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Overview

Measuring road safety performance and culture: A comparative study of 39 countries☆

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ABSTRACT

Monitoring of road safety performance is essential to effectively address the global road safety problem. Consistent and accurate monitoring allows policymakers to assess the effectiveness of current safety measures, identify emerging risk factors, and develop targeted interventions. Different key performance indicators can be used to monitor road safety performance. In addition to the traditional road safety indicators based on the number of fatalities or injured people in road traffic crashes, complementary road safety performance indicators can be used in relation to vehicles, infrastructure or road users' behaviour.

The *E*-Survey of Road Users' Attitudes (ESRA) is an online survey that aims to collect and analyse comparable data on road safety performance and traffic safety culture across the world. In its three editions (from 2015 to 2023) ESRA has included data from more than 120,000 road users from a total of 68 different countries. This paper focuses on data from the third edition of the ESRA survey (ESRA3), which was conducted in 2023 across 39 countries and includes answers from over 37,000 road users. The objectives are to provide an overview of the ESRA3 survey methodology and to present results related to several road safety topics, such as drink-driving, speeding, or distraction, across different types of road users: car drivers, pedestrians, cyclists, and moped riders/motorcyclists. It examines multiple dimensions of risky behaviours in traffic, including self-declared behaviours, personal acceptability of unsafe behaviours, and support for policy measures.

Results show low acceptability of unsafe traffic behaviours like speeding, drink-driving, fatigued driving or using a mobile phone while driving a car – less than 5 % of respondents considered these behaviours acceptable. Notwithstanding the low acceptability, a high percentage of car drivers declared engaging in risky behaviours in traffic: speeding within built-up areas was declared by 37 % to 47 % of car drivers, using a mobile phone by 22 % to 32 %, fatigued driving by 18 % to 20 %, and driving under the influence of alcohol by 10 % to 14 %. As for vulnerable road users, distraction (reading messages/checking social media or listening to music through headphones) was the most declared risky behaviour by pedestrians, the non-use of helmet the most declared by

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cyclists, and speeding the most declared by moped riders and motorcyclists. Most respondents support policy measures to restrict risky behaviour.

The ESRA survey offers a unique database and provides policy makers and researchers with valuable insights into public perception of road safety.

1. Introduction

1.1. Monitoring road safety performance

According to the World Health Organization's (WHO) Global Status Report on Road Safety 2023, an estimated 1.19 million people lost their lives in road traffic crashes in 2021, a 5 % reduction from the 1.25 million deaths reported in 2010 [1]. WHO notes that regularly monitoring road safety performance is essential to effectively address the global road safety problem and will help track progress towards international safety goals, such as those outlined in the WHO's Global Plan for the Decade of Action for Road Safety and the United Nations' Sustainable Development Goals (SDGs), which aim to reduce road traffic deaths and injuries by 50 % by 2030. To achieve these goals, countries need to assess their road safety situation, prepare or revise their road safety action plans and implement solutions. It is important to monitor and evaluate, at a global level, the progress and results of countries implementation of measures. This includes monitoring and collecting data to measure impact and assess progress in implementation. Consistent and accurate data collection allows policymakers to assess the effectiveness of current safety measures, identify emerging risk factors, and develop targeted interventions [1].

At European level, in the framework of the EU's Vision Zero strategy, the European Commission (EC) elaborated in 2019 a list of Key Performance Indicators (KPIs) for road safety. These KPIs are an integral part of the 'Safe System' approach to road safety. They will help to assess progress towards the European Union Road Safety Policy Framework 2021–2030, which sets interim targets such as a 50 % reduction in the number of road traffic fatalities and serious injuries by 2030 and move close to zero traffic fatalities by 2050 [2].

To assist the EU Member States in developing national KPIs, the European Commission supported the Baseline project (2020−2022) [3]. A total of 18 EU Member States participated in the project. At the heart of the initiative were eight KPIs developed by the European Commission in close cooperation with road safety experts from the Member States [2]. The project aimed to collect comparable data across EU countries for consistent tracking and evaluation of road safety performance. A key outcome was the development of a common framework, including methodological guidelines, to ensure consistent measurement and comparability of the eight KPIs across Member States, facilitating consistent monitoring of road safety across Europe. Following the Baseline project, the initiative was continued with the Trendline project [4], which runs from 2023 to 2025. Trendline involves 25 European countries, and four observer countries. Building on the foundation set by Baseline, Trendline aims to develop additional experimental indicators to further improve road safety data collection and monitoring. These new indicators are expected to provide deeper insights into road safety trends and challenges, helping to drive further improvements in road safety across Europe [5].

Baseline and Trendline produced KPIs related to infrastructure, post-crash care, vehicle safety, and road user behaviours, such as the "percentage of vehicles driving within the speed limit" or the "percentage of PTWs and bicycle riders wearing a protective helmet". Road user behaviours were assessed through roadside observations. There is a broad consensus among road safety experts that roadside observations are the gold standard for producing road safety performance indicators as they are based on observed behaviour in traffic. However, observational studies have also limitations. The number and type of variables that can be observed are limited. In addition, roadside observations require a sophisticated study design and protocol. They are very time consuming and expensive.

An alternative to using roadside observations to collect data on road user behaviour is the use of questionnaire surveys. Such surveys, if properly designed and sampled, can provide valuable information on road safety performance and traffic safety culture. Moreover, when conducted online, they are a relatively quick and inexpensive way to obtain indicators on road users' traffic safety culture and behaviour. Furthermore, these surveys allow data to be collected on many additional factors and can therefore provide insights into socio-cognitive determinants of behaviour: attitudes, perceived social norms, risk perception, or existing habits. Socio-cognitive factors (beliefs) can help to understand the underlying motivations for certain behaviours [6–9], valuable information for understanding the process leading to road crashes. In the current literature, these factors are often closely linked to the assessment of traffic safety culture, which Ward et al. defined as "the shared beliefs of a group that affect behaviours related to traffic safety" [10]. It is therefore tempting to use survey-based road safety indicators for benchmarking purposes. However, the results of national surveys are rarely comparable among countries because of differences in aims, scope, methodology, questions asked, or the sample population being surveyed.

Several questionnaires have been developed to assess risky behaviour in traffic. The Driver Behaviour Questionnaire (DBQ) is one of the most widely used instruments for measuring self-declared behaviours. Originally developed by Reason et al. [11], it assesses risky driving behaviours, violations, errors, and lapses among car drivers. The DBQ has been validated across different populations, with studies demonstrating associations between road crash involvement, violations, and other driver characteristics [12]. Based on the DBQ, Elliott et al. [13] developed the Motorcycle Rider Behaviour Questionnaire (MRBQ) specifically for motorcyclists, adapting the original structure to reflect behaviours on motorcycle riding. The MRBQ includes dimensions such as errors, violations, and protective behaviours, making it a comprehensive tool for assessing self-reported riding behaviour and its relationship to crash risk. Although the DBQ and MRBQ are valuable tools to understand behaviours in traffic and its relationships with road crashes, they have several limitations. They are limited to specific road users (car drivers in DBQ and motorcyclists in MRBQ), excluding other road users such as pedestrians, cyclists, or e-scooter riders. Additionally, both focuses only on risky behaviours and do not capture valuable information such as attitudes, risk perception or support for policy measures. Moreover, studies using the DBQ or MRBQ rarely apply a uniform sampling methodology across a large number of countries.

The first project using the same questionnaire and methodology in a large number of countries was SARTRE (Social Attitudes to Road Traffic Risk in Europe), initiated in 1991 and carried out in 15 European countries. The project aimed to survey, with a uniform methodology, attitudes, opinions, self-reported behaviour and experiences of European road users. A common questionnaire and study design were developed, and face-to-face interviews were conducted with a representative sample of the national adult population of European countries. Four editions of the SARTRE survey were launched (1991, 1996, 2002, and 2010) [14].

1.2. The ESRA initiative

The ESRA (*E*-Survey of Road users' Attitudes; website: www.esranet.eu) initiative was launched by Vias institute (Belgium) in 2015 to fill the

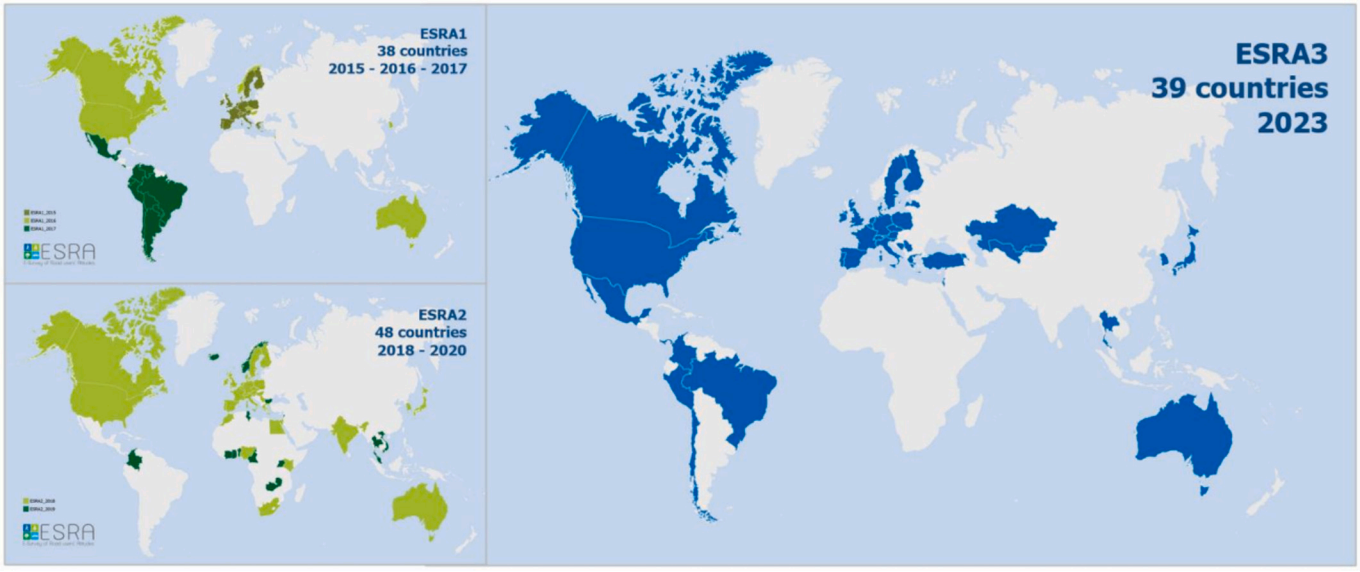

Fig. 1. Evolution geographic coverage of the different ESRA editions (2015–2023) (Figure extracted from www.esranet.eu).

Table 1
ESRA3 survey main themes, road safety topics, and targeted road users.

Themes	Road safety topics	Road users
▪ Socio-demographic information ▪ Mobility & exposure ▪ Self-declared safe and unsafe behaviour in traffic ▪ Acceptability of safe and unsafe traffic behaviour ▪ Attitudes towards safe and unsafe traffic behaviour ▪ Subjective safety and risk perception ▪ Support for policy measures ▪ Enforcement of traffic laws ▪ Road crash involvement ▪ Infrastructure	▪ Driving under the influence of alcohol, drugs, and medication ▪ Speeding ▪ Distraction ▪ Fatigue ▪ Protective systems (e.g., seat belt use, helmet use) ▪ Compliance with traffic rules	▪ Car drivers ▪ Car passengers ▪ Moped riders and motorcyclists ▪ Cyclists ▪ Pedestrians ▪ *E*-scooter riders (electric stand-up scooters)

gap left after the end of SARTRE – no other road safety survey using the same questionnaire and methodology across a large number of countries existed between the end of SARTRE and the launch of ESRA. The ESRA survey was built on the SARTRE experience and aimed to collect internationally comparable data on road safety performance and traffic safety culture, initially in European countries. Over time, it has become a global initiative, collecting data in countries all over the world. The ESRA initiative celebrates 10 years in 2025 and has already completed three editions: ESRA1 (2015–2017), ESRA2 (2018–2020), and ESRA3 (2023), with the participation of more than 120,000 road users from 68 countries.

The ESRA initiative 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 traffic safety culture. Within ESRA the term traffic safety culture is defined according to Ward et al. [10], as "the shared beliefs of a group (i.e., country) that affect behaviours related to traffic safety" which include e.g. the perceived acceptability of a certain unsafe traffic behaviour or support for related policy measures. The main goals of the ESRA initiative can be summarized as [15]: (1) provide scientific support for road safety policy at national and international levels; (2) make internationally comparable data available on the current road safety situation in countries all over the world; (3) develop a series of reliable, cost-effective and comparable road safety performance indicators; (4) develop time series on road safety performance – the intention is to repeat the survey every three to four years. Thus, the ESRA data can be used as a benchmark for a variety of road safety performance indicators based on opinions, self-reported behaviour and attitudes with respect to road safety and related traffic issues.

The first ESRA survey (ESRA1) was launched in 2015, initially covering 17 European countries in its first wave. The initiative quickly gained traction within the international road safety community, leading to the participation of an additional 21 countries, mainly from outside Europe, in two subsequent waves conducted in 2016 and 2017. Overall, the first edition of ESRA gathered responses from nearly 40,000 road users across 38 countries worldwide. The three-wave approach provided a comprehensive dataset, establishing a solid foundation for future editions of the survey [16].

The second edition of the ESRA survey (ESRA2) was carried out in two waves, the first in 2018 and the second during 2019–2020. This edition expanded its scope to include more than 45,000 road users from 48 countries. The first wave in 2018 involved 32 countries, while the second wave added 16 more countries to the dataset. ESRA2 further demonstrated the scalability and growing relevance of the initiative,

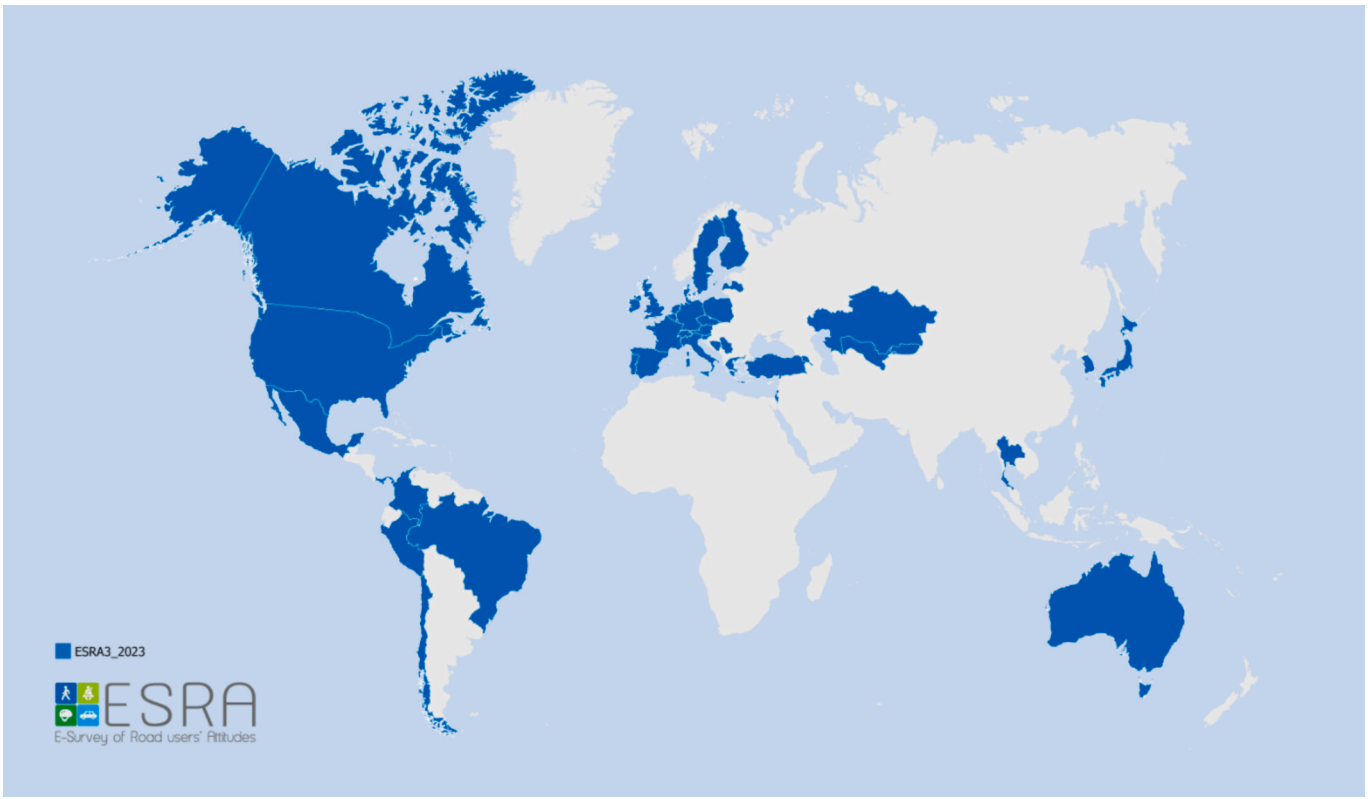

Fig. 2. Geographical coverage of the ESRA3 survey in 2023 – participating countries are highlighted in blue (Figure extracted from www.esranet.eu).

Table 2
Subjects, topics, questions, and answer scales.

Themes	Road users	Road safety topics/ items
Self-declared unsafe behaviour in traffic "Over the last 30 days, how often did you as a [road user] …?" *5-point scale from 1 "never" to 5 "(almost) always" – results of at least once (2–5) are presented.*	Answered by **car drivers** at least a few days a month	**Alcohol**: drive when you may have been over the legal limit for drinking and driving. **Distraction**: talk on a hand-held mobile phone while driving; read a message or check social media/news while driving. **Fatigue**: drive when you were so sleepy that you had trouble keeping your eyes open. **Speeding**: drive faster than the speed limit inside built-up areas.
	Answered by **pedestrians** at least a few days a month	**Alcohol**: walk down the street when you think you may have had too much to drink. **Distraction**: listen to music through headphones while walking down the street; read a message or check social media/news while walking down the street. **Respect for traffic rules**: cross the road when a pedestrian light is red.
	Answered by **cyclists** at least a few days a month	**Alcohol**: cycle when you think you may have had too much to drink. **Distraction**: cycle while listening to music through headphones; read a message or check social media/news while cycling. **Protective systems**: cycle without a helmet. **Respect for traffic rules**: cross the road when a traffic light is red.
	Answered by **moped riders/ motorcyclists** at least a few days a month	**Alcohol**: ride when you may have been over the legal limit for drinking and driving. **Distraction**: read a message or check social media/news while riding. **Protective systems**: not wear a helmet on a moped or motorcycle. **Speeding**: ride faster than the speed limit outside built-up areas (except motorways/ freeways).
Personal acceptability of unsafe traffic behaviour "How acceptable do you, personally, feel it is for a **car driver** to…?" *5-point scale from 1 "unacceptable" to 5 "acceptable"– results of acceptable (4–5) are presented.*	Answered by all the respondents	**Alcohol**: drive when he/she may be over the legal limit for drinking and driving. **Distraction**: talk on a hand-held mobile phone while driving; read a message or check social media/news while driving. **Fatigue**: drive when he/she is so sleepy that he/she has trouble keeping their eyes open. **Speeding**: drive faster than the speed limit inside built-up areas.
Support for policy measures "Do you oppose or support a legal obligation to …?" *5-point scale from 1 "oppose" to 5 "support"– results of support (4–5) are presented.*	Answered by all the respondents	**Alcohol:** forbidding all drivers of motorized vehicles to drive with a blood alcohol concentration above 0.0 ‰ (zero tolerance). **Distraction:** forbidding all drivers of motorized vehicles to use a hand-held mobile phone while driving. **Protective systems:** requiring all cyclists to wear a helmet. **Speeding:** limiting the speed limit to 30 km/h in all built-up areas (except on main thoroughfares).

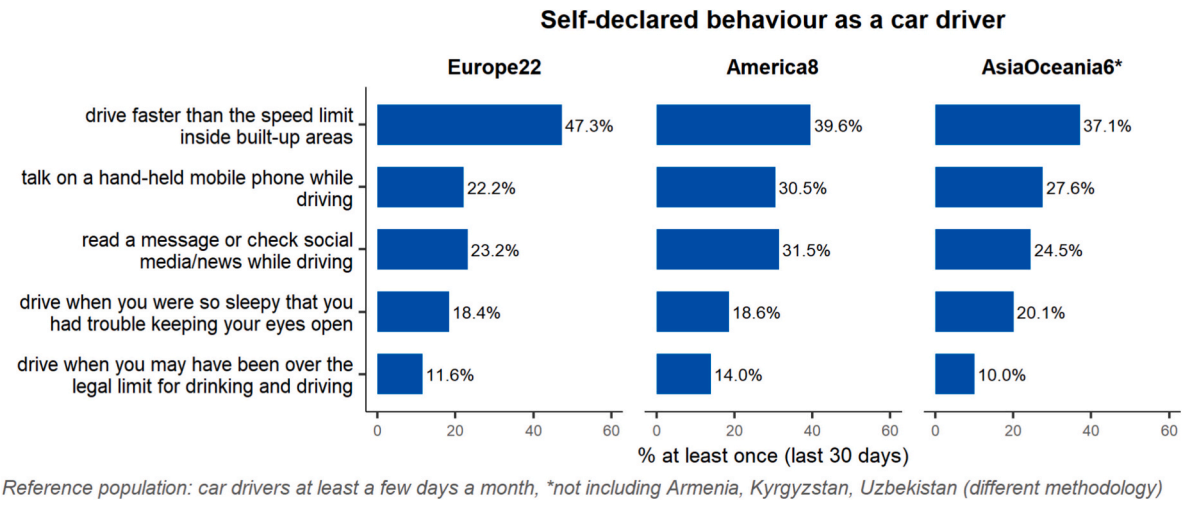

Fig. 3. Self-declared behaviour as a car driver, by region (% at least once in the past 30 days – scores 2 to 5 on a 5-point scale from 1 "never" to 5 "[almost] always").

providing valuable insights into road safety attitudes across a more diverse range of countries [17–19].

The most recent edition, ESRA3, was conducted in 2023, collecting data simultaneously from road users in 39 countries. This third edition included over 37,000 respondents from five continents. Continuing to build on the work of previous editions, ESRA3 contributed further to the growing body of comparable, global road safety data, reinforcing the initiative's role in supporting evidence-based road safety policies worldwide. This extensive geographical coverage and large dataset have solidified ESRA as a crucial tool for understanding global road safety performance and developing internationally comparable safety indicators. Fig. 1 provides a visual representation of the geographical reach achieved across the three editions of the survey.

At the core of the ESRA initiative is an online survey conducted using representative samples aiming at 1000 road users from the national adult population in each participating country. A key strength of the initiative is the use of the same questionnaire and methodology across all countries, ensuring consistent data collection and making international comparisons meaningful. The ESRA3 questionnaire, based on the frameworks of ESRA1 and ESRA2, maintains consistency in key questions while incorporating new topics (e.g., infrastructure) and road users (e-scooter riders). The overall goal for ESRA3 was to align closely with the ESRA2 study design [17], keeping the methodology consistent in terms of data collection, question formulation, sampling procedures, and data processing. While some minor adjustments were made to refine the study design, substantial efforts were made to ensure a high degree of comparability with ESRA2.

The ESRA initiative was initiated and is coordinated by Vias institute in Brussels, Belgium, in collaboration with ten ESRA3 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).

Each participating country has a designated national partner responsible for supporting the initiative. These national partners handle the survey's funding, translate the questionnaire into the respective national languages, and interpret the findings. For the data collection of ESRA3, funding was provided by the MAPFRE Foundation for six Latin American countries and by the WHO Regional Office for Europe for six additional countries in Europe and Asia. This collaborative effort ensures that the survey is effectively implemented across diverse cultural contexts while maintaining the integrity and consistency of the data collected.

1.3. Objectives

This paper focuses on data from the third edition of the ESRA survey (ESRA3), which was conducted in 2023 across 39 countries and includes answers from over 37,000 road users. The objectives are: 1) to provide an overview of the ESRA3 survey methodology, in particular, details on the questionnaire, design, sampling, data collection, data processing, quality control, and reporting procedures; and 2) to describe key results related to several road safety topics, such as drink-driving, speeding, or distraction, across different types of road users: car drivers, pedestrians, cyclists, and moped riders/motorcyclists. It examines multiple dimensions of these risky behaviours in traffic, including self-declared behaviours, personal acceptability of unsafe behaviours, and support for policy measures aimed at improving road safety.

2. Methods

This section describes the ESRA3 survey methodology, the key questions examined in this article and the statistical methods used for analysis. A more detailed explanation of the overall methodology, including data processing procedures and the complete questionnaire is available in the ESRA3 methodology report [15].

2.1. ESRA3 questionnaire

The foundation of the ESRA questionnaire was built on earlier road safety surveys, such as the BIVV/IBSR Three-yearly Road Safety Attitude Survey from Belgium [20], the SARTRE (Social Attitudes to Road Traffic Risk in Europe) survey [14], and the Traffic Safety Culture Index in the US [21]. Many of the questions in the first ESRA survey (ESRA1) were based on these earlier surveys. In 2017, a pilot study in six countries (n = 3000) helped to reduce a large number of items of the Theory of Planned Behaviour [6] used in ESRA1 survey to a smaller set that captures these key Theory of Planned Behaviour constructs (i.e., attitudes, norms, perceived behaviour control and intention). This set of items was used since the second ESRA survey (ESRA2). The ESRA3 questionnaire was primarily developed using the frameworks of the previous ESRA2 [17] and ESRA1 [16] questionnaires. Significant efforts were made to maintain consistency in the wording of common questions and items across editions. Initially developed in English by the ESRA3 steering group, the questionnaire was then translated into 49 national language versions by national ESRA3 partners.

The ESRA3 survey covers a range of themes assessing road safety performance and traffic safety culture, which include self-declared

Table 3
Self-declared behaviour as a car driver, by country and region (% at least once in the past 30 days – scores 2 to 5 on a 5-point scale from 1 "never" to 5 "[almost] always").

		Alcohol	Speeding	Distraction		Fatigue
Country/region	*Weighted sample*	drive when you may have been over the legal limit for drinking and driving	drive faster than the speed limit inside built-up areas	talk on a hand-held 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
Europe22	***16,900***	**11.6 %[a]**	**47.3 %[a]**	**22.2 %[a]**	**23.2 %[a]**	**18.4 %[a]**
Austria	*1420*	12.5 %	64.5 %	30.1 %	32.1 %	27.3 %
Belgium	*1346*	19.0 %	55.7 %	17.7 %	23.0 %	22.9 %
Bosnia Herzegovina	*597*	12.7 %	55.2 %	48.5 %	36.6 %	19.2 %
Czech Republic	*597*	7.0 %	65.0 %	27.7 %	25.1 %	20.7 %
Denmark	*647*	10.6 %	49.1 %	18.5 %	27.3 %	27.6 %
Finland	*683*	6.1 %	76.1 %	44.4 %	39.6 %	26.6 %
France	*769*	15.6 %	48.0 %	22.1 %	20.8 %	16.5 %
Germany	*618*	9.7 %	47.6 %	17.4 %	20.4 %	19.9 %
Greece	*754*	12.5 %	42.8 %	41.1 %	33.1 %	22.3 %
Ireland	*706*	8.0 %	47.1 %	20.4 %	28.4 %	17.8 %
Italy	*906*	12.9 %	36.7 %	20.1 %	24.2 %	12.8 %
Latvia	*621*	5.2 %	66.2 %	43.6 %	30.6 %	26.0 %
Luxembourg	*424*	24.1 %	60.8 %	26.5 %	40.5 %	31.1 %
Netherlands	*700*	12.0 %	57.9 %	14.6 %	18.8 %	25.6 %
Poland	*723*	4.2 %	55.7 %	30.9 %	28.2 %	19.3 %
Portugal	*844*	12.7 %	65.2 %	26.5 %	35.1 %	18.8 %
Serbia	*676*	9.6 %	51.5 %	36.9 %	25.5 %	14.7 %
Slovenia	*805*	14.5 %	58.9 %	29.3 %	25.3 %	22.5 %
Spain	*710*	17.2 %	48.4 %	22.2 %	24.7 %	23.7 %
Sweden	*633*	7.1 %	49.1 %	30.1 %	30.0 %	20.5 %
Switzerland	*776*	16.7 %	45.4 %	22.9 %	27.7 %	21.5 %
United Kingdom	*644*	8.1 %	5.5 %	15.9 %	14.2 %	12.5 %
America8	***5894***	**14.0 %[b]**	**39.6 %[b]**	**30.5 %[b]**	**31.5 %[b]**	**18.6 %[a]**
Brazil	*657*	15.3 %	40.5 %	33.6 %	35.1 %	15.8 %
Canada	*1385*	10.5 %	53.0 %	20.5 %	23.3 %	18.7 %
Chile	*576*	15.3 %	48.1 %	31.8 %	38.6 %	20.8 %
Colombia	*472*	12.6 %	46.1 %	36.9 %	44.7 %	19.3 %
Mexico	*647*	20.5 %	46.3 %	41.5 %	45.5 %	25.5 %
Panama	*542*	16.2 %	51.3 %	44.5 %	55.8 %	31.1 %
Peru	*401*	15.2 %	42.4 %	41.3 %	42.9 %	22.1 %
United States	*782*	11.7 %	34.5 %	25.6 %	24.3 %	17.3 %
AsiaOceania6*	***3931***	**10.0 %[a]**	**37.1 %[b]**	**27.6 %[b]**	**24.5 %[a]**	**20.1 %[a]**
Armenia	*122*	3.4 %	24.9 %	39.8 %	29.7 %	10.0 %
Australia	*809*	8.1 %	24.8 %	14.2 %	15.7 %	13.7 %
Israel	*796*	7.5 %	49.6 %	21.4 %	36.0 %	25.7 %
Japan	*570*	3.5 %	49.7 %	13.3 %	16.6 %	23.5 %
Kazakhstan	*250*	5.2 %	28.9 %	41.1 %	30.9 %	27.0 %
Kyrgyzstan	*166*	1.2 %	19.2 %	71.7 %	36.4 %	20.7 %
Thailand	*586*	23.2 %	40.0 %	51.8 %	39.9 %	27.5 %
Türkiye	*692*	8.9 %	22.0 %	31.1 %	23.4 %	10.9 %
Uzbekistan	*82*	15.8 %	39.1 %	50.4 %	51.8 %	30.7 %
Comparison by region	*p*-value [(1)]	<0.001	<0.001	<0.001	<0.001	0.268
	Cramer's V	0.039	0.086	0.082	0.078	0.015

NOTES: Reference population: car drivers at least a few days a month; [(1)] p-value of Chi-Square Test of Independence for comparison among regions; [ab] each superscript letter denotes regions whose proportions do not differ significantly from each other at the 0.01 level; * Not including Armenia, Kyrgyzstan, Uzbekistan (different methodology).

behaviour, attitudes and opinions on unsafe traffic behaviour, enforcement experiences, support for policy measures, and infrastructure.

The questionnaire addresses various road safety topics, such as driving under the influence of alcohol or drugs, speeding, distraction, fatigue, use of protective systems, and compliance with traffic rules. It targets different groups of road users, including car occupants, moped riders and motorcyclists, cyclists, pedestrians, and e-scooter riders. In ESRA3 the questions related to vulnerable road users (moped riders and motorcyclists, cyclists, pedestrians) have been expanded and questions on e-scooters and infrastructure have been added. An overview of main themes, road safety topics, and targeted road users included in ESRA3 survey is presented in Table 1. The full English version of the ESRA3 questionnaire is available in the ESRA3 methodology report [15].

The main road safety topics and the targeted road users included in the ESRA3 survey reflect key behavioural issues commonly highlighted by international organizations. These topics align with the priorities identified by the World Health Organization (WHO) [22] and the European Commission's recommended road safety performance indicators [2]. By addressing these areas, the ESRA3 survey ensures its relevance to global and regional efforts aimed at improving road safety outcomes.

2.2. Sample and data collection

ESRA is a web-based survey with data collected through online panels. It is designed to target the main road user types and to provide a comprehensive understanding of road safety attitudes, opinions, and behaviours across these groups. The survey aimed to gather data from representative samples of 1000 respondents from the national adult population in each participating country.

During the sampling procedure for the ESRA3 survey, hard quotas were applied for gender and age group (six groups: 18–24, 25–34, 35–44, 45–54, 55–64, and 65–74 years) based on population data from the United Nations [23]. To achieve national representativeness, the

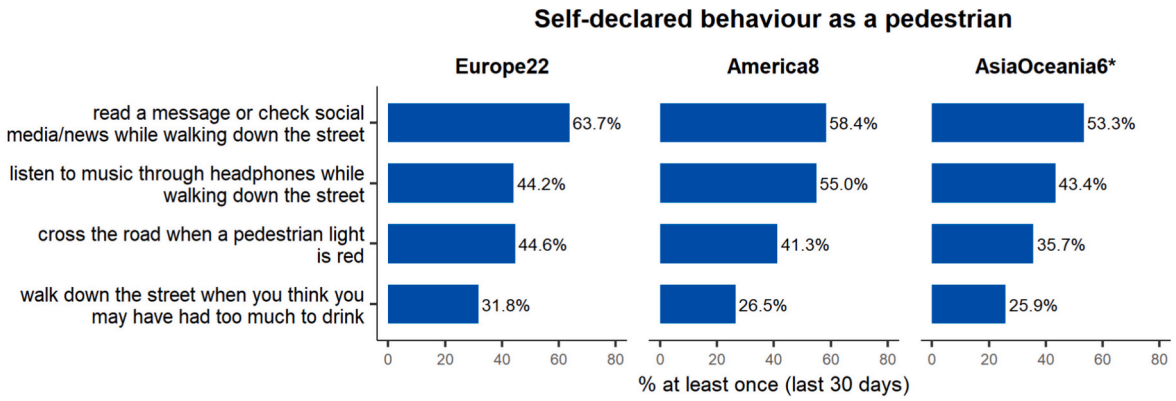

Fig. 4. Self-declared behaviour as a pedestrian, by region (% at least once in the past 30 days – scores 2 to 5 on a 5-point scale from 1 "never" to 5 "[almost] always").

geographical distribution of the sample across each country was at least monitored (soft quota). Data collection was carried out by three market research agencies – Dynata, Ipsos, and Punto de Fuga – under the supervision of Vias institute. These agencies followed predefined criteria for sampling and data quality and provided the data in a custom-made database template. This standardized approach ensured consistency in both sampling and data collection across all participating countries.

Deviations from the standard procedures in the ESRA survey occurred in certain countries where the targeted sample size (targeted at $n = 1000$) could not be achieved, or where the national partner decided to use a larger sample (i.e. Austria, Belgium, and Canada). In some cases, the available online panels were too small, or the associated costs were too high. For example, in Luxembourg, the maximum feasible sample size was 500 respondents. In Armenia, Kyrgyzstan, and Uzbekistan, where no online panels were available, respondents were recruited face-to-face in various capital areas across the country and invited to participate in a Computer Assisted Personal Interview (CAPI). Additionally, data collection in these countries was limited to the three youngest age categories, as hard quotas for the older age groups could not be guaranteed. Due to the different methodology used, the results from these three countries were not included in regional means.

The fieldwork was conducted simultaneously in all 39 participating countries between May and September 2023. In total, the ESRA3 survey collected data from more than 37,000 road users across 39 countries (Fig. 2) from three regions: America, Asia/Oceania, and Europe. For more details on the regions and countries see section 2.4.

2.3. Quality control and data cleaning

After receiving the cleaned data files from the agencies, several quality control steps were performed before finalizing the data. These steps included checking the received data against the predefined ESRA3 codebook, merging datasets from the three agencies, ensuring programming consistency, and verifying compliance with the requested quotas for national representativity based on gender and age.

Besides these quality checks, the data cleaning process included the following key actions:

- Duplicate Entries and Inconsistencies – the market research agency was responsible for removing duplicate entries based on factors such as age, gender, country, and IP address. They also checked for inconsistencies in respondent panel information, such as regional data.
- Length of Interview (LOI) – the ESRA3 survey aimed for a median interview length of 20 min. Cut-off criteria were applied to remove "speeders" (respondents who completed the survey too quickly) and "turtles" (those who took excessively long). "Speeders" were defined as car drivers who completed the questionnaire in less than 8 min – only car drivers were considered for this criterium, as they had to answer to more questions than non-car drivers. "Turtles" were those who took more than 24 h, regardless of road user type. Interview duration up to 24 h was accepted because respondents often take breaks or face internet issues, causing the timer to keep running. However, interruptions longer than one day were excluded to minimize the impact of external factors on response patterns.
- Straightlining – respondents displaying straightlining behaviour, where they repeatedly selected the same response across multiple items, were removed. For transport modes, respondents who consistently answered "never" or "at least 4 days a week" across all items were excluded, as these responses were considered unrealistic. For further checks, "straightliner" was defined as someone who gave the same answer on more than 75 % of items in certain matrix questions (e.g., self-declared behaviour, acceptability, attitudes, and policy support). If a respondent showed straightlining on at least three of these four matrix questions, they were excluded from the sample.
- Instructed response items (trick items) – two "instructed response items" were included in the questionnaire (e.g., instructing respondents to select a specific number on the answer scale). Respondents who failed to answer at least one of these items correctly were removed, as this indicated careless responding. Instructed response items are a widely recommended method for detecting careless respondents, as they help ensure that participants are paying attention to the survey content [24–26].

These above-described actions lead to remove 5742 (13.4 %) respondents from the original pre-cleaned sample provided by the market research agencies ($N = 42{,}835$). The final sample consisted of 37,093 road users. The sample size, the gender and age distribution by country and region are presented in Appendix – Table A.1.

2.4. Data analysis

Results of the ESRA3 survey are presented by country and by region. Each region refers to the group of countries of a continent and is named as:

- America8: Brazil, Canada, Chile, Colombia, Mexico, Panama, Peru, United States;

Table 4
Self-declared behaviour as a pedestrian, by country and region (% at least once in the past 30 days – scores 2 to 5 on a 5-point scale from 1 "never" to 5 "[almost] always").

Country/region	*Weighted sample*	Alcohol	Distraction		Respect for traffic rules
		walk down the street when you think you may have had too much to drink	listen to music through headphones while walking down the street	read a message or check social media/news while walking down the street	cross the road when a pedestrian light is red
Europe22	***19,119***	**31.8 %[a]**	**44.2 %[a]**	**63.7 %[a]**	**44.6 %[a]**
Austria	*1682*	43.2 %	40.8 %	69.3 %	42.4 %
Belgium	*1583*	33.8 %	40.8 %	61.3 %	38.9 %
Bosnia Herzegovina	*716*	27.0 %	33.2 %	76.9 %	37.6 %
Czech Republic	*845*	40.9 %	41.5 %	66.7 %	38.0 %
Denmark	*729*	40.9 %	52.1 %	72.7 %	46.9 %
Finland	*889*	41.1 %	53.7 %	72.2 %	54.2 %
France	*768*	24.3 %	38.0 %	54.3 %	51.0 %
Germany	*678*	30.1 %	32.1 %	52.5 %	33.3 %
Greece	*843*	30.8 %	53.7 %	80.7 %	57.1 %
Ireland	*744*	44.4 %	60.7 %	75.2 %	61.6 %
Italy	*885*	23.5 %	50.0 %	72.0 %	35.9 %
Latvia	*777*	32.2 %	40.2 %	68.7 %	47.3 %
Luxembourg	*411*	40.3 %	41.9 %	81.5 %	54.3 %
Netherlands	*856*	35.8 %	43.5 %	61.9 %	45.7 %
Poland	*864*	30.2 %	41.3 %	53.6 %	28.8 %
Portugal	*917*	27.2 %	50.9 %	82.2 %	59.9 %
Serbia	*893*	22.8 %	35.8 %	77.9 %	40.3 %
Slovenia	*849*	27.9 %	28.4 %	62.4 %	29.3 %
Spain	*865*	39.2 %	59.4 %	81.4 %	67.3 %
Sweden	*727*	37.4 %	59.8 %	76.0 %	58.6 %
Switzerland	*910*	38.8 %	47.8 %	64.6 %	43.9 %
United Kingdom	*823*	36.2 %	44.5 %	57.8 %	47.9 %
America8	***6187***	**26.5 %[b]**	**55.0 %[b]**	**58.4 %[b]**	**41.3 %[b]**
Brazil	*788*	26.0 %	65.4 %	71.6 %	51.2 %
Canada	*1429*	26.3 %	52.1 %	57.5 %	40.4 %
Chile	*793*	31.2 %	70.5 %	76.4 %	55.5 %
Colombia	*805*	34.3 %	65.2 %	70.3 %	51.3 %
Mexico	*789*	30.2 %	63.3 %	71.8 %	49.0 %
Panama	*705*	20.1 %	62.8 %	69.8 %	29.6 %
Peru	*765*	37.3 %	72.4 %	76.6 %	53.5 %
United States	*644*	22.4 %	39.9 %	38.1 %	27.4 %
AsiaOceania6*	***4705***	**25.9 %[b]**	**43.4 %[a]**	**53.3 %[c]**	**35.7 %[c]**
Armenia	*441*	18.0 %	33.0 %	60.9 %	25.0 %
Australia	*757*	23.7 %	42.2 %	47.6 %	31.1 %
Israel	*764*	21.5 %	57.1 %	83.8 %	44.5 %
Japan	*740*	22.8 %	25.2 %	38.6 %	37.1 %
Kazakhstan	*707*	28.3 %	54.6 %	77.7 %	18.8 %
Kyrgyzstan	*429*	8.6 %	40.3 %	59.1 %	10.9 %
Thailand	*592*	37.3 %	53.6 %	60.1 %	37.7 %
Türkiye	*830*	23.0 %	58.8 %	63.2 %	36.4 %
Uzbekistan	*287*	15.1 %	64.5 %	70.4 %	44.5 %
Comparison by region	*p*-value [(1)]	<0.001	<0.001	<0.001	<0.001
	Cramer's V	0.058	0.089	0.080	0.066

NOTES: Reference population: pedestrians at least a few days a month; [(1)] p-value of Chi-Square Test of Independence for comparison among regions; [abc] each superscript letter denotes regions whose proportions do not differ significantly from each other at the 0.01 level; * Not including Armenia, Kyrgyzstan, Uzbekistan (different methodology).

- AsiaOceania6*: Australia, Israel, Japan, Kazakhstan, Thailand, Türkiye (*Armenia, Kyrgyzstan, and Uzbekistan are not included in the regional mean due to different methodology in data collection – face-to-face CAPI instead of online panel);
- Europe22: Austria, Belgium, Bosnia and Herzegovina, Czech Republic, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Luxembourg, Netherlands, Poland, Portugal, Serbia, Slovenia, Spain, Sweden, Switzerland, United Kingdom.

Data weighting was applied to calculate representative means at both national and regional levels, based on UN population data [23]. These weights were used to make minor adjustments for national representativeness concerning gender and age group (18–24, 25–34, 35–44, 45–54, 55–64, 65–74). At the regional level, weighting also considered each country's population size within its region. The largest deviations were found at a country level for women aged 65–74, who were underrepresented in Brazil, Colombia, Peru, Thailand, Bosnia and Herzegovina, Kazakhstan, Türkiye, and Panama (weights between 2 and 6), and for men in the same age group in Bosnia and Herzegovina and Panama (weights between 2.1 and 3.6).

Most of the questions in the ESRA3 survey were presented on Likert scales, mainly 5-point scales which were then dichotomized for analysis. This dichotomization process was centrally managed and applied in all descriptive analyses of the ESRA3 results and reports. Table 2 presents the questions from the ESRA3 survey presented in this article together with the corresponding answer scales and dichotomizations. It is important to note that these questions represent only a subset of the full ESRA3 survey. They are initial examples of questions which are used in ESRA3 to assess road safety performance and traffic safety cultures. For a more comprehensive analysis and discussion of additional questions, themes, topics, and road users, please refer to the thematic reports available on the ESRA website (www.esranet.eu) and other articles in this Special Issue of IATSS Research dedicated to ESRA. The ESRA3 thematic reports provide, among other publications, more detailed

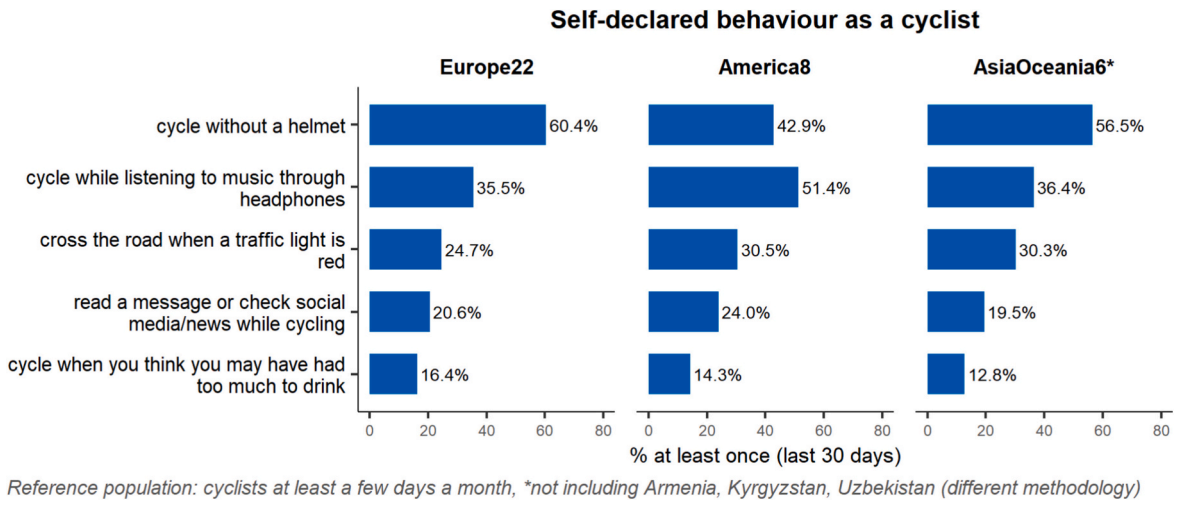

Fig. 5. Self-declared behaviour as a cyclist, by region (% at least once in the past 30 days – scores 2 to 5 on a 5-point scale from 1 "never" to 5 "[almost] always").

information on age group and gender comparisons, and use regression models to examine the relationships between various determinants of unsafe traffic behaviour (e.g., driving under the influence of alcohol [27], speeding [28], or talking on a hand-held mobile phone while driving [29]). A more in-depth analysis of the relationship between key Theory of Planned Behaviour constructs, unsafe traffic behaviour and traffic safety culture can be found in Meesmann et al. [30] for drink-driving, as well as in one of the articles in the current Special Issue of IATSS Research focusing on mobile phone use while driving [31].

Given the nominal nature of the data, the Chi-square Test for Independence was used to determine whether the answers depend significantly on the region. The strength of the association was evaluated using the Cramér's V coefficient, with the following thresholds established to categorize the strength of associations [32]: small = 0.06, medium = 0.17, and large = 0.29.

SPSS 26.0 [33] and R 4.3.1 [34] were used for the data processing and data analysis.

3. Results

3.1. Self-declared behaviour

To assess the extent of unsafe behaviour in traffic, road users were asked to indicate the frequency of this behaviour in the last 30 days ("Over the last 30 days, how often did you as a [road user] …?") – specific questions for car drivers, pedestrians, cyclists, and moped riders/ motorcyclists were included. Only road users who used a certain transport mode at least a few days a month in the past 12 months answered the questions related to that transport mode. A 5-point scale from 1 "never" to 5 "(almost) always" was used – the percentages of respondents stating "at least once" (answers 2 to 5) are presented in the results.

3.1.1. Car drivers

Results of self-declared behaviours of car drivers in the past 30 days are presented in Fig. 3 (by region) and Table 3 (by country/region) – percentages of at least once in the past 30 days are presented.

Speeding inside built-up areas was the most frequently declared behaviour among car drivers in all three regions, with 47.3 % in Europe22, 39.6 % in America8, and 37.1 % in AsiaOceania6. On the other hand, driving over the legal alcohol limit was the least reported behaviour: 11.6 % in Europe22, 14.0 % in America8, and 10.0 % in AsiaOceania6. Fatigued driving was declared by about one in five drivers, with 18.4 % in Europe22, 18.6 % in America8, and 20.1 % in AsiaOceania6. Talking on a hand-held phone and reading messages while driving a car had similar rates across all regions. In Europe22, 22.2 % reported talking on the phone and 23.2 % reading messages, while in America8 the percentages were 30.5 % and 31.5 %, and in AsiaOceania6, 27.6 % and 24.5 %, respectively. The differences among regions were significant for all behaviours ($p < 0.001$) except for fatigued driving ($p = 0.268$), but of small effect size in all the variables, with Cramer's V values all below 0.086 (Fig. 3 and Table 3).

3.1.2. Pedestrians

As for self-declared pedestrian behaviours, the results in Fig. 4 and Table 4 show that distraction behaviours, particularly reading messages or checking social media while walking, were the most frequently reported. More than half of pedestrians in every region declared that they had read messages or checked social media while walking in the street at least once in the past 30 days, with the highest rate in Europe22 (63.7 %), followed by America8 (58.4 %) and AsiaOceania6 (53.3 %). Listening to music through headphones was also reported by more than half of American8 pedestrians (55.0 %) and by 44.2 % in Europe22 and 43.4 % in AsiaOceania6. Between 35.7 % to 44.6 % declared crossing the road when a pedestrian light was red and a smaller percentage of pedestrians declared walking down the street when they may have had too much to drink: 31.8 % in Europe22, 26.5 % in America8, and 25.9 % in AsiaOceania6. Although the percentages of the pedestrian self-declared behaviours differ significantly among regions ($p < 0.01$), the effect size was small (Cramer's V < 0.090).

3.1.3. Cyclists

Results of self-declared behaviours of cyclists in the past 30 days are presented in Fig. 5 (by region) and Table 5 (by country/region).

More than half of the cyclists in Europe22 (60.4 %) and AsiaOceania6 (56.5 %) declared cycling without a helmet – percentages significantly higher than in America8 (42.9 %) ($p < 0.01$). In America8, cycling while listening to music through headphones was the most declared behaviour (51.4 %), with a percentage significantly higher than in Europe22 (35.5 %) and AsiaOceania6 (36.4 %) ($p < 0.01$). Cycling when the cyclist thinks he/she may have had too much to drink was the least frequently declared behaviour in all the regions: 16.4 % in Europe22, 14.3 % America8, and 12.8 % in AsiaOceania6. Between 25 % (Europe22) and 30 % (America8 and AsiaOceania6) of cyclists declared that they crossed the road when a traffic light was red and between about 20 % (Europe22 and AsiaOceania6) and 24 % (America8) declared that they read a message or checked social media/news while cycling at least once in the past 30 days (Fig. 5 and Table 5).

Table 5
Self-declared behaviour as a cyclist, by country and region (% at least once in the past 30 days – scores 2 to 5 on a 5-point scale from 1 "never" to 5 "[almost] always").

		Alcohol	Distraction		Respect for traffic rules	Protective systems
Country/region	*Weighted sample*	cycle when you think you may have had too much to drink	cycle while listening to music through headphones	read a message or check social media/news while cycling	cross the road when a traffic light is red	cycle without a helmet
Europe22	***10,650***	**16.4 %[a]**	**35.5 %[a]**	**20.6 %[ab]**	**24.7 %[a]**	**60.4 %[a]**
Austria	*876*	17.0 %	29.5 %	16.2 %	24.6 %	62.8 %
Belgium	*852*	25.0 %	33.5 %	22.7 %	27.7 %	69.9 %
Bosnia Herzegovina	*369*	8.9 %	31.8 %	25.2 %	23.8 %	69.5 %
Czech Republic	*406*	25.0 %	33.2 %	16.0 %	21.5 %	70.7 %
Denmark	*520*	31.3 %	44.3 %	29.3 %	33.4 %	64.0 %
Finland	*554*	23.0 %	44.0 %	24.2 %	36.2 %	69.2 %
France	*409*	16.0 %	29.7 %	21.2 %	24.5 %	50.5 %
Germany	*457*	15.8 %	25.4 %	18.2 %	24.2 %	57.8 %
Greece	*325*	8.9 %	42.5 %	18.8 %	21.6 %	56.0 %
Ireland	*259*	20.4 %	46.4 %	26.8 %	34.3 %	51.6 %
Italy	*549*	10.8 %	41.9 %	19.3 %	22.5 %	64.2 %
Latvia	*378*	12.9 %	37.5 %	16.4 %	26.8 %	85.2 %
Luxembourg	*141*	5.9 %	22.9 %	14.4 %	32.5 %	39.8 %
Netherlands	*744*	32.0 %	35.9 %	24.1 %	40.6 %	88.3 %
Poland	*584*	10.6 %	40.1 %	23.1 %	14.8 %	79.7 %
Portugal	*260*	11.5 %	42.5 %	17.3 %	29.2 %	48.8 %
Serbia	*488*	8.7 %	29.3 %	22.2 %	15.5 %	83.4 %
Slovenia	*464*	15.2 %	21.2 %	15.1 %	24.2 %	65.2 %
Spain	*381*	17.0 %	43.2 %	23.5 %	34.2 %	52.0 %
Sweden	*446*	27.4 %	49.6 %	31.3 %	35.3 %	70.0 %
Switzerland	*522*	20.1 %	35.8 %	21.3 %	26.4 %	52.2 %
United Kingdom	*327*	15.1 %	37.6 %	16.7 %	16.5 %	31.6 %
America8	***3967***	**14.3 %[ab]**	**51.4 %[b]**	**24.0 %[a]**	**30.5 %[b]**	**42.9 %[b]**
Brazil	*508*	13.5 %	59.1 %	28.4 %	38.4 %	53.7 %
Canada	*611*	19.0 %	42.8 %	22.1 %	31.8 %	47.4 %
Chile	*401*	14.7 %	65.1 %	29.6 %	38.2 %	63.9 %
Colombia	*510*	10.7 %	68.7 %	29.0 %	37.8 %	61.8 %
Mexico	*437*	16.9 %	60.3 %	27.7 %	41.4 %	63.4 %
Panama	*318*	10.3 %	68.4 %	30.4 %	24.7 %	62.4 %
Peru	*434*	13.2 %	76.8 %	33.6 %	35.8 %	66.7 %
United States	*468*	14.1 %	39.0 %	18.3 %	20.1 %	23.2 %
AsiaOceania6*	***2524***	**12.8 %[b]**	**36.4 %[a]**	**19.5 %[b]**	**30.3 %[b]**	**56.5 %[a]**
Armenia	*41*	4.9 %	39.1 %	9.6 %	26.9 %	58.5 %
Australia	*392*	11.8 %	28.1 %	14.6 %	14.8 %	13.2 %
Israel	*120*	9.9 %	48.1 %	34.1 %	31.6 %	35.0 %
Japan	*365*	7.2 %	13.1 %	11.2 %	31.4 %	64.2 %
Kazakhstan	*245*	13.9 %	56.6 %	28.1 %	15.0 %	77.9 %
Kyrgyzstan	*69*	0.0 %	50.1 %	21.2 %	7.2 %	81.3 %
Thailand	*482*	23.0 %	50.9 %	31.5 %	35.8 %	59.2 %
Türkiye	*405*	9.1 %	52.2 %	17.2 %	29.7 %	53.7 %
Uzbekistan	*86*	24.1 %	45.5 %	42.3 %	33.3 %	63.1 %
Comparison by region	*p*-value [(1)]	0.005	<0.001	0.006	<0.001	<0.001
	Cramer's V	0.038	0.136	0.038	0.063	0.145

NOTES: Reference population: cyclists at least a few days a month; [(1)] p-value of Chi-Square Test of Independence for comparison among regions; [ab] each superscript letter denotes regions whose proportions do not differ significantly from each other at the 0.01 level; * Not including Armenia, Kyrgyzstan, Uzbekistan (different methodology).

3.1.4. Moped riders/motorcyclists

Results of self-declared behaviours of moped riders and motorcyclists (Fig. 6 and Table 6), show that speeding (riding faster than the speed limit outside built-up areas) was the most frequently declared behaviour in Europe22 (35.1 %) and America8 (30.1 %), while riding without a helmet was the most declared in AsiaOceania6 (37.7 %). Drink riding was the risky behaviour least declared in the three regions: the percentage of moped riders/motorcyclists who reported riding when they may have been over the legal alcohol limit was 19.4 % in Europe22, 17.7 % in America8, and 18.9 % in AsiaOceania6. As for distraction, the percentages of riders who admitted to reading messages or checking social media/news while riding, were 20.7 % in Europe22, 22.8 % in America8, and 24.9 % in AsiaOceania6.

3.2. Personal acceptability of unsafe behaviours in traffic by car drivers

Results on personal acceptability of unsafe traffic behaviour by car drivers ("How acceptable do you, personally, feel it is for a car driver to…?") are presented in Fig. 7 (by region) and Table 7 (by country/region). Results show low levels of personal acceptability of the five unsafe car driver behaviours considered. In fact, less than 5 % of respondents in all the regions considered acceptable for a car driver to speed inside built-up areas, to talk or read messages on a mobile phone, to drive when he/she may be over the legal limit for drinking and driving, or to drive when he/she is so sleepy that he/she has trouble keeping their eyes open. Among these risky behaviours, driving faster than the speed limit inside built-up areas (4.7 %–4.9 % acceptable) and talking on a hand-held mobile phone (4.3 %–4.6 %) where considered the most acceptable, while drink driving (2.6 %–3.7 %) and fatigued driving (2.5 %–3.5 %) were the least acceptable in all the regions.

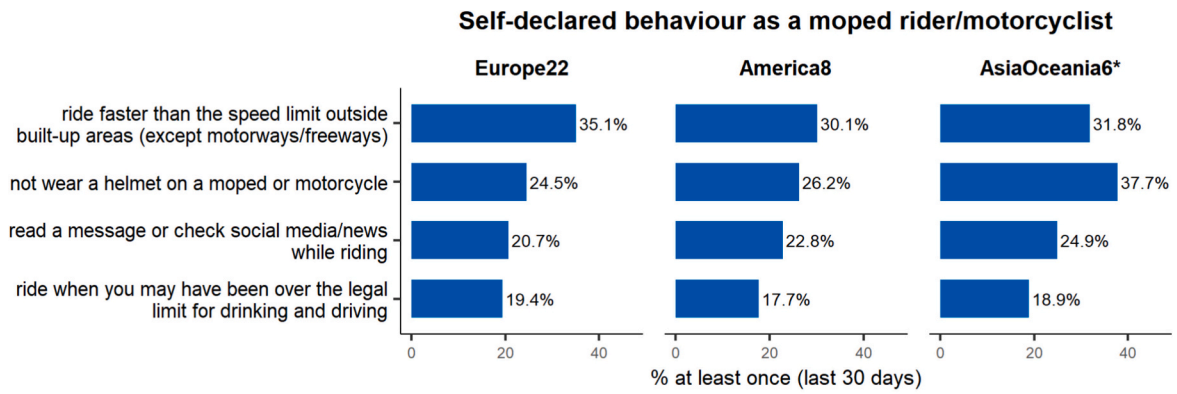

Fig. 6. Self-declared behaviour as a moped rider/motorcyclist, by region (% at least once in the past 30 days – scores 2 to 5 on a 5-point scale from 1 "never" to 5 "[almost] always").

3.3. Support for policy measures

Support for policy measures was assessed by asking "Do you oppose or support a legal obligation to …?" using a 5-point scale from 1 = "oppose" to 5 = "support" – percentages of support (answers 4 to 5) are presented in Fig. 8 (by region) and Table 8 (by country/region).

Most of the respondents support forbidding all drivers of motorized vehicles to drive with a blood alcohol concentration above 0.0 ‰ (65.8 % in Europe22, 73.6 % in America8, and 71.2 % in AsiaOceania6), and support forbidding all drivers to use a hand-held mobile phone while driving (79.3 % in Europe22, 81.3 % in America8, and 79.2 % in AsiaOceania6). Requiring all cyclists to wear a helmet is also supported by most of the respondents of the three regions: 64.7 % in Europe22, 64.3 % in AsiaOceania6, and 79.3 % in America8 (significantly higher in America8 than in the other regions: $p < 0.001$, Cramer's V = 0.131). Limiting the speed limit to 30 km/h in all built-up areas (except on main thoroughfares) is supported by less than half of the respondents in Europe22 (42.1 %) and AsiaOceania6 (46.5 %), and by 54.8 % in America8 (significant differences among the three regions: $p < 0.001$, Cramer's V = 0.104) (Fig. 8 and Table 8).

4. Discussion

This paper included data from 37,000 road users from 39 countries that participated in the third edition of the ESRA survey (ESRA3) – conducted in 2023. Results presented in this paper are just a small part of the data produced by ESRA3 survey.

Of the unsafe behaviours included in ESRA3, speeding within built-up areas was the most frequently declared by car drivers – it was declared by more than 35 % of car drivers in all the regions. Other ESRA3 results show even higher percentages for speeding outside built-up areas and on motorways [35]. Car drivers appear to underestimate the risks of speeding (especially outside built-up areas), a key risk factor in road traffic, strongly associated with both the number and severity of crashes [36]. Conversely, drink-driving was the least prevalent behaviour in all regions. Nevertheless, the percentages of drinking and driving are quite substantial – ranging from 10 % in AsiaOceania6 to 14 % in America8. Both behaviours were considered acceptable by less than 5 % of road users, indicating that many drivers are aware of the dangers, but this does not stop them from continuing these risky behaviours on the road. Personal acceptability of fatigued driving was quite low, with 2.5 % to 3.5 % of road users considering this behaviour acceptable – similar to driving a car under the influence of alcohol. Despite the low level of personal acceptability, fatigued driving was declared by 1 in 4 car drivers, suggesting that car drivers are unable to prevent or adequately react to the problem of fatigued driving, even though they may have strong personal norms against this type of behaviour [37]. A large number of car drivers reported the use of a mobile phone while driving, with the percentages of those who declared to talk or read messages/social media ranging from 22 % in Europe22 to 32 % in America8. Several reasons might explain high rates of self-reported mobile phone use while driving despite the low acceptability of this behaviour (less than 5 % considered it acceptable in the ESRA3 survey). Those reasons could be for example: personality traits that predispose drivers to risky driving [38], the social expectation to answer calls or text messages immediately, professional reasons, or perceived practical, social, and psychological benefits [39].

The self-declared behaviours of vulnerable road users – pedestrians, cyclists, and moped riders/motorcyclists – also showed high prevalence of several risky behaviours. For pedestrians, distractions such as reading messages/checking social media or listening to music on headphones while walking on the road were the most commonly declared behaviours, with more than 40 % of pedestrians admitting to such activities. Among cyclists, cycling without a helmet was the most frequently reported risky behaviour, particularly in Europe22 and AsiaOceania6, where more than half of cyclists declared cycling without a helmet. Among moped riders and motorcyclists, speeding outside built-up areas was the most common behaviour in Europe22 and America8, while riding without a helmet was most common in AsiaOceania6. These findings show that vulnerable road users continue to engage in risky behaviours and highlight the need for targeted measures to improve safety, particularly in relation to distraction and helmet use.

Most of the road users support the policy measures to reduce unsafe behaviours in traffic, such as forbidding all drivers of motorized vehicles to drive with a blood alcohol concentration above 0.0 ‰, forbidding all drivers to use a hand-held mobile phone while driving, and requiring all cyclists to wear a helmet. This support, together with the low level of acceptability of risky behaviours shows that most road users are aware of the negative consequences of unsafe behaviours in traffic. Despite being aware of the risks, there is still a high percentage of road users who engage in these risky behaviours on the road. This may be partly explained by the (unrealistic) "optimism" bias of many road users, who believe that road crashes (like other negative events) happen to others, but not to them [40].

The ESRA initiative has proven to be an important source of data for building a benchmark of road safety indicators that can be used together with other data, such as data from crash statistics or roadside surveys, to provide a more complete picture of the level of traffic safety in a country and a better understanding of the process that leads to road crashes. By using the same questionnaire and methodology, ESRA data enables reliable comparisons among countries, the positioning of a particular country within a region, and the monitoring of trends over time. Country

Table 6
Self-declared behaviour as a moped rider/motorcyclist, by country and region (% at least once in the past 30 days – scores 2 to 5 on a 5-point scale from 1 "never" to 5 "[almost] always").

		Alcohol	Speeding	Distraction	Protective systems
Country/region	*Weighted sample*	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)	read a message or check social media/news while riding	not wear a helmet on a moped or motorcycle
Europe22	***3732***	**19.4 %[a]**	**35.1 %[a]**	**20.7 %[a]**	**24.5 %[a]**
Austria	*194*	19.7 %	58.8 %	20.8 %	19.4 %
Belgium	*222*	27.5 %	43.4 %	28.2 %	32.9 %
Bosnia Herzegovina	*96*	13.6 %	35.3 %	18.1 %	52.0 %
Czech Republic	*75*	21.7 %	54.0 %	18.9 %	32.0 %
Denmark	*115*	30.0 %	40.0 %	32.0 %	32.6 %
Finland	*97*	15.2 %	53.2 %	14.6 %	14.5 %
France	*190*	17.1 %	25.3 %	21.0 %	20.7 %
Germany	*133*	16.9 %	33.5 %	18.0 %	19.3 %
Greece	*200*	12.6 %	46.4 %	16.0 %	27.7 %
Ireland	*62*	36.0 %	55.4 %	37.4 %	42.5 %
Italy	*266*	15.4 %	34.5 %	15.0 %	19.3 %
Latvia	*43*	11.7 %	67.2 %	11.9 %	27.6 %
Luxembourg	*44*	16.6 %	64.6 %	11.5 %	7.1 %
Netherlands	*145*	29.0 %	49.4 %	33.1 %	44.7 %
Poland	*94*	17.8 %	42.2 %	27.4 %	36.8 %
Portugal	*91*	16.0 %	52.3 %	16.8 %	14.8 %
Serbia	*72*	13.8 %	30.2 %	18.0 %	45.6 %
Slovenia	*146*	13.9 %	42.8 %	13.3 %	29.3 %
Spain	*159*	23.1 %	43.5 %	23.7 %	23.3 %
Sweden	*88*	27.5 %	50.8 %	27.1 %	35.0 %
Switzerland	*200*	18.3 %	30.7 %	19.5 %	20.4 %
United Kingdom	*179*	24.5 %	26.4 %	23.1 %	29.3 %
America8	***2650***	**17.7 %[a]**	**30.1 %[a]**	**22.8 %[a]**	**26.2 %[a]**
Brazil	*299*	15.2 %	39.1 %	22.6 %	23.8 %
Canada	*221*	26.8 %	39.8 %	27.3 %	29.9 %
Chile	*105*	20.3 %	36.0 %	35.3 %	37.3 %
Colombia	*284*	15.6 %	45.7 %	32.7 %	36.9 %
Mexico	*196*	23.5 %	37.7 %	27.5 %	39.8 %
Panama	*84*	22.6 %	41.0 %	39.7 %	38.6 %
Peru	*216*	24.4 %	48.1 %	36.1 %	47.7 %
United States	*407*	17.1 %	22.5 %	20.1 %	22.4 %
AsiaOceania6*	***1708***	**18.9 %[a]**	**31.8 %[a]**	**24.9 %[a]**	**37.7 %[b]**
Armenia	*8*	0.0 %	37.4 %	0.0 %	24.8 %
Australia	*280*	10.5 %	18.0 %	11.9 %	13.7 %
Israel	*33*	18.0 %	63.2 %	24.8 %	24.0 %
Japan	*84*	6.1 %	39.5 %	8.5 %	3.7 %
Kazakhstan	*49*	37.1 %	47.0 %	22.8 %	46.0 %
Kyrgyzstan	*7*	0.0 %	56.3 %	42.3 %	28.1 %
Thailand	*632*	25.4 %	34.2 %	33.2 %	52.1 %
Türkiye	*264*	12.3 %	26.2 %	18.6 %	29.7 %
Uzbekistan	*30*	28.2 %	48.7 %	42.4 %	49.2 %
Comparison by region	p-value [(1)]	0.553	0.028	0.078	<0.001
	Cramer's V	0.019	0.047	0.040	0.115

NOTES: Reference population: moped riders and/or motorcyclists at least a few days a month; [(1)] p-value of Chi-Square Test of Independence for comparison among regions; [ab] each superscript letter denotes regions whose proportions do not differ significantly from each other at the 0.01 level; * Not including Armenia, Kyrgyzstan, Uzbekistan (different methodology).

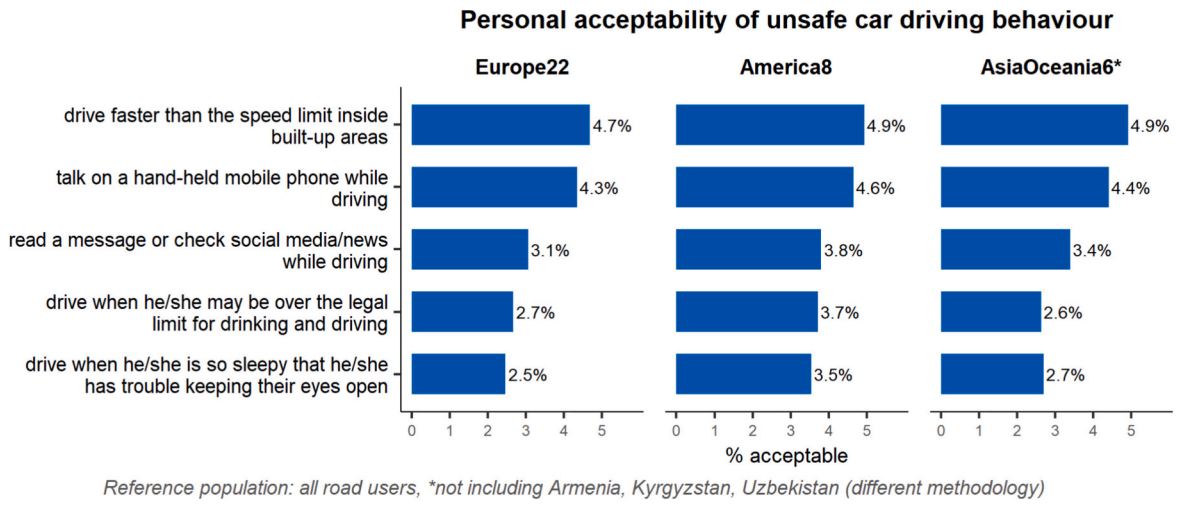

Fig. 7. Personal acceptability of unsafe behaviours in traffic by car drivers, by region (% of acceptable – scores 4 and 5 on a 5-point scale from 1 "unacceptable" to 5 "acceptable").

comparisons and regional positioning help to identify specific strengths and weaknesses, enabling policymakers to tailor interventions effectively. For example, countries can learn from the successes and challenges of their neighbours, facilitating the adoption of best practices and targeted strategies. The longitudinal aspect of the ESRA initiative also plays a crucial role in monitoring progress over time. By asking the same questions over time, researchers can identify trends, evaluate the effectiveness of policies implemented, and adjust strategies as needed to improve road safety outcomes. This ability is crucial for assessing how attitudes and behaviours evolve in response to safety interventions, campaigns, or legislation [41].

5. Limitations of the data

One significant limitation is the impact of cultural differences among the countries surveyed. Road users from diverse regions, including Europe, America, Asia and Oceania, may interpret questions differently based on their cultural contexts, which can affect their responses. Factors such as social values, personality traits, status, laws, or infrastructure vary significantly across countries and may influence how individuals answer the survey questions [16]. Additionally, self-report surveys are subject to biases such as social desirability bias, where respondents may provide answers that make them appear more favourable. Misunderstandings of questions or memory errors can also skew results [42,43].

The self-declared nature of the survey data introduces unexplained variance due to the lack of objective data and situational context. While the survey captures various socio-cognitive determinants of behaviour such as attitudes, norms, risk perception, and some other elements of traffic safety culture, it does not account for all influencing factors such as personal abilities and infrastructural differences. This limitation means that further research is needed to fully understand the specific country results and the differences observed among countries.

The ESRA3 survey has a large sample size of over 37,000 respondents from 39 countries. Such a large sample size means that even small differences can become statistically significant. For this reason, effect sizes in the form of Cramer's V are also reported and these show that most effect sizes are rather small. In addition, online panels used for data collection can lead to selection and coverage biases, excluding those without internet access or less inclined to participate online. This can underrepresent certain age groups, such as those over 75 years old, and lead to non-response bias, where those who choose to participate may differ from non-respondents. Furthermore, in countries like Armenia, Kyrgyzstan and Uzbekistan, where online panels were unavailable, face-to-face recruitment was used and the sample size was reduced, which potentially affected the representativeness and the comparability of the data with other countries. Therefore, the data of these countries was not considered when calculating the according regional means (AsiaOceania6).

In summary, while the ESRA3 survey offers valuable insights, its limitations include cultural biases, response biases, sample representativeness issues, and the inherent limitations of self-declared data. These factors should be considered when interpreting the results, and further research is needed to address these limitations and provide a more comprehensive understanding of road safety perceptions and behaviours.

6. Conclusions

The initial aim of ESRA was to develop a system for collecting reliable and comparable information on 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 such as the Global Status Report on Road Safety (GSRRS) of the WHO [1], the country profiles [44] and thematic reports [45] of the European Road Safety Observatory (ERSO) of the European Commission [46].

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.

Table 7
Personal acceptability of unsafe behaviours in traffic by car drivers, by country and region (% of acceptable – scores 4 and 5 on a 5-point scale from 1 "unacceptable" to 5 "acceptable").

		Alcohol	Speeding	Distraction		Fatigue
Country/region	*Weighted sample*	drive when he/she may be over the legal limit for drinking and driving	drive faster than the speed limit inside built-up areas	talk on a hand-held 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
Europe22	***22,000***	**2.7 %[a]**	**4.7 %[a]**	**4.3 %[a]**	**3.1 %[a]**	**2.5 %[a]**
Austria	*1804*	5.0 %	8.5 %	10.0 %	5.2 %	4.1 %
Belgium	*1795*	3.6 %	5.5 %	3.3 %	3.2 %	3.0 %
Bosnia Herzegovina	*914*	1.7 %	2.4 %	2.7 %	1.4 %	1.7 %
Czech Republic	*965*	1.3 %	4.3 %	4.1 %	1.4 %	1.1 %
Denmark	*874*	2.4 %	4.7 %	5.1 %	3.3 %	3.5 %
Finland	*993*	0.7 %	8.5 %	7.6 %	2.3 %	1.1 %
France	*965*	3.5 %	4.4 %	2.4 %	2.6 %	2.1 %
Germany	*832*	2.1 %	3.9 %	5.7 %	3.7 %	2.6 %
Greece	*978*	1.7 %	2.6 %	2.8 %	2.3 %	1.8 %
Ireland	*901*	2.8 %	3.8 %	3.8 %	3.3 %	1.9 %
Italy	*1007*	3.5 %	5.1 %	3.5 %	3.4 %	2.7 %
Latvia	*911*	1.3 %	7.0 %	6.3 %	2.6 %	1.2 %
Luxembourg	*471*	4.0 %	6.0 %	4.6 %	2.7 %	0.9 %
Netherlands	*905*	2.3 %	4.4 %	3.2 %	2.7 %	2.8 %
Poland	*927*	1.9 %	8.1 %	5.3 %	3.4 %	2.1 %
Portugal	*1032*	1.2 %	4.1 %	2.0 %	1.9 %	1.2 %
Serbia	*982*	0.7 %	1.8 %	1.6 %	0.6 %	0.3 %
Slovenia	*945*	1.2 %	2.7 %	1.9 %	1.6 %	1.6 %
Spain	*935*	2.4 %	4.3 %	3.5 %	2.6 %	1.5 %
Sweden	*922*	2.6 %	4.8 %	6.4 %	3.6 %	2.6 %
Switzerland	*979*	3.5 %	4.9 %	6.8 %	3.2 %	2.4 %
United Kingdom	*921*	3.1 %	3.9 %	5.1 %	3.3 %	3.8 %
America8	***8000***	**3.7 %[b]**	**4.9 %[a]**	**4.6 %[a]**	**3.8 %[a]**	**3.5 %[b]**
Brazil	*947*	2.7 %	4.0 %	3.2 %	3.6 %	2.1 %
Canada	*1904*	2.8 %	5.4 %	4.7 %	3.0 %	2.9 %
Chile	*923*	1.3 %	2.9 %	2.7 %	2.6 %	1.3 %
Colombia	*909*	1.0 %	2.6 %	2.3 %	1.8 %	0.7 %
Mexico	*932*	3.1 %	4.1 %	4.9 %	2.9 %	2.4 %
Panama	*855*	1.2 %	3.3 %	3.1 %	3.0 %	1.2 %
Peru	*843*	2.0 %	3.5 %	3.8 %	2.9 %	1.7 %
United States	*938*	5.3 %	6.3 %	5.8 %	4.7 %	5.5 %
AsiaOceania6*	***6000***	**2.6 %[ab]**	**4.9 %[a]**	**4.4 %[a]**	**3.4 %[a]**	**2.7 %[ab]**
Armenia	*467*	0.6 %	1.3 %	9.4 %	2.5 %	2.1 %
Australia	*953*	2.1 %	2.5 %	3.0 %	2.1 %	1.9 %
Israel	*965*	2.7 %	8.8 %	3.8 %	4.1 %	2.3 %
Japan	*986*	1.4 %	4.6 %	2.6 %	2.2 %	1.6 %
Kazakhstan	*845*	2.8 %	5.6 %	8.8 %	5.3 %	3.4 %
Kyrgyzstan	*468*	1.9 %	1.9 %	2.8 %	2.5 %	3.4 %
Thailand	*870*	5.6 %	7.5 %	8.0 %	6.5 %	5.3 %
Türkiye	*897*	2.0 %	3.2 %	3.7 %	2.5 %	2.2 %
Uzbekistan	*433*	1.9 %	2.9 %	5.4 %	6.2 %	3.9 %
Comparison by region	p-value [(1)]	0.006	0.787	0.752	0.104	0.005
	Cramer's V	0.026	0.006	0.006	0.017	0.027

NOTES: Reference population: all road users; [(1)] p-value of Chi-Square Test of Independence for comparison among regions; [ab] each superscript letter denotes regions whose proportions do not differ significantly from each other at the 0.01 level; * Not including Armenia, Kyrgyzstan, Uzbekistan (different methodology).

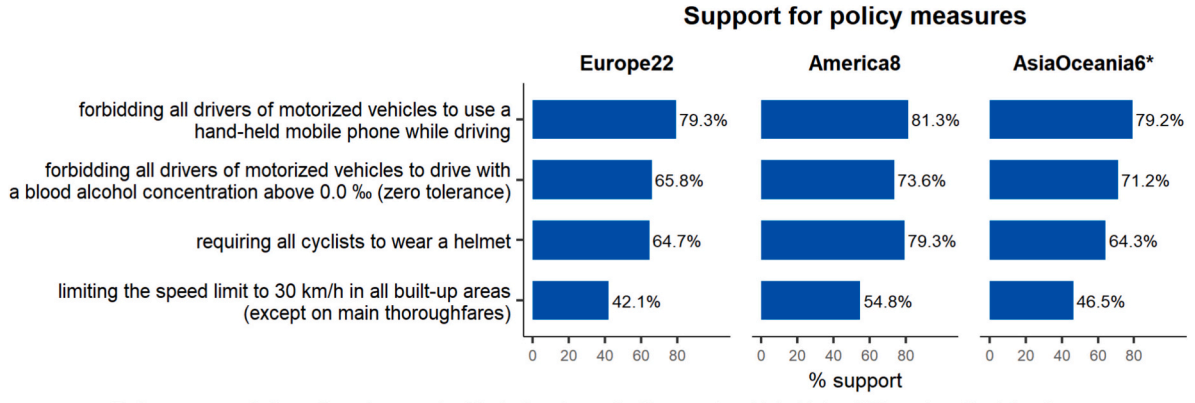

Fig. 8. Support for policy measures, by region (% of support – scores 4 and 5 on a 5- point scale from 1 "oppose" to 5 "support").

Table 8
Support for policy measures, by country and region (% of support – scores 4 and 5 on a 5- point scale from 1 "oppose" to 5 "support").

		Alcohol	Distraction	Speeding	Protective systems
Country/region	*Weighted sample*	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
Europe22	***22,000***	**65.8 %[a]**	**79.3 %[a]**	**42.1 %[a]**	**64.7 %[a]**
Austria	*1804*	52.8 %	74.9 %	28.4 %	55.8 %
Belgium	*1795*	59.7 %	83.7 %	37.1 %	55.0 %
Bosnia Herzegovina	*914*	72.6 %	83.2 %	48.5 %	64.3 %
Czech Republic	*965*	73.3 %	71.2 %	24.4 %	56.1 %
Denmark	*874*	46.0 %	79.5 %	25.5 %	48.4 %
Finland	*993*	55.9 %	73.4 %	28.7 %	50.4 %
France	*965*	65.3 %	63.7 %	43.7 %	73.0 %
Germany	*832*	66.6 %	77.0 %	40.8 %	55.9 %
Greece	*978*	61.9 %	83.5 %	54.5 %	77.5 %
Ireland	*901*	66.1 %	84.5 %	54.2 %	79.7 %
Italy	*1007*	59.4 %	87.3 %	39.4 %	68.7 %
Latvia	*911*	58.5 %	77.1 %	38.1 %	46.4 %
Luxembourg	*471*	42.8 %	(a)	30.5 %	69.1 %
Netherlands	*905*	59.3 %	83.0 %	43.1 %	21.2 %
Poland	*927*	68.3 %	80.7 %	27.6 %	47.6 %
Portugal	*1032*	60.4 %	89.0 %	34.8 %	83.3 %
Serbia	*982*	74.7 %	88.2 %	45.7 %	55.0 %
Slovenia	*945*	60.6 %	81.6 %	27.4 %	55.5 %
Spain	*935*	72.3 %	86.1 %	57.6 %	85.3 %
Sweden	*922*	71.9 %	79.0 %	55.7 %	49.0 %
Switzerland	*979*	51.9 %	77.8 %	32.9 %	64.0 %
United Kingdom	*921*	72.8 %	81.3 %	47.1 %	76.1 %
America8	***8000***	**73.6 %[b]**	**81.3 %[a]**	**54.8 %[c]**	**79.3 %[b]**
Brazil	*947*	81.2 %	85.6 %	49.8 %	78.5 %
Canada	*1904*	64.2 %	73.1 %	42.8 %	72.5 %
Chile	*923*	85.2 %	87.6 %	52.9 %	89.5 %
Colombia	*909*	81.7 %	87.5 %	60.9 %	89.2 %
Mexico	*932*	75.1 %	86.2 %	63.5 %	87.7 %
Panama	*855*	68.1 %	81.6 %	63.4 %	90.1 %
Peru	*843*	81.8 %	84.7 %	69.4 %	88.2 %
United States	*938*	67.8 %	76.6 %	53.8 %	74.8 %
AsiaOceania6*	***6000***	**71.2 %[b]**	**79.2 %[a]**	**46.5 %[b]**	**64.3 %[a]**
Armenia	*467*	79.3 %	56.2 %	57.1 %	57.5 %
Australia	*953*	63.6 %	84.3 %	45.3 %	89.0 %
Israel	*965*	66.1 %	85.5 %	37.5 %	88.0 %
Japan	*986*	75.2 %	81.6 %	26.0 %	47.5 %
Kazakhstan	*845*	68.0 %	73.7 %	49.8 %	51.6 %
Kyrgyzstan	*468*	86.7 %	77.3 %	68.9 %	53.4 %
Thailand	*870*	65.3 %	71.4 %	66.3 %	75.0 %
Türkiye	*897*	73.9 %	81.1 %	64.5 %	75.1 %
Uzbekistan	*433*	66.0 %	61.7 %	57.1 %	52.2 %
Comparison by region	p-value [(1)]	<0.001	0.040	<0.001	<0.001
	Cramer's V	0.073	0.021	0.104	0.131

NOTES: Reference population: all road users; [(1)] p-value of Chi-Square Test of Independence for comparison among regions; [abc] each superscript letter denotes regions whose proportions do not differ significantly from each other at the 0.01 level; * Not including Armenia, Kyrgyzstan, Uzbekistan (different methodology); (a) no data for Luxembourg.

Declarations of competing interest

None.

CRediT authorship contribution statement

Carlos Pires: Visualization, Formal analysis, Conceptualization, Writing – original draft, Investigation, Data curation, Writing – review & editing, Methodology. **Uta Meesmann:** Conceptualization, Supervision, Methodology, Funding acquisition, Writing – review & editing, Writing – original draft, Project administration, Investigation. **Alain Areal:** Conceptualization, Writing – review & editing, Methodology. **Naomi Wardenier:** Writing – review & editing, Data curation, Writing – original draft, Formal analysis, Investigation, Project administration, Conceptualization, Methodology. **Marie-Axelle Granié:** Conceptualization, Writing – review & editing, Methodology. **Gerald Furian:** Methodology, Writing – review & editing, Conceptualization. **Dimitrios Nikolaou:** Writing – review & editing, Conceptualization, Methodology. **Dagmara Jankowska-Karpa:** Methodology, Conceptualization, Writing – review & editing. **Craig Lyon:** Writing – review & editing, Methodology, Conceptualization. **Mette Møller:** Methodology, Conceptualization, Writing – review & editing. **Fabian Surges:** Conceptualization, Methodology, Writing – review & editing. **Hideki Nakamura:** Writing – review & editing, Methodology, Conceptualization. **Agnieszka Stelling:** Methodology, Writing – review & editing, Conceptualization.

Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work the author(s) used ChatGPT, a large language model developed by OpenAI, in order to improve readability and refining language. After using this tool/service, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the publication.

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Appendix A. Sample size and sample description

Table A.1
Sample size, gender, and age distribution by country (unweighted) and region (weighted means).

Country	Sample size	Gender			Age group					
		Male	Female	Other	18-24y	25-34y	35-44y	45-54y	55-64y	65y+
Armenia	467	47.3 %	52.5 %	0.2 %	20.3 %	41.3 %	38.3 %	–	–	–
Australia	953	49.4 %	50.5 %	0.1 %	10.7 %	20.3 %	19.1 %	18.6 %	16.7 %	14.7 %
Austria	1804	47.8 %	51.9 %	0.2 %	8.9 %	17.8 %	18.0 %	21.5 %	20.2 %	13.7 %
Belgium	1795	47.4 %	52.4 %	0.2 %	9.4 %	16.9 %	18.1 %	20.5 %	20.1 %	15.0 %
Bosnia Herzegovina	914	44.0 %	55.5 %	0.5 %	14.7 %	24.8 %	22.3 %	23.1 %	12.1 %	3.0 %
Brazil	947	47.4 %	52.5 %	0.1 %	15.6 %	26.8 %	22.4 %	18.3 %	11.6 %	5.3 %
Canada	1904	48.2 %	51.4 %	0.4 %	11.0 %	17.4 %	18.4 %	17.8 %	20.0 %	15.4 %
Chile	923	47.1 %	52.5 %	0.3 %	12.1 %	24.9 %	20.5 %	17.7 %	16.4 %	8.5 %
Colombia	909	49.5 %	50.3 %	0.2 %	16.6 %	22.4 %	22.8 %	18.4 %	14.5 %	5.3 %
Czech Republic	965	49.4 %	50.6 %	0.0 %	8.5 %	16.4 %	21.1 %	21.3 %	16.6 %	16.1 %
Denmark	874	49.5 %	50.5 %	0.0 %	10.9 %	17.6 %	16.1 %	19.7 %	19.6 %	16.1 %
Finland	993	47.9 %	51.7 %	0.4 %	9.6 %	18.0 %	18.6 %	17.4 %	19.5 %	16.8 %
France	965	49.8 %	50.1 %	0.1 %	10.9 %	16.7 %	18.4 %	18.9 %	18.3 %	16.8 %
Germany	832	49.3 %	50.6 %	0.1 %	8.5 %	14.1 %	15.0 %	22.6 %	23.4 %	16.3 %
Greece	978	48.2 %	51.8 %	0.0 %	10.1 %	14.7 %	20.2 %	22.7 %	20.7 %	11.6 %
Ireland	901	48.8 %	51.2 %	0.0 %	12.1 %	17.1 %	21.2 %	19.9 %	17.2 %	12.5 %
Israel	965	49.2 %	50.7 %	0.1 %	15.8 %	22.0 %	20.1 %	17.4 %	13.2 %	11.6 %
Italy	1007	50.6 %	49.3 %	0.1 %	9.3 %	14.0 %	18.6 %	23.8 %	20.1 %	14.2 %
Japan	986	49.0 %	50.9 %	0.1 %	10.1 %	12.9 %	17.0 %	21.1 %	19.8 %	19.1 %
Kazakhstan	845	48.5 %	49.7 %	1.8 %	11.4 %	27.0 %	22.5 %	20.4 %	14.8 %	4.0 %
Kyrgyzstan	468	50.6 %	49.4 %	0.0 %	27.1 %	42.1 %	30.8 %	–	–	–
Latvia	911	47.2 %	52.8 %	0.0 %	8.7 %	18.4 %	19.0 %	18.8 %	20.2 %	14.9 %
Luxembourg	471	50.5 %	49.0 %	0.4 %	10.8 %	21.9 %	20.4 %	18.7 %	17.4 %	10.8 %
Mexico	932	48.1 %	51.7 %	0.2 %	16.3 %	23.3 %	20.3 %	18.1 %	15.9 %	6.1 %
Netherlands	905	47.2 %	52.6 %	0.2 %	10.5 %	16.7 %	17.5 %	19.2 %	19.8 %	16.4 %
Panama	855	46.9 %	52.9 %	0.2 %	17.7 %	26.3 %	24.3 %	20.2 %	9.7 %	1.8 %
Peru	843	51.4 %	48.5 %	0.1 %	17.9 %	25.6 %	23.3 %	18.9 %	10.6 %	3.8 %
Poland	927	48.0 %	51.9 %	0.1 %	10.4 %	19.7 %	20.2 %	17.3 %	17.8 %	14.7 %
Portugal	1032	47.2 %	52.8 %	0.0 %	10.0 %	15.6 %	20.4 %	21.4 %	19.1 %	13.5 %
Serbia	982	49.1 %	50.9 %	0.0 %	9.7 %	16.8 %	18.5 %	18.7 %	18.7 %	17.5 %
Slovenia	945	50.3 %	49.7 %	0.0 %	8.0 %	15.1 %	19.7 %	20.8 %	20.1 %	16.2 %

(*continued on next page*)

Table A.1 (*continued*)

Country	Sample size	Gender			Age group					
		Male	Female	Other	18-24y	25-34y	35-44y	45-54y	55-64y	65y+
Spain	935	47.4 %	52.4 %	0.2 %	10.1 %	14.2 %	22.8 %	21.0 %	18.2 %	13.8 %
Sweden	922	48.7 %	51.2 %	0.1 %	9.5 %	17.9 %	18.2 %	19.5 %	17.9 %	16.9 %
Switzerland	979	50.3 %	49.4 %	0.3 %	12.4 %	19.2 %	18.2 %	19.9 %	17.7 %	12.7 %
Thailand	870	50.1 %	48.6 %	1.3 %	13.3 %	22.3 %	25.1 %	21.3 %	13.3 %	4.7 %
Türkiye	897	51.2 %	48.6 %	0.2 %	15.2 %	26.1 %	22.0 %	19.8 %	13.4 %	3.6 %
United Kingdom	921	46.1 %	53.2 %	0.7 %	12.6 %	17.9 %	18.0 %	18.9 %	18.3 %	14.2 %
United States	938	49.3 %	50.5 %	0.2 %	10.6 %	22.3 %	17.5 %	16.4 %	18.4 %	14.8 %
Uzbekistan	433	49.2 %	50.8 %	0.0 %	23.6 %	42.5 %	33.9 %	–	–	–
Europe22	21,958	49.5 %	50.3 %	0.2 %	10.8 %	17.1 %	18.5 %	19.7 %	18.8 %	15.1 %
America8	8251	49.0 %	50.8 %	0.2 %	15.3 %	21.9 %	19.5 %	17.2 %	15.3 %	10.7 %
AsiaOceania6*	6884	49.4 %	50.2 %	0.5 %	12.9 %	19.8 %	20.0 %	19.5 %	14.9 %	13.0 %
TOTAL	37,093									

Notes: (1) Reference population: all road users. (2) Unweighted sample for countries and for regions. (3) * Armenia, Kyrgyzstan, Uzbekistan not included due to different methodology (face-to-face CAPI).

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