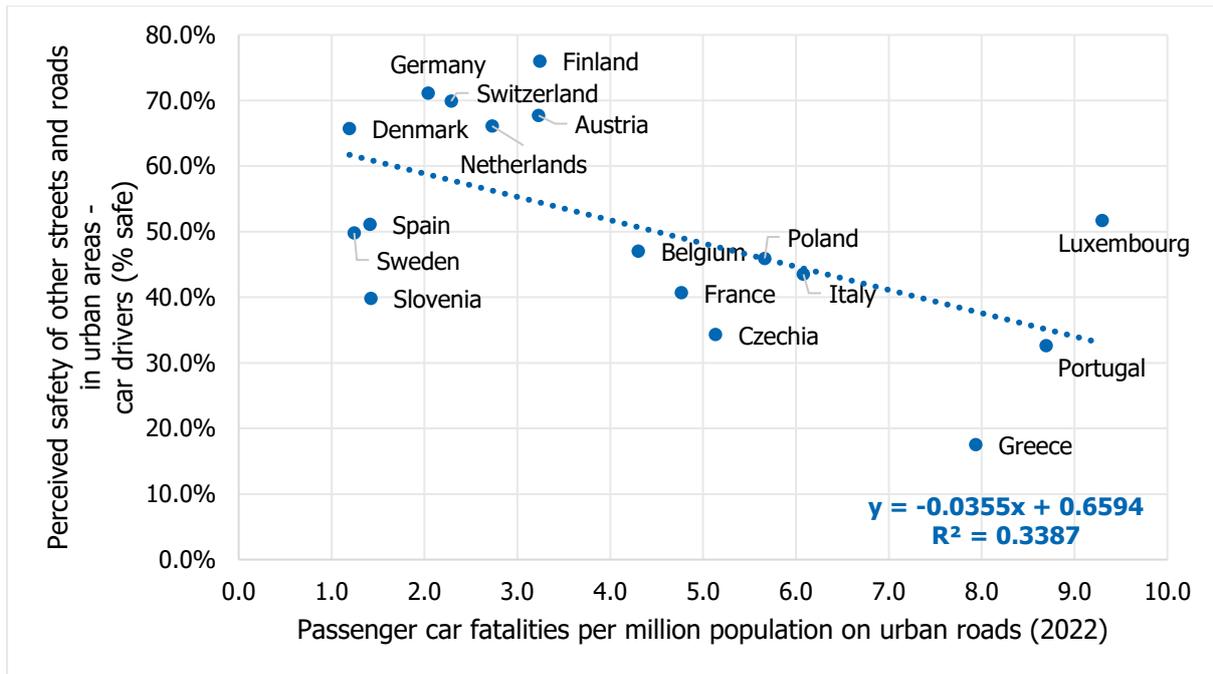


Figure 93: Linear relationship between car drivers’ perceived safety of other streets and roads in urban areas and passenger car fatalities per million population on urban roads (2022)

It can be observed that as passenger car fatalities increase, the safety perception of using inter-city motorways is reduced. Furthermore, countries with fewer recorded fatalities for 2022 report higher percentages of perceived safety for the use of this type of infrastructure and they are gathered in the upper left part of the figure. The safety feeling of respondents is reflected in road fatalities.

The highest coefficient of determination ( $R^2$ ) is recorded for the dependent variable of the perceived safety of other streets and roads in urban areas ( $R^2=0.34$ ), while the lowest is for the safety perception of intercity motorways ( $R^2= 0.24$ ).

Figures 94, 95, 96, and 97 present the correlation between Gross Domestic Product (GDP) per capita for the ESRA3 participating countries in 2021 with the dependent variables of the perceived safety of inter-city motorways, thoroughfares and high-speed roads within cities and other streets and roads in urban areas respectively.

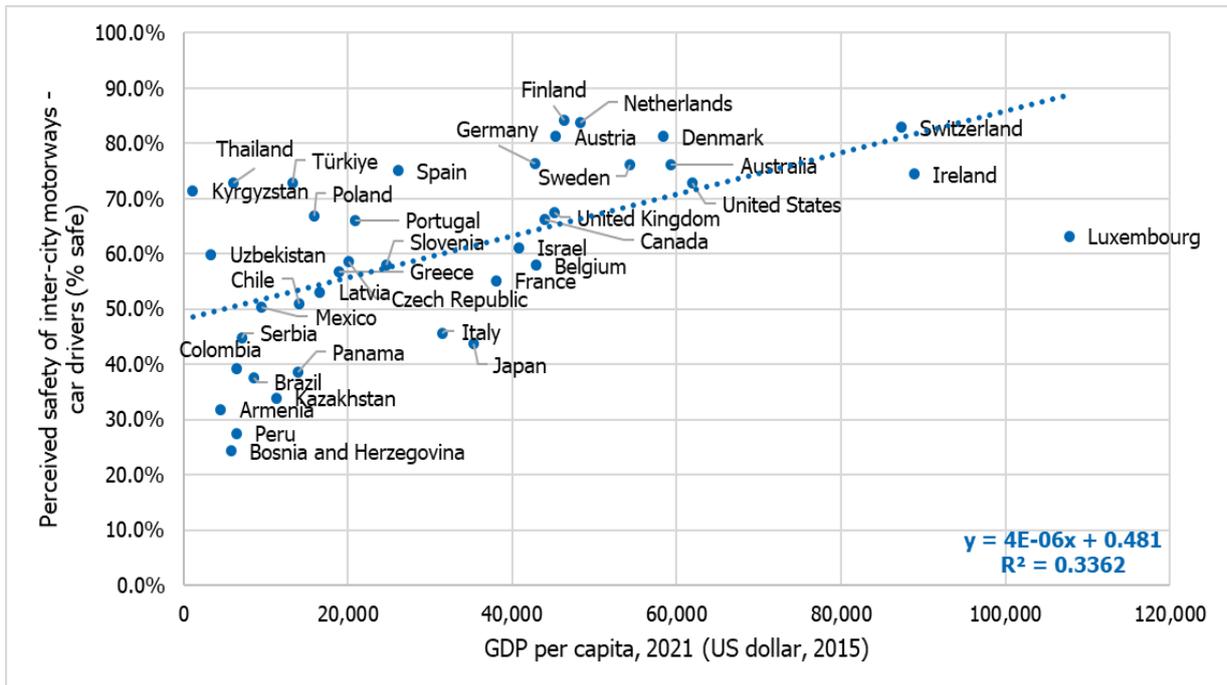


Figure 94: Linear relationship between car drivers’ perceived safety of inter-city motorways and Gross Domestic Product per capita (2021)

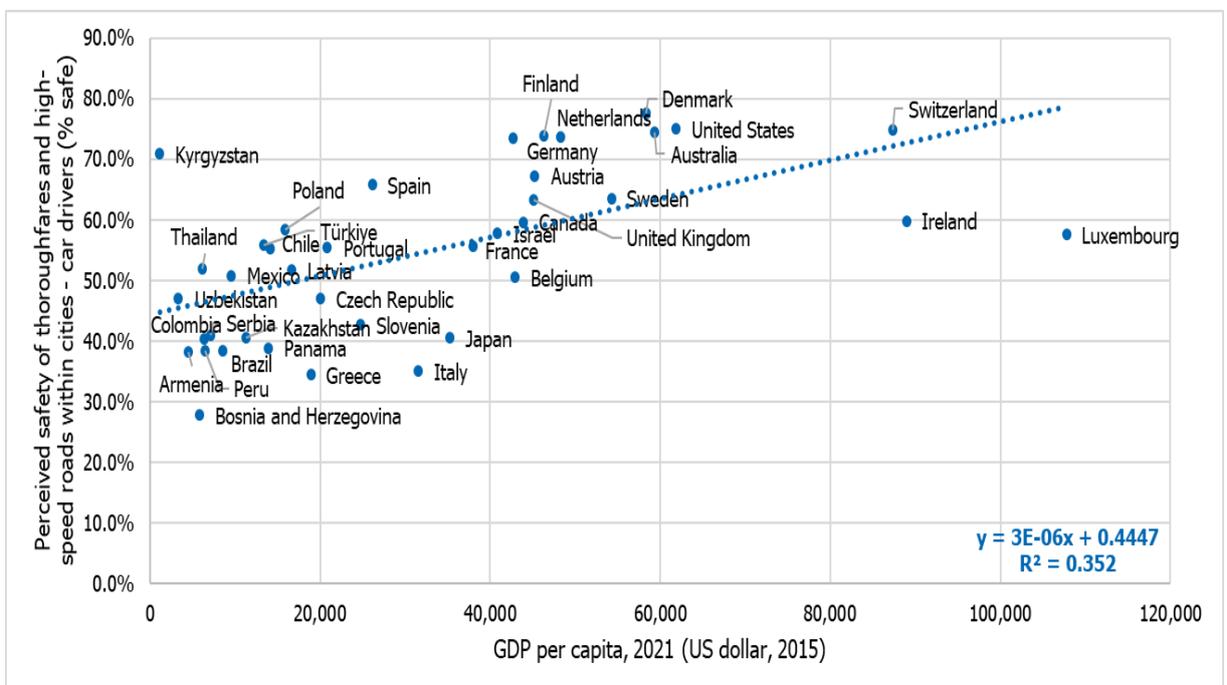


Figure 95: Linear relationship between car drivers’ perceived safety of thoroughfares and high-speed roads within cities and Gross Domestic Product per capita (2021)

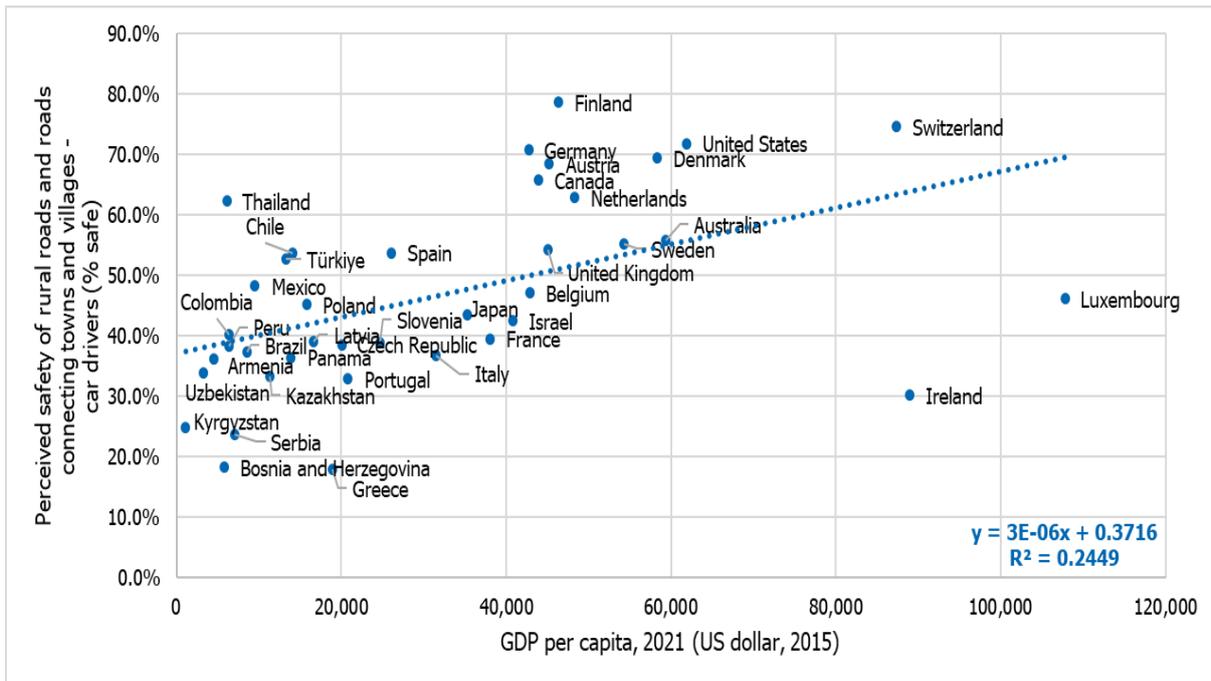


Figure 96: Linear relationship between car drivers’ perceived safety of rural roads and roads connecting towns and villages and Gross Domestic Product per capita (2021)

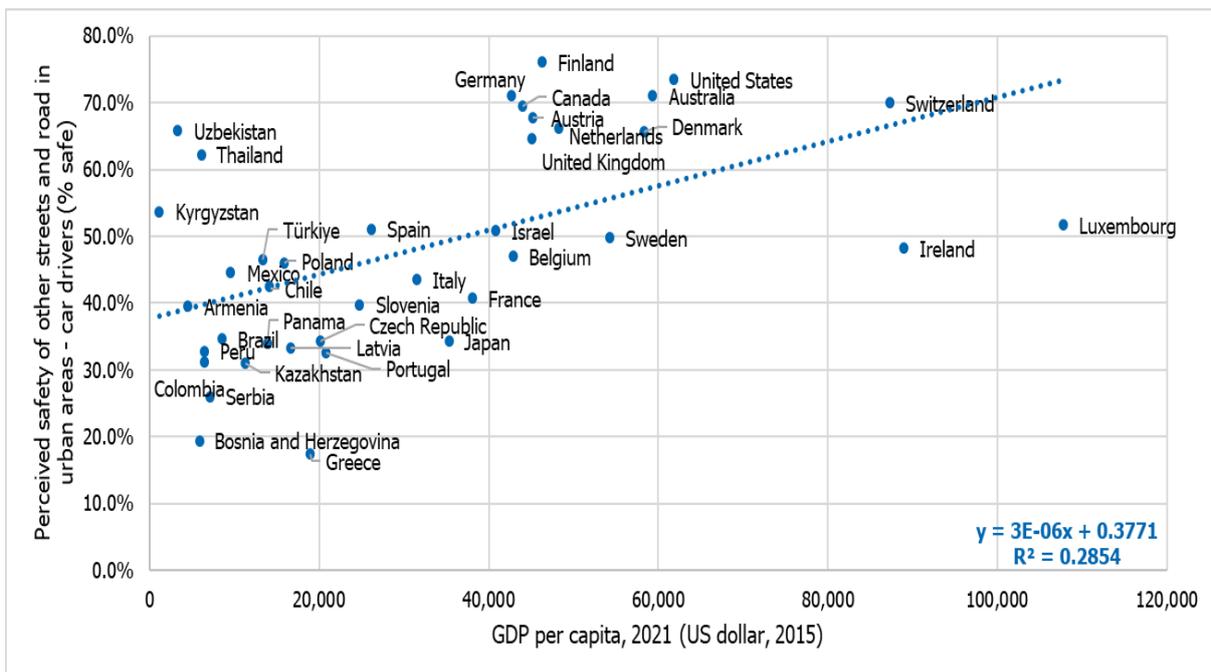


Figure 97: Linear relationship between car drivers’ perceived safety of other streets and roads in urban areas and Gross Domestic Product per capita (2021)

According to the previous figures, there is a quite evident linear relationship between GDP per capita and perceived safety rates. More precisely, as the GDP per capita increases, the perceived safety of the use of these types of infrastructure also increases.

The highest coefficient of determination ( $R^2$ ) is recorded for the dependent variable of the perceived safety of thoroughfares and high-speed roads within cities ( $R^2=0.35$ ), while the lowest for the safety perception of intercity motorways ( $R^2= 0.24$ ).

### 3.2.2 Moped riders and Motorcyclists

Figures 98, 99 and 100 present the correlation between moped riders and motorcyclists' fatalities per million population in 2022 with the dependent variables of perceived safety of rural roads and roads connecting towns and villages, thoroughfares and high-speed roads within cities and other streets and roads in urban areas respectively.

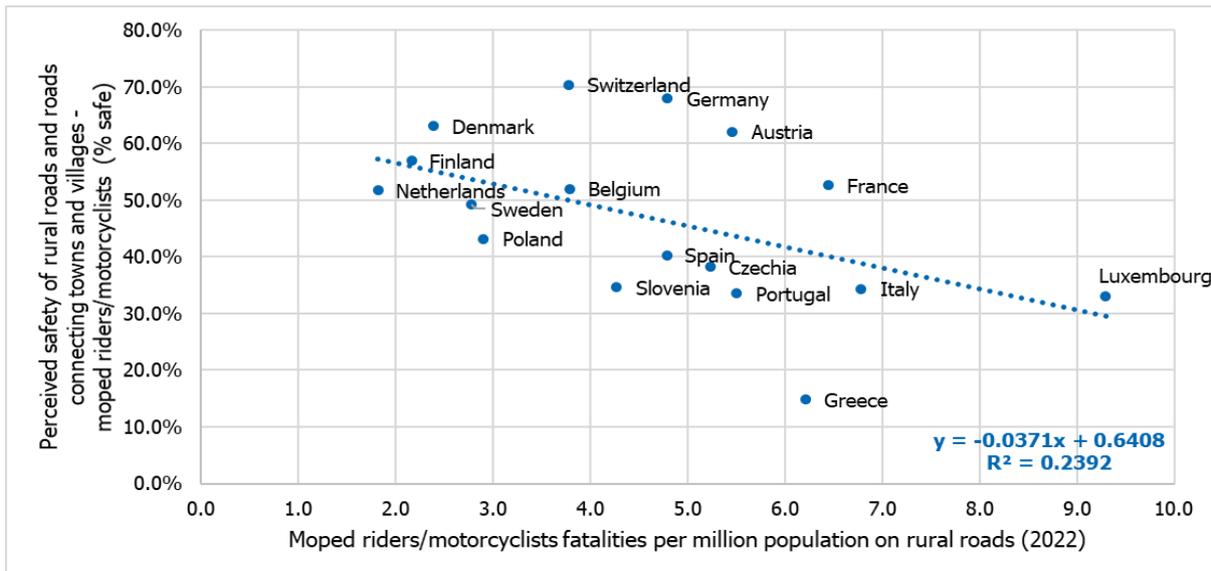


Figure 98: Linear relationship between moped riders and motorcyclists' perceived safety of rural roads and roads connecting towns and villages and moped riders and motorcyclists' fatalities per million population on rural roads (2022)

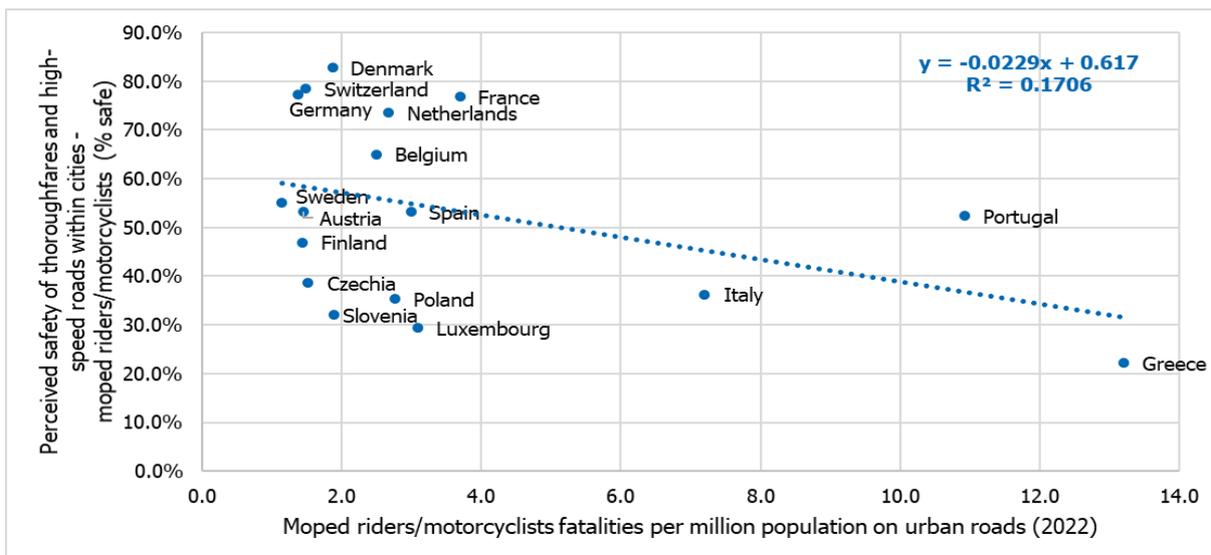


Figure 99: Linear relationship between moped riders and motorcyclists' perceived safety of thoroughfares and high-speed roads within cities and moped riders and motorcyclists' fatalities per million population on urban roads (2022)

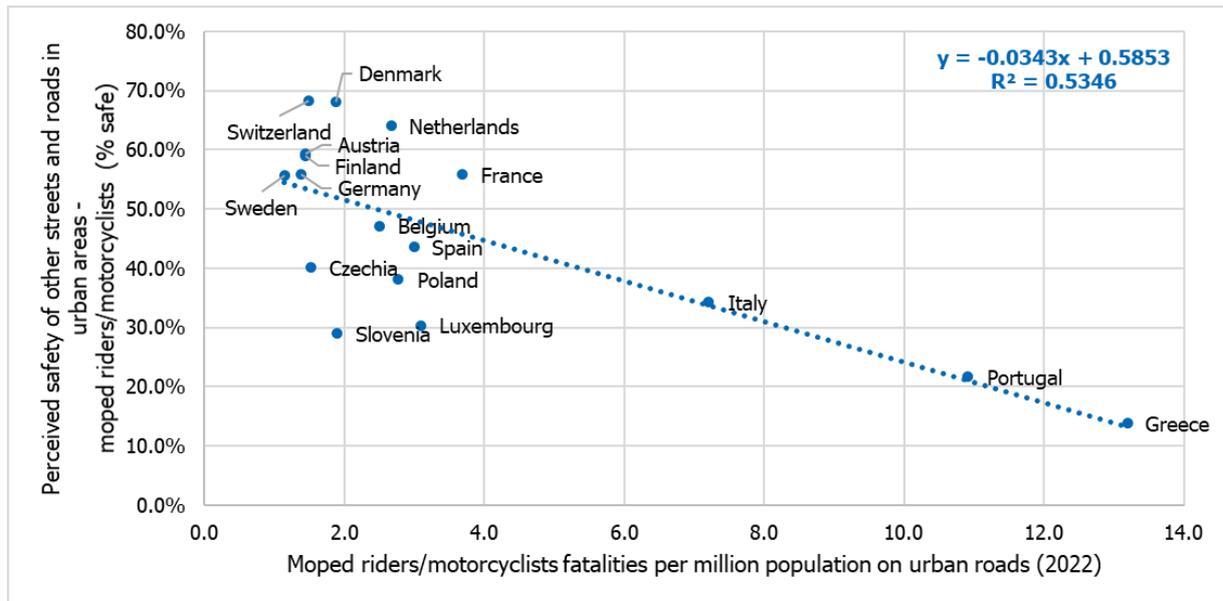


Figure 100: Linear relationship between moped riders and motorcyclists’ perceived safety of other streets and roads in urban areas and moped riders and motorcyclists’ fatalities per million population on urban roads (2022)

According to the previous figures, as the fatalities of moped riders and motorcyclists increase, the safety perception of using rural roads and roads connecting towns and villages, thoroughfares and high-speed roads within cities and other streets and roads in urban areas is reduced. Furthermore, countries with fewer recorded fatalities for 2022 report higher percentages of perceived safety for the use of this type of infrastructure and the majority of the countries are gathered in the upper left part of the figures.

The highest coefficient of determination ( $R^2$ ) is recorded for the dependent variable of the perceived safety of other streets and roads in urban areas ( $R^2=0.53$ ), while the lowest for the safety perception of thoroughfares and high-speed roads within cities ( $R^2= 0.17$ ).

### 3.2.3 Pedestrians

Figures 101, 102 and 103 present the correlation between pedestrians’ fatalities per million population in 2022 with the dependent variable of perceived safety of rural roads and roads connecting towns and villages with sidewalks and streets and roads in urban areas with and without sidewalks respectively.

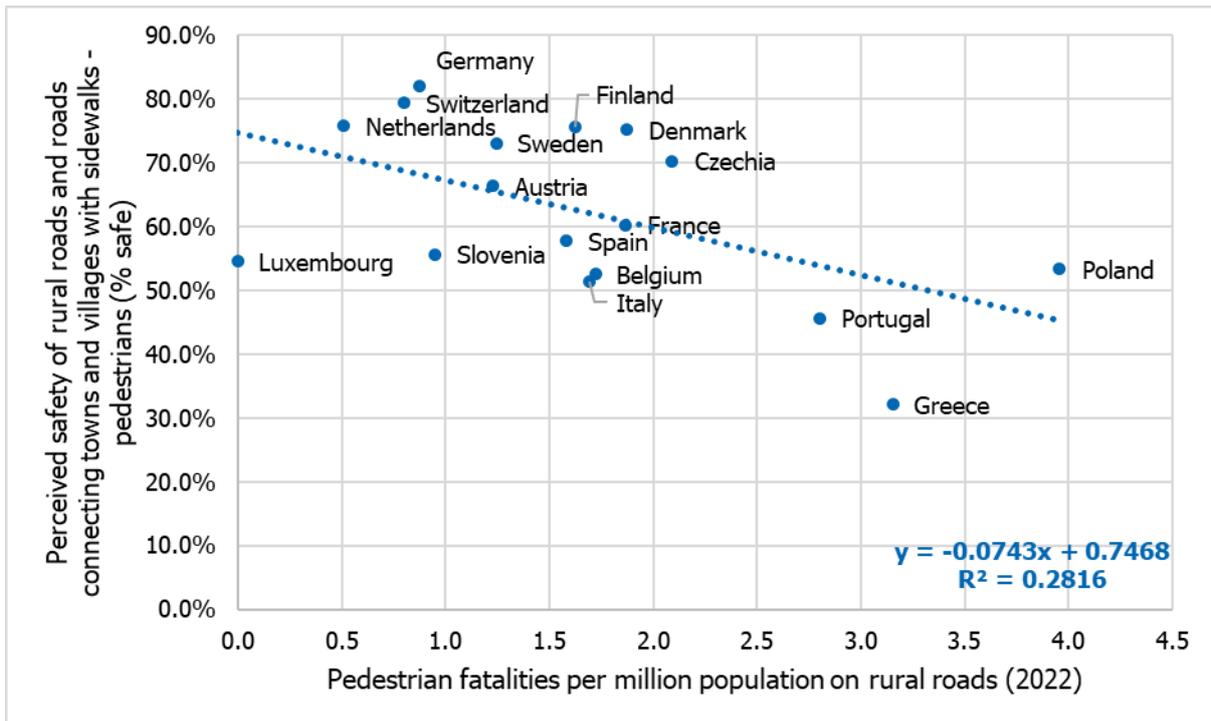


Figure 101: Linear relationship between pedestrians’ perceived safety of rural roads and roads connecting towns and villages with sidewalks and pedestrians’ fatalities per million population on rural roads (2022)

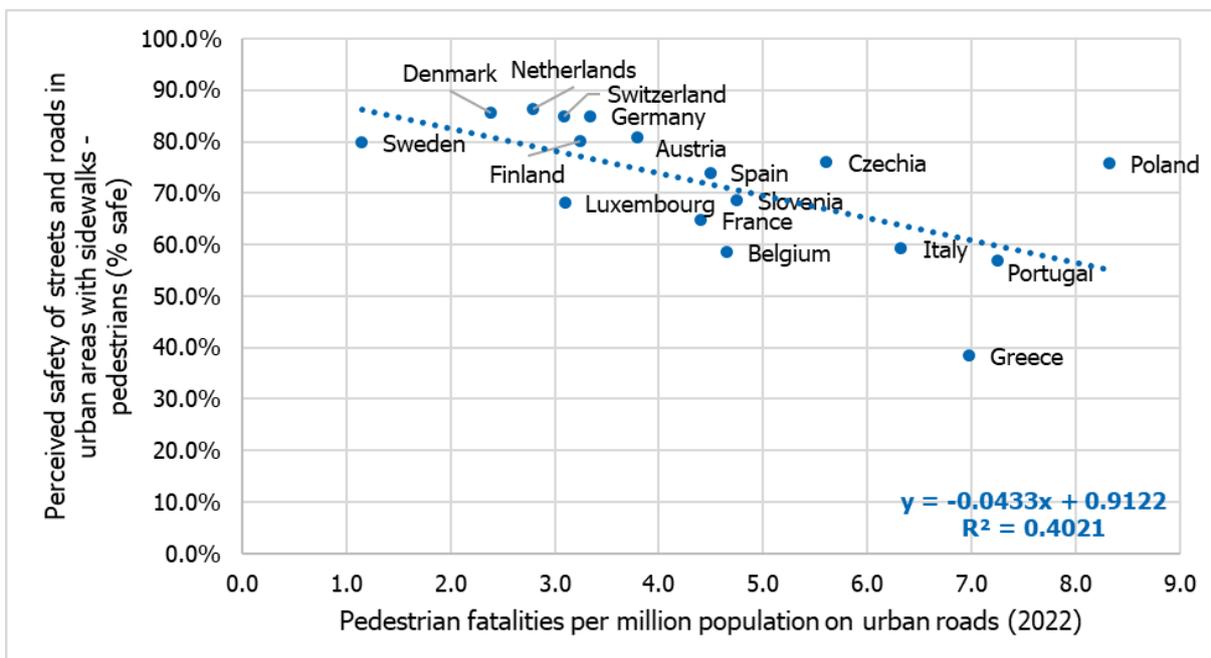


Figure 102: Linear relationship between pedestrians’ perceived safety of streets and roads in urban areas with sidewalks and pedestrians’ fatalities per million population on urban roads (2022)

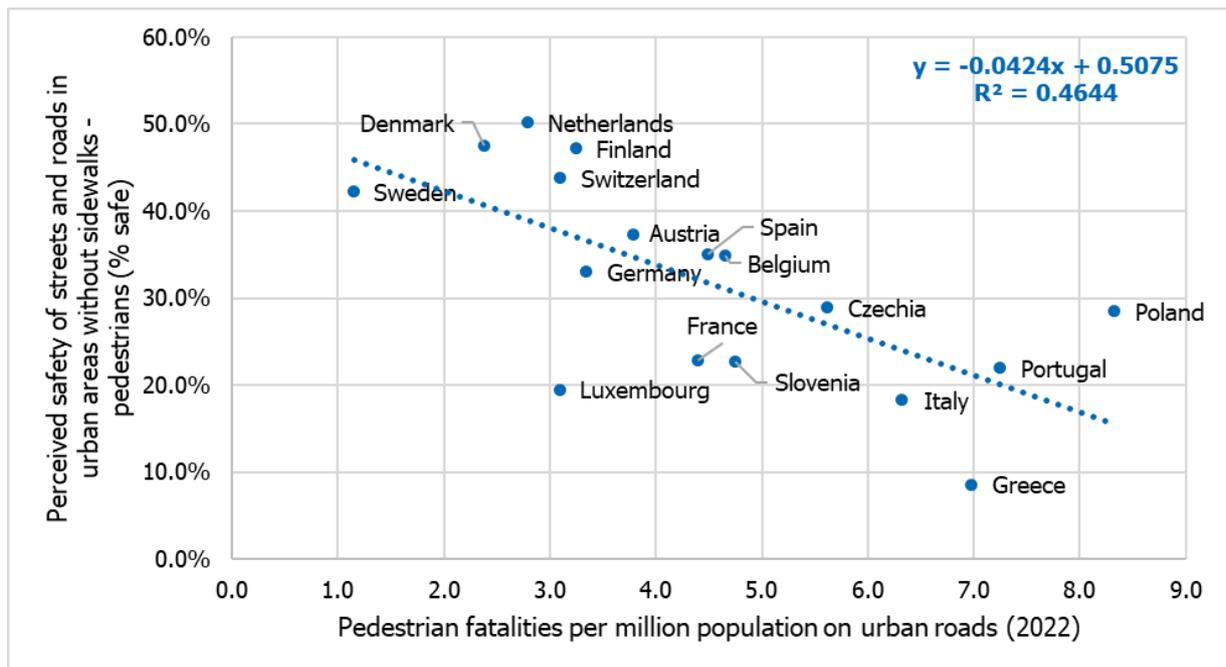


Figure 103: Linear relationship between pedestrians' perceived safety of streets and roads in urban areas without sidewalks and pedestrians' fatalities per million population on urban roads (2022)

According to the previous Figures, as the fatalities of pedestrians increase, the safety perception of using rural roads and roads connecting towns and villages with sidewalks and streets and roads in urban areas with and without sidewalks is reduced.

Regarding the coefficient of determination ( $R^2$ ), the highest value is recorded for the dependent variable of the perceived safety of streets and roads in urban areas without sidewalks ( $R^2=0.46$ ), while the lowest for the safety perception of rural roads and roads connecting towns and villages with sidewalks ( $R^2= 0.28$ ).

### 3.3 Limitations of the data

This report is based on self-reported behaviours and attitudes on road safety issues, which have known limitations regarding their accuracy and lack of direct observation capabilities (Kelley et al., 2003). In general, self-reported data are vulnerable to some biases. Common biases are (Choi & Pak, 2005; Krosnick and Presser, 2010):

- desirability bias – the tendency of respondents to provide answers which present a favourable image of themselves, e.g., individuals may over-report good behaviour or under-report bad, or undesirable behaviour. In other words, subjects may make the more socially acceptable answer rather than being truthful,
- bias through misunderstanding of questions - the wording of the questions may be confusing or have different meanings to different subjects,
- recall error - unintentional faulty answers due to memory errors.

## 4 Conclusions

The findings from the comprehensive analysis of infrastructure usage and safety perceptions among various road users provide valuable insights into the current state of road safety across different regions and road types. These insights are crucial for developing targeted strategies aimed at improving road infrastructure and enhancing safety measures.

The study revealed distinct patterns in the types of infrastructure utilized by different road users across continents. Regarding the use of inter-city motorways by car drivers Europe presents the highest usage rates at 62.9%, followed closely by America at 59.3%. Thoroughfares and high-speed roads within cities are heavily utilized across all regions, with America leading at 69.8%. Rural roads and roads connecting towns and villages see significant usage in Europe, where 75.2% of car drivers utilize these routes. In urban areas, other streets and roads are most frequently used, particularly in Asia-Oceania where 68.1% of car drivers navigate these roads. Mopeds and motorcyclists demonstrate varying rates for use of infrastructure, with high usage rates on thoroughfares within cities in America (64.3%) and Europe (50.6%). Cyclists show the highest usage rates on urban roads with cycle lanes, particularly in Europe, where it reaches 71.6%. Pedestrians, likewise, have the highest usage rates on urban streets with sidewalks, with Europe achieving a notable 88.9%.

Perceptions of safety varied significantly across different types of infrastructure and user groups. Car drivers generally perceive inter-city motorways as relatively safe, particularly in Europe (66.1%), while thoroughfares within cities are perceived with slightly lower confidence in Asia-Oceania (53.0%). Rural roads and roads connecting towns and villages are perceived as moderately safe across all regions, with safety perceptions ranging from 49.6% in Asia-Oceania to 55.8% in America. In urban areas, safety perceptions are slightly lower, with other streets and roads perceived as safe by 51.4% in Europe and 55.3% in America. Moped riders and motorcyclists perceive thoroughfares within cities as safer in America (68.0%), compared to Asia-Oceania (52.1%). Similarly, cyclists express higher safety perceptions on urban roads with cycle lanes, particularly in Europe (64.5%). Pedestrians consistently feel safest on urban streets and roads with sidewalks, with perceptions exceeding 70% in Europe and remaining positive across all regions.

Road safety is reported to have significant social and economic impacts, especially in developing countries where crash costs constitute about 2%-4% of their GDP (Jadaan et al., 2018). The positive correlation between GDP per capita and perceived safety suggests that wealthier regions can afford better infrastructure and safety measures, which enhances the overall safety perception among road users. Conversely, the high crash costs in developing countries highlight the urgent need for improved road safety measures to mitigate these economic impacts.

Gender differences in infrastructure usage and safety perception were also investigated. Male car drivers, for instance, use most types of roads more frequently than their female counterparts, except for other streets and roads in urban areas. Similarly, male moped riders and motorcyclists use thoroughfares and high-speed roads within cities more frequently, while male cyclists prefer streets and roads in urban areas with cycle lanes. Pedestrians, irrespective of gender, predominantly use urban streets and roads with sidewalks. However, for a more thorough analysis, exposure data related to the mobility of road users (such as vehicle-kilometres travelled by vehicle type, gender, age, etc.) are necessary to analyze such patterns more comprehensively.

Based on these findings, several recommendations can be made to enhance road safety across different types of infrastructure: prioritizing maintenance and upgrades on inter-city motorways and rural roads to reduce crash rates caused by poor road conditions, implementing advanced warning systems and speed management measures on thoroughfares and high-speed roads within cities to improve driver awareness and reduce speeding, designating lanes for cyclists and building sidewalks on urban streets and roads to enhance safety for vulnerable road users, and integrating smart technologies such as adaptive traffic signals and real-time traffic updates to improve traffic management and safety.

In conclusion, the findings underscore the importance of tailored safety measures and infrastructure improvements to enhance road safety globally. By addressing the specific needs and preferences of different road users and regions, authorities can effectively reduce crash rates and improve overall

transportation safety standards. Future research could also explore the potential connection between the frequency of use of different modes of transport and the perception of safety. Investigating this relationship could provide additional insights into how usage patterns influence safety perceptions and further guide targeted safety interventions and infrastructure improvements. Certainly, future research should continue to monitor safety perceptions and infrastructure usage patterns to guide ongoing improvements and policy developments in road safety.

### **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<sup>1</sup>)?** 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

<sup>1</sup> 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 ( $\leq 50$  cc or  $\leq 4$  kW) - drive a motorcycle ( $> 50$  cc or  $> 4$  kW) - 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<sup>2</sup>

#### 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<sup>3</sup> without using child restraint systems (e.g., child safety seat, cushion)
- transport children above 150cm<sup>4</sup> 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<sup>5</sup>:** 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

<sup>2</sup> This question was adapted to national legal regulation.

<sup>3</sup> This question was adapted to national legal regulation.

<sup>4</sup> This question was adapted to national legal regulation.

<sup>5</sup> 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<sup>6</sup>) 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.

<sup>6</sup> 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 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<sup>7</sup> 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!

<sup>7</sup> 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

