ESRA

www.esranet.eu

E-Survey of Road users' Attitudes

Distraction (mobile phone use) & fatigue

ESRA3 Thematic report Nr. 3

Publication date of this report: 16/07/2024
Main responsible organization for this report: Portuguese Road Safety Association (PRP), Portugal
D/2024/0779/48- Report number: 2024-R-20-EN

Authors: Alain Areal[1], Carlos Pires[1], Rosa Pita[1], Patrícia Marques[1], & José Trigoso[1]

[1] Portuguese Road Safety Association, Portugal

Please refer to this document as follows: *Areal A., Pires C., Pita R., Marques P., & Trigoso J. (2024). Distraction (mobile phone use) & fatigue. ESRA3 Thematic report Nr. 3.* ESRA project (E-Survey of Road users' Attitudes). (2024-R-20-EN). Portuguese Road Safety Association.
https://www.esranet.eu/storage/minisites/esra2023thematicreportno3distractionandfatigue.pdf

Distraction (mobile phone use) & fatigue

ESRA3 Thematic report Nr. 3

Partners in the ESRA3 survey

ESRA coordination

- Vias institute, Belgium: *Uta Meesmann, Naomi Wardenier, Sophie Vanhove*

ESRA3 steering group partners

- BASt - Federal Highway Research Institute, Germany: *Fabian Surges, Anna Marie Harkin*
- DTU - Technical University of Denmark, Division of Transportation Science, Denmark: *Mette Møller, Thomas Christian Jensen*
- IATSS - International Association of Traffic and Safety Sciences, Japan: *Hideki Nakamura, Minoru Makuta, Yutaka Ohno*
- ITS - Motor Transport Institute, Poland: *Dagmara Jankowska-Karpa*
- KFV - Austrian Road Safety Board, Austria: *Gerald Furian, Susanne Kaiser*
- NTUA - National Technical University of Athens, Greece: *George Yannis, Alexandra Laiou, Dimitrios Nikolaou, Konstantinos Kaselouris*
- PRP - Portuguese Road Safety Association, Portugal: *Alain Areal, José Trigoso, Carlos Pires*
- SWOV - Institute for Road Safety Research, Netherlands: *Agnieszka Stelling*
- TIRF - Traffic Injury Research Foundation, Canada: *Craig Lyon, Ward Vanlaar, Robyn Robertson, Karen Bowman, Steve Brown, Milad Delavary*
- University Gustave Eiffel, France: *Marie-Axelle Granié, Brice Douffet, Aline Alauzet, Patricia Champelovier, Frédéric Martinez*

ESRA3 national/regional partners

- AAAFTS - AAA Foundation for Traffic Safety, USA: *Rebecca Steinbach*
- ATRANS - Asian Transportation Research Society, Thailand: *Tuenjai Fukuda*
- ORS/DITRDCA - Office of Road Safety, Department of Infrastructure, Transport, Regional Development, Communications and the Arts, Australia: *Joanne Wilson-Ridley*
- AVP - Slovenian Traffic Safety Agency, Slovenia: *Saša Jevšnik Kafol*
- BFU - Swiss Council for Accident Prevention, Switzerland: *Yvonne Achermann Stürmer*
- CDV - Transport Research Centre, Czech Republic: *Pavlina Skládaná*
- CTL - Research Centre for Transport and Logistics, Italy: *Davide Shingo Usami, Luca Persia, Francesca Damiani*
- Department for Transport, United Kingdom: *Matthew Tranter*
- DGT - Traffic General Directorate, Ministry of Interior, Spain: *Patricia Fernandez, Alvaro Gómez Mendez*
- Liikenneturva - Finnish Road Safety Council, Finland: *Marja Pakarinen, Leena Poysti*
- Fundación MAPFRE, Spain: *Jesús Monclús, Jorge Ortega*
- NRSA - Israel National Road Safety Authority, Israel: *Yiftach Gordoni-Lavy*
- RSA - Road Safety Authority, Ireland: *Velma Burns*, *Sharon Heffernan*
- RTSA - Road Traffic Safety Agency, Republic of Serbia: *Bojana Miljković, Milica Dragišić, Mladen Kovač*
- RTSD - Road traffic safety directorate, Latvia: *Juris Kreicbergs, Aivars Aksenoks*
- The Ministry of Mobility and Public Works, Luxembourg: *Alain Disiviscour, Nadine Di Letizia*
- VTI - Swedish National Road and Transport Research Institute, Sweden: *Anna Vadeby, Gunilla Sörensen*
- WHO - WHO Regional Office for Europe, Germany: *Jonathon Passmore*

Acknowledgement

The authors of this report would like to thank the following persons and organizations for their much-appreciated contribution to this report:

- PRP (Carlos Pires) for providing the descriptive figures;
- NTUA (Dimitrios Nikolaou) for providing contextual information on the topic;
- BASt (Fabian Surges) for reviewing this report and SWOV (Agnieszka Stelling) for coordinating the review procedure;
- Vias institute (Uta Meesmann, Naomi Wardenier, Sophie Vanhove) for coordinating the ESRA initiative, the fieldwork and the development of the ESRA3 survey and database;
- all ESRA3 steering group members for helping to develop the ESRA3 survey and the common ESRA3 output;
- all ESRA3 partners for supporting and financing the national ESRA3 surveys in 39 countries.

ESRA is funded through the contributions of the partner organisations, either from their own resources or from sponsoring. Part of the funding for Vias institute is provided by the Belgian Federal Public Service Mobility & Transport.

Table of contents

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)
OR	Odds Ratio

Executive summary

Objective and methodology

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

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

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

This thematic report describes the results of the ESRA3 survey concerning distraction and fatigue in traffic. Results on distraction focuses the use of a mobile phone while driving a car. It includes the analysis of aspects related to self-declared unsafe behaviours in traffic, acceptability of unsafe traffic behaviours (personal and social), attitudes towards the use of the mobile phone while driving a car, risk perception of using the mobile phone, support for policy measures, and perception of enforcement. Results of self-declared behaviours and personal acceptability are also presented for moped riders/motorcyclists, cyclists, and pedestrians. Only results for car drivers are included for fatigued driving: self-declared behaviours, personal acceptability, and risky perception. Results are presented separately for the three regions: Europe22, America8, and AsiaOceania6. The report includes comparisons among the regions as well as results by age and gender group within each region, by country, and the identification of factors that influence the self-declared behaviour of talking on a hand-held mobile phone while driving a car and driving a car while fatigued.

Key results

Distraction

Talking on a hands-free mobile phone while driving a car was the most prevalent self-declared behaviour in the three regions (% of at least once in the past 30 days): 51.0% in Europe22, 47.6% in America8, and 44.3% in AsiaOceania6. A lower percentage of car drivers reported talking on a hand-held mobile phone and reading a message or checking social media/news, however, the prevalence of these behaviours was similar within each region: 22.2% and 23.2% in Europe22; 30.5% and 31.5% in America8; 27.6% and 24.5% in AsiaOceania6. Overall, the use of a mobile phone while driving a car is more prevalent among men than women, and in younger car drivers than in the older ones.

Reading a message or checking social media/news at least once in the past 30 days was declared by more than 20% of the moped riders/motorcyclists in all regions: 20.7% in Europe22, 22.8% in America8, and 24.9% in AsiaOcenia6.

Reading a message or checking social media/news at least once in the past 30 days was declared by 20.5% of cyclists in Europe22, 24.0% in America8, and 19.5% in AsiaOcenia6.

More than half of the pedestrians reported that they had read a message or checked social media/news or had texted a message while walking down the street at least once in the past 30 days: 63.7% and 60.3%, in Europe22; 58.0% and 57.0% in America8; 53.5% and 51.6% in AsiaOceania6 region.

The personal acceptability of handling a mobile phone to talk or to text in traffic was rather low in all the regions – less than 5% of the road users considered acceptable to talk on a hand-held mobile phone while driving a car and to read a message or check social media/news while driving a car, riding a moped/ motorcycle, or while cycling. A much higher percentage of road users consider acceptable to talk on a hands-free mobile phone while driving a car: 38.6% in Europe22, 23.9% in America8, and 28.5% in AsiaOceania6. Overall, respondents believe that behaviours related to using mobile phones while driving a car are more acceptable by 'others', than by themselves.

The perceived behaviour control of talking on a hand-held mobile phone and of checking messages on the mobile phone while driving were the attitude's items with the highest percentage of agreement in all the regions: 8.0% and 5.7% in Europe22, 9.4% and 7.0% in America8, and 8.1% and 6.3% in AsiaOceania6. Men and the younger car drivers have a perception of higher behaviour control of using a mobile phone while driving than women and the older car drivers.

More than half of the European (66.3%) and American (53.2%) road users believe that using a hand-held mobile phone while driving is often/frequently the cause of a road crash involving a car – these percentages were higher than in AsiaOceania6 region (35.6%). Using a hands-free mobile phone was considered less risky in all the regions: 41.8% in Europe22, 43.7% in America8, and 31.2% in AsiaOceania6.

Most road users support forbidding all drivers of motorized vehicles to use a hand-held mobile phone while driving: 79.3% in Europe22, 81.3% in America8, and 79.2% in AsiaOceania6.

The perception of enforcement for the use of a hand-held mobile phone to talk or text while driving is higher in AisaOceania6 region (25.9% answered that it is likely to be checked by the police for this behaviour) than in Europe22 (15.0%) and America8 (15.9%).

Overall, the odds of talking on a hand-held mobile phone while driving a car are higher for male drivers, younger drivers, drivers with lower household's income, professional drivers, and increase with the frequency of driving a car. Stronger attitudes towards using the mobile while driving a car are associated with higher likelihood of talking on a hand-held mobile phone while driving. The perceived behaviour control of being able to talk on a hand-held mobile phone while driving a car is the attitude that influences the most the self-declared behaviour.

The comparison between ESRA2 and ESRA3 results suggest that car drivers may be replacing the use of a hand-held mobile phone to talk while driving a car by hands-free systems. On average, in 24 countries that was possible to compare, the percentage of car drivers who reported talking on a hand-held mobile phone while driving a car decreased by 4.6%, while the percentage of using hands-free systems increased by 3.8%.

The correlation between self-declared behaviours and observed behaviours (Baseline project) at a country level show that the prevalence of handling a mobile device while driving a car (observed behaviour) is positively correlated with the self-declared behavior of talking on a hand-held mobile phone while driving a car ($r = 0.906$, p-value = 0.013) and reading a message or checking social media/news while driving a car ($r = 0.636$, p-value = 0.174) – analysis only possible with 6 countries.

In countries where the population spend more time using smartphones and the internet on mobile phones, the percentages of the self-declared behaviour of talking on a hand-held mobile phone and of reading a message or checking social media/news are higher – positive correlation between the prevalence of the self-declared behaviour and the average time spent using smartphones and using the internet on mobile phones at a country level (r between 0.723 and 0.747).

Fatigue

Fatigued driving at least once in the past 30 days was reported by about one out of five car drivers in all the regions: 18.4% in the Europe22, 18.6% in America8, and 20.1% in AsiaOceania6. This behaviour

is more prevalent among men than women in all the regions. European car drivers until 44 years reported fatigue driving more often the older ones.

Despite the high rates of the self-declared behaviour, fatigued driving was considered acceptable by less than 4% in all the regions: 2.5% in Europe22, in 3.5% in America8, and 2.7% in AsiaOceania6. The personal acceptability was higher among men than women in Europe22 and America8, but no differences were found in AsiaOcenia6 region. The behaviour is more acceptable in European drivers until 44 years and in American drivers aged 35 to 54 years than in the other age groups – no differences regarding the age were found in AsiaOcenia6.

More than half of the European (64.4%) and American (52.1%) road users believe that driving while tired is often/frequently the cause of a road crash involving a car – these percentages were higher than in AsiaOceania6 region (38.4%). Small differences were found between men and women in all the regions. The proportion of road users who perceive tired driving as a frequent road crash cause is higher in road users older than 44 years than the younger ones in Europe22 and America8 – no age differences were found in AsiaOcenia6.

Overall, the odds the self-declared fatigued driving are higher for male drivers, drivers until 54 years, professional drivers, and increase with the frequency of driving a car. The personal acceptability of driving a car while fatigued has a strong influence in the self-declared behaviour in all the regions: OR = 5.62 in Europe22, OR = 7.71 in America8, and OR = 4.51 in AsiaOceania6.

Key recommendations

Policy recommendations at national and regional level

- Define indicators and set targets at national and regional levels, such as the prevalence of distracted driving, the prevalence of fatigued driving, the number of controls for mobile phone use.
- Incorporate information on risks associated with distraction in traffic and fatigued driving in educational programmes and in driver license training.
- Conduct awareness-raising campaigns on the risks of distraction in traffic and fatigued driving.
- Advise drivers for the importance of fatigue detection systems in their vehicles, how to use it, and to take warning signals by these systems seriously.
- Increase enforcement (and enforcement perception) and find new methods of enforcement in relation to the mobile phone use while driving. Ensure that penalties are applied to drivers who break the law.
- Implement rumble strips on major roadways (motorways and rural roads). Make the use of rumble strips mandatory in the Trans-European Transport Network.

Specific recommendations to particular stakeholders

- *[To Non-Governmental Organizations (NGOs)]* Contribute to education and awareness raising campaigns and events against distraction in traffic and fatigued driving.
- *[To vehicle manufacturers, other companies and research organisations]* Develop low-cost solutions to be incorporated in vehicles that can detect and prevent distraction and fatigue.
- *[To private and public companies]* Develop road safety plans that include policies concerning the use of the mobile phone in traffic and fatigued driving.

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

Driver distraction and fatigued driving are generally considered central issues in road safety, and two of the basic risk factors in traffic, together with speeding and driving under the influence of alcohol and drugs (DUI). It is estimated that road users' distraction is a contributing factor in about 5 to 25% of road crashes in Europe (European Commission, 2022) and fatigued driving in 15 to 20% of serious road crashes (European Commission, 2021). However, these figures are likely to be an underrepresentation as the impact of distraction and fatigue on road crashes is difficult to estimate due to the difficulties in coding it as contributory factors after the event.

Distraction can be defined as a diversion of attention away from activities critical for safe driving toward a competing activity (Lee et al., 2008). Distracted drivers are still alert, but their attention is focussed on other activities than driving. Activities like talking on the mobile phone, reading/typing messages, operating a GPS, talking to a passenger, eating, and drinking are all potentially distracting activities. These activities can affect the essential aspects of driving a vehicle and increase the risk of having a road crash. Distracted drivers swerve more, which indicates diminished control over the vehicle; have longer reaction times; miss information from the road environment; and make more errors while driving (SWOV, 2020).

Using a hand-held mobile phone while driving involves four types of distraction: visual (looking at something other than the road), auditory (hearing something not related to driving), manual (manipulating something other than the steering wheel) and cognitive (when drivers focus their attention away from the driving task). Often, different types of distraction occur simultaneously. Using a hands-free mobile phone has no significant advantages because it also causes cognitive distraction. Like drivers using hand-held mobile phones, drivers using hands-free devices also tend to 'look at' but not 'see' and are more likely to fail relevant information from the road. Drivers talking on the phone focus on a smaller area of the road and fail to see hazards, even when they look directly at them (Briggs et al., 2016). They tend to miss exits, go through red lights and stop signs, and miss other important information from the road. Furthermore, the reaction time, which involves attention resources and information processing, is longer during phone conversations while driving (NSC, 2012). Reading or sending text messages or emails while driving, which also requires visual, manual, and cognitive attention from the driver, is becoming an increasing source of distraction, mainly among young drivers. While texting, drivers spend long periods without looking to the road, which has a huge impact on the visual distraction and increases the risk of being in an accident (Olson et al., 2009).

Results from ESRA2 survey on distraction (Pires et al., 2019; Meesmann et al., 2022a) showed that 29% of European car drivers (24 countries) talked on a hand-held mobile phone while driving at least once in the 30 days previous to the survey, 48% talked on a hands-free mobile phone, and 24% read a text message/email or checked social media while driving. These percentages were higher in countries from other regions: 38%, 51%, and 36% in United States/Canada; 41%, 57%, and 40% in nine Asia/Oceanic countries; 52%, 65%, and 45% in 12 African countries. In the National Survey on Distracted Driving Attitudes and Behaviours in the United States (Schroeder et al., 2018) 42% of drivers reported answering their cell phones while driving at least some of the time (21% do it rarely and 37% reported never answering). Concerning texting, 9% declared sending text messages or e-mails while driving at least sometimes and 11% do it rarely.

Survey data mentioned above allow to estimate a period prevalence, which represents the proportion of road users who reported the behaviour over a period of time (e.g. in last 30 days). Different measures can be obtained through studies that involve observing behaviours in traffic. Such studies estimate a point prevalence, which represents the proportion of road users engaging in a particular behaviour at a specific point in time. For example, according to data from Baseline project based on roadside observation surveys in 15 European countries, the point prevalence of handling a mobile device while driving ranged from 1.7% in Finland to 9.5% in Latvia (Boets, 2023). In the United States, the National Highway Traffic Safety Administration estimates that 5.3% of drivers were using some type of phone, either hand-held or hands-free, at a typical daylight moment in 2017: 2.9% were handling cell phones, 0.4% were using headsets and 2.0% were manipulating hand-held devices (NHTSA, 2019).

Research has identified several factors that influence the decision of using the mobile phone while driving. Several studies report that men and younger people are more likely to engage in several risky driving behaviours, including using mobile phone while driving (Ivers et al., 2009; Nurullah, 2013). A

positive attitude towards the use of the mobile phone while driving, the perceived behaviour control, and the perception of others' approval increase the likelihood of its use while driving (Ajzen, 1991; Sullman et al., 2018). Personality traits that lead drivers to take risks while driving (Zhao et al., 2013), the social expectation to return calls or answer text messages immediately, professional reasons, or perceived practical, social, and psychological benefits were associated with a higher risk of using the mobile phone while driving (Nurullah, 2013). Other factors like income, education and frequency of driving were also related with a higher probability of talking on the phone while driving. On the other hand, the risk perception is associated with a lower likelihood of using the mobile phone while driving (Shi et al., 2016; Oviedo-Trespalacios et al, 2017; Trigoso et al., 2016; Pires et al., 2019).

Countermeasures to tackle the use of the mobile phone in traffic should focus on road users, road infrastructure, and vehicles (European Commission, 2022). Increasing enforcement and the subjective chance of being caught for hand-held mobile, raising awareness about the dangers of distraction in traffic through campaigns, and including the topic of driver distraction in driver education and continuing training for professional drivers are some of the measures that can lead to behavioural change in road users. In terms of infrastructure, the European Commission mentions that rumble strips can reduce the number of crashes caused by distraction or limit their severity. Forward collision and lane departure warning systems in vehicles are some the technologies that can prevent the consequences of distracted driving (European Commission, 2022).

Fatigue while driving is another problem that can endanger the safety of road users. The Road Safety Thematic Report on Fatigue from the European Road Safety Observatory (European Commission, 2021) highlights that fatigue is a broad concept often used interchangeably with terms like tiredness, drowsiness, and sleepiness, and lacks a single definition. The report includes several definitions of fatigue, such as "an overwhelming sense of tiredness, lack of energy, and a feeling of exhaustion, associated with impaired physical and/or cognitive functioning." It also describes fatigued driving as "a psychophysiological state that occurs when a person is driving and feeling tired or drowsy, to the extent that they have reduced capacity to function, resulting in performance decrements, negative emotions, and boredom as they attempt to stay awake during the task." Fatigue can result in both cognitive and motor function impairment, which, while driving, lead to increased reaction times, reduce attention, poorer psychometric coordination, and less efficient information processing. This condition can compromise the drivers' ability to control their vehicle and increase the crash risk. For example, a meta-analysis that included 14 studies (Moradi, Nazari & Rahmani, 2018) estimated that the odds of having a road crash is 1.29 (95% CI: 1.24-1.34) times higher for fatigued drivers than for non-fatigued drivers.

The amount of time spent carrying out a particular task – for example driving for long hours without interruption – is one of the most important causes of fatigue. Other causes are the lack of sleep, biorhythm, the monotony of the task, and individual characteristics like age, medical condition, or the use of medicines, alcohol, or drugs (SWOV, 2019). Professional drivers, people working in shifts, young men, and people with untreated sleep problems/disorders are some of groups more often involved fatigue-related crashes (European Commission, 2021).

Results from ESRA2 survey (Goldenbeld & Nikolaou, 2022; Meesmann et al., 2022a), showed that fatigued driving, defined as "driving a car so sleepy that the driver has trouble keeping his/her eyes open", was reported by 20% of European car drivers (24 countries), by 21% in three American countries, by 26% in nine Asia/Oceanic countries, and by 22% in 12 African countries. The same report concluded that men, drivers younger than 55 years, drivers with lower education levels, and drivers who live in semi-urban/rural areas have higher risk of driving while tired. Drivers who consider that fatigued driving is acceptable are more likely to report the behaviour and drivers who believe that fatigued driving is frequently the cause of a road crash involving car are less likely to drive a car while tired.

Driver fatigue countermeasures should focus on drivers, road infrastructure, and vehicles (European Commission, 2021). Drivers should be informed about causes, effects, and symptoms of fatigue, and advised on how to limit fatigue effects through mass-media publicity campaigns and during education training. Furthermore, for professional drivers, employers should plan the work in such a way that their drivers can abide by the driving times and rest periods, and they should actively ensure drivers comply with these requirements. As for the infrastructure, the European Commission suggests the provision of

sufficient locations and facilities on the roads to allow truck and car drivers to take a rest as a measure to reduce the prevalence of fatigued driving. The implementation of longitudinal rumble strips to warn drivers, both auditorily and kinetically, that their vehicle is about to run off the road can reduce the consequences of fatigue driving (Botteghi et al., 2024; European Commission, 2022). Forward collision and lane departure warning systems in vehicles can also prevent the consequences of fatigued driving (European Commission, 2022).

This thematic ESRA report aims at describing self-declared behaviours and attitudes related to distracted (mobile phone use) and fatigued driving in a sample from 39 countries worldwide. Factors that influence both self-declared behaviours are also identified within each of the three ESRA3 regions: Europe22, America8, AsiaOceania6.

The ESRA3 findings are used to answer the following research questions:

- What is the prevalence of self-declared distracted (mobile phone use) and fatigued driving?
- What is the level of self-declared acceptability of distracted (mobile phone use) and fatigued driving?
- How strong are the attitudes toward towards using a mobile phone while driving?
- How common is the perception of distracted driving (mobile phone use) and driving while tired as a cause of a road crash involving a car?
- How common is the perception that a car driver can checked by the police for using a mobile phone while driving?
- What are the differences between regions, gender, and age groups regarding the self-declared behaviours, acceptability, and perceptions?
- Which factors are associated with the prevalence of the self-declared behaviour of talking on a mobile phone while driving a car and of driving a car while fatigued?

2 Methodology

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

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

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

The participating countries in ESRA3 were:

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

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

Table 1: ESRA3 Thematic Reports.

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

The present report summarizes the ESRA3 results with respect to distraction (mobile phone use) in traffic and fatigued driving. 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).

Three risky behaviours concerning the use of the mobile phone while driving are explored in this report: talking on a hand-held mobile phone, talking on a hands-free mobile phone, and reading a message or checking social media/news while driving. It focuses on car drivers, but results of moped riders/motorcyclists, cyclists, and pedestrians are also presented. For these road users, results are less detailed as there are specific ESRA reports where more detailed results are available. The report includes the analysis of several aspects related to the use of mobile phone in traffic: self-declared behaviours, acceptability (personal and social), behaviour believes and attitudes, perceived behaviour control, habits, risk perception, support for policy measures, and perception of enforcement. As for fatigued driving, only results for car drivers are included: self-declared behaviours, personal acceptability, and risky perception.

Most of the questions of the ESRA3 survey were presented on Likert scales, which were dichotomized for the analysis. Description of the scales, the correspondent dichotomization and the reference population for each question are described in the beginning of each section in the results.

All the results are presented separately for the three ESRA3 regions: Europe22, America8, and AsiaOceania6. The AsiaOcenaia6 mean does not included Armenia, Kyrgyzstan, and Uzbekistan due to different methodology in data collection in these countries (face-to-face CAPI). The report also includes results by gender and by age group within each region, and by country. 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 regions, the weighting also took into account the population size of each country in the total set of countries from this region. More information about the weighting is available in Appendix 2: ESRA3 weights.

Due to the nominal nature of the data, the Chi-square Test for Independence was used to assess if the answers depend significantly on the region, on the gender and on the age group. Pairwise comparisons were used to identify the pairs of groups (region, gender, age groups) that differ significantly. The strength of the association between variables, also described as effect size, was assessed through the Cramer's V coefficient. The following thresholds were considered to classify the effect size (Cohen, 1988): association with region (2 degrees of freedom) – small=0.07, medium=0.21, large=0.35; association with gender (1 degree of freedom) – small=0.10, medium=0.30, large=0.50; association with age group (5 degrees of freedom) – small=0.05, medium=0.13, large=0.22. Logistic regression models were carried out to study the factors that influence the self-declared behaviours of distracted driving and fatigued driving. Odds ratios (OR), and the respective 99% Confidence Intervals (CI 99%), were used to measure the strength of association between the variables. Pearson Correlation Coefficient (r) was used to assess the association between variables at a country level.

Due to the large sample size, a significance level of 1% was considered. SPSS 29.0 (IBM Corp. Released, 2022) and R 4.3.1 (R Core Team, 2023) were used for the analyses.

3 Results

3.1 Overall results

This section focuses on results of descriptive statistics on questions related to distraction in traffic (Section 3.1.1) and driver fatigue (Section 0). Results by country, region, gender, and age group are presented.

3.1.1 Distraction

ESRA3 survey included questions on distraction for car drivers, moped riders/motorcyclists, cyclists, and pedestrians. The results for each road user are presented in the following sections.

3.1.1.1 Car drivers

The questions for car drivers focused on the use of a mobile phone while driving: talking on a hand-held mobile phone, talking on a hands-free mobile phone, and reading a message or checking social media/news. For these road users, several themes related to the mobile phone use while driving are covered: self-declared behaviours, acceptability (personal and social), attitudes, perceived behaviour control, habits, risk perception, support for policy measures, and perception of enforcement.

Self-declared unsafe behaviour in traffic (last 30 days)

To assess self-declared behaviours in traffic, car drivers were asked '*Over the last 30 days, how often did you as a car driver …?*'. Three items concerning the use of mobile phone while driving were included:

- …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.

Questions on self-declared behaviours as a car driver were only answered by respondents who reported having driven a car at least a few days a month in the past 12 months (sample sizes in Appendix 3). The questions were answered on a Likert scale from 1 (never) to 5 (almost (always)) – the percentages of 'at least once' (answers 2 to 5) are presented in the results (Figure 1, Figure 2, Figure 3, and Figure 4).

Talking on a hands-free mobile phone while driving a car was the most prevalent self-declared behaviour in the three regions: 51.0% in Europe22, 47.6% in America8, and 44.3% in AsiaOceania6 (p-value < 0.001, Cramer's V = 0.049). The percentage was significantly higher in Europe22 than in AsiaOceania6 ($p < 0.01$) (Figure 1).

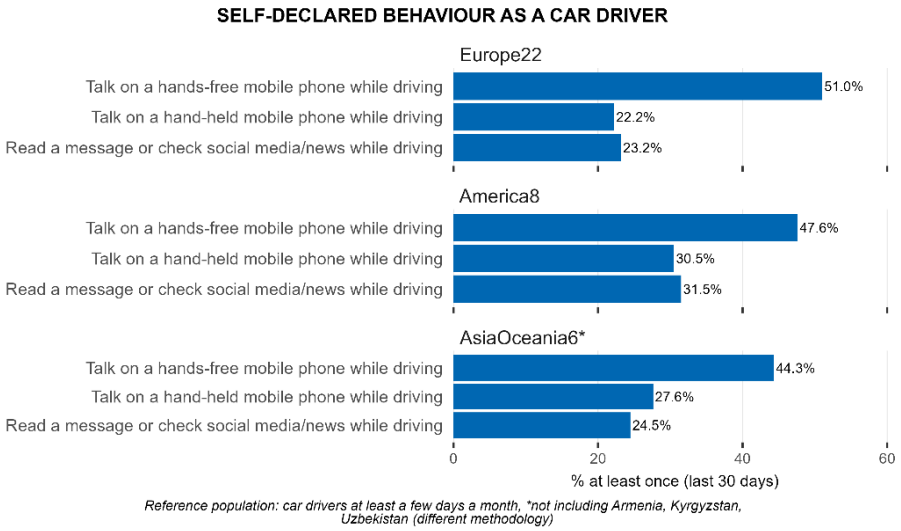


Figure 1: Self-declared behaviour as a car driver, by region (% at least once in the past 30 days).

The percentages of respondents who reported talking on a hand-held mobile phone and reading a message or checking social media/news while driving were similar in all the regions: 22.2% and 23.2% in Europe22; 30.5% and 31.5% in America8; 27.6% and 24.5% in AsiaOceania6. The differences between regions were significant, but only small effect size for both behaviours (p-value < 0.001, Cramer's V = 0.08) (Figure 1).

Results by country (Figure 2) shows that Netherlands, the United Kingdom, and Germany stood out as the European countries with the lowest prevalence of handling the mobile phone while driving (talking and reading). Germany and United Kingdom (together with France) are also among the three countries with lower percentage of car drivers who reported talking on a hands-free mobile phone while driving. The proportion of European car drivers who reported talking on a hand-held mobile phone while driving was lower than 20% in Netherlands (14.6%), United Kingdom (15.9%), Germany (17.4%), Belgium (17.7%), and Denmark (18.5%), and higher than 40% in Bosnia and Herzegovina (48.5%), Finland (44.4%), Latvia (43.6%), and Greece (41.1%). Reading a message or checking social media/news while driving a car was reported by less than 20% of car drivers in the United Kingdom (14.2%) and Netherlands (18.8%), and by more than 40% in Luxembourg (40.5%). Talking on a hands-free mobile phone while driving ranged from 38.7% in France and 39.6% in the United Kingdom to more than 70% in Luxembourg (75.5%), Portugal (73.4%), and Latvia (70.3%).

Results in the American countries show higher percentages of using the mobile phone while driving a car in the Latin American countries and lower percentages in the North American countries. The exception was the percentage of talking on a hands-free mobile phone in Brazil (44.6%), whose percentage was close to the ones in Canada (45.9%) and United States (39.7%). Panama stood out as the American country with the highest percentage in the three behaviours: 44.5% of car drivers reported talking on hand-held mobile phone, 55.8% reported reading a message or checking social media/news, and 70.9% reported talking on a hands-free mobile phone while driving (Figure 2).

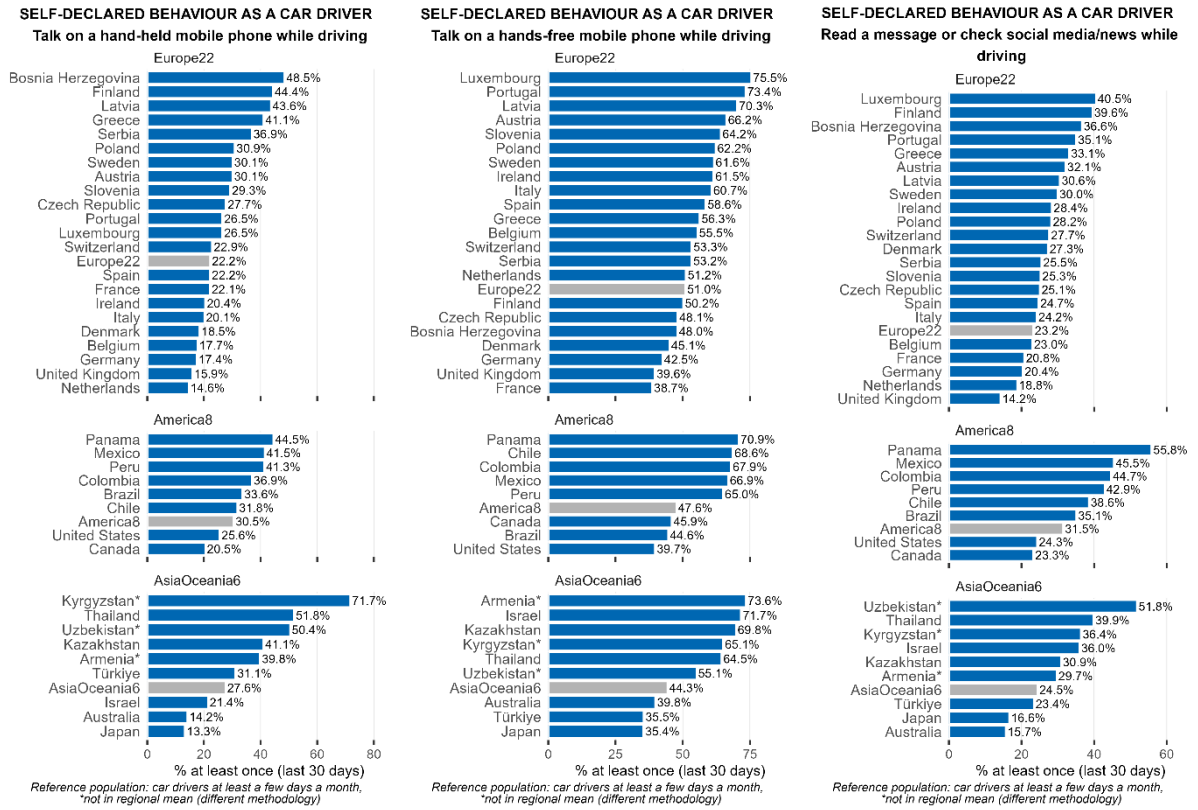


Figure 2: Self-declared behaviour as a car driver, by region and country (% at least once in the past 30 days).

As for the countries from AsiaOceania, the proportion of car drivers who reported talking on a hand-held mobile phone and reading a message or checking social media/news was lower in Australia (14.2% and 15.7%, respectively) and Japan (13.3% and 16.6%, respectively) than in all the other countries.

Kyrgyzstan was the country with the highest percentage of car drivers who reported talking on a hand-held mobile phone (71.7%), Armenia the country with the highest percentage of talking on a hands-free mobile phone (73.6%), and Uzbekistan the country with the highest percentage of car drivers who reported reading a message or checking social media/news while driving (51.8%). It should be noted that the methodology of data collection in these three countries (face-to-face CAPI) was different from the other countries (online panels in the other countries) (Figure 2).

Overall, men reported using the mobile phone while driving a car more often than women in the three regions. The differences between men and women were the largest for talking on a hand-held mobile phone in America8 region (36.3% vs. 24.3%, p-value < 0.001, Cramer's V = 0.131). The percentage of car drivers who reported this behaviour was also significantly higher in men (24.2%) than women (20.0%) in Europe22 region (p-value < 0.001, Cramer's V = 0.051), but the differences were not statistically significant in AsiaOceania6 region (p-value = 0.037, Cramer's V = 0.043). As for talking on a hands-free mobile phone, the differences were only significant in the AsiaOceania6 region (p-value < 0.001, Cramer's V = 0.097) and for reading a message or checking social media/news while driving the differences were only significant in the America8 region (p-value < 0.001, Cramer's V = 0.092) (Figure 3).

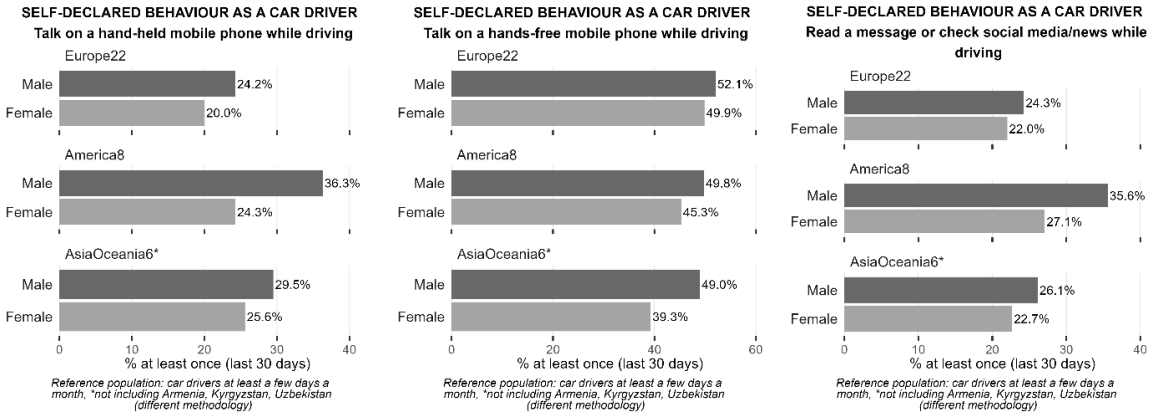


Figure 3: Self-declared behaviour as a car driver, by region and gender (% at least once in the past 30 days).

Figure 4 shows the percentage of self-declared behaviours by age group in the three regions.

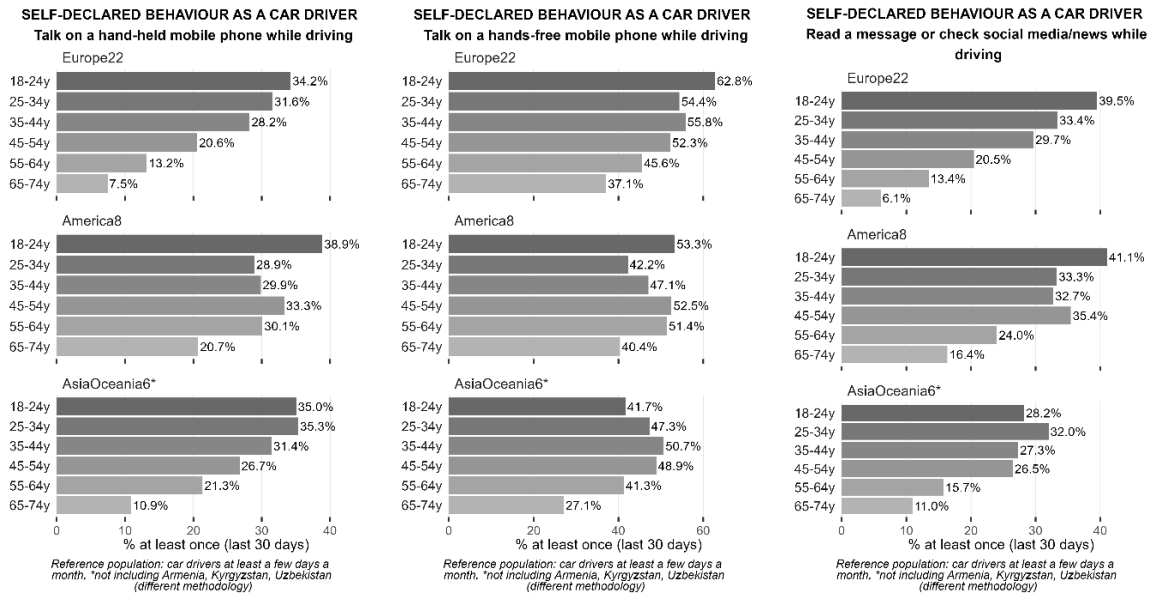


Figure 4: Self-declared behaviour as a car driver, by region and age group (% at least once in the past 30 days).

The percentage of car drivers who reported the use of a mobile phone while driving depends significantly on the age group in all the regions ($p < 0.01$). The differences between age groups were larger for talking on a hand-held mobile phone and for reading a message or checking social media/news than for talking on a hands-free mobile phone. Overall, talking on a hand-held mobile phone and reading a message or checking social media/news while driving was more prevalent in the younger car drivers than in the older ones. The association was particularly strong in the Europe22 region (Cramer's V = 0.219 and Cramer's V = 0.252, respectively) where the proportion of car drivers who reported both behaviours decrease linearly with the increase of the age group (Figure 4).

Acceptability of unsafe traffic behaviour

To assess the level of acceptability (personal and perception of other's acceptability) of unsafe behaviours concerning the use of mobile phone while driving, the respondents were asked to answer to the questions:

- Where you live, how acceptable would most other people say it is for a car driver to….?
- How acceptable do you, personally, feel it is for a car driver to…?

Both questions were answered on a Likert scale from 1 (unacceptable) to 5 (acceptable). The percentages of acceptable (answers 4 or 5) are shown in the results. Questions on acceptability of unsafe traffic behaviours were answered by all the respondents (sample sizes in Appendix 3).

Results of the personal acceptability of the three behaviours presented in Figure 5 show that talking on a hands-free mobile phone while driving a car is much more acceptable than talking on a hand-held mobile or reading a message or checking social media/news in the three regions. The proportion of respondents who consider acceptable talking on a hands-free mobile was 38.6% in the Europe22 region, 23.9% in the America8 region, and 28.5% in the AsiaOceania6 region, while less than 5% considered acceptable talking on a hand-held mobile phone or reading a message or checking social media/news while driving a car in all the regions. The differences between regions were significant for talking on a hands-free mobile (p-value < 0.001, Cramer's V = 0.135), but not for talking on a hand-held mobile phone (p-value = 0.752, Cramer's V = 0.006) or for reading a message or checking social media/news (p-value = 0.104, Cramer's V = 0.017).

It worth noting that percentages of personal acceptability are much lower than the percentages of the correspondent self-declared behaviours (Figure 1), showing that many car drivers use the mobile phone while driving even if they consider the behaviour unacceptable.

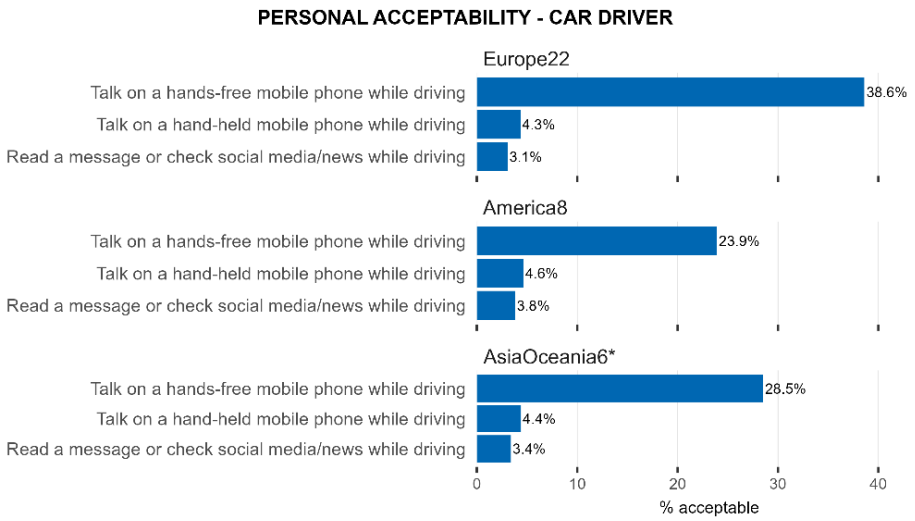


Figure 5: Personal acceptability of unsafe traffic behaviour of car drivers, by region (% acceptable).

Results of the personal acceptability at a country level are presented in Figure 6.

Austria is the European country with the highest percentage of road users who consider acceptable talking on a hand-held mobile phone (10.0%) and reading a message or checking social media/news (5.2%) while driving a car. On the other hand, Serbia is the European country with the lowest percentage in both behaviours: 1.6% and 0.6%, respectively. In America8 region, the United States stood with the highest percentages of acceptability of talking on a hand-held mobile phone (5.8%) and reading a message or checking social media/news (4.7%), and Colombia with the lowest percentages in both behaviours (2.3% and 1.8%, respectively). As for the AsiaOceania region, Australia, Japan, and Kyrgyzstan are the countries where both behaviours are less acceptable (< 3%).

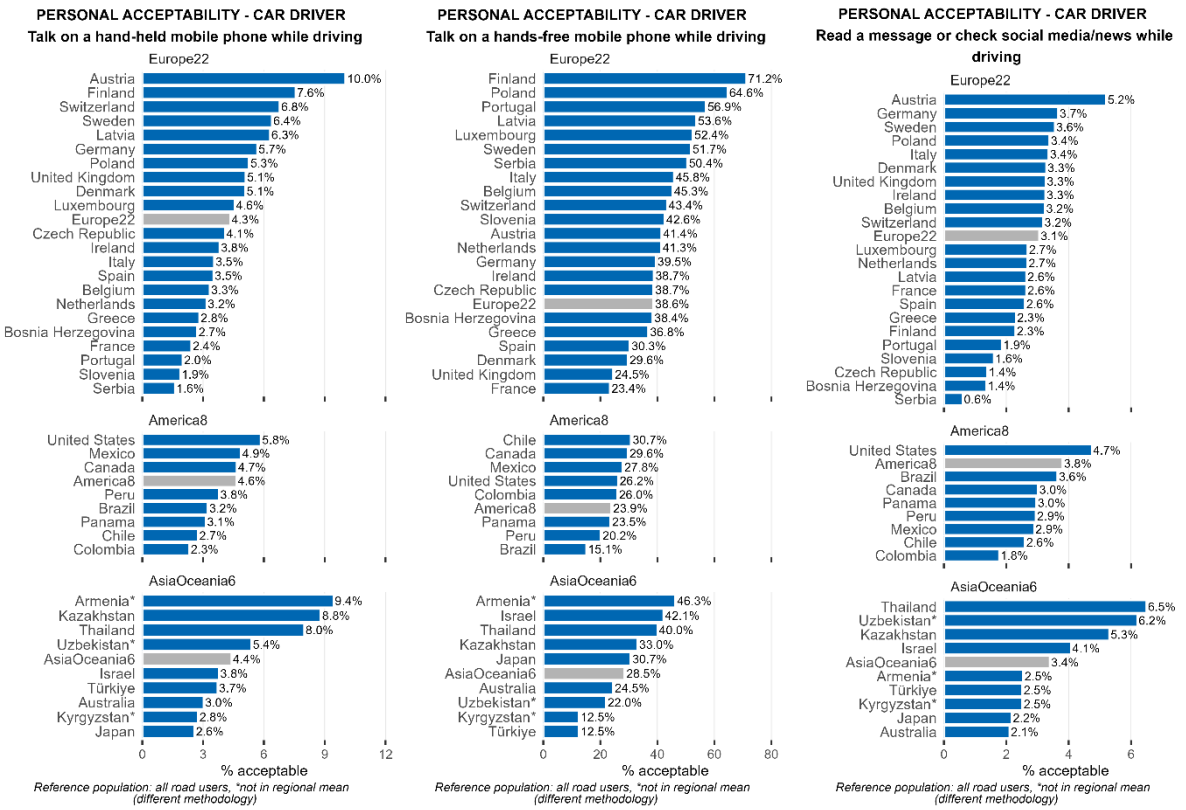


Figure 6: Personal acceptability of unsafe traffic behaviour of car drivers, by region and country (% acceptable).

Results of the perception of other's acceptability of talking on a hand-held mobile phone and reading a message or checking social media/news while driving a car, by region and country, are presented in Figure 25 in Appendix 4. Results show that the percentages of the perception of other's acceptability are higher than the percentages of personal acceptability in all the countries and regions, for both behaviours. These results show that the respondents consider that 'the others' accept more readily the use of mobile phones while driving a car, than they do themselves.

Results of the personal acceptability by gender and by age group are presented in Figure 26 and in Figure 27, respectively, in Appendix 4. Men consider using the mobile phone while driving a car more acceptable than women in Europe22 and America8 regions (the differences are significant, but of small effect size: p-value < 0.001, Cramer's V < 0.10), but no significant difference exists in AsiaOceania6 region (p-value > 0.05). Overall, talking on a hand mobile phone and reading a message or checking social media/news while driving a car is more acceptable by the younger drivers than by the older ones. The differences were stronger in Europe22 region, where the percentage of acceptability decrease with the increase of the age group.

Attitudes, perceived behaviour control, and habits of using the mobile phone while driving

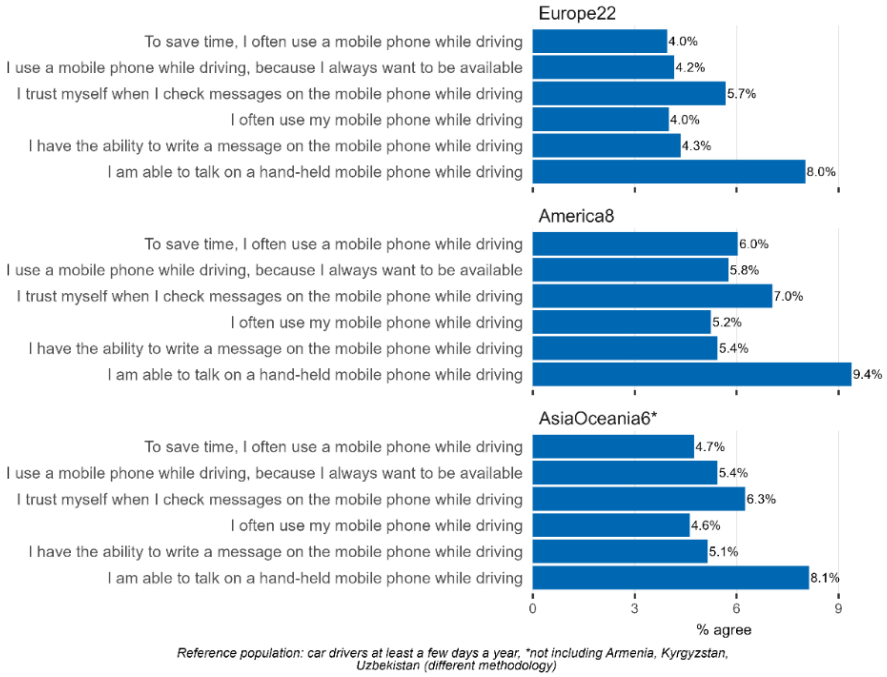
Attitudes, perceived behaviour control, and the habits of using a mobile phone while driving a car were assessed by asking the level of agreement with the statements:

- Behaviour believes and attitudes: 'I use a mobile phone while driving, because I always want to be available' and 'To save time, I often use a mobile phone while driving'.
- Perceived behaviour control: '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' and 'I am able to talk on a hand-held mobile phone while driving'.
- Habits: 'I often use my mobile phone while driving'.

These questions were answered by car drivers at least a few days a year in the past 12 months (sample sizes in Appendix 3) on a Likert scale from 1 (disagree) to 5 (agree). The percentages of agreement (answers 4 or 5) are presented in the results.

Of the six items presented, the perceived behaviour control of talking on a hand-held mobile phone while driving ('I am able to talk on a hand-held mobile phone while driving') was the one with the highest percentages of agreement in the three regions: 8.0% in Europe22, 9.4% in America8, and 8.1% in AsiaOceania6. Fewer respondents trust themselves when they check messages on the mobile phone while driving (5.7% in Europe22, 7.0% in America8, and 6.3% in AsiaOceania6) and believes that they have the ability to write a message on the mobile phone while driving (4.3% in Europe22, 5.4% in America8, and 5.1% in AsiaOceania6). Regarding the habits, 4.0% of the European drivers, 5.2% of the American drivers, and 4.6% of drivers from AsiaOceania6 reported that they often use the mobile while driving. As for the Behaviour believes and attitudes, the percentages of agreement with the sentences 'I use a mobile phone while driving, because I always want to be available' and 'To save time, I often use a mobile phone while driving' were 4.0% and 4.2% in Europe22 regions, 6.0% and 5.9% in America8 region, and 4.7% and 5.4% in AsiaOceania6 region (Figure 7).

The strength of the association between these variables and the region was rather small (Cramer's V ranged from 0.020 to 0.086).



*Reference population: car drivers at least a few days a year, *not including Armenia, Kyrgyzstan, Uzbekistan (different methodology)*

Figure 7: Attitudes, perceived behaviour control, and habits of using the mobile phone while driving a car, by region (% agree).

Results of questions on attitudes, perceived behaviour control, and habits of using the mobile phone while driving a car by region and country, are presented in Figure 28 and in Figure 29 in Appendix 4.

Results on the items of perceived behaviour control by gender and by age group are presented in Figure 8 and in Figure 9, respectively.

The perception of behaviour control of using a mobile phone to talk of to write/check messages while driving is higher among male than among female drivers. The strongest differences were found in the America8 region (p-value < 0.001, Cramer's V from 0.074 to 0.080), where the percentages of agreement with the three sentences were about the double in male drivers when compared to female drivers. In Europe22 region the differences between female and male drivers were significant, but smaller than the ones observed in America8 region (p-value < 0.001, Cramer's V from 0.036 to 0.041). No significant differences were found in the AsiaOceania6 region (p-value > 0.05) (Figure 8).

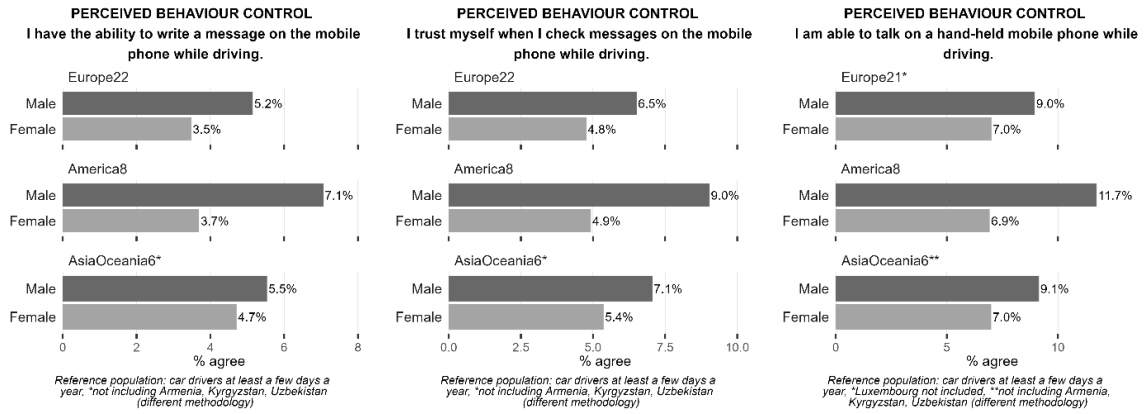


Figure 8: Perceived behaviour control of using a mobile phone while driving a car, by gender (% agree).

The percentages of agreement with the sentences on the perceived control of using a mobile phone while driving are higher in the younger drivers than in the older ones. The differences are stronger for the attitudes related to write and check messages while driving than for talking on a hand-held mobile phone. For talking on a hand-held mobile phone while driving, no significant differences were found between age groups in the America8 region (p-value = 0.097) nor in the AsiaOceani6 region (p-value = 0.169) (Figure 9).

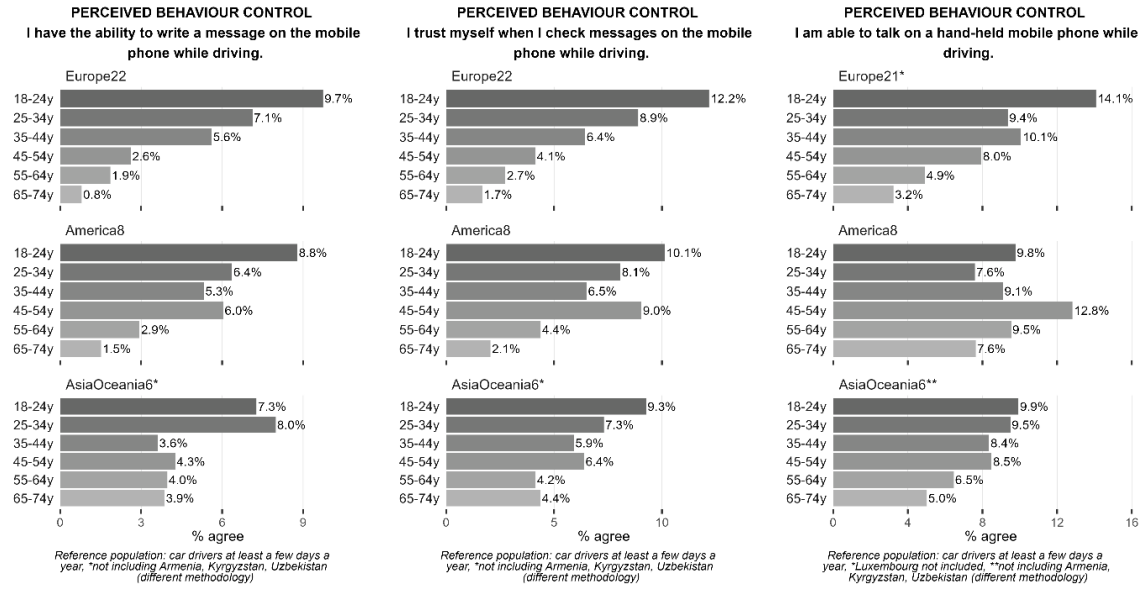


Figure 9: Perceived behaviour control of using a mobile phone while driving a car, by age group (% agree).

Results on the items of behaviour believes, attitudes and habits by gender and age group are presented in Figure 30 and in Figure 31, respectively, in Appendix 4. The results are similar to the ones of perceived behaviour control.

Perception of factors of road crashes

To assess the perception of the use of a mobile phone while driving as a cause of a road crash (risk perception) respondents were asked 'How often do you think each of the following factors is the cause of a road crash involving a car?'. Several items related to risky behaviours while driving a car were included. Two of them concerning to the use of mobile phone: 'using a hand-held mobile phone while driving' and 'using a hands-free mobile phone while driving'. This question was answered by all the respondents (sample sizes in Appendix 3). The scale of answer ranged from 1 (never) to 6 ((almost) always). The percentages of often/frequently (answers 4 to 6) are shown in the results.

The results by region and country (Figure 10) shows that road users consider riskier talking on a hand-held mobile phone while driving than using a hands-free mobile phone in all the three regions. The differences were higher in Europe22 region (65.3% vs. 41.8%) than in America8 (53.2% vs. 43.7%) and AsiaOceania6 (34.7% vs. 31.2%) regions.

The percentages of respondents who consider that talking on a hand-held mobile phone while driving is often/frequently the cause of a road crash involving a car were significantly different between all pairs of regions (p-value < 0.001, Cramer's V = 0.230): Europe22 (65.3%), America8 (53.2%), and AsiaOceania6 (34.7%). As for talking on a hands-free mobile phone (p-value < 0.001, Cramer's V = 0.085), the proportion was significantly lower in AsiaOceania6 (31.2%) than in the other regions (p-value < 0.01): Europe22 (41.8%) and America8 (43.7%) – there were no significant differences between these two regions (p-value > 0.01).

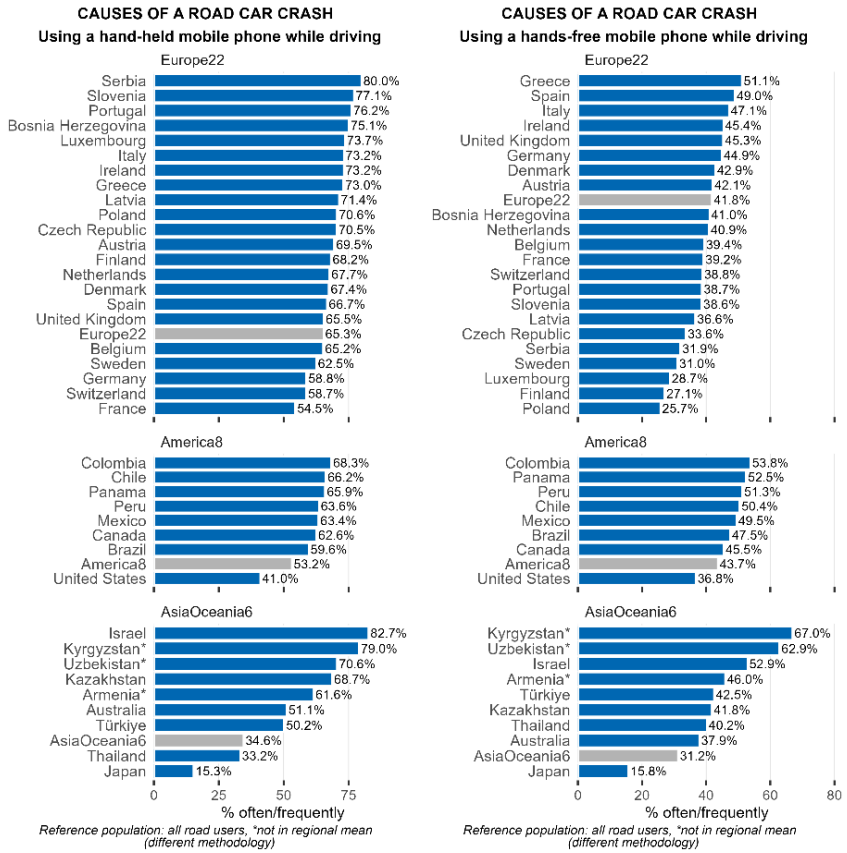


Figure 10: Risk perception of talking on a mobile phone while driving a car, by region and country (% often/frequently).

Results on the perception of causes of road crashes by gender and age group are presented in Figure 32 and in Figure 33, respectively, in Appendix 4. The risk perception is higher in women than men in the Europe22 region (p-value < 0.001, Cramer's V = 0.062), but no significant differences exist in the other regions (p-value > 0.05). The risk perception depends significantly on the age group in the Europe22 and America8 regions (p-value < 0.001, Cramer's V from 0.125 to 0.234) – overall, the percentages are higher for respondents aged 45-75 years – but not the AsiaOceani6 (p > 0.05).

Support for policy measures

The support for policy measures was assessed by asking 'Do you oppose or support the legal obligation: forbidding all drivers of motorized vehicles to use a hand-held mobile phone while driving?'. This question was answered by all the respondents (sample sizes in Appendix 3). An answer scale from 1 (oppose) to 5 (support) was used – the percentages of support (answers 4 to 5) are shown in the results.

Forbidding all drivers of motorized vehicles to use a hand-held mobile phone while driving was supported for most of the respondents of the three regions: 79.3% in Europe22, 81.3% in America8, and 79.2% in AsiaOceania6. The percentages of support do not differ significantly among the regions (p-value = 0.040, Cramer's V = 0.021) (Figure 11). It worth noting that the percentages of support in America8 region is higher in the countries of Latin America than in countries of North America.

The percentage of support was significantly higher in female respondents than in male respondents in Europe22 (80.9% vs. 77.7%, p-value < 0.001, Cramer's V = 0.040) and America6 (84.4% vs. 78.0%, p-value < 0.001, Cramer's V = 0.082) regions, but not in AsisOceani6 region (80.7% vs. 77.9%, p-value = 0.047, Cramer's V = 0.034). The percentage of support depends strongly on the age group (p-value < 0.001, Cramer's V = 0.193) in the Europe22 region – the percentage increase linearly with the increase of the age group, from 66.2% in respondents aged 18-24 years to 89.5% in respondents aged 65-74 years. In America8 region (p-value < 0.001, Cramer's V = 0.095), respondents aged 18-24 years are the ones with lower percentage of support (73.3%) – the percentage in respondents older than 24 years are similar (ranges from 80.5% to 84.6%). In the AsiaOceania6 region (p-value < 0.001, Cramer's V = 0.131) the proportion of respondents who supports forbidding the use of a hand-held mobile phone while driving was higher than 81% for respondents older than 44 years and lower than 76% for respondents younger than 45 years (Figure 11).

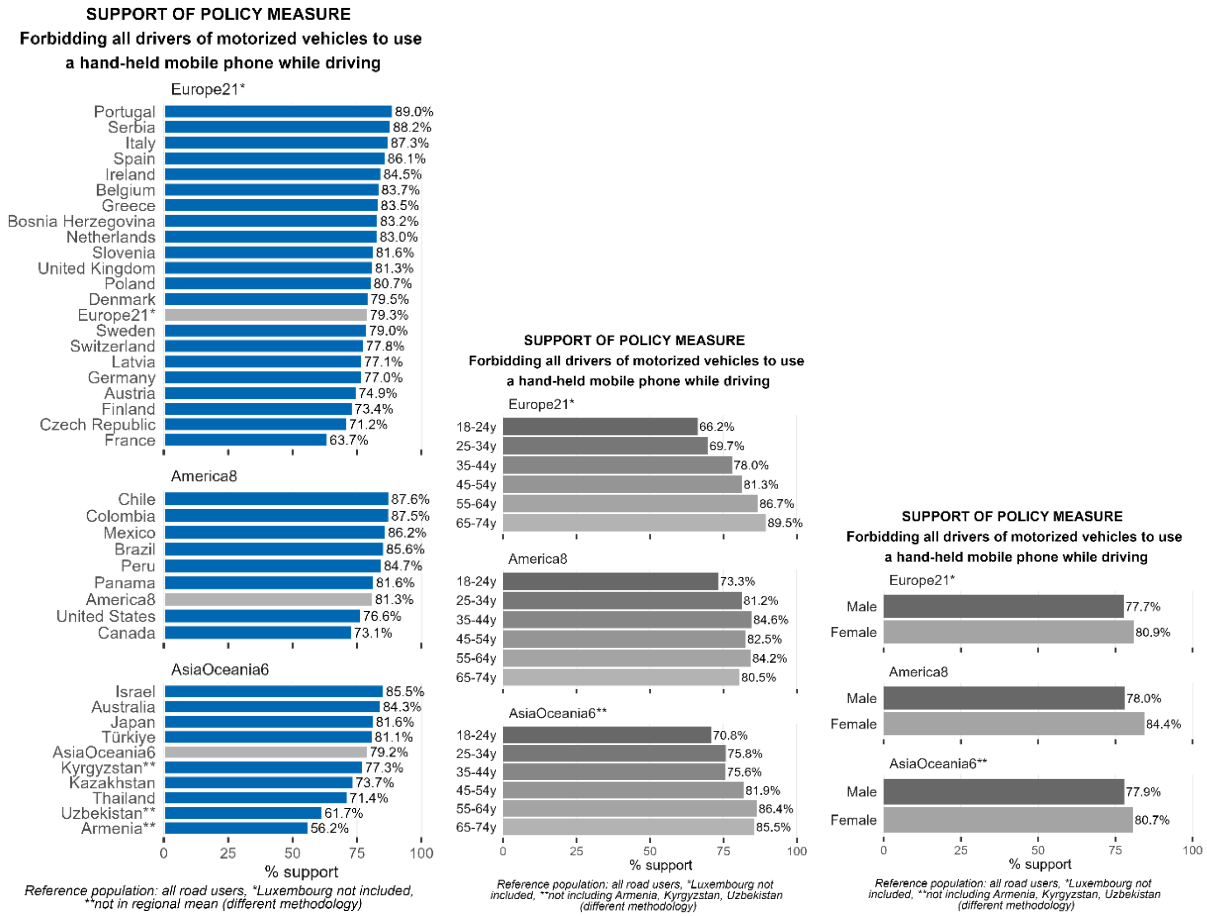


Figure 11: Support for policy measures, by region, country, age group, and gender (% support).

Enforcement perception

Enforcement perception was assessed by asking '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 the use of a hand-held mobile phone to talk or text while driving?'. This question was answered by car drivers at least a few days a year in the past 12 months (sample sizes in Appendix 3) on a Likert scale from 1 (very unlikely) to 7 (very likely). The percentages of likely (answers 5 or 7) are presented in the results.

About one out of four car drivers from AsiaOceania6 region (25.9%) considered that it is likely to be checked by the police for the use of a hand-held mobile phone while driving a car, on a typical day. This percentage was significantly higher than the ones in the Europe22 (15.0%) and America6 (15.9%) regions – the differences between these two regions are not statistically significant ($p > 0.01$). It worth noting that the enforcement perception in America8 region is higher in the countries of Latin America than in countries of North America (Figure 12).

The enforcement perception only depends significantly on the gender in the America6 region (p-value < 0.001, Cramer's V = 0.015) – the percentage of respondents who said that it is likely to be checked by the police for the use of a hand-held mobile phone while driving is higher in men (19.7%) than in women (12.0%). No significant differences among age groups were found in any of the regions ($p > 0.01$) (Figure 12).

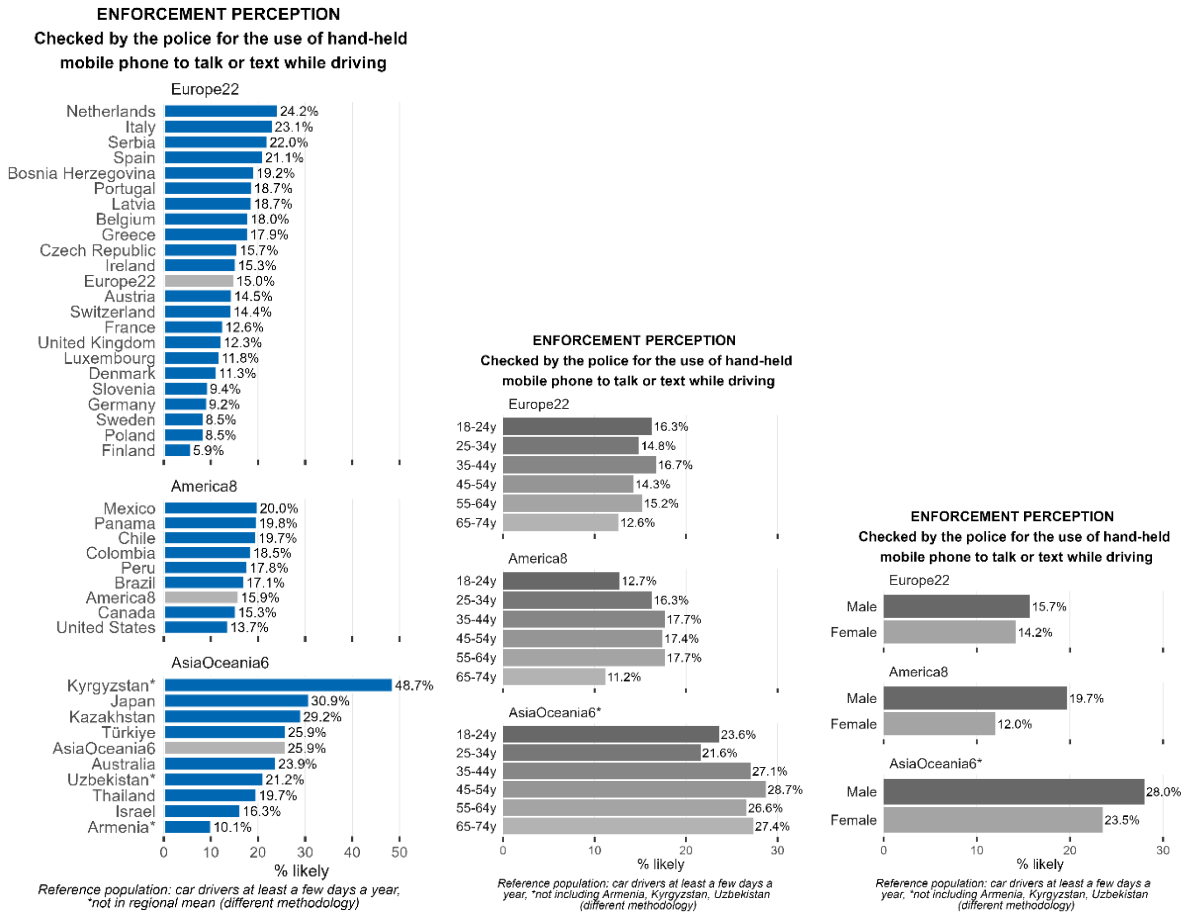


Figure 12: Enforcement perception, by region, country, age group, and gender (% likely).

3.1.1.2 Moped riders/ motorcyclists

ESRA3 survey included two questions regarding the self-declared behaviour and personal acceptability of reading a message or check social media/news while riding a moped or motorcycle:

- Over the last 30 days, how often did you as a moped rider or motorcyclist read a message or check social media/news while riding.
- How acceptable do you, personally, feel it is for a moped rider or motorcyclist to read a message or check social media/news while riding.

A Likert scale from 1 (unacceptable) to 5 (acceptable) was used for acceptability (percentages of 'acceptable' (answers 4 or 5) are presented) and a Likert scale from 1 (never) to 5 (almost (always)) was used for self-declared behaviour (percentages of 'at least once' (answers 2 to 5) are presented). The question on acceptability was answered by all the respondents, while the question on self-declared behaviour was only answered by moped riders/ motorcyclists at least a few days a month in the past 12 months (sample sizes in Appendix 3). Results of the self-declared behaviour should be interpreted with caution for some countries due to small sample sizes. For example, the number of moped riders or motorcyclists who answered this question was less than 50 in Armenia (n = 8), Israel (n = 33), Kyrgyzstan (n = 7), Latvia (n = 43), Luxembourg (n = 44), and Uzbekistan (n = 30).

Reading a message or checking social media/news while riding a moped or motorcycle in the past 30 days was reported by 20.7% of European riders, by 22.8% of American riders and by 24.9% Asian/Oceanic riders. These percentages do not differ significantly among regions (p-value = 0.078, Cramer's V = 0.040). The percentages of personal acceptability ranged between 2.3% in the Europe22 region and 4.0% in the America8 region (Figure 13).

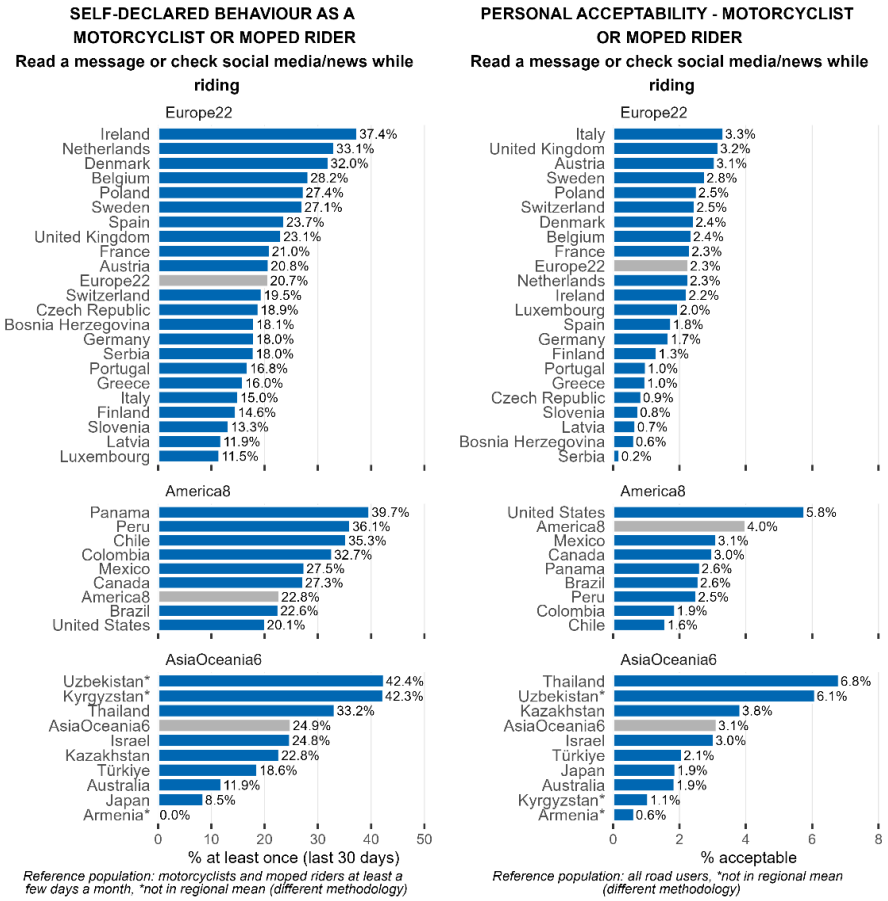


Figure 13: Self-declared behaviour as a moped rider/motorcyclist (% at least once in the past 30 days), and personal acceptability of unsafe traffic behaviour of moped riders/motorcyclists (% acceptable), by region and country.

Results by gender and age group are presented in Figure 34 and in Figure 35, respectively, in Appendix 4. American male riders declared the behaviour more often than female riders (27.5% vs. 16.7%, $p < 0.001$, Cramer's V = 0.128) and consider the behaviour more acceptable (5.5% vs. 2.6%, $p < 0.001$, Cramer's V = 0.074). Gender differences were small in the other two regions (Cramer's V < 0.049). The percentage of the self-declared behaviour ($p < 0.001$, Cramer's V = 0.164) and of acceptability ($p < 0.001$, Cramer's V = 0.107) in Europe22 region depends significantly on the age – both percentages are higher in younger European riders (until 44 years) than in the older ones. No differences were found in America8 region ($p > 0.05$).

3.1.1.3 Cyclists

Self-declared behaviours (in the past 30 days) and personal acceptability of reading a message or checking social media/news while cycling was assessed for cyclists. ESRA3 survey also included a question on the self-declared behaviour of cycling while listening to music through headphones:

- Over the last 30 days, how often did you as a cyclist…?: 'read a message or check social media/news while cycling'; 'cycle while listening to music through headphones'.
- How acceptable do you, personally, feel it is for a cyclist to read a message or check social media/news while cycling.

The question on acceptability was answered by all the respondents, while the questions on self-declared behaviour were only answered by cyclists at least a few days a month in the past 12 months (sample sizes in Appendix 3). A Likert scale from 1 (unacceptable) to 5 (acceptable) was used for acceptability (percentages of 'acceptable' (answers 4 or 5) are presented) and a Likert scale from 1 (never) to 5 (almost (always)) was used for self-declared behaviour (percentages of 'at least once' (answers 2 to 5) are presented). Results on the self-declared behaviours by region and country are presented in Figure 14.

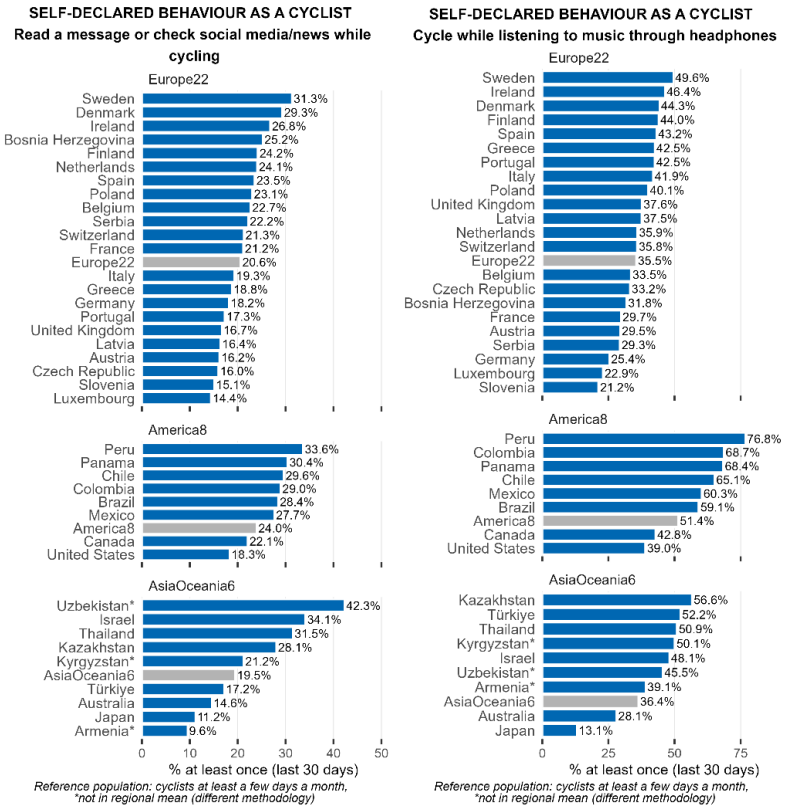


Figure 14: Self-declared behaviour as a cyclist, by region and country (% at least once in the past 30 days).

Results in Figure 14 show that 20.6% of European cyclists, 24.0% of American cyclists, and 19.5% of Asian/Oceanic cyclists reported that they read a message or checked social media/news while cycling at least once in the past 30 days (p-value = 0.006, Cramer's V = 0.038). About half the cyclists in America8 region (51.4%) reported listening to music while cycling – percentage significantly higher than the percentages observed in Europe22 (25.5%) and AsiaOceania6 (36.4%) p-value < 0.001, Cramer's V = 0.136). At a country level, in the Europe22 region, Sweden, Denmark, and Ireland stood out as the countries with the highest prevalence of both behaviours, and Luxembourg and Slovenia as the countries with the lowest prevalence. It should also be noted that both behaviours are less frequent in the North American countries (Canada and United States) than in Latin American countries.

Results of the self-declared behaviours of reading a message or checking social media/news and of listening to music through headphones while cycling, by gender and age group are presented in Figure 36 and in Figure 37, respectively, in Appendix 4. Differences between male and female cyclists were only significant in America8 region, where male cyclists reported more frequently that they had read a message or checking social media/news while cycling (28.8% vs. 18.2%, p < 0.001, Cramer's V = 0.123) and had listen to music through headphones while cycling (54.6% vs. 47.5%, p = 0.004, Cramer's V = 0.071) than female cyclists. Both self-declared behaviours depend significantly on the age in all the regions (p < 0.001) – both are more prevalent in younger cyclists (18-24 years). The differences were particularly strong in Europe22 region (Cramer's V = 0.30) – a clear trend of decreasing percentages with the increase of the age is visible in this region.

Results of personal acceptability of reading a message or checking social media/news while cycling are presented in Figure 38 in Appendix 4. Less than 5% of the road users considered acceptable to read a message or checking social media/news while cycling: 3.3% in Europe22, 4.3% in America8, and 3.8% in AsiaOceania6. Male road users and road users aged 18-24 years were the ones who considered this behaviour more acceptable.

3.1.1.4 Pedestrians

ESRA3 survey included three questions regarding self-declared behaviour and one on the personal acceptability of unsafe behaviours of pedestrians:

- Over the last 30 days, how often did you as a pedestrian…?: 'listen to music through headphones while walking down the street', 'read a message or check social media/news while walking down the street', and 'text a message while walking down the street'.
- How acceptable do you, personally, feel it is for a pedestrian to read a message or check social media/news while walking down the street.

The question on acceptability was answered by all the respondents, while the questions on self-declared behaviour were only answered by pedestrians at least a few days a month in the past 12 months (sample sizes in Appendix 3). A Likert scale from 1 (unacceptable) to 5 (acceptable) was used for acceptability (percentages of 'acceptable' (answers 4 or 5) are presented) and a Likert scale from 1 (never) to 5 (almost (always)) was used for self-declared behaviour (percentages of 'at least once' (answers 2 to 5) are presented).

More than half of the pedestrians in the three regions reported that they had read a message or checked social media/news or had texted a message while walking down the street at least once in the past 30 days: 63.7% and 60.3%, respectively, in Europe22 region; 58.0% and 57.0%, respectively, in America8 region; and 53.5% and 51.6%, respectively, in AsiaOceania6 region. The differences among regions were significant (p-value < 0.001), but small (Cramer's V < 0.080). At a country level, Germany, Poland, and France in Europe22 region, Canada and United States in America8 region, and Australia and Japan in AsiaOceania6 region, were the countries with the lowest prevalence of these behaviour in each region. Listen to music through headphones while walking down the street was reported by more than half of the American pedestrians (55.0%) – percentage significantly higher than the percentages in the Europe22 (44.2%) and AsiaOceania6 (43.4%) regions (p-value < 0.001, Cramer's V = 0.089) (Figure 15).

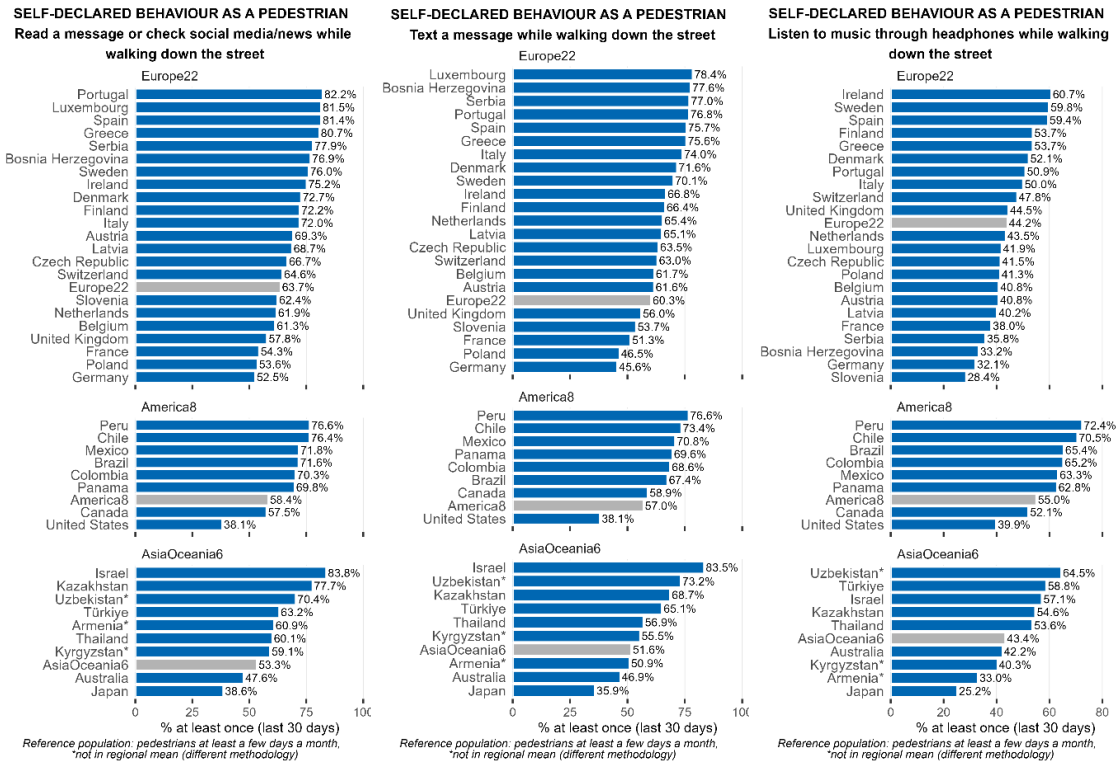


Figure 15: Self-declared behaviour as a pedestrian, by region and country (% at least once in the past 30 days).

Results by gender and age group are presented in Figure 39 and in Figure 40, respectively, in Appendix 4. The percentages of pedestrians who declared the behaviours only differ significantly between men and women in Amertica8 region (p-value < 0.001, Cramer's V from 0.045 and 0.084) – all the behaviours were more declared by male pedestrians than by female pedestrians. The prevalence of listen to music through headphones, read a message or check social media/news, and text a message while walking down the street strongly depends on the age in the three regions (Cramer's V > 0.16) – the percentages are higher in the younger pedestrians (18-24 years) and decrease with the increase of the age.

Results of personal acceptability of reading a message or checking social media/news while walking down the street are presented in Figure 41 in Appendix 4. Reading a message or checking social media/news while walking down the street was considered more acceptable in Europe22 region (31.2%) than in America8 (18.8%) and in AsiaOceania6 (16.7%) regions. The differences among regions were significant (p-value < 0.001, Cramer's V = 0.148) – significantly higher in Europe than in the other regions. In America8 region male road users consider the behaviour more acceptable than female road users (22.2% vs. 15.5%, p-value < 0.001, Cramer's V = 0.086) – no significant differences were found in Europe22 or in AsiaOceania6 (p > 0.01). The acceptability of this behaviour significantly depends on the age in the three regions (p-value < 0.01). The differences between age groups were particularly strong in Europe22 (p-value < 0.001, Cramer's V = 0.194) where more than half of the road users aged 18-24 years considered acceptable to read a message or check social media/news while walking down the street.

3.1.2 Fatigue (car drivers)

ESRA3 survey only included questions on fatigued driving for car drivers. Self-declared fatigued driving in the past 30 days and personal acceptability of fatigued driving were assessed. ESRA3 survey also included one question on the perception of driving while tired as a cause of road crash.

Self-declared behaviour of fatigued driving in traffic (last 30 days)

Self-declared behaviour of fatigued driving was assessed by asking 'Over the last 30 days, how often did you as a car driver drive when you were so sleepy that you had trouble keeping your eyes open?'. A Likert scale from 1 (never) to 5 (almost (always)) was used (percentages of 'at least once' (answers 2 to 5) are presented). This question was answered by respondents who reported having driven a car at least a few days a month in the past 12 months (sample sizes in Appendix 3). Results are presented in Figure 16.

Fatigued driving at least once in the past 30 days was reported by about one out of five car drivers in all the regions: 18.4% in the Europe22 region, 18.6% in America 8 region, and 20.1% in AsiaOceania6 region. The prevalence of fatigued driving does not differ significantly among regions (p-value = 0.268, Cramer's V = 0.015). The proportion of car drivers who reported fatigued driving was significantly higher among men than among women in the three regions (p < 0.001): 21.6% vs. 14.8% in Europe22, 23.9% vs. 12.8% in America8, and 23.1% vs. 16.8% in AsiaOceania6. The prevalence of driving while fatigued depends significantly on the age in the Europe22 region (p-value < 0.001, Cramer's V = 0.167), with higher percentages among car drivers until 44 years than in than in the older ones. The differences among age groups in the America8 (p-value = 0.006, Cramer's V = 0.083) and AsiaOceania6 (p-value = 0.057, Cramer's V = 0.068) regions were small (Figure 16).

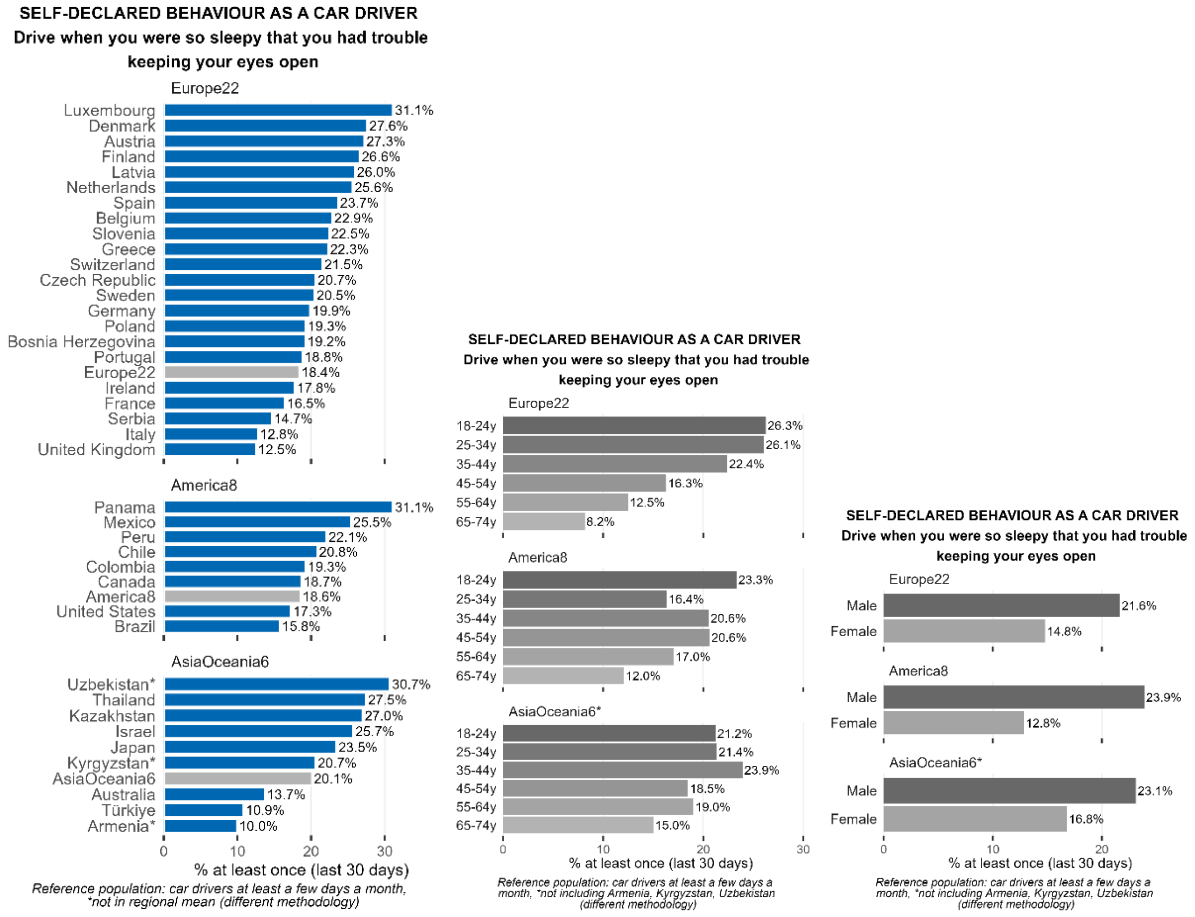


Figure 16: Self-declared behaviour as a car driver, by region, country, age group, and gender (% at least once in the past 30 days).

Acceptability of fatigued driving

Personal acceptability of fatigued driving was assessed by asking 'How acceptable do you, personally, feel it is for a car driver to drive when he/she is so sleepy that he/she has trouble keeping their eyes open?'. A Likert scale from 1 (unacceptable) to 5 (acceptable) was used (percentages of 'acceptable' (answers 4 to 5) are presented). This question was answered by all the respondents (sample sizes in Appendix 3). Results are presented in Figure 17.

As shown in Figure 17, the percentages of road users who find that fatigued driving is acceptable are quite low in the three regions: 2.5% in Europe22, in 3.5% in America8, and 2.7% in AsiaOceania6 (p-value = 0.005, Cramer's V = 0.027). At a country level, the United States (5.5%) and Thailand (5.3%) are the two ESRA countries with the highest percentages of acceptability. The personal acceptability is higher among men than women in Europe22 (3.3% vs. 1.6%, p-value < 0.001, Cramer's V = 0.054) and in America8 (5.5% vs. 1.6%, p-value < 0.001, Cramer's V = 0.105), but no significant differences regarding gender were found in AsiaOceania6 (2.4% vs. 3.0%, p-value = 0.278, Cramer's V = 0.019). As for age differences, the acceptability of fatigued driving depends significantly on the age group in Europe22 (p-value < 0.001, Cramer's V = 0.114) and in America8 (p-value < 0.001, Cramer's V = 0.084), but not in AsiaOceania6 (p-value = 0.113, Cramer's V = 0.051). This behaviour is more acceptable in European drivers until 44 years and in American drivers aged 35 to 54 years than in the other age groups (Figure 17).

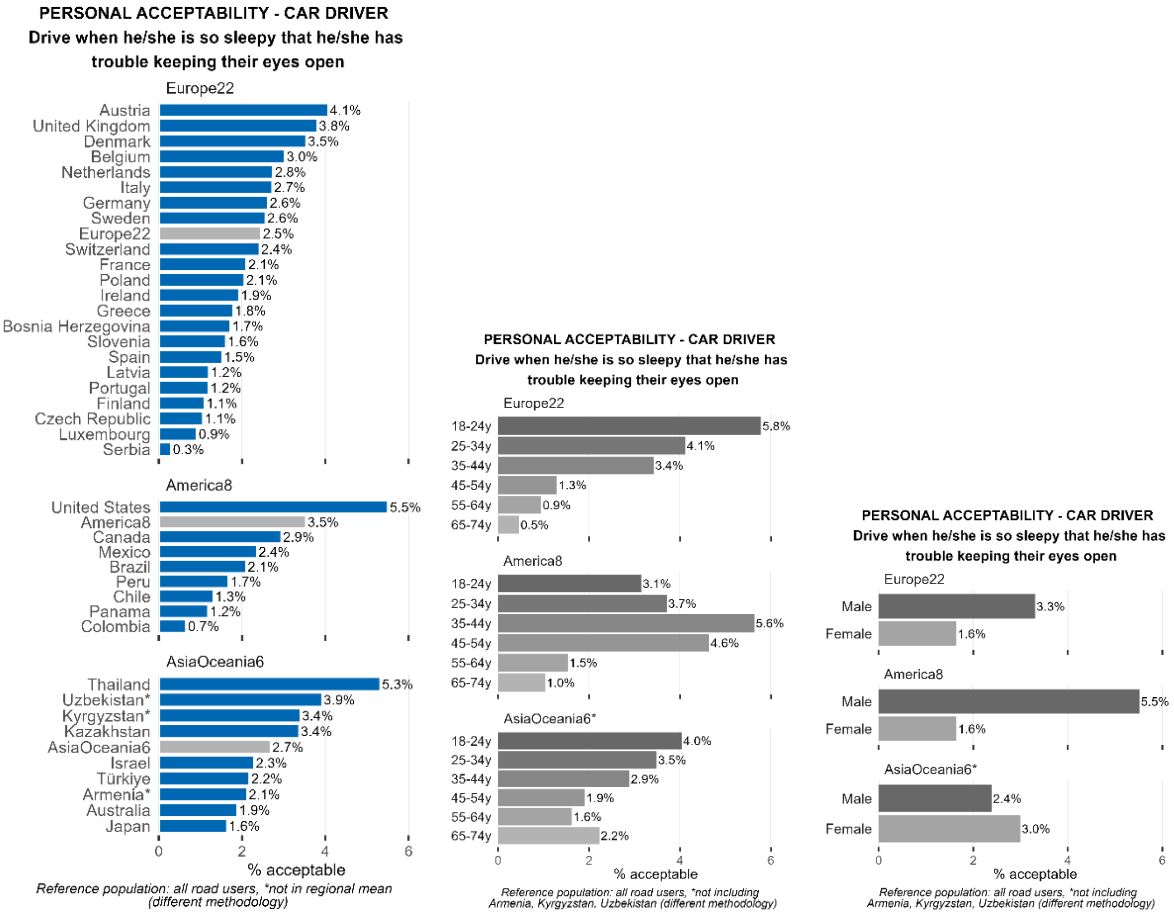


Figure 17: Personal acceptability of unsafe traffic behaviour of car drivers, by region, country, age group, and gender (% acceptable).

Perception of driving while tired as a factor of road crashes (risk perception)

To assess the perception driving while tired as a road crash factor, respondents were asked 'How often do you think each of the following factors is the cause of a road crash involving a car?'. Several items related to risky behaviours while driving a car were included, among them on related to fatigued driving "driving while tired". The scale of answer ranged from 1 (never) to 6 ((almost) always) (percentages of often/frequently (answers 4 to 6) are shown in the results). This question was answered by all the respondents (sample sizes in Appendix 3). Results are presented in Figure 18.

Results show that European road users most commonly perceive tired driving as a frequent road crash cause (64.6%) than American (52.1%) and Asian/Oceanic (38.4%) road users (p-value < 0.001, Cramer's V = 0.198). Results by country show that the percentage of road users who stated that driving when tired is often/frequently the cause of a road crash was lower than 50% (or close) in France (50.4%), United States (38.8%), Thailand (35.0%), and Japan (22.9%). Small differences between male and female road users were found in Europe22 region (61.3% vs. 67.4%, p-value < 0.001, Cramer's V = 0.063) and no significant differences exist in the other regions (p-value > 0.05, Cramer's V < 0.020). The risk perception depends strongly on the age group in Europe22 (p-value < 0.001, Cramer's V = 0.190) and in America8 (p-value < 0.001, Cramer's V = 0.219) regions – the proportion of road users who perceive tired driving as a frequent road crash cause is higher in road users older than 44 years than the younger ones in both regions. No age differences were found in AsiaOceani6 region (p-value = 0.175, Cramer's V = 0.048) (Figure 18).

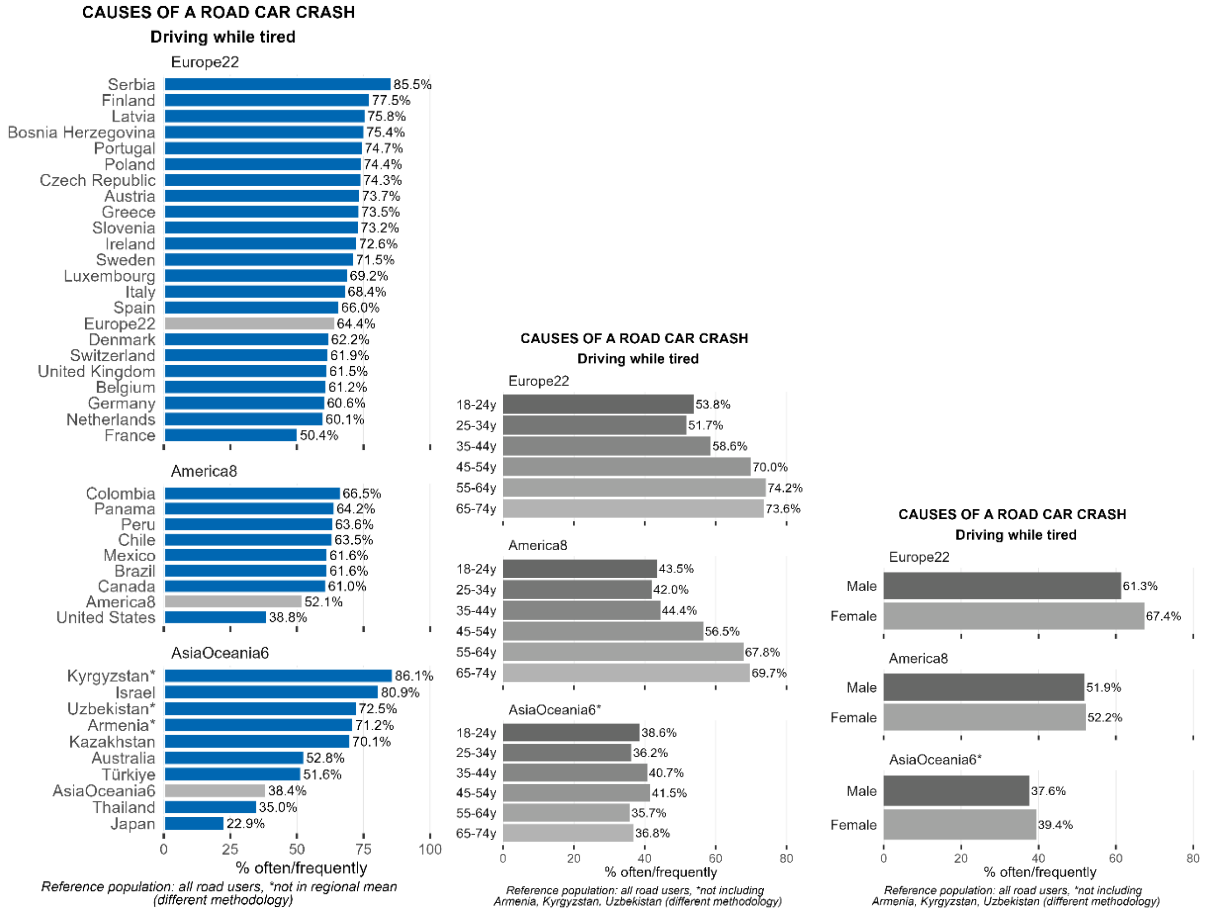


Figure 18: Risk perception driving a car while tired, by region, country, age group, and gender (% often/frequently).

3.2 Advanced analyses

In this section, binary logistic multiple regression models are used to study the factors that influence self-declared distracted driving (talking on a hand-held mobile phone while driving a car) and fatigued driving (driving a car when the driver is so sleepy that he/she has trouble keeping the eyes open). Multiple regression models provide a more comprehensive understanding of how various factors (independent variables) influence a dependent variable – in this case the self-declared behaviours. By including multiple independent variables, multiple regression models allow to control for possible confounding variables, providing a clearer view of the true effect of each independent variable on the dependent variable. Additionally, the inclusion of a Social Desirability Scale allows to control for desirability bias, ensuring that the effects of other variables are not distorted by the tendency of respondents to present themselves in a positive way.

Models were carried out separately for each of the three regions: Europe22, America8, and AsiaOceania6. In each model, the outcome is a binary variable indicating the absence (0=never) or presence (1=at least once) of self-declared behaviour in the past 30 days. Models include car drivers who have driven a car at least a few days a month in the past 12 months. Independent variables entered in the model in two blocks. The first block included sociodemographic characteristics (gender, age group, educational level, household's income, level of urbanisation, and driving a vehicle during main professional activity) and the frequency of driving a car – variables included in the models for distract driving and for fatigued driving. The second block for the models of distracted driving included the variables that assess the attitudes towards unsafe traffic behaviours (personal and social acceptability, behaviour believes and attitudes, and perceived behaviour control) and support for policy measures (forbidding all drivers of motorized vehicles to use a hand-held mobile phone while driving). The models for fatigued driving only include the personal acceptability of fatigued driving.

Models were adjusted for country and the Social Desirability Scale. Odds ratios (and the respective 99% Confidence Intervals) were used to measure the strength of association between the variables.

3.2.1 Factors that influence distracted driving

Table 2 shows the results of the three logistic regression models for talking on a hand-held mobile phone while driving a car – one model for each region.

The odds of talking on a hand-held mobile phone while driving a car for men, in comparison with women, increase by 11% (OR = 1.11, p-value < 0.01) in Europe22, by 16% (OR = 1.16, p-value < 0.05) in America8, and by 26% (OR = 1.26, p-value < 0.01) in AsiaOceania6. Overall, the odds decrease with the increase of the age group in the three regions. In other words, the older the driver, the lower the probability of talking on a hand-held mobile phone while driving. However, comparing to drivers aged 18-24 years, drivers aged 25-34 years in Europe22 region and drivers aged 25-44 years in America8 and AsiaOceania6 regions have a similar likelihood of talking on a hand-held mobile phone while driving a car.

Considering a significant level of 1%, the level of urbanization of the area where the respondent lives and the educational level do not influence significantly the self-declared behaviour of talking on a hand-held mobile phone while driving a car in any of the regions ($p > 0.01$). However, the household's income significantly influences the behaviour in Europe22 ($p < 0.01$) and America8 ($p < 0.01$) regions. Compared to car drivers who stated that they live comfortably on present income, car drivers with lower income levels are more likely to talk on a hand-held mobile phone while driving a car.

Overall, professional drivers are more likely to talk on the hand-held mobile phone while driving a car than non-professional car drivers in the three regions. In the Europe22 region the effect is stronger for professional car drivers who transports mainly goods (OR = 2.15, $p < 0.001$) than for drivers who transports mainly other person(s) (OR = 1.77, $p < 0.001$) or who transports mainly himself/herself (OR = 1.46, $p < 0.001$). In the America8 region, the OR are 1.52 ($p < 0.001$) for car drivers who transports mainly other person(s), 1.39 ($p < 0.05$) for car drivers who transports mainly goods, and 1.31 ($p < 0.001$) for car drivers who transports mainly himself/herself. In AsiaOceania6, only car drivers who

transports mainly goods (OR = 1.64, p < 0.05) and car drivers who transports mainly himself/herself (OR = 1.41, p < 0.01) have higher likelihood than non-professional car drivers.

Car drivers who drive more often are more likely to report talking on a hand-held mobile phone while driving in all the regions. Comparing to car drivers who only drive a car a few days a month, car drivers who drive a car at least four days a week are more like to talk on hand-held mobile phone while driving in Erope22 (OR = 1.92, p < 0.001), America8 (OR = 1.31, p < 0.01), and AsiaOceania6 (OR = 1.59, p < 0.001).

Table 2: Factors that influence the self-declared behaviour of talking on a hand-held mobile phone while driving a car.

Independent variables (reference categories)	Dependent variable: self-declared behaviour (past 30 days) - **talk on a hand-held mobile phone while driving a car** (0=never; 1=at least once)		
	Europe22	**America8**	**AsiaOceania6**
	Odds Ratio (CI99%)	Odds Ratio (CI99%)	Odds Ratio (CI99%)
BLOCK 1 – Sociodemographic			
Gender (Ref. female)			
Male	**1.11**** (1.00-1.23)	**1.16*** (0.99-1.37)	**1.26**** (1.02-1.57)
Age group (Ref. 18-24y)			
25-34y	**0.90** (0.75-1.09)	**0.98** (0.74-1.30)	**0.87** (0.60-1.26)
35-44y	**0.76***** (0.63-0.91)	**0.92** (0.69-1.23)	**0.76** (0.52-1.10)
45-54y	**0.58***** (0.48-0.70)	**0.78*** (0.58-1.05)	**0.65**** (0.45-0.96)
55-64y	**0.42***** (0.34-0.51)	**0.73*** (0.53-1.00)	**0.51***** (0.33-0.78)
65-74y	**0.29***** (0.23-0.37)	**0.49***** (0.33-0.74)	**0.26***** (0.14-0.47)
Educational level (Ref. none/ primary education)			
Secondary education	**0.87** (0.66-1.16)	**0.55*** (0.29-1.02)	**1.13** (0.44-2.93)
Bachelor's degree or similar	**0.97** (0.73-1.30)	**0.66** (0.36-1.22)	**1.36** (0.53-3.49)
Master's degree or higher	**0.98** (0.72-1.32)	**0.61*** (0.33-1.15)	**1.27** (0.47-3.37)
Household's income (Ref. Living comfortably on present income)			
Coping on present income	**1.16**** (1.02-1.32)	**1.35***** (1.10-1.66)	**1.30*** (0.99-1.70)
Finding it difficult on present income	**1.20**** (1.03-1.41)	**1.52***** (1.18-1.96)	**1.29*** (0.93-1.77)
Finding it very difficult on present income	**1.31**** (1.03-1.65)	**1.50**** (1.02-2.22)	**0.97** (0.61-1.54)
Level of urbanisation (Ref. rural)			
Urban/ semi-urban	**0.90*** (0.80-1.01)	**0.93** (0.70-1.23)	**1.14** (0.80-1.63)
Drive a vehicle during main professional activity (Ref. no)			
yes, transports mainly other person(s) (e.g., taxi, bus, rickshaw, …)	**1.77***** (1.42-2.20)	**1.52***** (1.15-2.00)	**1.00** (0.70-1.43)
yes, transports mainly goods (e.g., truck, courier, food delivery, …)	**2.15***** (1.71-2.70)	**1.39*** (0.96-2.03)	**1.64*** (0.95-2.81)
yes, transports mainly himself/herself (e.g., visiting patients, salesperson, …)	**1.46***** (1.27-1.67)	**1.31***** (1.08-1.60)	**1.41**** (1.08-1.83)
Frequency of driving a car (Ref. a few days a month)			
1 to 3 days a week	**1.45***** (1.20-1.76)	**1.17** (0.91-1.51)	**1.15** (0.79-1.66)
at least 4 days a week	**1.92***** (1.61-2.29)	**1.31**** (1.04-1.65)	**1.59***** (1.14-2.23)
BLOCK 2			
Acceptability (Ref. unacceptable/neutral)			
Others' acceptability (acceptable)	**1.68***** (1.40-2.02)	**1.68***** (1.21-2.33)	**2.06***** (1.33-3.19)
Personal acceptability (acceptable)	**2.53***** (1.93-3.31)	**3.15***** (1.89-5.25)	**1.55*** (0.86-2.79)
Attitudes and perceived behaviour control (Ref. disagree/neutral)			
I use a mobile phone while driving, because I always want to be available (agree)	**1.50***** (1.17-1.92)	**1.89***** (1.21-2.94)	**1.98**** (1.19-3.31)
To save time, I often use a mobile phone while driving (agree)	**1.74***** (1.33-2.27)	**2.05***** (1.35-3.12)	**1.58*** (0.90-2.78)
I am able to talk on a hand-held mobile phone while driving (agree)	**3.47***** (2.90-4.15)	**3.01***** (2.19-4.14)	**3.38***** (2.29-5.00)
Support for policy measures (Ref. oppose/neutral)			
Support of forbidding all drivers of motorized vehicles to use a hand-held mobile phone while driving (support)	**0.41***** (0.36-0.47)	**0.56***** (0.46-0.70)	**0.35***** (0.27-0.46)
Nagelkerke R Square	0.304	0.251	0.331
Sample size	21922	8230	5485

*Notes: (1) reference population – car drivers at least a few days a month; (2) models adjusted for country and for Social Desirability Scale; (3) * p-value<0.05, **p-value<0.01, ***p-value<0.001.*

As for the effect of the attitudes on the self-declared behaviour, stronger attitudes towards using the mobile while driving a car are associated with higher likelihood of talking on a hand-held mobile phone while driving. All the independent variables that assess the attitudes towards using the mobile while driving a car increase the likelihood of the self-declared behaviour in the three regions: personal acceptability, perception of other's acceptability, using a mobile phone while driving because they always want to be available, using a mobile phone while driving to save time, and being able to talk on a hand-held mobile phone while driving (perceived behaviour control). The perceived behaviour control ('I am able to talk on a hand-held mobile phone while driving') is the attitude that increases the most the likelihood of the self-declared behaviour (OR > 3) in Europe22 (OR = 3.47, p < 0.001) and in AsiaOceania6 (OR = 3.38, p < 0.001). In America8 region, besides the perceived behaviour control (OR = 3.01, p < 0.001), the personal acceptability of talking on a hand-held mobile phone while driving also has a OR > 3 (OR = 3.15, p < 0.001).

The car drivers who support the policy measure of forbidding all drivers of motorized vehicles to use a hand-held mobile phone while driving are less likely to report this behaviour than the one who do not support/are neutral in all the regions: OR = 0.41 (p < 0.001) in Europe22, OR = 0.56 (p < 0.001) in America8, and OR = 0.35 (p < 0.001) in AsiaOceania6.

3.2.2 Factors that influence fatigued driving

Table 3 shows the results of the three logistic regression models for fatigued driving ('Over the last 30 days, how often did you as a car driver drive when you were so sleepy that you had trouble keeping your eyes open?').

Results show that men are more likely to report fatigued driving than women in all the regions: OR = 1.43 (p < 0.001) in Europe22, OR = 1.47 (p < 0.001) in America8, and OR = 1.35 (p < 0.001) in AsiaOceania6. When comparing with drivers aged 18-24 years, the odds of driving when fatigued decrease for drivers over 34 years in Europe22 (35-44y: OR = 0.79; 45-54y: OR = 0.61; 55-64y: OR = 0.52; 65-74y: OR = 0.43), for drivers over 54 in America8 (55-64y: OR = 0.69; 65-74y: OR = 0.52), and only for drivers over 64 years in AsiaOceania6 (OR = 0.49).

Self-declared fatigued driving is not significantly influenced by the educational level in any of the regions (p > 0.01), but it is influenced by the household's income in Europe22 (p< 0.01) and in Amrecica8 (p < 0.01) regions – compared to car drivers who stated that they live comfortably on present income, car drivers with lower income levels are more likely to declare driving while fatigued.

European car drivers who live in urban/semi-urban areas are less likely to report fatigued driving than car drivers who live in rural areas (OR = 0.86, p < 0.01). The level of urbanization of the area where the respondent lives does not influence significantly the self-declared behaviour in America8 (p < 0.05) nor in AsiaOceania6 (p < 0.05).

Overall, professional drivers are more likely to drive a car while fatigued than non-professional car drivers in the three regions – this effect is visible for professional car drivers who transports mainly other person(s) (OR = 1.96 in Europe22, OR = 2.23 in America8, OR = 1.51 in AsiaOceania6), for professional car drivers who transports mainly goods (OR = 1.96 in Europe22, OR = 1.47 in America8, OR = 1.98 in AsiaOceania6), and for professional car drivers who transports mainly himself/herself (OR = 1.44 in Europe22, OR = 1.48 in America8, OR = 1.62 in AsiaOceania6).

The frequency of driving a car influences the self-declared behaviour of fatigued driving. Comparing to car drivers who only drive a car a few days a month, car drivers who drive a car 1 to 3 days a week or at least 4 days a week are more likely to reported fatigued driving in Europe22 (OR = 1.74 and OR = 1.23, respectively), in America8 (OR = 1.57 and OR = 1.55, respectively), and in AsiaOceania6 (OR = 1.60 and OR = 1.27, respectively).

As for the effect of attitudes, the personal acceptability of driving a car when the driver is so sleepy that he/she has trouble keeping the eyes open has a strong effect on the self-declared behaviour in all the regions. Car drivers who consider the behaviour acceptable are much more like to report the behaviour

than the one who consider the behaviour unacceptable/neutral in Europe22 (OR = 5.62, p < 0.001), in America8 (OR = 7.71, p < 0.001), and in AsiaOceania6 (OR = 4.51, p < 0.001).

Table 3: Factors that influence the self-declared behaviour of fatigued driving.

Independent variables (reference categories)	Dependent variable: self-declared behaviour (past 30 days) - **'how often did you as a car driver drive when you were so sleepy that you had trouble keeping your eyes open?'** (0=never; 1=at least once)		
	Europe22 Odds Ratio (CI99%)	**America8** Odds Ratio (CI99%)	**AsiaOceania6** Odds Ratio (CI99%)
BLOCK 1 – Sociodemographic			
Gender (Ref. female)			
Male	**1.43***** (1.28-1.59)	**1.47***** (1.21-1.78)	**1.35**** (1.08-1.70)
Age group (Ref. 18-24y)			
25-34y	**0.92** (0.76-1.12)	**0.90** (0.66-1.24)	**0.95** (0.64-1.43)
35-44y	**0.79**** (0.65-0.96)	**0.93** (0.67-1.29)	**0.94** (0.63-1.40)
45-54y	**0.61***** (0.50-0.75)	**0.80** (0.57-1.12)	**0.80** (0.53-1.22)
55-64y	**0.52***** (0.43-0.64)	**0.69**** (0.47-1.00)	**0.87** (0.56-1.36)
65-74y	**0.43***** (0.34-0.55)	**0.52***** (0.33-0.84)	**0.49**** (0.28-0.85)
Educational level (Ref. none/ primary education)			
Secondary education	**1.09** (0.81-1.45)	**0.79** (0.39-1.63)	**1.16** (0.43-3.18)
Bachelor's degree or similar	**1.06** (0.79-1.43)	**0.81** (0.40-1.66)	**1.16** (0.42-3.14)
Master's degree or higher	**1.22** (0.89-1.66)	**0.73** (0.35-1.52)	**1.20** (0.42-3.40)
Household's income (Ref. Living comfortably on present income)			
Coping on present income	**1.24***** (1.08-1.42)	**1.21*** (0.95-1.54)	**1.15** (0.86-1.53)
Finding it difficult on present income	**1.41***** (1.20-1.65)	**1.27*** (0.95-1.71)	**1.32*** (0.94-1.86)
Finding it very difficult on present income	**1.18** (0.92-1.52)	**1.98***** (1.30-3.01)	**1.01** (0.62-1.65)
Level of urbanisation (Ref. rural)			
Urban/ semi-urban	**0.86**** (0.76-0.97)	**0.80** (0.58-1.08)	**1.01** (0.71-1.44)
Drive a vehicle during main professional activity (Ref. no)			
yes, transports mainly other person(s) (e.g., taxi, bus, rickshaw, …)	**1.96***** (1.57-2.44)	**2.23***** (1.65-2.99)	**1.51**** (1.03-2.20)
yes, transports mainly goods (e.g., truck, courier, food delivery, …)	**1.96***** (1.55-2.47)	**1.47*** (0.97-2.23)	**1.98**** (1.16-3.38)
yes, transports mainly himself/herself (e.g., visiting patients, salesperson, …)	**1.44***** (1.25-1.66)	**1.48***** (1.18-1.85)	**1.62***** (1.23-2.14)
Frequency of driving a car (Ref. a few days a month)			
1 to 3 days a week	**1.74***** (1.45-2.09)	**1.57***** (1.18-2.09)	**1.60**** (1.10-2.33)
at least 4 days a week	**1.23**** (1.00-1.51)	**1.55***** (1.14-2.11)	**1.27** (0.84-1.91)
BLOCK 2			
Personal acceptability (Ref. unacceptable/neutral)			
Acceptable	**5.62***** (4.08-7.75)	**7.71***** (4.22-14.09)	**4.51***** (2.44-8.36)
Nagelkerke R Square	0.162	0.195	0.169
Sample size	21922	8230	5485

*Notes: (1) reference population – car drivers at least a few days a month; (2) models adjusted for country and for Social Desirability Scale; (3) * p-value<0.05, **p-value<0.01, ***p-value<0.001.*

3.3 Comparisons over time (ESRA2-ESRA3)

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

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

In 2025 the ESRA initiative plans to publish a dedicated report on 10 years of ESRA. This report will offer deeper insights into the evolution of ESRA and compare results over time since its start in 2015.

The comparison between ESRA2 and ESRA3 focuses on the self-declared behaviour of car drivers. The comparison was done at a country level for 24 countries with comparable data in ESRA2 and in ESRA3: Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Ireland, Israel, Italy, Japan, Netherlands, Poland, Portugal, Serbia, Slovenia, Spain, Sweden, Switzerland, United Kingdom, and United States. For these countries the formulation of the question ('Over the last 30 days, how often did you as a car driver …?') and the answer scale (5-points scale, where 1 = never & 5 = (almost) always) were the same in ESRA2 and ESRA3. Of the items on self-declared behaviour included in ESRA3, it was possible to compare three items related to distraction and fatigue: 'Talk on a hand-held mobile phone while driving', 'Talk on a hands-free mobile phone while driving', and 'Drive when you were so sleepy that you had trouble keeping your eyes open' – the formulation of these questions was the same in both editions. Results in Figure 19, Figure 20, and Figure 21 and in Table 5 in Appendix 4 show the percentages of 'at least once' (answers 2 to 5 in a 5-points scale, where 1 = never & 5 = (almost) always)) in the past 30 days and the correspondent 95% Confidence Intervals (95% CI).

The proportion of car drivers who reported talking on a hand-held mobile phone while driving decreased in 18 countries and increased in 6 countries (Figure 19). On the other hand, car drivers who reported talking on a hands-free mobile phone while driving increased in 19 countries and decreased in 5

countries (Figure 20). On average, the percentage of talking on a hand-held mobile phone in the 24 countries decreased by 4.6%, while the percentage of using hands-free systems increased by 3.8%. Even if the differences in proportions between ESRA2 and ESRA3 may not be statistically significant for most of the countries, these results suggest that car drivers may be replacing the hand-held mobile phone by hands-free systems to talk while driving.

It should be noted that for some countries very large differences between ESRA2 and ESRA3 were found. For example, the percentage of car drivers who reported using a hand-held mobile phone while driving changed largely in Germany (40.2% in ESRA2 to 17.4% in ESRA3), United Kingdom (7.3% in ESRA2 to 15.9% in ESRA3), and United States (39.6% in ESRA2 to 25.6% in ESRA3). As mentioned in the beginning of this section, these results should be interpreted with caution, as it may be influenced by methodological differences in ESRA2 and ESRA3 surveys.

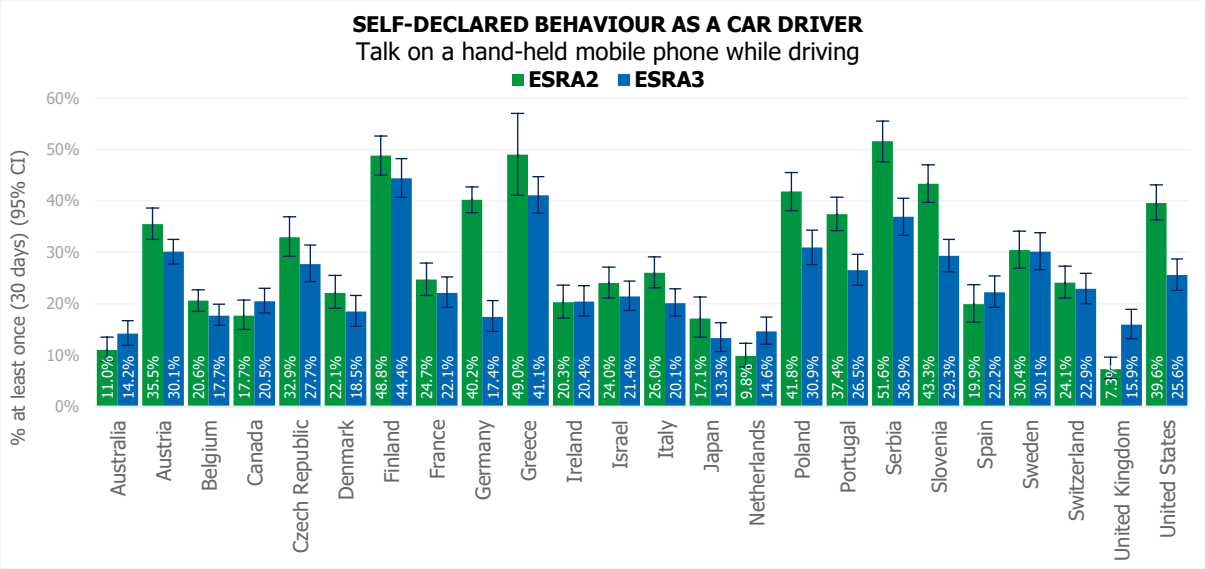


Figure 19: Self-declared behaviour as a car driver, in ESRA2 and in ESRA3, by country (% at least once in the past 30 days ± 95% Confidence Intervals). ESRA2 results recalculated for comparability.

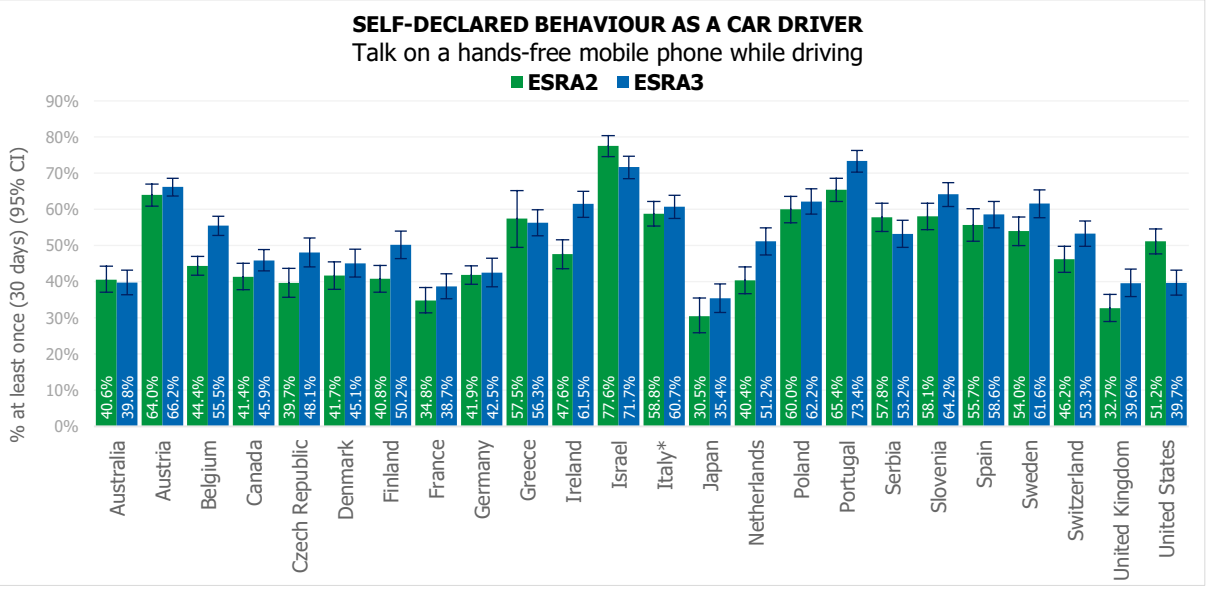


Figure 20: Self-declared behaviour as a car driver, in ESRA2 and in ESRA3, by country (% at least once in the past 30 days ± 95% Confidence Intervals). ESRA2 results recalculated for comparability.

As for fatigued driving (Figure 21), on average, the percentage of car drivers who reported had driven when they were so sleepy that they had trouble keeping their eyes open in the 24 countries decreased by 1.0%. With exception of Japan, no overlap in 95% CI were found in any of the countries. These results suggest that no changes occurred between ESRA2 and ESRA3 in ESRA countries. In Japan the percentage decreased from 37.1% (95% CI: 32.2%-42.3%) to 23.5% (95% CI: 20.1%-27.1%) – only country with no overlap between 95% CI.

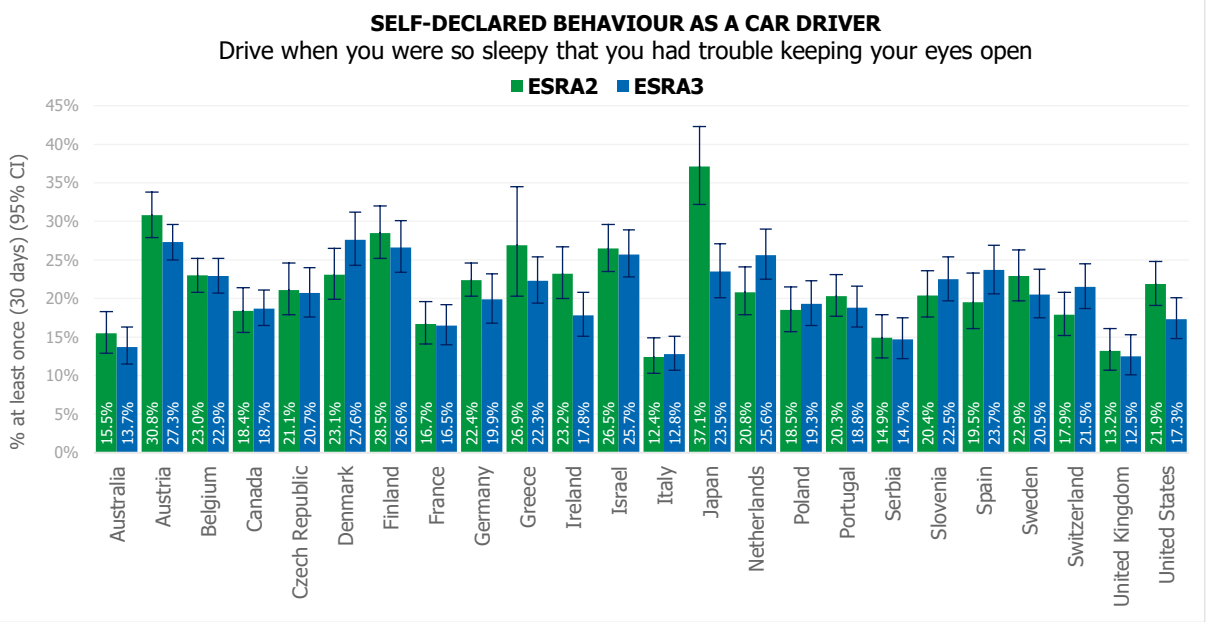


Figure 21: Self-declared behaviour as a car driver, in ESRA2 and in ESRA3, by country (% at least once in the past 30 days ± 95% Confidence Intervals). ESRA2 results recalculated for comparability.

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

3.4 Comparison with other findings

This section includes the analysis of external data and its association with results of ESRA3 survey – data at a country level.

3.4.1 Observed (Baseline) vs. self-declared behaviour (ESRA3)

Baseline project (https://www.baseline.vias.be) produced values for Road Safety KPIs (Key Performance Indicators) in EU Member States. One KPI related to distraction while driving was produced: 'Percentage of drivers not using a handheld mobile device'. Data collection was carried out between 2020 and 2022 through roadside observations. Drivers of different vehicles (passenger cars, light goods vehicles, bus/coach) in different time periods (weekdays and/or weekend days) were observed. For effects of comparability with ESRA3 data, only Baseline countries with data for car passenger drivers collected on both weekdays and weekend days were included in this report: Austria, Belgium, Czech Republic, Greece, Latvia, and Poland (Spain also met these criteria, but it was not included because the KPI also included handling onboard devices – not only mobile devices). Data was extracted from the 'Baseline report on the KPI Distraction' (see table 12 – ´Week- and weekend day') (Boets, 2023).

Based on the data in the Baseline report, the percentage of car passenger drivers using a handheld mobile device while driving was calculated for each country. This prevalence of the behaviour (observed) was correlated with the self-declared behaviors of talking on a hand-held mobile phone while driving a car and reading a message or checking social media/news while driving a car (% of at least once in the past 30 days) – ESRA3 data. Results are presented in Figure 22.

Results show that the prevalence of handling a mobile device while driving a car (observed behaviour) is positively correlated with the self-declared behavior of talking on a hand-held mobile phone while driving a car (r = 0.906, p-value = 0.013) and reading a message or checking social media/news while driving a car (r = 0.636, p-value = 0.174).

Despite the low number of countries included in the analysis (only six), these results show that countries with high prevalence of observed behaviour have high prevalence of the self-declared behaviours, and vice-versa.

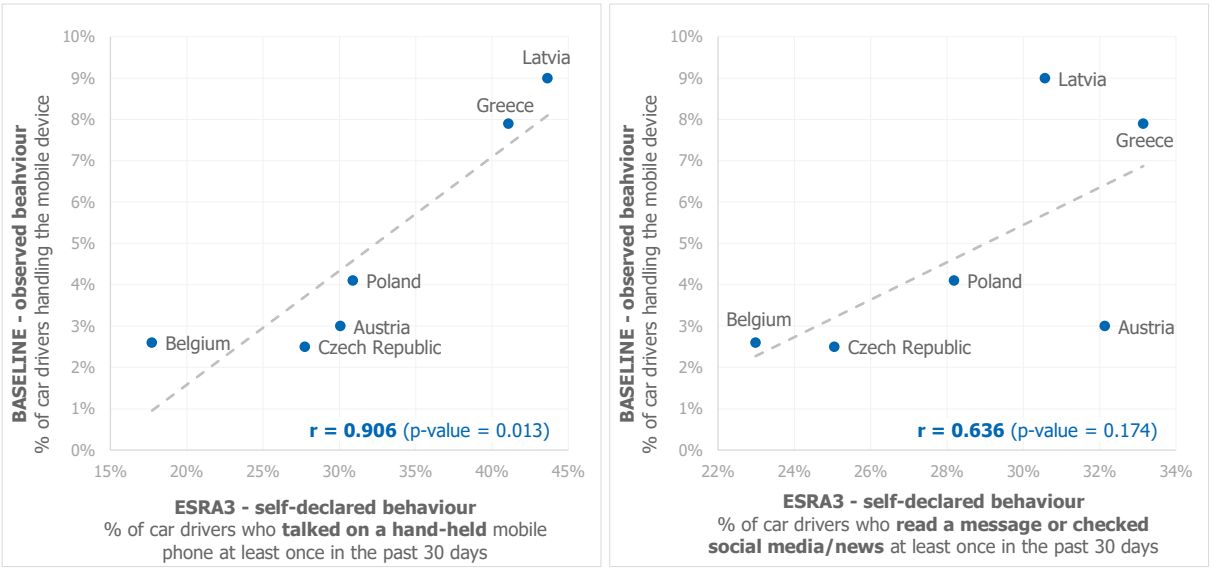


Figure 22: Prevalence of car drivers handling a mobile device (observed behaviour according to Baseline project) vs. self-declared behaviours of talking on a hand-held mobile phone and of reading a message or checking social media/news (% of at least once in the past 30 days) (according to ESRA3 data).

3.4.2 Time spent using smartphones and using the internet on mobile phones

Data on the time spent using smartphones and the time spent using the internet on mobile phones were retrieved from the Digital 2023 July Global Statshot Report (We Are Social & Meltwater, 2023). Data represents the daily average number of hours in each country based on data collected in the first half of 2023 through online surveys of internet users aged 16-64 years. Data on the time spent using smartphones was available for 25 ESRA3 countries and data on the time spent using the internet on mobile phones was available for 27 ESRA3 countries.

Results in Figure 23 show that the prevalence of the self-declared behaviour of talking on a hand-held mobile phone while driving a car is strongly correlated with the average time spent using smartphones ($r = 0.747$, p-value < 0.001) and with the average time spent using the internet on mobile phones in the country ($r = 0.742$, p-value < 0.001). Similar correlations exist between the self-declared behaviour of reading a message or checking social media/news while driving a car and both times: $r = 0.723$ (p-value < 0.001) with the time spent using smartphones and $r = 0.737$ (p-value < 0.001) with the time spent using the internet on mobile phones (Figure 24).

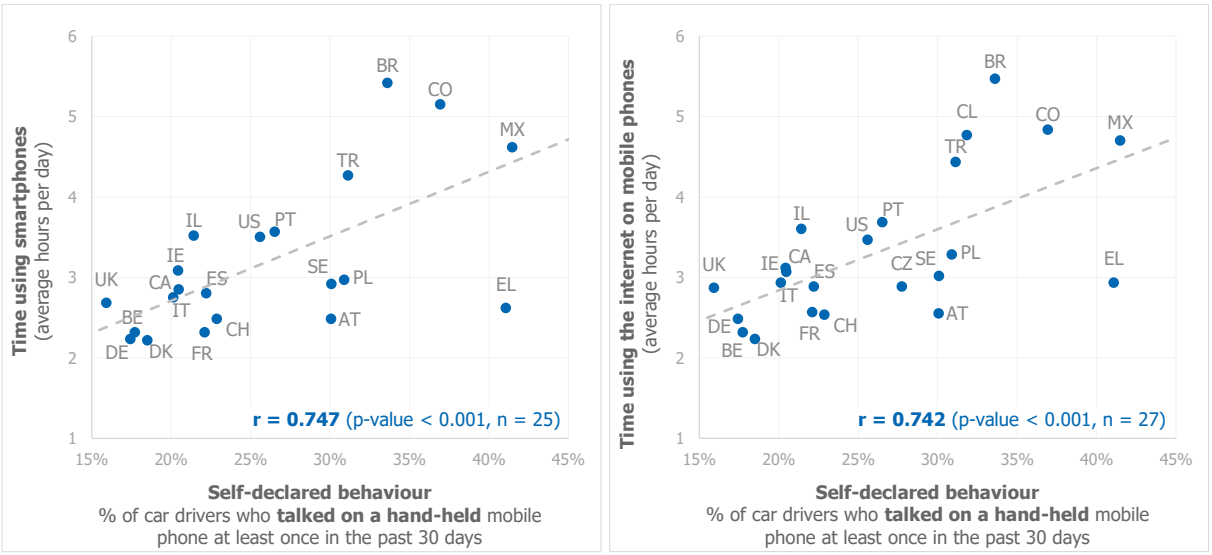


Figure 23: Self-declared behaviour of talking on a hand-held mobile phone while driving a car (% of at least once in the past 30 days) vs. average daily time using a smartphone (hours) and average daily time using the internet on mobile phones (hours).

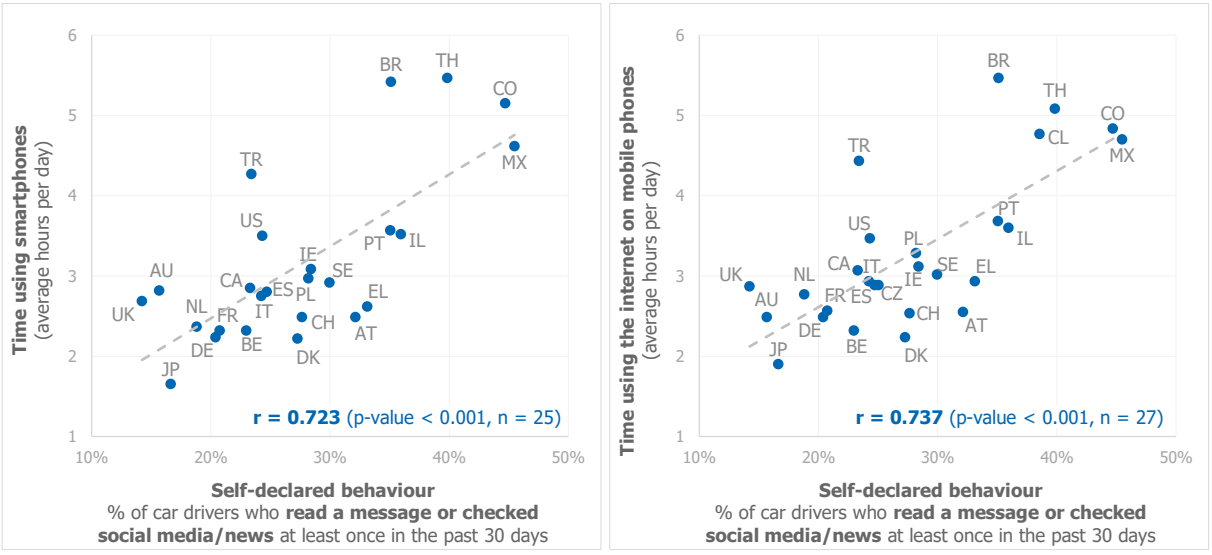


Figure 24: Self-declared behaviour of reading a message or checking social media/news while driving a car (% of at least once in the past 30 days) vs. average daily time using a smartphone (hours) and average daily time using the internet on mobile phones (hours).

3.5 Limitations of the data

One of the limitations of the ESRA data is the effect of cultural differences among the various countries across the world. Road users of countries from Europe, America, Asia, or Oceania may have different cultural interpretations of the questions on the survey or even other cultural ways of answering a survey. Factors like social values, capabilities, personality, the role of status of a person, laws, road safety culture, and infrastructural differences vary among the different countries and may influence road users' responses (Pires et al., 2020).

Other limitations refer to the possible biases of self-report data. Respondents may provide answers which present a favourable image of themselves – desirability bias (e.g. individuals may over-report good behaviour or under-report bad, or undesirable behaviour). Misunderstanding of questions (e.g., questions with difficult words or long questions) or unintentional faulty answers due to memory errors (recall error) may also bias the results of self-declared surveys (Choi & Pak, 2005; Krosnick and Presser, 2010). A Social Desirability Scale was included in the logistic regression models to correct the effects for desirability-related bias, but the descriptive results and the comparisons by region, gender, and age group were not adjusted for possible desirability bias.

Despite the advantages of online surveys, the representativeness of the surveyed populations may be a problem in certain countries and regions, mainly for countries with low rates of internet use, for which the sample may not represent the entire population. Furthermore, the small sample size for some groups of road users in some countries, like moped riders/motorcyclists or cyclists, lead to large errors in the estimates.

Although the logistic regression analysis identifies several explanatory variables that predict the self-declared behaviour, the associations between explanatory and dependent variables are correlational and the causal direction of influence between variables is not indicated by the analysis.

Limitations on the results of the comparison between ESRA2 and ESRA3 were already described in section 3.3. More information on general limitations of the ESRA3 survey can be found in the ESRA3 methodology report (Meesmann & Wardenier, 2024).

To explain specific results within one country or to explain the differences between countries recorded in this survey goes beyond the scope of this report. These explanations cannot be derived from the present data but require further research or information.

4 Summary and discussion

Results from ESRA3 survey presented in this report show that most road users are aware of the risks and negative road safety effects of using the mobile phone in traffic. The percentage of acceptability of talking on a hand-held mobile phone while driving a car was less than 3% in all the ESRA3 regions. Reading a message or checking social media/news while driving a car, riding a moped/ motorcycle, or cycling was considered acceptable by less than 5% of the road users. A higher percentage (more than half in Europe22 and America8 regions) believe that using a hand-held mobile phone while driving is often/frequently the cause of a road crash involving a car and most support forbidding all drivers of motorized vehicles to use a hand-held mobile phone while driving (more than 79% in all regions). Despite the low acceptability and high risk perception, there is still a high percentage of road users who use the mobile in traffic: talking on a hand-held mobile phone and reading a message or checking social media/news was reported by more than 20% of car drivers: and 23.2% in Europe22; 30.5% and 31.5% in America8; 27.6% and 24.5% in AsiaOceania6. The percentages of moped riders/motorcyclists and cyclists who reported reading a message or checking social media/news while riding/cycling were 20.7% and 20.5% in Europe22, 22.8% and 24.0% in America8, 24.9% and 19.5% in AsiaOcenia6. The social expectation to return calls or answer text messages immediately; professional reasons; or perceived practical, social, and psychological benefits could outweigh the risk of using the mobile phone while driving (Nurullah, 2013). Personality traits that lead drivers to take risks while driving could also be an explanation, as suggested by Zhao et al. (2013).

Talking on hands-free mobile phone while driving a car was considered more acceptable, less risky, and was reported more often than handling a mobile phone: 51.0% of European car drivers, 47.6% of American car drivers, and 44.3% of Asian/Oceanic car drivers reported this behaviour at least once in the past 30 days. The risk of using a mobile phone while driving is often only associated to physical and visual distraction. Cognitive distraction, which is similar when using a hand-held or a hands-free mobile phone (NSC, 2012), is underestimated by many road users. This fact, together with being legal in almost all countries, explain the higher percentages of drivers using hands-free devices.

The comparison between ESRA2 and ESRA3 results suggest that car drivers may be replacing the use of a hand-held mobile phone to talk while driving a car by hands-free systems. On average, in 24 countries that was possible to compare, the percentage of car drivers who reported talking on a hand-held mobile phone while driving a car decreased by 4.6%, while the percentage of using hands-free systems increased by 3.8%. This may be explained by the evolution of the mobile phones and the wireless earbuds to connect to the mobile phone, and by systems integrated in new cars that allow to easily connect the mobile phone to the car.

Logistic regression models identified several factors associated with increased risk of talking on a hand-held mobile phone while driving a car. Overall, the odds of talking on a hand-held mobile phone while driving a car are higher for male drivers, younger drivers, drivers with lower household's income, professional drivers, and increase with the frequency of driving a car. Stronger attitudes towards using the mobile while driving a car are associated with higher likelihood of talking on a hand-held mobile phone while driving. The perceived behaviour control of being able to talk on a hand-held mobile phone while driving a car is the attitude that influences the most the self-declared behaviour. Similar results have been found in previous ESRA editions (Trigoso et al., 2016; Pires et al., 2019) and in other studies (Ivers et al., 2009; Nurullah, 2013; Ajzen, 1991; Sullman et al., 2018).

The correlation between self-declared behaviours (ESRA3 data) and observed behaviours (Baseline project) at a country level show that the prevalence of handling a mobile device while driving a car (observed behaviour) is positively correlated with the self-declared behaviour of talking on a hand-held mobile phone ($R = 0.906$, p-value = 0.013) and reading a message or checking social media/news while driving a car ($R = 0.636$, p-value = 0.174). Despite the low number of countries included in the analysis (only six countries), these results show that data collected through self-declared surveys may be good safety performance indicators (SPIs) to assess the road safety performance of a country. However, more research is needed with a large number of countries.

In countries where the population spend more time using smartphones and the internet on mobile phones, the percentages of the self-declared behaviour of talking on a hand-held mobile phone and of

reading a message or checking social media/news are higher – positive correlation between the prevalence of the self-declared behaviour and the average time spent using smartphones and using the internet on mobile phones at a country level (R between 0.723 and 0.747.

As for fatigue, driving so sleepy that the driver has trouble keeping his/her eyes open was considered acceptable by less than 4% of the road users in all the ESRA3 regions. A higher percentage of road users believe that driving while tired is often/frequently the cause of a road crash involving a car (64.4% in Europe22, 52.1% in America8, and 38.4% AsiaOceania6). Despite the low acceptability and high risk perception, there is still a high percentage of car drivers who reported fatigued driving: 18.4% in Europe22, 18.6% in America8, and 20.1% AsiaOceania6. Overall, the odds the self-declared fatigued driving are higher for male drivers, drivers until 54 years, professional drivers, and increase with the frequency of driving a car. The personal acceptability of driving a car while fatigued has a strong influence in the self-declared behaviour in all the regions: OR = 5.62 in Europe22, OR = 7.71 in America8, and OR = 4.51 in AsiaOceania6. These results suggest that car drivers appear not to be able to prevent or adequately react to the problem of fatigued driving, even though they may have strong personal norms against this type of behaviour. These results are in line with the results obtained in previous ESRA editions (Trigoso et al., 2016; Goldenbeld & Nikolaou, 2022).

Recommendations

Policy recommendations at national and regional level

- Define indicators and set targets at national and regional levels, such as the prevalence of distracted driving, the prevalence of fatigued driving, the number of controls for mobile phone use.
- Facilitate and support the exchange of best practice in terms of countermeasures for the use of the mobile phone in traffic and for fatigued driving.
- Support more research on effective countermeasures for distraction and fatigue through developments in vehicle and Information Communication Technology (ICT).
- Incorporate information on risks associated with distraction in traffic and fatigued driving in educational programmes and in driver license training.
- Conduct awareness-raising campaigns on the risks of fatigued driving. Campaigns should provide helpful and clear instructions on how to prevent fatigued driving and how to react in a real situation.
- Conduct awareness-raising campaigns on the risks of distracted driving. One of the aims of the campaigns should be to demystify that talking on a hand-held mobile phone while driving a car is much less risky than talking on a hands-free mobile phone since there is no much difference in terms of cognitive distraction.
- Develop specific campaigns and awareness raising activities in relation to distraction of pedestrians, cyclists, motorcyclists, and other powered transport modes such as e-scooters.
- Raise the awareness about the very high risks of texting in traffic and increase penalties.
- Advise drivers for the importance of fatigue detection systems in their vehicles, how to use it, and to take warning signals by these systems seriously.
- Implement rumble strips on major roadways (motorways and rural roads). Make the use of rumble strips mandatory in the Trans-European Transport Network.
- Increase enforcement (and enforcement perception) and find new methods of enforcement in relation to the mobile phone use while driving. Ensure that penalties are applied to drivers who break the law.
- Implement public roadside rest areas providing safe parking areas for tired drivers allowing them to rest and reduce the opportunity of having a crash.
- Mandated driving times and rest periods should be established to manage the work hours and rest breaks of professional drivers.

- Increase the screening of sleep disorders mainly obstructive sleep apnea (OSA) since drivers suffering from untreated OSA have a higher risk of being involved in a crash. Raise awareness of these risks among the groups most at risk.

Specific recommendations to particular stakeholders

- *[To Non-Governmental Organizations (NGOs)]* Contribute to education and awareness raising campaigns and events against distraction in traffic and fatigued driving.
- *[To vehicle manufacturers, other companies and research organisations]* Develop low-cost solutions to be incorporated in vehicles that can detect and prevent distraction and fatigue.
- *[To private and public companies]* Develop road safety plans that include policies concerning the use of the mobile phone in traffic and fatigued driving.

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.

Lists of tables and figures

References

Ajzen, I. (1991). The theory of planned behavior. Organizational Behavior and Human Decision Processes, 50, 179-211.

Boets, S. (2023). Baseline report on the KPI Distraction. Baseline project, Brussels: Vias institute" https://www.baseline.vias.be/storage/minisites/baseline-kpi-distraction.pdf

Botteghi, G., Ziakopoulos, A., Papadimitriou, E., Diamandouros,K., Arampidou, K. (2017 Implementation of edgeline rumble strips, European Road Safety Decision Support System, developed by the H2020 project SafetyCube. Retrieved from www.roadsafety-dss.eu on 11-06-2024.

Briggs, G., Graham, H, Land, M. (2016). Imagery-inducing distraction leads to cognitive tunnelling and deteriorated driving performance. Transportation Research Part F: Traffic Psychology and Behaviour, Volume 38, April 2016, Pages 106-117. doi: 10.1016/j.trf.2016.01.007

Choi, B., Pak, A. (2005). A catalog of biases in questionnaires. Preventing Chronic Disease, 2 (1), A13.

Cohen, J. (1988). Statistical power analysis for the behavioral sciences (2nd ed.). Hillsdale, New Jersey: Lawrence Erlbaum Associates.

European Commission (2021) Road safety thematic report – Fatigue. European Road Safety Observatory. Brussels, European Commission, Directorate General for Transport. https://road-safety.transport.ec.europa.eu/system/files/2021-07/road_safety_thematic_report_fatigue_tc_final.pdf

European Commission (2022) Road safety thematic report – Driver distraction. European Road Safety Observatory. Brussels, European Commission, Directorate General for Transport. https://road-safety.transport.ec.europa.eu/system/files/2022-04/Road_Safety_Thematic_Report_Driver_Distraction_2022.pdf

Goldenbeld, C., & Nikolaou, D. (2022). Driver fatigue. ESRA2 Thematic report Nr. 4 (updated version). ESRA project (E-Survey of Road users' Attitudes). (2022-T-01-EN). SWOV Institute for Road Safety Research. https://www.esranet.eu/storage/minisites/esra2019thematicreportno4fatigue-update.pdf

Highway Traffic Safety Administration – US Department of Transportation. https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812665.

International Organization for Standardization (ISO). (2024). ISO 3166 Country Codes. https://www.iso.org/iso-3166-country-codes.html

Ivers, R., Senserrick, T., Boufous, S., Stevenson, M., Chen, H., Woodward, M., & Norton R. (2009). Novice Drivers' Risky Driving Behavior, Risk Perception, and Crash Risk: Findings From the DRIVE Study. Am J Public Health, 99(9):1638–1644. doi:10.2105/AJPH.2008.150367

IBM Corp. (2022). IBM SPSS Statistics for Windows (Version 29.0) [Computer software] IBM Corp. https://www.ibm.com/products/spss-statistics

Krosnick, J., Presser S. (2010). Questionnaire design. In: J. D. Wright & P. V. Marsden (Eds.), Handbook of Survey Research (Second Edition). West Yorkshire, England: Emerald Group.

Lee, J.D., Young, K.L., & Regan, M.A. (2008). Defining driver distraction. In: Regan, M.A., Lee, J.D., & Young, K.L. (red.), Driver distraction: theory, effects and mitigation. CRC Press, Taylor & Francis Group, Boca Raton, Florida, p. 31-40.

Lyon, C., Vanlaar, W., & Robertson, R. D. (2024). The impact of COVID-19 on transportation-related and risky driving behaviors in Canada. *Transportation research part F: traffic psychology and behaviour*, *100*, 13-21. https://doi.org/10.1016/j.trf.2023.11.011

McArthur, A., Kay, J., Savolainen, P. T., & Gates, T. J. (2013). Effects of Public Rest Areas on Fatigue-Related Crashes. Transportation Research Record, 2386(1), 16-25. https://doi.org/10.3141/2386-03

Meesmann, U., Wardenier, N., Torfs, K., Pires, C., Delannoy, S., & Van den Berghe, W. (2022a). A global look at road safety: Synthesis from the ESRA2 survey in 48 countries. (2022-R-12-EN). ESRA project (E-Survey of Road users' Attitudes). Vias institute. https://www.esranet.eu/storage/minisites/esra2-main-report-def.pdf

Meesmann, U., Torfs, K., Wardenier, N. & Van den Berghe, W. (2022b). ESRA2 methodology. ESRA2 report Nr. 1 (updated version). ESRA project (E-Survey of Road users' Attitudes). (2022-R-16-EN). Vias institute. https://www.vias.be/publications/ESRA2%20methodology%20-%20Up/ESRA2%20methodology%20-%20ESRA2%20report%20Nr.%201%20(updated%20version).pdf

Meesmann, U., & Wardenier, N. (2024). ESRA3 methodology. ESRA3 Thematic report Nr. 1. Version 1.0. ESRA project (E-Survey of Road users' Attitudes). (2024 – R – 09 – EN). Vias institute. https://www.esranet.eu/storage/minisites/esra3-methodology-report.pdf

Moradi, A., Nazari, S.S.H., & Rahmani, K. (2018). Sleepiness and the risk of road traffic accidents: A systematic review and meta-analysis of previous studies. Transportation Research Part F: Traffic Psychology and Behaviour, 65, 620-629. https://doi.org/10.1016/j.trf.2018.09.013

NHTSA (2019). Traffic Safety Facts – Research note: Driver Electronic Device Use in 2014. National

NSC (2012). Understanding the distracted brain – why driving while using hands-free cell phones is risky behaviour (white paper). National Safety Council, US. https://www.nsc.org/getmedia/2ea8fe8b-d7b7-4194-8ea5-306d30a73972/cognitive-distraction-white-paper.pdf

Nurullah, A. S., Thomas, J., & Vakilian, F. (2013). The Prevalence of Cell Phone Use while Driving in a Canadian Province. Transportation Research Part F: Traffic Psychology and Behaviour, 19, pp. 52–62. doi: 10.1016/j.trf.2013.03.006

Olson, R.L., Bocanegra, R.J., Hanowski, J., & Hickman J. S. (2009). Driver Distraction in Commercial Vehicle Operations. U.S. Department of Transportation. https://www.fmcsa.dot.gov/sites/fmcsa.dot.gov/files/docs/DriverDistractionStudy.pdf

Oviedo-Trespalacios, O., King, M., Haque, M., & Washington, S. (2017). Risk factors of mobile phone use while driving in Queensland: Prevalence, attitudes, crash risk perception, and task-management strategies. PloS one, 12(9), e0183361. doi: 10.1371/journal.pone.0183361

Pires, C., Areal, A., & Trigoso, J. (2019). Distraction (mobile phone use). ESRA2 Thematic report Nr. 3. ESRA project (E-Survey of Road users' Attitudes). (2019-T-04-EN). Portuguese Road Safety Association. https://www.esranet.eu/storage/minisites/esra2018thematicreportno3distraction.pdf

Pires, C., Torfs, K., Areal, A., Goldenbeld, C., Vanlaar, W., Granié, M.-A., Stürmer, Y. A., Usami, D. S., Kaiser, S., Jankowska-Karpa, D., Nikolaou, D., Holte, H., Kakinuma, T., Trigoso, J., Van den Berghe, W., & Meesmann, U. (2020). Car drivers' road safety performance: A benchmark across 32 countries. IATSS Research, 44(3), 166–179. https://doi.org/10.1016/j.iatssr.2020.08.002

R Core Team. (2023). R: A Language and Environment for Statistical Computing (Version 4.3.1) [Computer software] R Foundation for Statistical Computing. https://www.R-project.org/

Trigoso, J., Areal, A., & Pires, C. (2016). Distraction and fatigue. ESRA thematic report no. 3. ESRA project (European Survey of Road users' safety Attitude). (2016-T-03-EN). Prevenção Rodoviária Portuguesa. https://www.esranet.eu/storage/minisites/esra2015thematicreportno3distractionandfatigue-0.pdf

Schroeder, P., Wilbur, M., & Peña, R. (2018, March). National survey on distracted driving attitudes and behaviors - 2015 (Report No. DOT HS 812 461). Washington, DC: National Highway Traffic Safety Administration.https://www.nhtsa.gov/sites/nhtsa.gov/files/documents/13123-2015_natl_survey_distracted_driving_031418_v5_tag.pdf

Shi, J., Xiao, Y., & Atchley, P. (2016) Analysis of factors affecting drivers choice to engage with a mobile phone while driving in Beijing. Transportation Research Part F: Traffic Psychology and Behaviour, Volume 37, February 2016, Pages 1-9. doi: 10.1016/j.trf.2015.12.003

Sullman, M., Hill, T., & Stephens, A. (2018). Predicting intentions to text and call while driving using the theory of planned behaviour. Transportation Research Part F: Traffic Psychology and Behaviour, Volume 58, October 2018, Pages 405-413. doi: 10.1016/j.trf.2018.05.002

SWOV (2019). Fatigue. SWOV fact sheet, September 2019. SWOV, The Hague.

SWOV (2020). Distraction in traffic. SWOV fact sheet, July 2020. SWOV, The Hague.

The World Bank Group. (2023). World Bank Country and Lending Groups. https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups

United Nations Statistics Division. (2023). UNData. Population by age, sex and urban/rural residence. http://data.un.org/Data.aspx?d=POP&f=tableCode%3A22

We Are Social & Meltwater (2023). Digital 2023 July Global Statshot Report - We Are Social & Meltwater. [online] Available at: https://datareportal.com/reports/digital-2023-july-global-statshot [Accessed May 06 2024].

Zhao, N., Reimer, B., Mehler, B., D'Ambrosio, L. A., & Coughlin, J. F. (2013). Self-reported and observed risky driving behaviors among frequent and infrequent cell phone users. Accident Analysis and Prevention, 61, p.71–77.

Appendix 1: ESRA3 Questionnaire

Introduction

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

Socio-demographic information

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Mobility & exposure

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

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

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

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

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

Self-declared safe and unsafe behaviour in traffic

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

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

Items (random order):

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

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

Only asked to HIC/UMIC countries.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Items (random order):

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

Acceptability of safe and unsafe traffic behaviour

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Attitudes towards safe and unsafe behaviour in traffic

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

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

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

Perceived behaviour control = self-efficacy

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

Habits

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

Intention

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

Subjective safety & risk perception

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

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

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

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

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

Support for policy measures

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

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

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

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

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

Items only for LMIC countries (random order):

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

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

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

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

Enforcement

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

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

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

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

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

Involvement in road crashes

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

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

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

Infrastructure

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Social desirability scale

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

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

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

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

Closing comment: Thank you for your contribution!

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

Appendix 2: ESRA3 weights

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

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

Appendix 3: Sample size

Table 4: Weighted sample size by region and country.

Country	All road users	car drivers, at least a few days a year	car drivers, at least a few days a month	motorcyclists/ moped riders, at least a few days a month	cyclists, at least a few days a month	pedestrians, at least a few days a month
Armenia	467	140	122	8	41	441
Australia	953	828	809	280	392	757
Austria	1804	1506	1420	194	876	1682
Belgium	1795	1391	1346	222	852	1583
Bosnia and Herzegovina	914	644	597	96	369	716
Brazil	947	721	657	299	508	788
Canada	1904	1464	1385	221	611	1429
Chile	923	635	576	105	401	793
Colombia	909	557	472	284	510	805
Czech Republic	965	641	597	75	406	845
Denmark	874	689	647	115	520	729
Finland	993	769	683	97	554	889
France	965	801	769	190	409	768
Germany	832	649	618	133	457	678
Greece	978	814	754	200	325	843
Ireland	901	736	706	62	259	744
Israel	965	836	796	33	120	764
Italy	1007	921	906	266	549	885
Japan	986	603	570	84	365	740
Kazakhstan	845	336	250	49	245	707
Kyrgyzstan	468	176	166	7	69	429
Latvia	911	674	621	43	378	777
Luxembourg	471	433	424	44	141	411
Mexico	932	692	647	196	437	789
Netherlands	905	740	700	145	744	856
Panama	855	606	542	84	318	705
Peru	843	475	401	216	434	765
Poland	927	772	723	94	584	864
Portugal	1032	902	844	91	260	917
Serbia	982	724	676	72	488	893
Slovenia	945	824	805	146	464	849
Spain	935	748	710	159	381	865
Sweden	922	690	633	88	446	727
Switzerland	979	803	776	200	522	910
Thailand	870	620	586	632	482	592
Türkiye	897	738	692	264	405	830
United Kingdom	921	668	644	179	327	823
United States	938	823	782	407	468	644
Uzbekistan	433	103	82	30	86	287
Europe22	22000	17710	16900	3732	10650	19119
America8	8000	6331	5894	2650	3967	6187
AsiaOceania6*	6000	4180	3931	1708	2524	4705

** Not including Armenia, Kyrgyzstan, Uzbekistan (different methodology).*

Appendix 4: Additional results

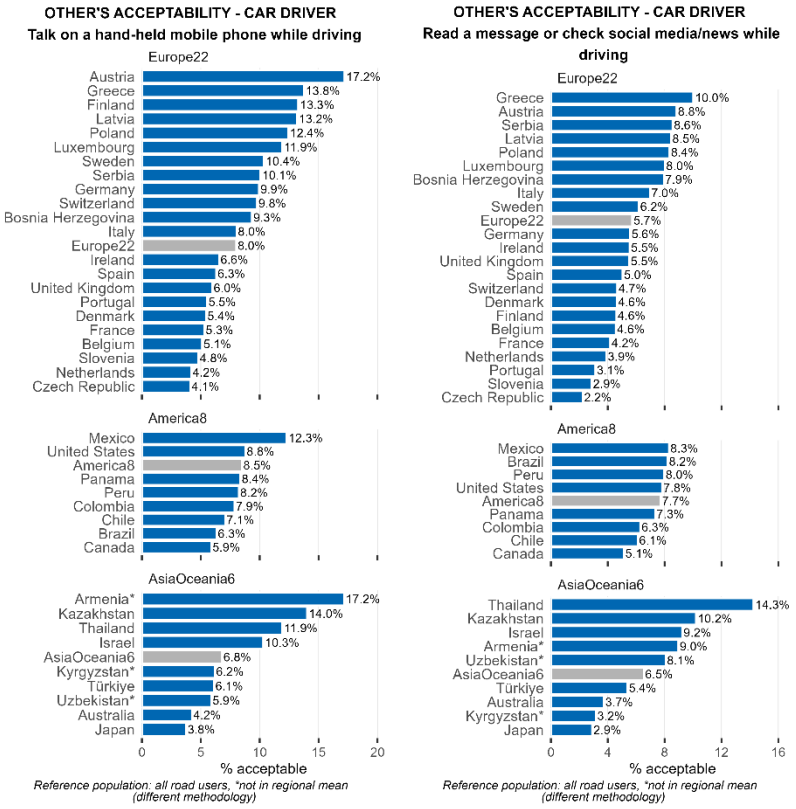


Figure 25: Other's acceptability of unsafe traffic behaviour of car drivers, by region and country (% acceptable).

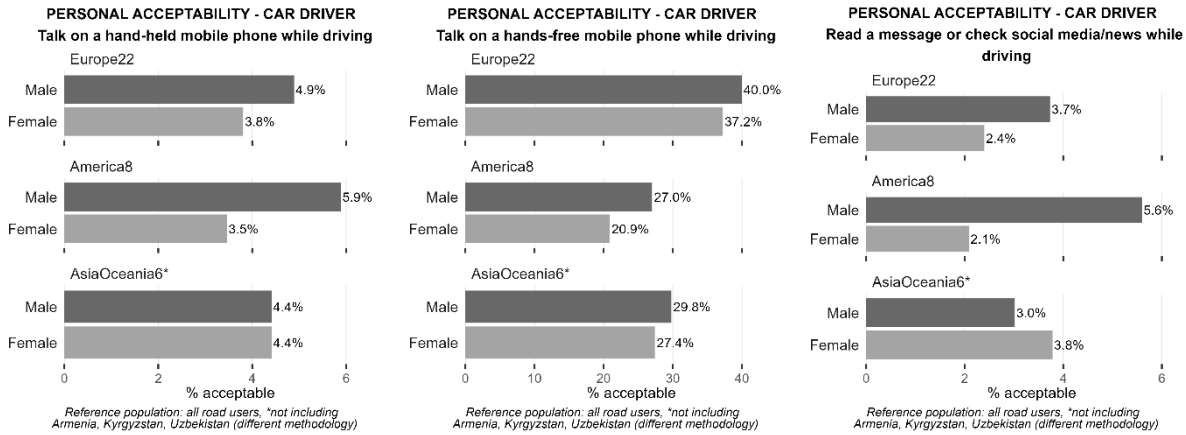


Figure 26: Personal acceptability of unsafe traffic behaviour of car drivers, by region and gender (% acceptable).

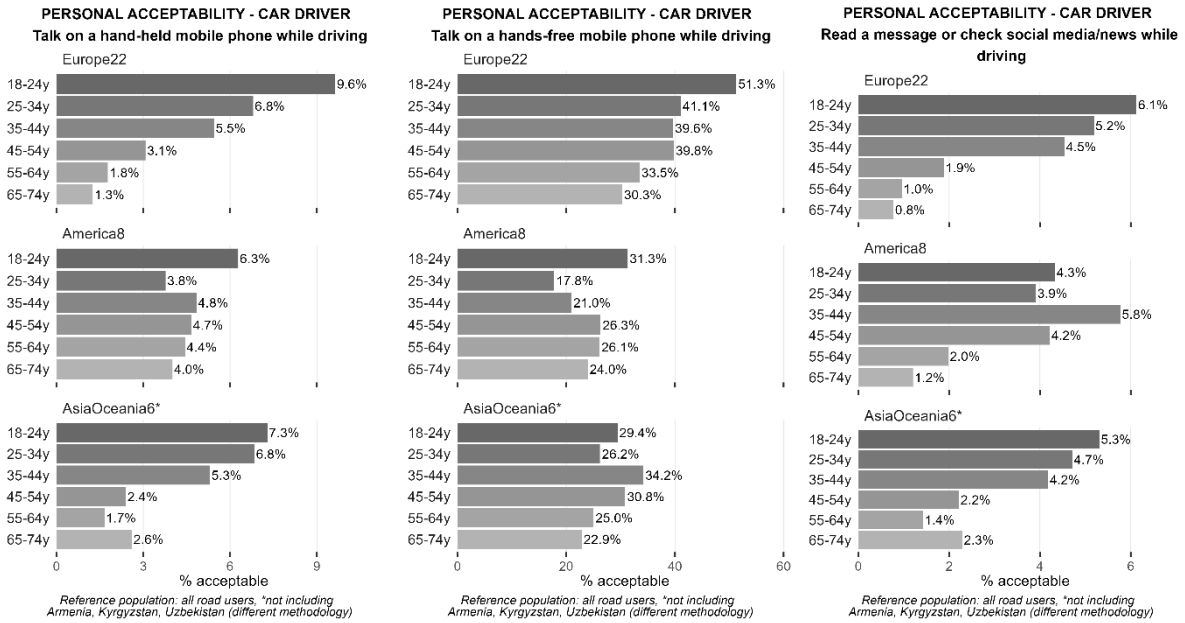


Figure 27: Personal acceptability of unsafe traffic behaviour of car drivers, by region and age group (% acceptable).

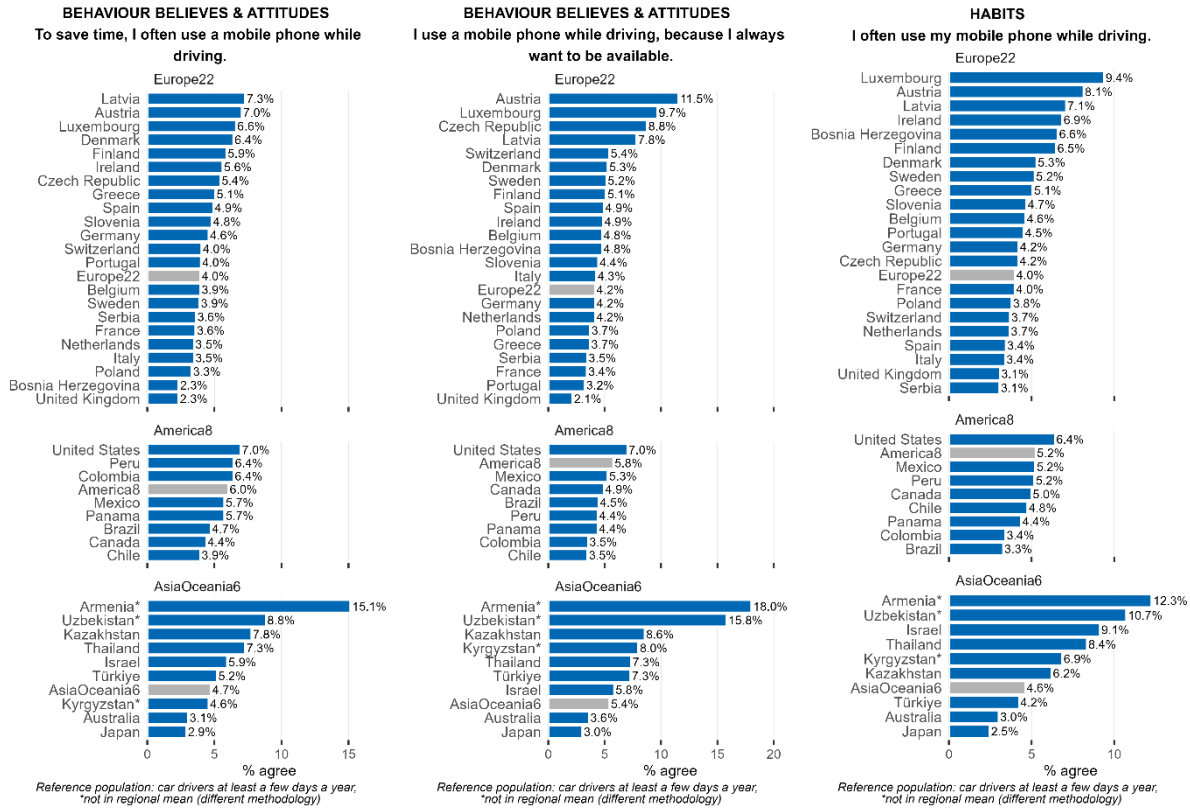


Figure 28: Behaviour beliefs, attitudes, and habits of using the mobile phone while driving a car, by region and country (% agree).

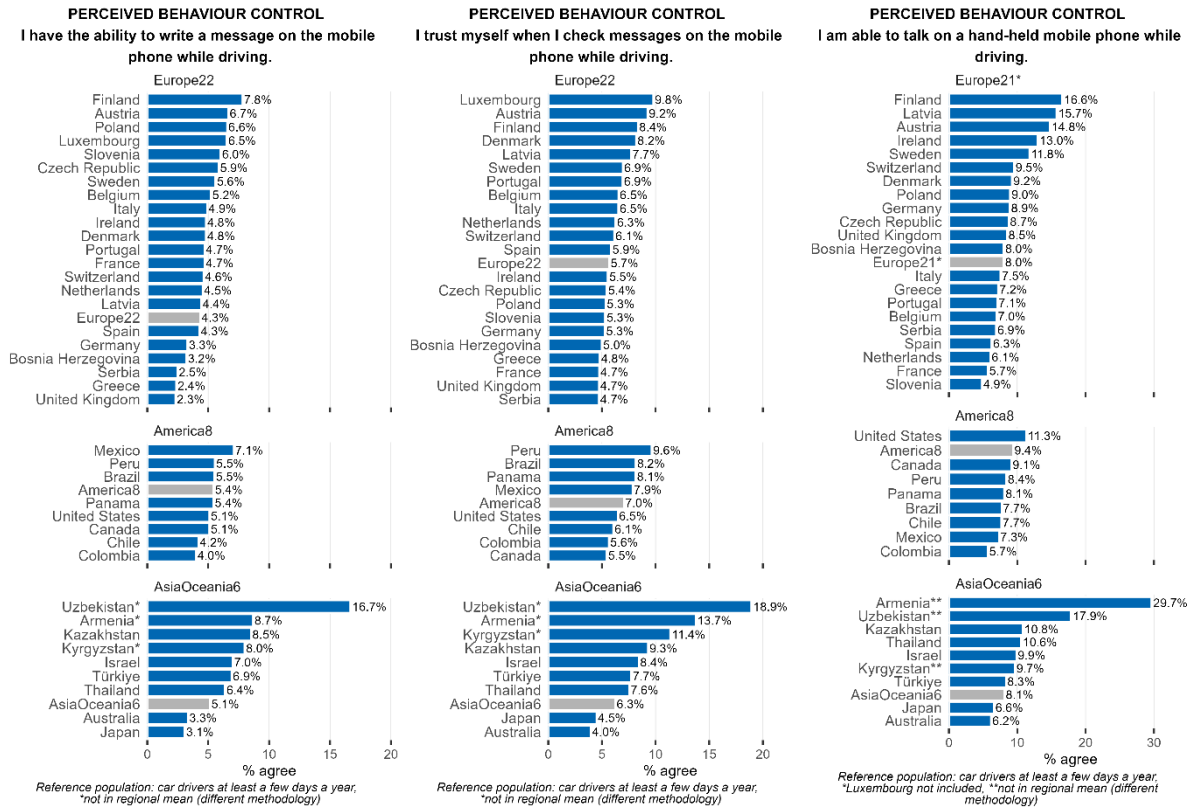


Figure 29: Perceived behaviour control of using the mobile phone while driving a car, by region and country (% agree).

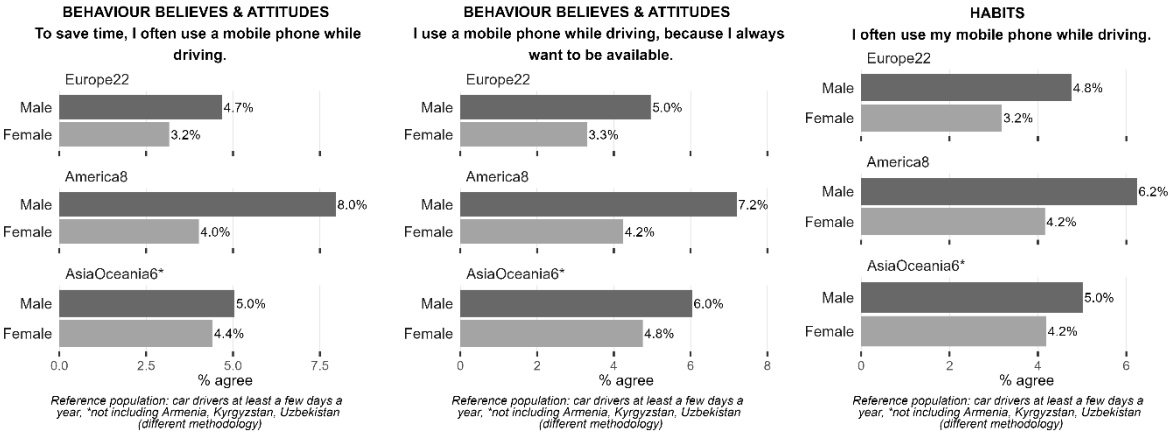


Figure 30: Behaviour beliefs, attitudes, and habits of using the mobile phone while driving a car, by gender (% agree).

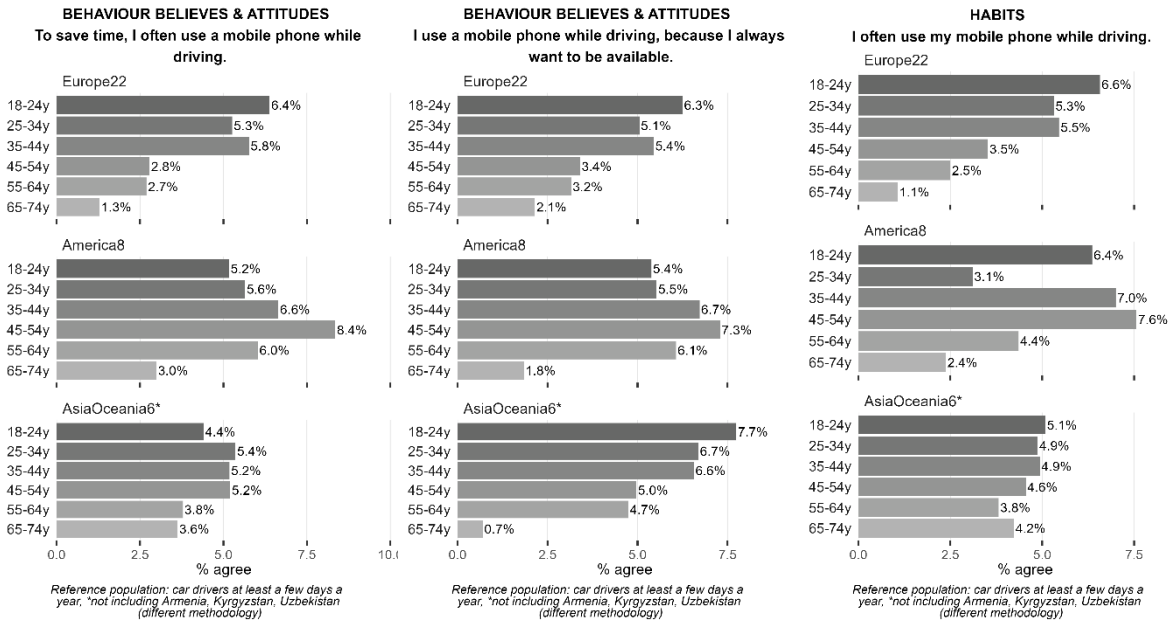


Figure 31: Behaviour beliefs, attitudes, and habits of using the mobile phone while driving a car, by age group (% agree).

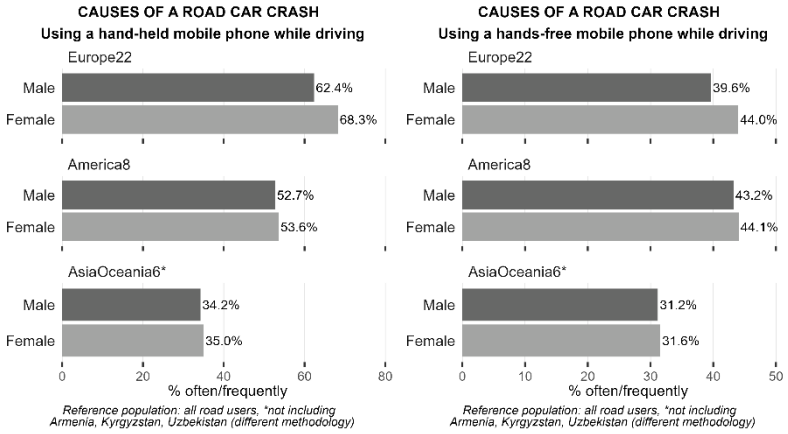


Figure 32: Risk perception of talking on a mobile phone while driving a car, by region and gender (% often/frequently).

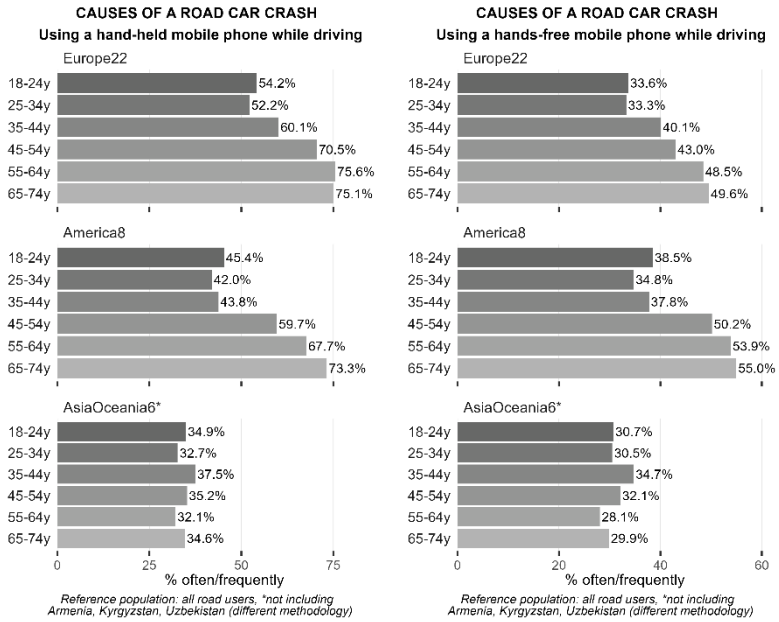


Figure 33: Risk perception of talking on a mobile phone while driving a car, by region and age group (% often/frequently).

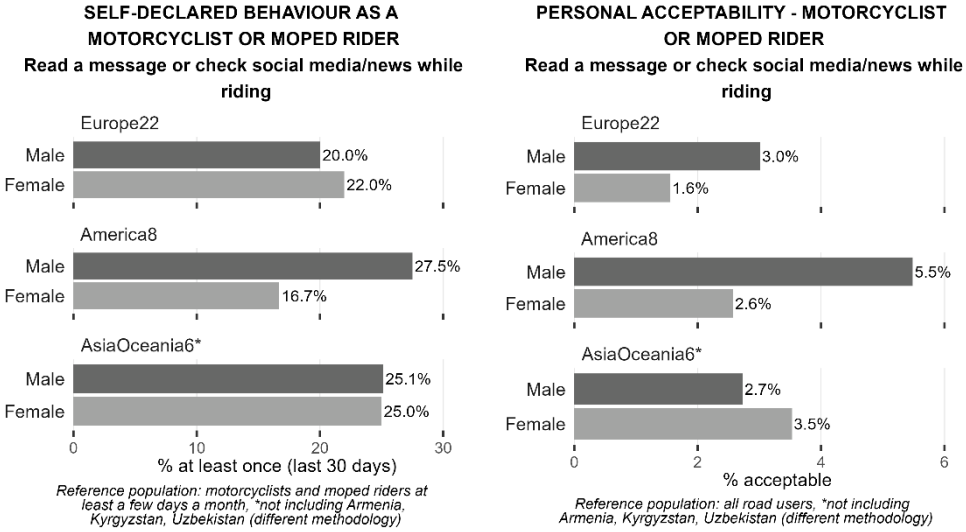


Figure 34: Self-declared behaviour as a moped rider/motorcyclist (% at least once in the past 30 days), and personal acceptability of unsafe traffic behaviour of moped riders/motorcyclists (% acceptable), by region and gender.

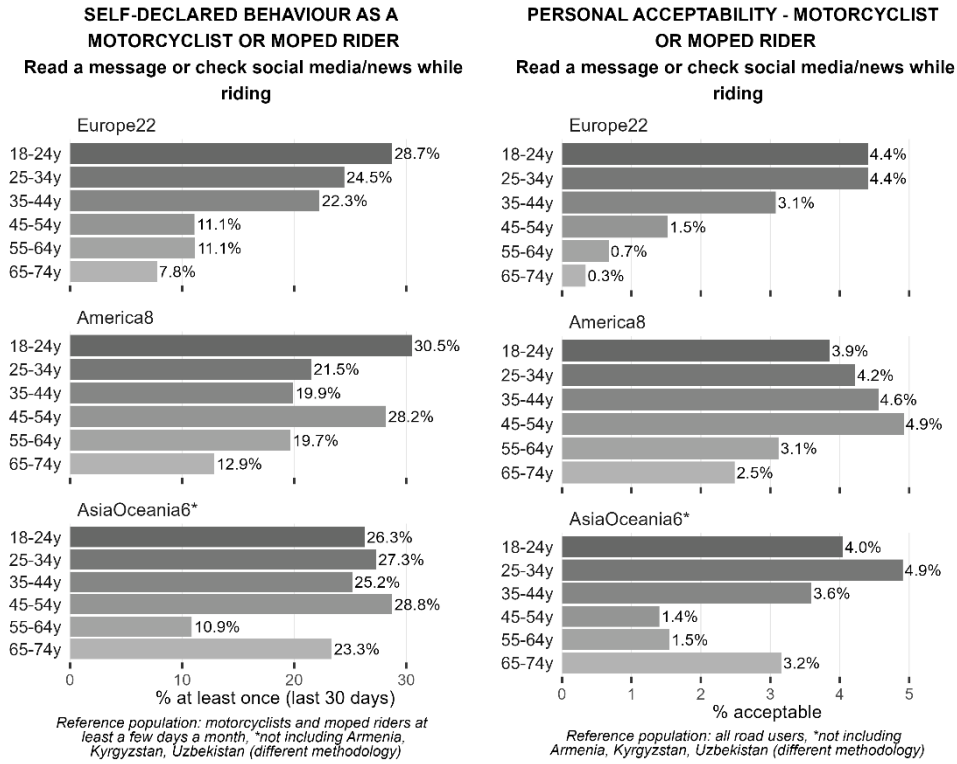


Figure 35: Self-declared behaviour as a moped rider/motorcyclist (% at least once in the past 30 days), and personal acceptability of unsafe traffic behaviour of moped riders/motorcyclists (% acceptable), by region and age group.

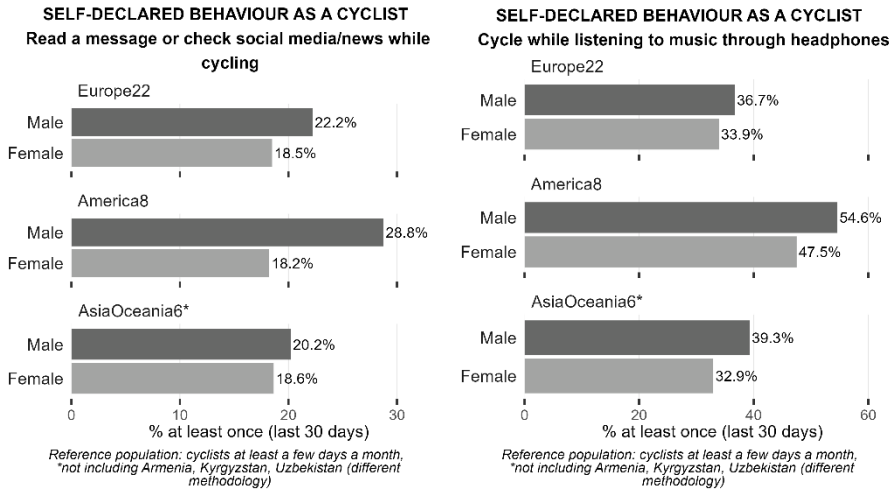


Figure 36: Self-declared behaviour as a cyclist, by region and gender (% at least once in the past 30 days).

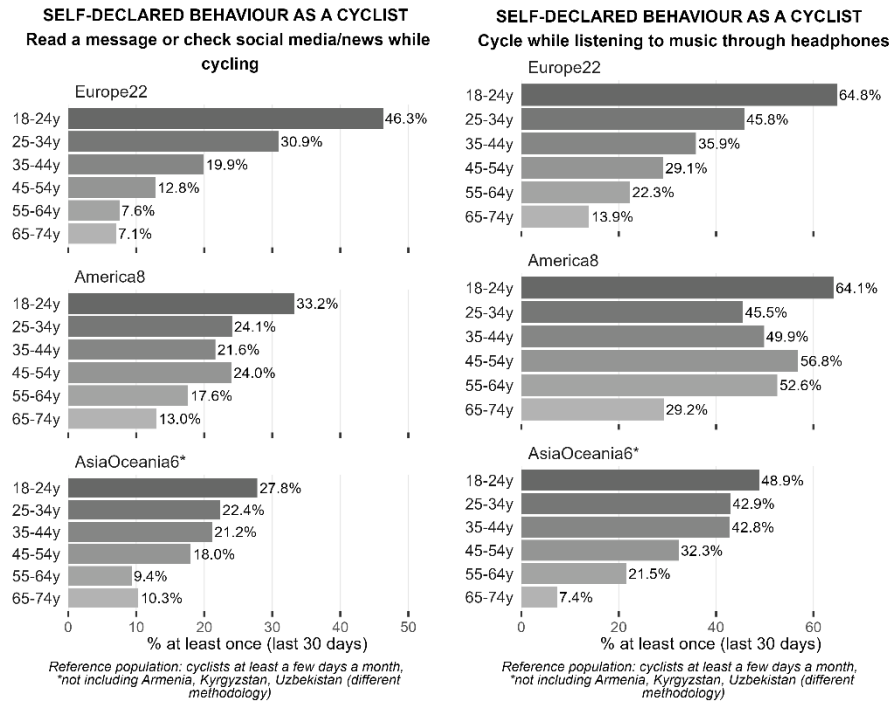


Figure 37: Self-declared behaviour as a cyclist, by region and age group (% at least once in the past 30 days).

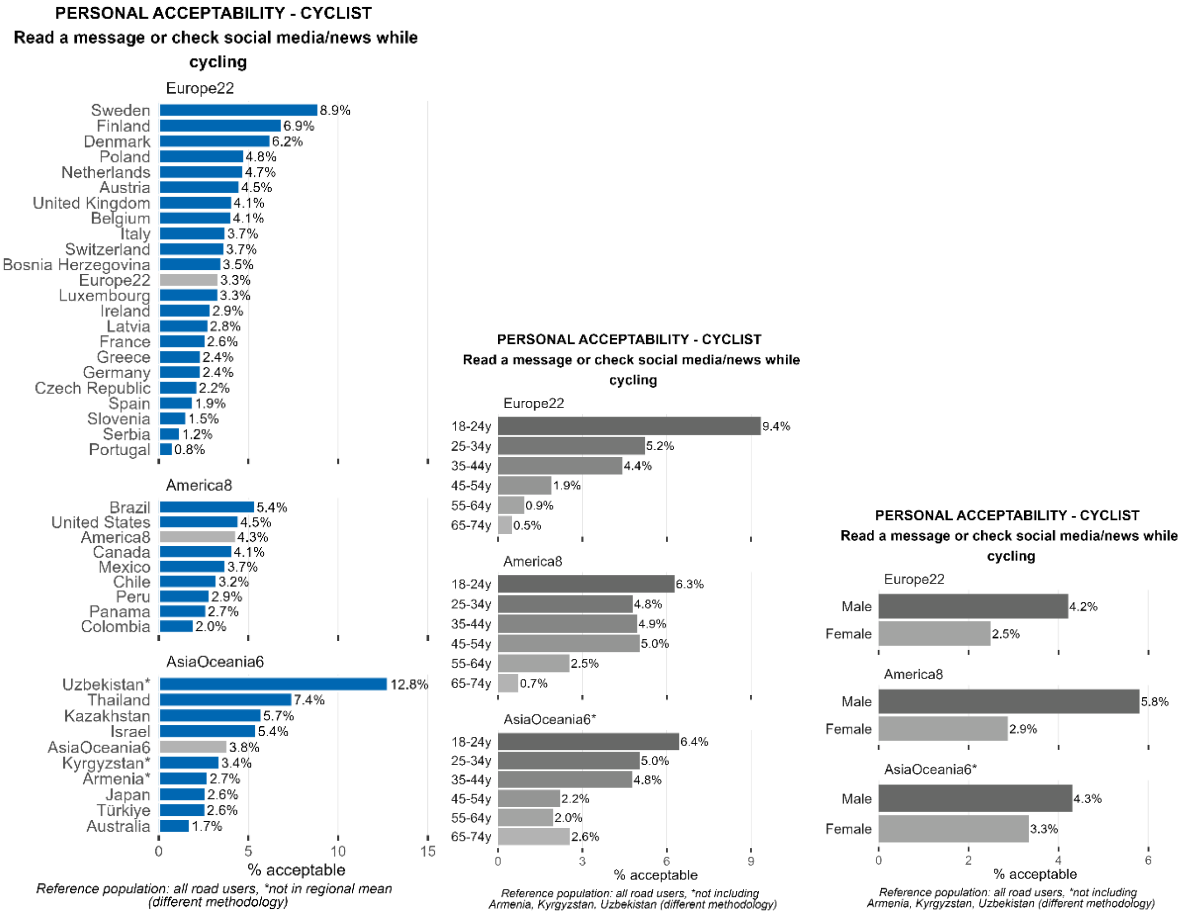


Figure 38: Personal acceptability of unsafe traffic behaviour of cyclists, by region, country, age group, and gender (% acceptable).

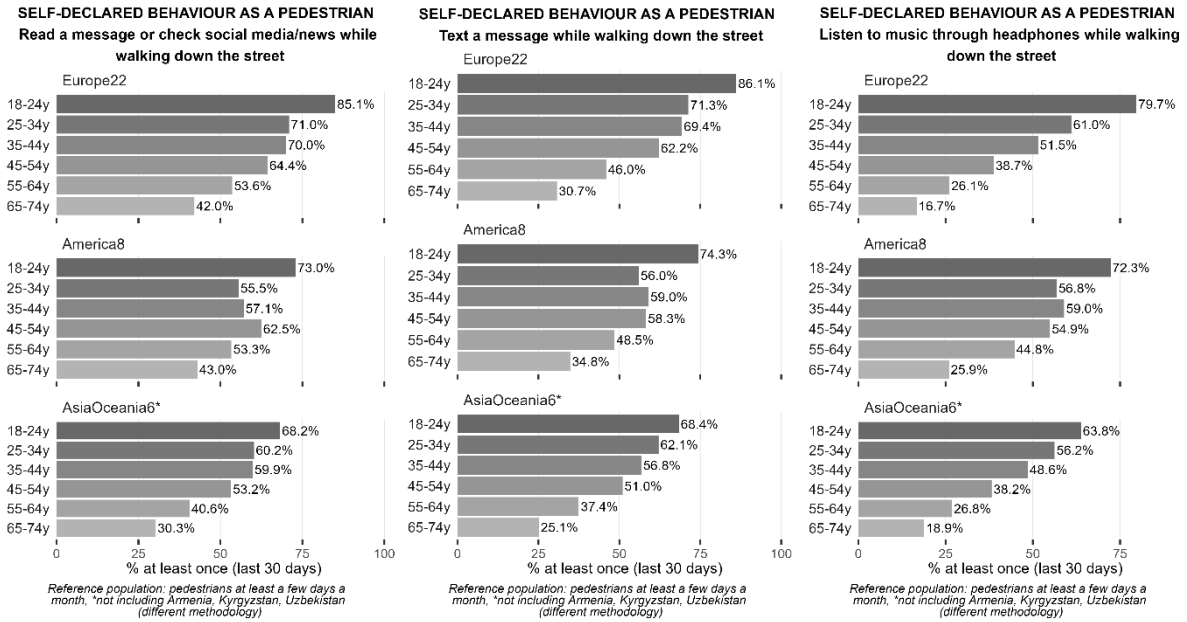


Figure 39: Self-declared behaviour as a pedestrian, by region and age group (% at least once in the past 30 days).

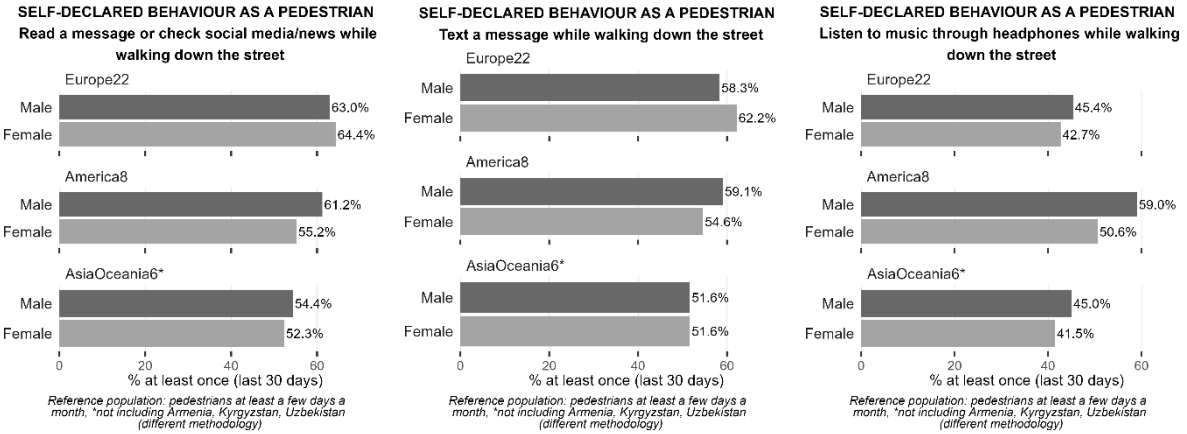


Figure 40: Self-declared behaviour as a pedestrian, by region and gender (% at least once in the past 30 days).

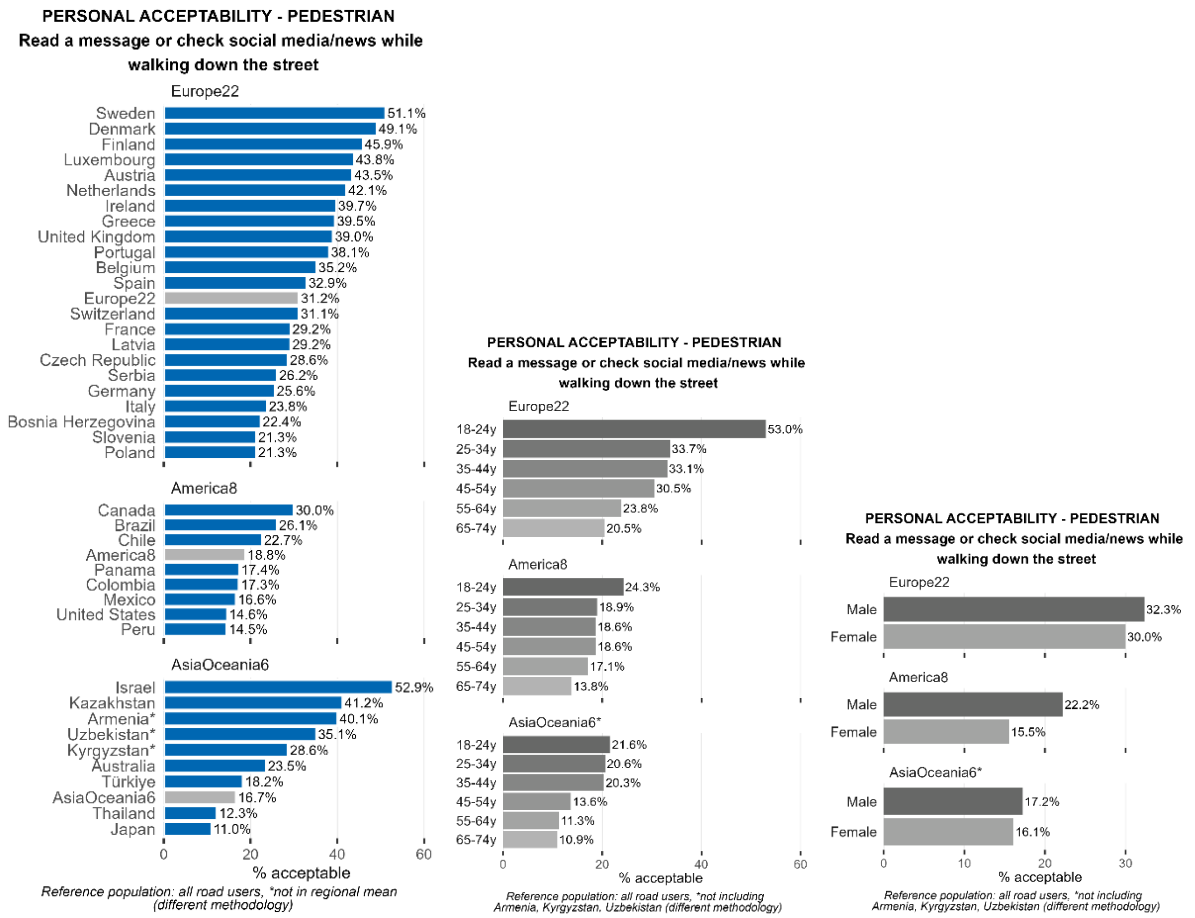


Figure 41: Personal acceptability of unsafe traffic behaviour of pedestrians, by region, country, age group, and gender (% acceptable).

Table 5: Self-declared behaviours of car drivers in ESRA2 and in ESRA3.

Country	Edition	*Weighted sample*	talk on a hand-held mobile phone while driving	talk on a hands-free mobile phone while driving	drive when you were so sleepy that you had trouble keeping your eyes open
			% at least once (past 30 days) (95% CI)	% at least once (past 30 days) (95% CI)	% at least once (past 30 days) (95% CI)
Australia	ESRA3	*809*	14.2% (11.9%-16.7%)	39.8% (36.4%-43.2%)	13.7% (11.5%-16.3%)
	ESRA2	*714*	11.0% (8.8%-13.5%)	40.6% (37.1%-44.3%)	15.5% (12.9%-18.3%)
Austria	ESRA3	*1420*	30.1% (27.7%-32.5%)	66.2% (63.7%-68.6%)	27.3% (25.0%-29.6%)
	ESRA2	*943*	35.5% (32.5%-38.6%)	64.0% (60.9%-67.0%)	30.8% (27.9%-33.8%)
Belgium	ESRA3	*1346*	17.7% (15.8%-19.9%)	55.5% (52.8%-58.1%)	22.9% (20.7%-25.2%)
	ESRA2	*1417*	20.6% (18.5%-22.7%)	44.4% (41.8%-47.0%)	23.0% (20.8%-25.2%)
Canada	ESRA3	*1385*	20.5% (18.2%-23.0%)	45.9% (43.0%-48.9%)	18.7% (16.5%-21.1%)
	ESRA2	*695*	17.7% (15.0%-20.7%)	41.4% (37.8%-45.1%)	18.4% (15.6%-21.4%)
Czech Republic	ESRA3	*597*	27.7% (24.3%-31.4%)	48.1% (44.1%-52.1%)	20.7% (17.6%-24.0%)
	ESRA2	*571*	32.9% (29.2%-36.9%)	39.7% (35.7%-43.7%)	21.1% (17.9%-24.6%)
Denmark	ESRA3	*647*	18.5% (15.6%-21.6%)	45.1% (41.3%-49.0%)	27.6% (24.3%-31.2%)
	ESRA2	*641*	22.1% (19.1%-25.5%)	41.7% (37.9%-45.5%)	23.1% (19.9%-26.5%)
Finland	ESRA3	*683*	44.4% (40.7%-48.2%)	50.2% (46.4%-54.0%)	26.6% (23.4%-30.1%)
	ESRA2	*660*	48.8% (45.0%-52.6%)	40.8% (37.1%-44.5%)	28.5% (25.2%-32.0%)
France	ESRA3	*769*	22.1% (19.3%-25.2%)	38.7% (35.3%-42.2%)	16.5% (14.0%-19.2%)
	ESRA2	*720*	24.7% (21.6%-27.9%)	34.8% (31.4%-38.4%)	16.7% (14.1%-19.6%)
Germany	ESRA3	*618*	17.4% (14.6%-20.6%)	42.5% (38.6%-46.5%)	19.9% (16.8%-23.2%)
	ESRA2	*1440*	40.2% (37.7%-42.7%)	41.9% (39.3%-44.4%)	22.4% (20.3%-24.6%)
Greece	ESRA3	*754*	41.1% (37.6%-44.7%)	56.3% (52.7%-59.9%)	22.3% (19.4%-25.4%)
	ESRA2	*596*	49.0% (41.1%-57.0%)	57.5% (49.5%-65.2%)	26.9% (20.3%-34.5%)
Ireland	ESRA3	*706*	20.4% (17.6%-23.5%)	61.5% (57.8%-65.0%)	17.8% (15.1%-20.8%)
	ESRA2	*693*	20.3% (17.2%-23.6%)	47.6% (43.6%-51.6%)	23.2% (20.0%-26.7%)
Israel	ESRA3	*796*	21.4% (18.7%-24.4%)	71.7% (68.5%-74.7%)	25.7% (22.8%-28.9%)
	ESRA2	*795*	24.0% (21.1%-27.1%)	77.6% (74.6%-80.4%)	26.5% (23.5%-29.6%)
Italy	ESRA3	*906*	20.1% (17.6%-22.9%)	60.7% (57.5%-63.9%)	12.8% (10.7%-15.1%)
	ESRA2	*811*	26.0% (23.1%-29.1%)	58.8% (55.4%-62.2%)	12.4% (10.3%-14.9%)
Japan	ESRA3	*570*	13.3% (10.7%-16.3%)	35.4% (31.5%-39.4%)	23.5% (20.1%-27.1%)
	ESRA2	*505*	17.1% (13.5%-21.3%)	30.5% (25.9%-35.5%)	37.1% (32.2%-42.3%)
Netherlands	ESRA3	*700*	14.6% (12.1%-17.4%)	51.2% (47.4%-54.9%)	25.6% (22.5%-29.0%)
	ESRA2	*667*	9.8% (7.7%-12.3%)	40.4% (36.7%-44.1%)	20.8% (17.9%-24.1%)
Poland	ESRA3	*723*	30.9% (27.6%-34.3%)	62.2% (58.7%-65.7%)	19.3% (16.5%-22.3%)
	ESRA2	*694*	41.8% (38.1%-45.5%)	60.0% (56.3%-63.6%)	18.5% (15.7%-21.5%)
Portugal	ESRA3	*844*	26.5% (23.6%-29.6%)	73.4% (70.3%-76.3%)	18.8% (16.3%-21.6%)
	ESRA2	*856*	37.4% (34.2%-40.7%)	65.4% (62.2%-68.6%)	20.3% (17.7%-23.1%)
Serbia	ESRA3	*676*	36.9% (33.3%-40.5%)	53.2% (49.5%-57.0%)	14.7% (12.2%-17.5%)
	ESRA2	*707*	51.6% (47.6%-55.5%)	57.8% (53.9%-61.7%)	14.9% (12.3%-17.9%)
Slovenia	ESRA3	*805*	29.3% (26.2%-32.5%)	64.2% (60.8%-67.4%)	22.5% (19.7%-25.4%)
	ESRA2	*783*	43.3% (39.7%-47.0%)	58.1% (54.4%-61.7%)	20.4% (17.6%-23.6%)
Spain	ESRA3	*710*	22.2% (19.3%-25.4%)	58.6% (54.9%-62.2%)	23.7% (20.6%-26.9%)
	ESRA2	*727*	19.9% (16.4%-23.7%)	55.7% (51.2%-60.2%)	19.5% (16.1%-23.3%)
Sweden	ESRA3	*633*	30.1% (26.6%-33.8%)	61.6% (57.7%-65.4%)	20.5% (17.5%-23.8%)
	ESRA2	*614*	30.4% (26.9%-34.1%)	54.0% (50.0%-57.9%)	22.9% (19.7%-26.3%)
Switzerland	ESRA3	*776*	22.9% (20.0%-25.9%)	53.3% (49.8%-56.8%)	21.5% (18.7%-24.5%)
	ESRA2	*742*	24.1% (21.1%-27.3%)	46.2% (42.6%-49.8%)	17.9% (15.2%-20.8%)
United Kingdom	ESRA3	*644*	15.9% (13.2%-18.9%)	39.6% (35.9%-43.5%)	12.5% (10.1%-15.3%)
	ESRA2	*599*	7.3% (5.4%-9.6%)	32.7% (29.0%-36.5%)	13.2% (10.7%-16.1%)
United States	ESRA3	*782*	25.6% (22.6%-28.7%)	39.7% (36.3%-43.2%)	17.3% (14.8%-20.1%)
	ESRA2	*807*	39.6% (36.3%-43.1%)	51.2% (47.7%-54.6%)	21.9% (19.1%-24.8%)

Notes: Self-declared behaviours assessed by asking: 'Over the last 30 days, how often did you as a car driver …?'; answer scale: 5-points scale, where 1 = never & 5 = (almost) always – percentages of 'at least once' (answers 2 to 5) are presented; percentages whose 95% CI of ESRA2 and ESRA3 do not overlap are highlighted in blue; ESRA2 results recalculated for comparability.

ESRA

www.esranet.eu

E-Survey of Road users' Attitudes