Driving under the influence of alcohol and drugs

ESRA2 Thematic report Nr. 5

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Acknowledgement

List of Abbreviations

Country codes

AT	Austria
AU	Australia
BE	Belgium
CA	Canada
CH	Switzerland
CZ	Czech Republic
DE	Germany
DK	Denmark
EG	Egypt
EL	Greece
ES	Spain
FI	Finland
FR	France
HU	Hungary
IE	Ireland
IL	Israel
IN	India
IT	Italy
JP	Japan
KE	Kenya
KR	Republic of Korea
MA	Morocco
NG	Nigeria
NL	Netherlands
PL	Poland
PT	Portugal
RS	Serbia
SE	Sweden
SI	Slovenia
UK	United Kingdom
US	United States
ZA	South Africa

Other abbreviations

ESRA	E-Survey of Road Users' Attitudes
EU	European Union
ICW	Individual country weight used in ESRA2
Q	Question

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, 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.

Vias institute in Brussels (Belgium) initiated and coordinates ESRA, in cooperation with eleven core group partners (BASt, BFU, CTL, IATSS, IFSTTAR, ITS, KFV, NTUA, PRP, SWOV, TIRF). 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, motorcycle and moped drivers, cyclists and pedestrians.

The present report is based on the second edition of this global survey, which was conducted in 2018 (ESRA2_2018). In total this survey collected data from more than 35.000 road users across 32 countries. An overview of the ESRA initiative and the project-results is available on: www.esranet.eu.

This thematic ESRA report on driving under influence of alcohol and drugs describes the self-declared behaviour and attitudes on driving under influence of road users in 32 countries. It includes comparisons amongst the participating countries as well as results in relation to age and gender. The aspects analysed in this thematic report cover: self-declared behaviour (last 30 days), acceptability of driving under the influence (DUI) of alcohol, drugs or medication, attitudes and beliefs towards drink-driving, risk perception of alcohol and drugs, support for policy measures, opinions towards traffic rules and penalties, experience with enforcement and perceived likelihood for getting caught.

Key results

The countries with the highest prevalence of self-declared impaired driving (alcohol, drugs and/or medication) are as follow:

• For drink-driving (at least once in the last 30 days), the three countries with the highest prevalence rates are all situated in Europe: Portugal (34%), Switzerland (34%) and Belgium (33%).
• The largest proportions of self-declared drug-driving (once or more in the last month) are found in Africa and in Asia/Oceania: Nigeria (24%), India and Egypt (both 20%).
• The countries with the highest prevalence of driving under the influence of medication (at least once in the last 30 days) are spread over 3 continents: India (26%), followed by France and South Africa (both 23%).

There is a great variability of impaired driving across countries and regions:

• In Europe, the proportion of car drivers who report driving after drinking alcohol varies widely from one country to another. It ranges from 5% in Hungary to 34% in Portugal. In contrast, the response profile for drug-driving is most homogeneous. The difference between the lowest (1.7% in Finland) and the highest (7.5% in the United Kingdom) values amounts to only 6 percentage points.
• In North America, the proportions of self-reported impaired driving are very similar in Canada and the United States.
• There are large disparities between the countries of Asia and Oceania. The country with the highest proportion of car drivers who report drink-driving is Australia (24%), and the country with the lowest proportion is Japan (4%). With respect to DUI of drugs or medication, India is the country with the highest (20%, resp. 26%) and Israel with the lowest values (3%, resp. 6%).

- Among the African countries, South Africa shows an especially high proportion of self-declared drink-driving (32%), while in Morocco and Egypt, the prevalence rates are more than two times lower (below 15%). Nigeria has the highest proportion of self-reported drug-driving of all 32 countries (24%). The African country with the lowest drug-driving rate is South Africa (13%).

Attitudes and risk perceptions with respect to impaired driving differ across countries and regions:

- The acceptability rates for driving under the influence of an impairing substance are higher in Asia/Oceania and Africa (between 4.9% and 7.2%) than in Europe and North America (between 1.2% and 2.2%).
- The countries with the highest acceptability rates for impaired driving are India (drink-driving: 7.2% and driving under the influence of medication: 8.5%) and Egypt (drug-diving: 8.7%).
- The highest proportions of respondents indicating that they trust themselves to drive after having a glass of alcohol are found in Europe (Austria, 28%; Switzerland, 24%; Denmark, 24% and Slovenia, 22%), with one exception: South Africa (27%).
- In almost all countries, the majority of respondents replied that they were in favour of stricter traffic rules for drink-driving. The countries with the largest agreement rates are the Republic of Korea (97%), India (95%), Nigeria (93%) and Kenya (92%). Only in Egypt (14%) and Morocco (48%), there is a minority of respondents who consider that the rules for drink-driving should be stricter.
- In all regions, except in the Asian and Oceanian region, drink-driving was the most frequently mentioned cause for a road car crash. In the Asian and Oceanian region, drink-driving was the second most frequently mentioned cause of accident, just behind driving at excessive speed.
- Drug-driving is less often considered as a possible cause of a road crash involving a car. While DUI of drugs is the third most frequently reported cause of accidents in Europe, in North America and Africa, it is ranked 5th and in the Asia and Oceania region, even in the penultimate (=6th) position, just before 'using hands-free phone while driving'.
- Overall, the respondents in Europe tend to estimate the different possible causes of a road accident involving a car as more frequent than the respondents of the other regions.

Relation between level of enforcement and perceived likelihood to be checked for impaired driving:

- The proportion of respondents who were checked for drink-driving in the last 12 months is the highest in the Republic of Korea, Australia, Poland and Serbia (about 50%) and the lowest in the United States, the United Kingdom and Japan (no more than 5%).
- The countries with the highest rates of police checks for drug-driving are Kenya (17%), Egypt (14%) and India (12%). At the other end of the scale, we find Japan, Israel and the United States, with no more than 2% of respondents reporting having been checked at least once in the last 12 months.
- The relationship between the perceived probability of being checked for alcohol by the police and the experienced alcohol checks is not as strong as might be expected. The correlation coefficient is 0.700 (R^2= 0.488). Overall, in countries where the proportion of car drivers who have been checked for alcohol at least once in the last 12 months is high, the proportion of those who perceive it as (rather) likely to be checked for alcohol is also high, and vice-versa.
- However, in some countries, although the proportion of people checked is quite high, the perceived probability of being checked is low (the Republic of Korea, Australia and Finland). In Finland, for example, 39% of car drivers replied that they had been tested for alcohol at least once in the past 12 months, but only 16% perceived it as (rather) likely to be tested for alcohol.

Gender and age effect on impaired driving and related attitudes:

- Overall, men report more often DUI of alcohol and of drugs (other than medication) than women. Young drivers are more likely than older drivers to report drug-driving; the relationship between the age and driving under the influence of alcohol or medication is less clear.

- The level of personal acceptability of impaired driving (alcohol, drugs and medication) is generally lower among women than among men. In Asia and Oceania, the opposite is true. However, only the acceptability of drug-driving is statistically significant (female: 5.8% and male: 4.0%). In addition, the following trend emerges with respect to the age of respondents. The older they are, the less likely they are to accept behaviours such as impaired driving.

Identified explanatory variables associated with self-reported drink-driving:

- male gender
- higher age
- high level of education
- high driving frequency
- strong trust in being able to drive after drinking alcohol
- strong habit to drink and drive
- low intention to not drink and drive
- (strange enough) high risk perception of drink-driving as cause of an accident
- low support of policy measures against drink-driving
- (strange enough) experience of an alcohol check, which can be explained by selectivity of police checks
- low socially desirable responding score
- differences by country.

Identified explanatory variables associated with self-reported drug-driving:

- male gender
- younger age
- level of education (unclear effect)
- being from semi-urban or rural region
- low driving frequency
- high level of acceptability of drug-driving
- low risk perception of drug-driving as cause of an accident
- (strange enough) high perceived likelihood of a check, which can be explained by the fact that those who drive after taking drugs perceive themselves also more likely to be checked by the police (selectivity of the police checks)
- (strange enough) experience of an alcohol check, which can be explained by selectivity of police checks
- low socially desirable responding score
- differences by country.

Key recommendations

The efforts made in the past decades in order to reduce road casualties due to impaired driving must continue. The potential of reducing road traffic accidents due to impaired driving differs however greatly between the countries. Further research is needed for a better understanding of the influence that illegal and medicinal drugs may have on the driving ability and to estimate the prevalence in the course of time of drugs among the driving population. Moreover, it is expected that with the ageing population in Europe, there will in the future be an increasing proportion of persons driving under the influence of medicines that may impair the driving ability.

Policy recommendations at national and regional level

- Establish an impaired driving strategy that is based on a combination of measures, such as legislative initiatives, enforcement practices, awareness campaigns through media (if possible combined with deterrence through enforcement) and further research.

- Raise awareness of the impact of impaired driving on road safety and the need of alcohol and drugs controls.
- Have a nationwide system for random breath testing and random drug testing of drivers.
- Conduct awareness-raising campaigns on the risks of impaired driving and the legal consequences of drink/drug-driving, combined with more frequent police controls, primarily in the countries where a relatively large proportion of drivers are drink-driving and/or drug-driving.
- Mandatory installation of ignition interlocks in cars of drivers who have already been convicted for drink-driving.
- Test for alcohol and drugs for all drivers involved in fatal crashes.

Specific recommendations to particular stakeholders

- *[To Non-Governmental Organizations (NGOs)]* Contribute to education and awareness raising campaigns and events against impaired driving.
- *[To physicians and pharmacists]* Always explicitly mention the risks of driving under the influence of the medication they prescribe/deliver.
- *[To pharmaceutical companies]* Improve the information in the patient information leaflet on the potential impairing effect of the drug on driving ability.
- *[To vehicle manufacturers and other companies]* Develop low cost solutions to be incorporated in vehicles that can detect or prevent impaired 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 initiative on a triennial basis, retaining a core set of questions in every wave. 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

Driving under the influence (DUI) of alcohol and/or drugs constitutes a main cause of road casualties. The consumption of impairing substances leads to increased reaction time, lower vigilance, poor judgement and can impair visual functions. In its latest reports, the WHO estimates that between 5% and 35% of all road deaths are alcohol related (WHO, 2018a, WHO, 2018b). The WHO points out that data on drink-driving are not available in all countries, and if they are, they often rely on crash reports that generally underestimate the extent of the problem. In addition, there are wide differences in the way countries define and record deaths due to drink-driving (ETSC, 2018). WHO estimated in a report published in 2016 that of all road deaths worldwide in 2013 (about 1.25 million), illicit drug use is responsible for just over 39,600 deaths (WHO, 2016). This represents 3% of the total number of people killed on the roads. Approximately half (51%) of them were due to amphetamines, about one fifth (22%) to cannabis, and about 13% each to opioids and cocaine. By comparison, the number of deaths due to drink-driving in 2013 was just over 188,000, or about 15% of all people killed on the roads. Overall, alcohol thus poses a greater problem to road safety. Compared to alcohol, it is much more difficult to assess the importance of drugs in road traffic casualties. A variety of different medicines and drugs with different mechanisms of action can affect driving ability, and new substances are constantly being added. This makes it more difficult to detect these substances in road users, and studies on this subject are complex. The effect of medications and drugs on driving ability also depends on various factors such as how they are administered, the age and health status of the person, the length of time they are being taken, the use of other medications, etc. In the case of medication, it is often not easy to distinguish the effects of the disease from those of the medication. In addition, the ability to drive can be positively or negatively influenced by medication (on the one hand, they suppress or mitigate the manifestations of an illness, on the other hand, they may have undesirable side effects).

In order to better understand the magnitude of the problem of driving under the influence of alcohol or drugs, and to monitor the impact of prevention measures, reliable data is necessary. Several recently conducted roadside surveys, for example in Europe (i. e. DRUID), in North America or Australia have shown that the prevalence of DUI of alcohol or drugs varies widely between countries. Several reasons have been suggested for these disparities (Ragnhild, 2017). They may be due to different attitudes towards the use of alcohol and drugs in general population and different attitudes towards DUI, or to the different legislation on DUI of alcohol and drugs. Other reasons could be the different subjective perception of being caught by the police when DUI or the different level of control intensity of DUI by the police.

Thanks to the data of ESRA (E-Survey of Road users' Attitudes), it is possible to study and compare different countries in relation with the reasons mentioned above. This report presents the results on DUI based on the second edition of ESRA (ESRA2) in which data collection was carried out for 32 countries around the world at the end of 2018. A first report on DUI based on the first ESRA edition (ESRA1), which collected data for 17 European countries in 2015, was published in 2016.

The ESRA2 findings are used to answer following research questions:

- In which countries and regions is there a high prevalence of impaired driving due to alcohol, drugs or medication that may influence the ability to drive (defined in terms of self-declared behaviours)?
- Is there a great variability of such behaviours across countries and regions?
- Do the attitudes and risk perceptions with respect to impaired driving considerably differ across countries and regions?
- Which countries have the highest/lowest proportion of respondents having been checked by the police for drink-driving or drug-driving and is the expectation of being checked by the police in line with the control intensity?
- What is the influence of gender and age on these behaviours and attitudes?
- Which explanatory variables are associated with self-reported drink-driving?
- Which explanatory variables are associated with self-reported drug-driving?

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 is collected through online panel surveys, using a representative sample of the national adult populations in each participating country (at least N = 1000 per country). At the heart of this survey is a jointly developed questionnaire, 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, motorcycle and moped drivers, cyclists and pedestrians. The present report is based on the second edition of this global survey, which was conducted in 2018 (ESRA2_2018). In total this survey collected data from more than 35 000 road users across 32 countries.

The participating countries in ESRA2_2018 were:

- Europe: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, the Netherlands, Poland, Portugal, Serbia, Slovenia, Spain, Sweden, Switzerland, United Kingdom;
- America: Canada, USA;
- Asia and Oceania: Australia, India, Israel, Japan, Republic of Korea;
- Africa: Egypt, Kenya, Morocco, Nigeria, South Africa.

Vias institute in Brussels (Belgium) initiated and coordinates ESRA, in cooperation with eleven core group partners (BASt (Germany), BFU (Switzerland), CTL (Italy), IATSS (Japan), IFSTTAR (France), ITS (Poland), KFV (Austria), NTUA (Greece), PRP (Portugal), SWOV (the Netherlands), TIRF (Canada)). The common results of the ESRA2_2018 survey will be published in a Main Report, a Methodology Report and at least fifteen Thematic Reports (Table 1). Furthermore, 32 country fact sheets were produced, in which national key results are compared to a regional mean (benchmark) and scientific articles, national reports and many conference presentations are currently in progress. An overview of the results and news on the ESRA initiative is available on: www.esranet.eu

Table 1: ESRA2 Thematic Reports

Driving under influence	Child restraint systems	Cyclists
Speeding	Unsafety feeling & risk perception	Moped drivers & motorcyclists
Distraction (mobile phone use)	Enforcement	Young road users
Fatigue	Vehicle automation	Elderly road users
Seat belt	Pedestrians	Gender aspects

The present report summarizes the ESRA2_2018 results with respect to driving under the influence of alcohol and drugs. An overview of the data collection method and the sample per country can be found in (Meesmann & Torfs, 2019. ESRA2 methodology).

Note that a weighting of the data was applied to 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, 65y+; based on population statistics from United Nations data (United Nations Statistics Division, 2019). For the regions, the weighting also took into account the relative size of the population of each country within the total set of countries from this region. SPSS 24.0 and R 3.6.0 were used for all analyses.

3   Results & discussion

3.1   Overall results

3.1.1   Self-declared behaviour (last 30 days)

Four questions on self-reported impaired driving in the last 30 days were asked in the survey. The first two questions are about alcohol, the third about drugs and the last about medications that may affect the driving ability (see and also Question (Q) 12_1b of the questionnaire in Appendix 1). The answers make it possible to evaluate the proportion of people declaring that they drive under the influence of these substances and to carry out various comparisons. Car drivers had to answer on a five-point scale ranging from 1 'never' to 5 '(almost) always'. For the purpose of the analysis, the value of 1 was coded as never, and values 2 to 5 were coded as at least once.

SELF-DECLARED BEHAVIOUR AS A CAR DRIVER

Europe20

Drive when you may have been over legal limit for drink-driving	13.1%
Drive after taking medication with warning that it may influence driving ability	15.0%
Drive after drinking alcohol	20.6%
Drive 1 hour after using drugs (other than medication)	5.0%

NorthAmerica2

Drive when you may have been over legal limit for drink-driving	11.4%
Drive after taking medication with warning that it may influence driving ability	15.2%
Drive after drinking alcohol	21.7%
Drive 1 hour after using drugs (other than medication)	12.2%

AsiaOceania5

Drive when you may have been over legal limit for drink-driving	17.4%
Drive after taking medication with warning that it may influence driving ability	23.8%
Drive after drinking alcohol	14.3%
Drive 1 hour after using drugs (other than medication)	18.3%

Africa5

Drive when you may have been over legal limit for drink-driving	15.5%
Drive after taking medication with warning that it may influence driving ability	20.9%
Drive after drinking alcohol	18.7%
Drive 1 hour after using drugs (other than medication)	18.0%

% at least once (last 30 days)

Reference population: car drivers, at least a few days a month

Figure 1: Self-declared behaviour as a car driver on impaired driving, by region (% of car drivers that did it at least once ... in the past 30 days).

As Figure 1 shows, the proportion of car drivers who report DUI of alcohol, drugs and medication varies by regions. In Europe and North America, the impairing substance most frequently reported is alcohol (more than 20% in both regions), followed by medications that carry a warning that it may influence the driving ability (15% in both regions). Self-declared DUI of drugs is clearly lower in these two regions, particularly in Europe (5% vs. 12% in North America). In the Asian and Oceanian region as well as in Africa, the impairing substance most frequently reported by car drivers was medication (more than 20% in both regions, vs. between 14% and 19% regarding alcohol and drugs).

SELF-DECLARED BEHAVIOUR AS A CAR DRIVER

Drive after drinking alcohol	Drive 1 hour after using drugs (other than medication)	Drive after taking a medication that may influence the ability to drive

Europe20

Drive after drinking alcohol	Drive 1 hour after using drugs	Drive after taking a medication
Portugal 33.9%	United Kingdom 7.5%	France 23.2%
Switzerland 33.6%	Austria 7.3%	Austria 21.9%
Belgium 33.1%	Greece 7.2%	Spain 19.7%
Austria 30.6%	Belgium 7.1%	Belgium 18.1%
France 28.9%	Ireland 6.8%	Switzerland 16.2%
Greece 27.7%	France 6.3%	Europe20 15.0%
Slovenia 27.4%	Spain 5.9%	Netherlands 14.9%
Denmark 26.6%	Netherlands 5.1%	Ireland 13.8%
Spain 24.7%	Europe20 5.0%	Portugal 13.2%
Netherlands 21.1%	Sweden 4.7%	Finland 13.2%
Europe20 20.6%	Portugal 4.4%	Germany 13.0%
Italy 20.2%	Switzerland 4.4%	United Kingdom 13.0%
Serbia 19.4%	Italy 4.3%	Poland 12.8%
Germany 18.2%	Denmark 4.3%	Italy 12.6%
United Kingdom 17.9%	Serbia 3.8%	Denmark 12.2%
Ireland 12.2%	Germany 3.7%	Czech Republic 11.5%
Finland 9.3%	Slovenia 3.5%	Serbia 10.5%
Sweden 7.6%	Poland 2.9%	Hungary 10.2%
Czech Republic 7.2%	Czech Republic 2.7%	Sweden 10.1%
Poland 6.8%	Hungary 2.2%	Greece 8.4%
Hungary 5.4%	Finland 1.7%	Slovenia 6.8%

NorthAmerica2

Canada 25.9%	Canada 12.9%	Canada 16.7%
NorthAmerica2 21.7%	NorthAmerica2 12.2%	NorthAmerica2 15.2%
United States 21.2%	United States 12.1%	United States 15.0%

AsiaOceania5

Australia 23.7%	India 20.4%	India 26.1%
India 15.7%	AsiaOceania5 18.3%	AsiaOceania5 23.8%
AsiaOceania5 14.3%	Japan 12.5%	Republic of Korea 19.2%
Israel 10.9%	Australia 5.9%	Australia 13.4%
Republic of Korea 8.9%	Republic of Korea 3.5%	Japan 10.9%
Japan 3.7%	Israel 3.4%	Israel 6.1%

Africa5

South Africa 32.4%	Nigeria 24.0%	South Africa 23.4%
Kenya 22.7%	Egypt 20.3%	Kenya 21.9%
Africa5 18.7%	Morocco 18.1%	Africa5 20.9%
Nigeria 17.8%	Africa5 18.0%	Egypt 20.7%
Egypt 13.6%	Kenya 16.6%	Morocco 20.4%
Morocco 13.4%	South Africa 12.6%	Nigeria 16.1%

% at least once (last 30 days)
Reference population: car drivers, at least a few days a month
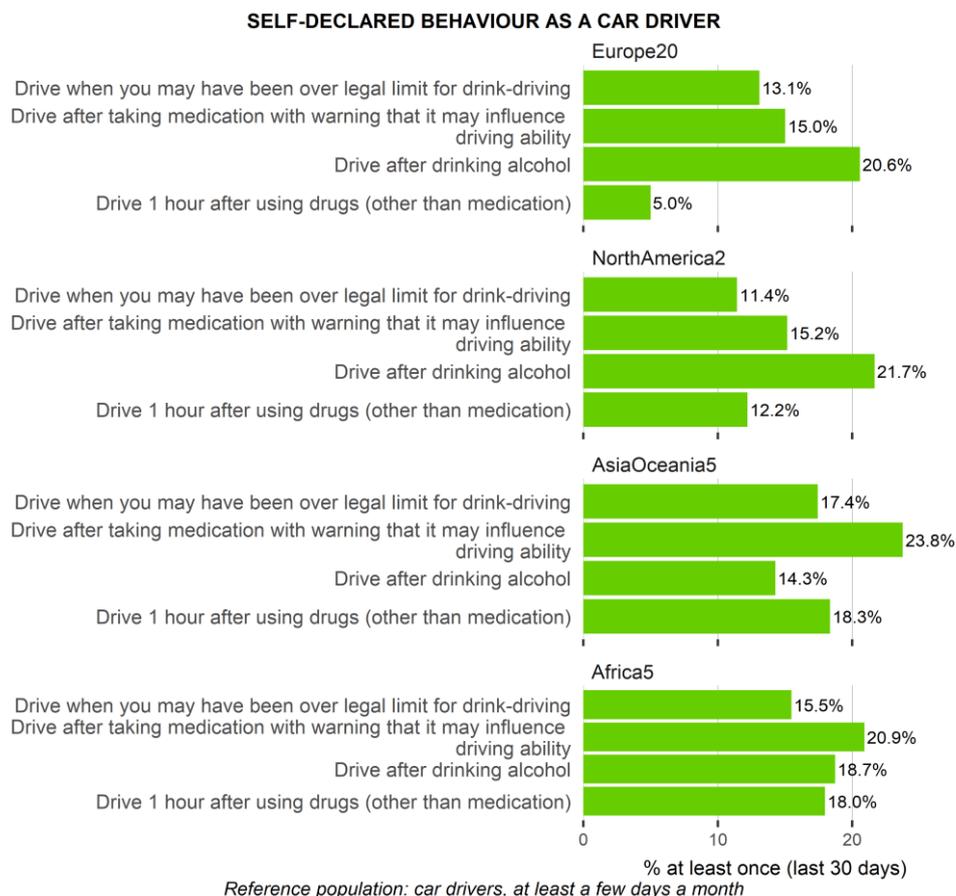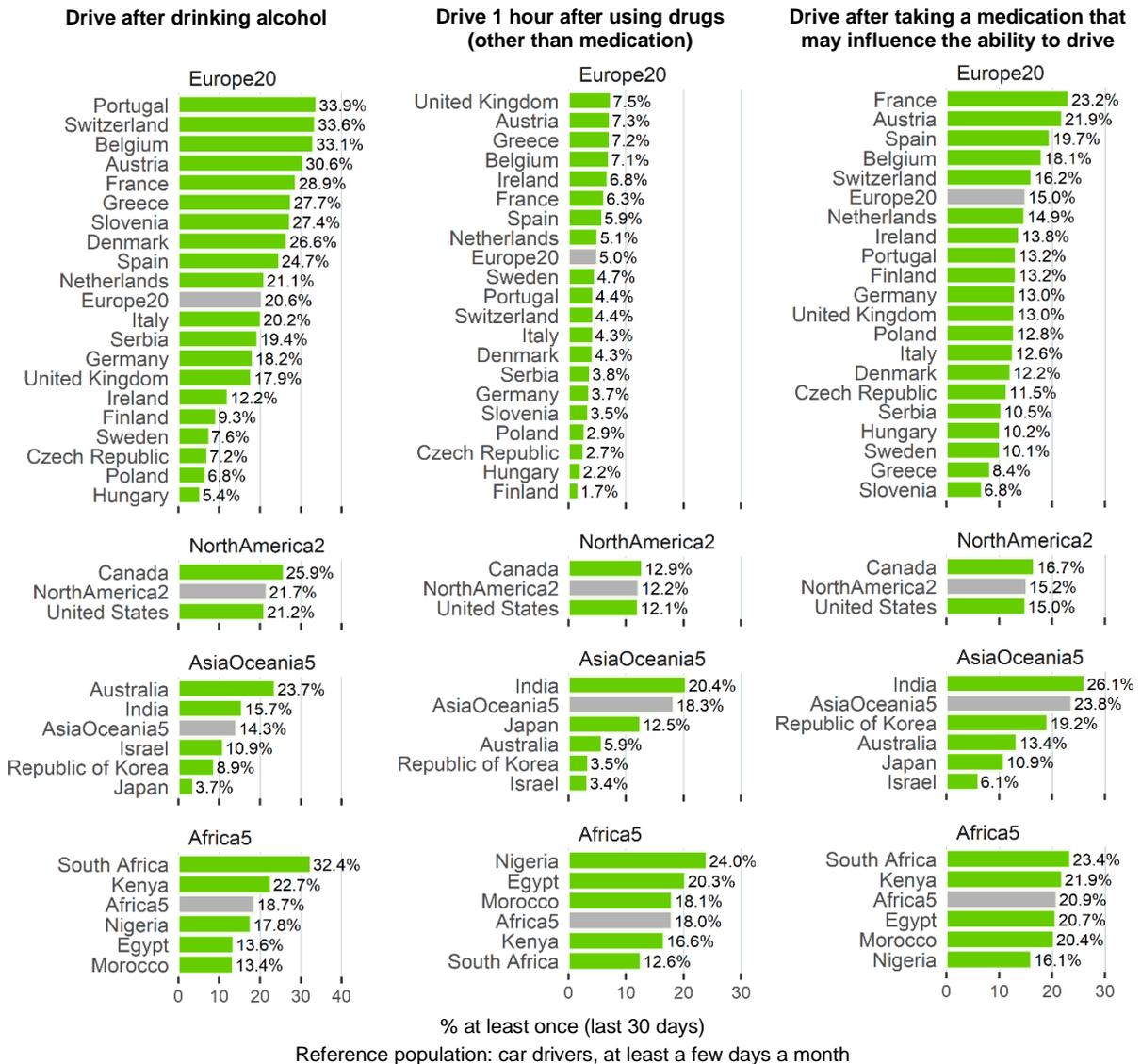
Figure 2: Self-declared behaviours on DUI, by country and by region (% of car drivers that did it at least once ... in the past 30 days).

Figure 2 presents the results broken down by country for three of the four questions mentioned previously. In order to eliminate redundancy, one of the two questions on alcohol was dropped. The question that has been retained allows for a better comparison between countries, because it is independent of the different alcohol limit values in force in the different countries.

Overall at country level, the highest prevalence rates are found for drink-driving, namely in Portugal (34%), Switzerland (34%) and Belgium (33%), and the lowest for drug-driving (without medication), in Finland (1.7%), Hungary (2.2%) and the Czech Republic (2.7%). As far as driving after drinking alcohol is concerned, the general legal blood alcohol concentration (BAC) limit in Portugal, Switzerland and Belgium is 0.5 g/l. Thus, driving after drinking a small amount of alcohol is legally allowed (except for certain driver groups, e.g. young/novice drivers).

In Europe, the proportion of car drivers who report driving after drinking alcohol varies widely from one country to another. It ranges from 5% in Hungary to 34% in Portugal, which represents a difference of 29 percentage points. In contrast, the response profile for drug-driving is most homogeneous. The difference between the lowest (1.7% in Finland) and the highest (7.5%) in the United Kingdom) values amounts to only 6 percentage points.

In North America, the proportions of self-reported impaired driving are very similar in Canada and the United States.

There are large disparities between the countries of Asia and Oceania. The country with the highest proportion of car drivers who report drink-driving is Australia (24%), and the country with the lowest proportion is Japan (4%). With respect to DUI of drugs or medication, India is the country with the highest and Israel with the lowest values.

Among the African countries, South Africa shows an especially high proportion of self-declared drink-driving (32%). Nigeria has the highest proportion of self-reported drug-driving not only in Africa, but also among the 32 countries surveyed. As regards self-reported DUI of medication that may influence the ability to drive, however, Nigeria has the lowest proportion of all African countries.

SELF-DECLARED BEHAVIOUR AS A CAR DRIVER

% at least once (last 30 days)
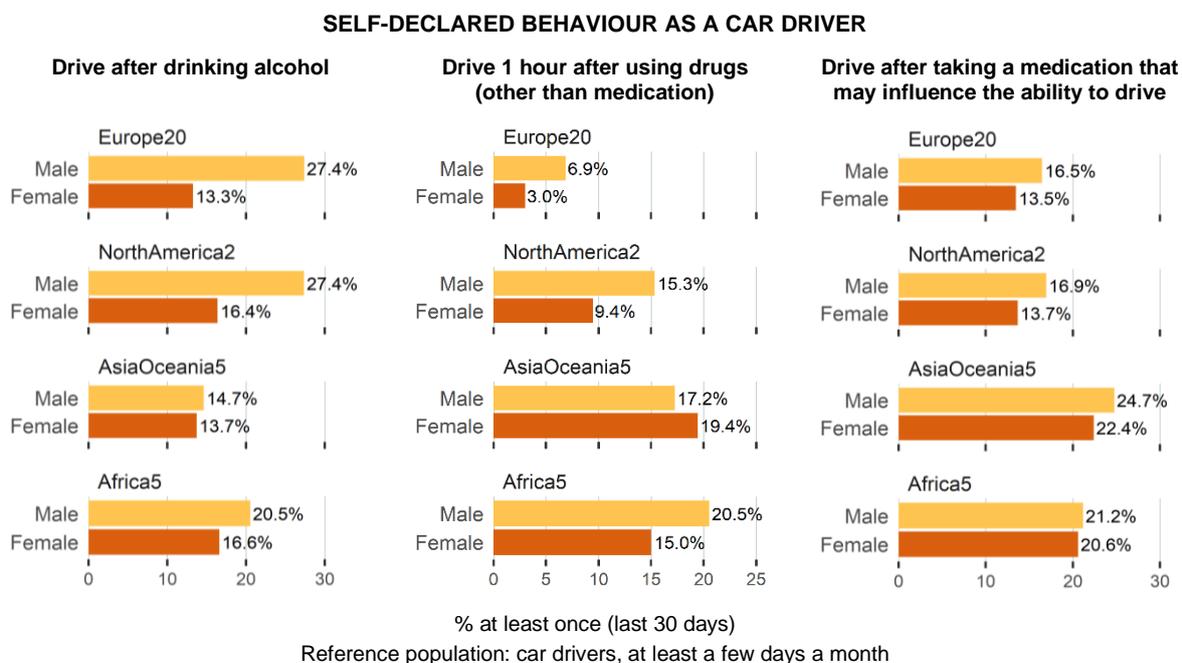Reference population: car drivers, at least a few days a month

Figure 3: Self-declared behaviours on DUI, by gender and type of impairing substances (% of car drivers that did it at least once ... in the past 30 days).

In all regions, men report more often DUI of alcohol and of drugs (other than medication) than women, except in Asia and Oceania for drug-driving (see Figure 3). Whatever the substance involved, no significant gender differences were observed in the Asian and Oceanian region. With respect to self-reported DUI of medication, the only significant gender difference was observed in Europe where the overall gender difference is particularly strong. The greatest difference was found for driving after drinking alcohol in the last 30 days, which was reported by 27% of all male drivers in Europe, compared to 13% of all female drivers (chi-square = 461.45; df = 1; p-value < 0.001; Cramer's V: 0.174).

The corresponding results, broken down by age group, are presented in the appendix (see Figure 31). Additionally, the self-reported drink-driving as a moped driver/motorcyclist or as a cyclist, broken down by country, can also be found in the appendix (see Figure 32).

3.1.2   Acceptability of driving under the influence (DUI) of alcohol, drugs or medication

In order to determine the level of acceptability of certain behaviours, such as driving under the influence of alcohol or drugs, five questions were asked in the survey. The first two questions focus on social acceptance (as perceived by the respondents) of drink-driving and drug-driving. The other three questions refer to the personal acceptance of driving under the influence of alcohol, drugs, and medication (see appendix 1, Q13 and Q14 for precise formulations). The answering scale ranged from 1 (unacceptable) to 5 (acceptable).

The results concerning personal acceptability are presented first (see Figure 4 to Figure 7). In a second step, we compare personal acceptability with social acceptability.

PERSONAL ACCEPTABILITY

Europe20

Drive when he/she may be over legal limit for drink-driving	1.9%
Drive after taking medication that may influence ability to drive	2.2%
Drive 1 hour after using drugs (other than medication)	1.4%

NorthAmerica2

Drive when he/she may be over legal limit for drink-driving	1.6%
Drive after taking medication that may influence ability to drive	1.2%
Drive 1 hour after using drugs (other than medication)	2.2%

AsiaOceania5

Drive when he/she may be over legal limit for drink-driving	6.1%
Drive after taking medication that may influence ability to drive	7.2%
Drive 1 hour after using drugs (other than medication)	4.9%

Africa5

Drive when he/she may be over legal limit for drink-driving	4.8%
Drive after taking medication that may influence ability to drive	4.9%
Drive 1 hour after using drugs (other than medication)	5.9%

% acceptability
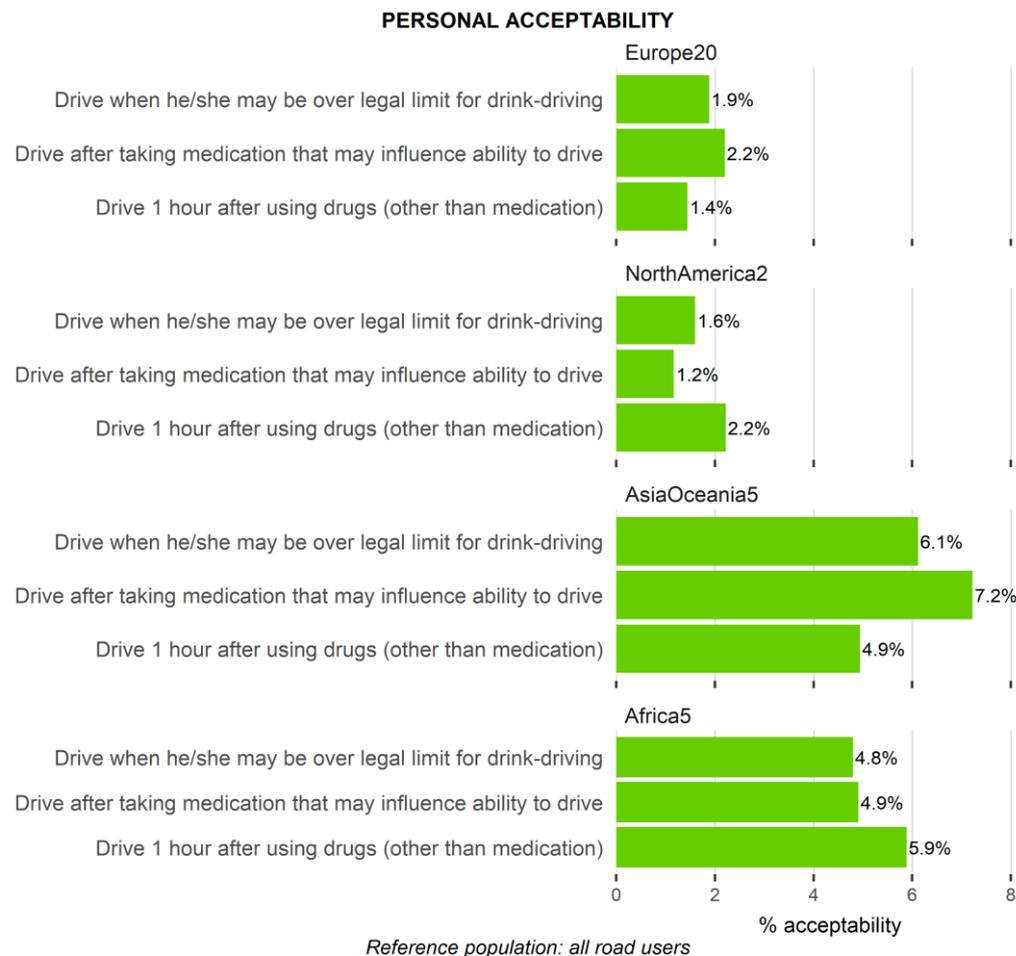
Reference population: all road users

Figure 4: Personal acceptability of impaired driving, by region and type of impairing substances (% acceptability; scores 4 and 5 on a 5-point scale from 1 'unacceptable' to 5 'acceptable').

A large majority of the respondents (over 90%) is of the opinion that driving under the influence of an impairing substance is unacceptable, rather unacceptable or were neutral (scores 1 to 3) and less than 10% considered these behaviours as acceptable or rather acceptable (scores 4 to 5). As Figure 4 shows, the acceptability rates for driving under the influence of an impairing substance are higher in Asia/Oceania and Africa (between 4.8% and 7.2%) than in Europe and North America (between 1.2% and 2.2%).

The proportions of those who found such behaviours (rather) acceptable differ considerably depending on impairing substance and region.

When asked whether it is acceptable for a driver to drive when he/she may be over the legal limit for drink-driving, 6.1 % of the respondents in the Asian and Oceania region found it acceptable or rather acceptable. The corresponding proportions were significantly lower at 1.6% in North America, 1.9% in Europe and 4.8% in Africa (chi-square = 324.54; df = 3; p-value < 0.001). No statistically significant difference was found between Europe and North America. The strength of the association of the personal acceptability of this behaviour and the region was rather small (Cramer's V: 0.101).

Driving under the influence of medication (which can influence driving ability) leads to the greatest differences in attitude between regions. The proportions of people who find such behaviour (rather) acceptable are at both ends 7.2% in Asia/Oceania and 1.2% in North America (chi-square = 381.62; df = 3; p-value < 0.001).
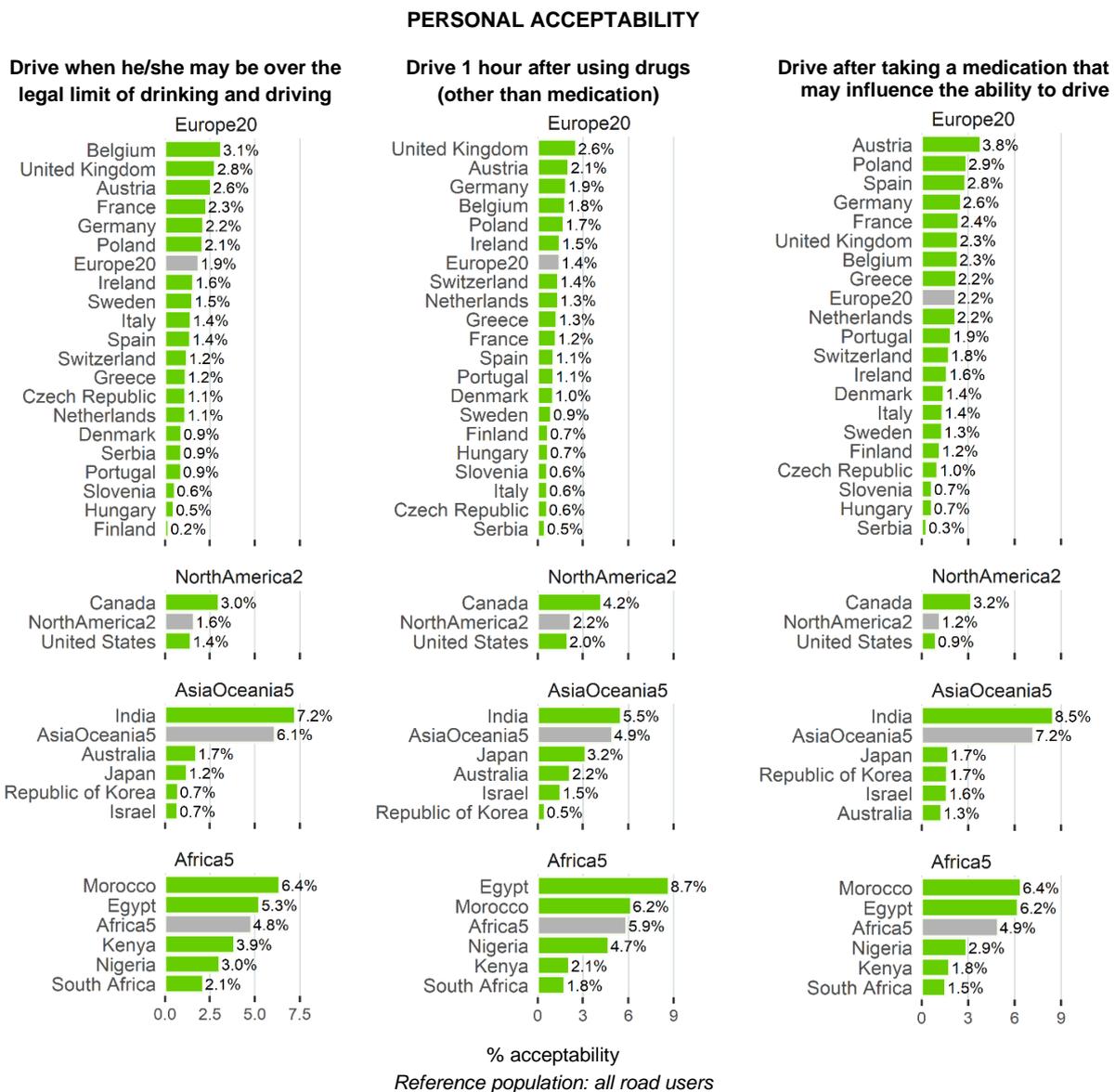
PERSONAL ACCEPTABILITY

Figure 5: Personal acceptability of impaired driving, by country, region and type of impairing substances (% acceptability; scores 4 and 5 on a 5-point scale from 1 'unacceptable' to 5 'acceptable'

As Figure 5 shows, there is a rather consistent pattern of responses concerning the acceptability of impaired driving (alcohol, drugs and medications) by country. Most countries with acceptability rates

above average (of the region) for drink-driving also have acceptability rates above average for drug-driving and driving under the influence of medication that may influence the ability to drive and vice-versa.

A strikingly high discrepancy in acceptability of impaired driving can be observed between the five countries in the region 'Asia and Oceania'. The acceptability of impaired driving for all three types of substances is much higher in India than in the four other countries.

In Europe, we observe that five countries have acceptability rates of impaired driving that are above average for all three types of substances: Belgium, the United Kingdom, Austria, Poland and Germany. France has an acceptability rate above average only for alcohol, Ireland only for drugs and Spain as well as Greece, only for medication.

A notable difference can also be observed between the United States and Canada with the latter showing figures more than twice as high.

On closer examination of the African countries, we note that the high figures were found in the North African countries of Egypt and Morocco.

PERSONAL ACCEPTABILITY

% acceptability
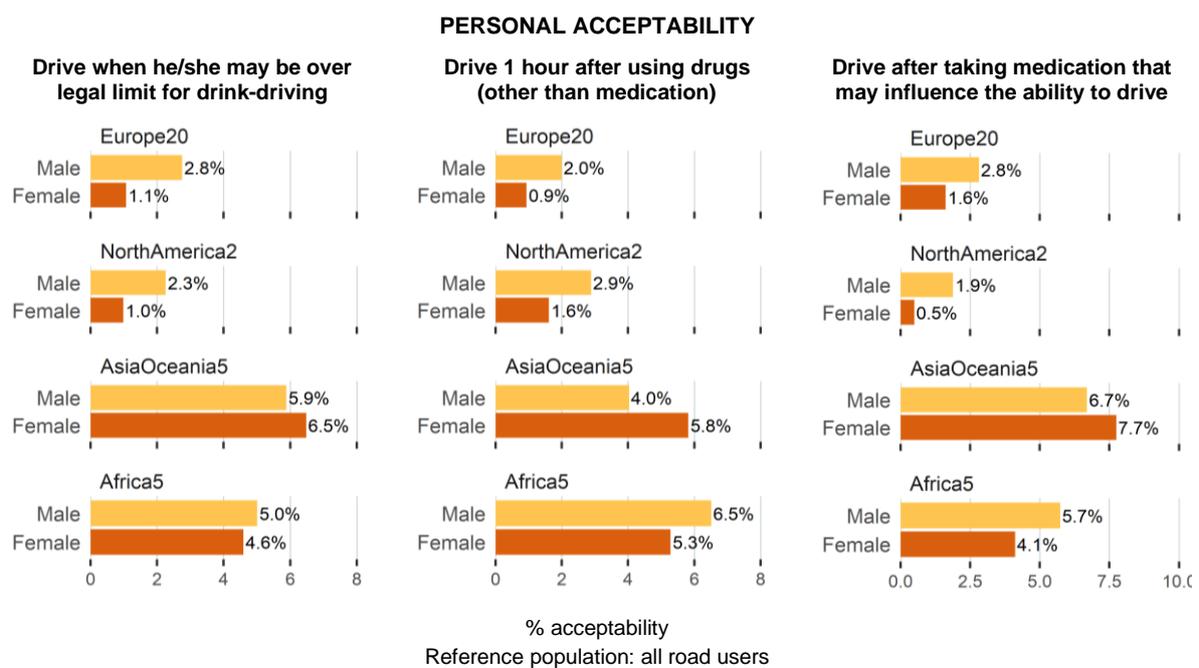Reference population: all road users

Figure 6: Personal Acceptability of impaired driving, by gender and type of impairing substances (% acceptability; scores 4 and 5 on a 5-point scale from 1 'unacceptable' to 5 'acceptable').

As shown in Figure 6, the level of personal acceptability of impaired driving (alcohol, drugs and medication) is generally lower among women than among men. In Asia and Oceania, the opposite is true. However, the differences between men and women by region and by type of impairing substances are not all statistically significant. In Asia/Oceania, for example, only the acceptability of drug-driving results in a statistically significant difference between female (5.8%) and male (4.0%) respondents (chi-square = 8.21; df = 1; p-value = 0.004). In Europe and North America, the gender differences were all statistically significant. In Africa, the difference between men and women was only significant concerning the acceptability of driving under the influence of medication that may influence the ability to drive (chi-square = 7.10; df = 1; p-value = 0.008).
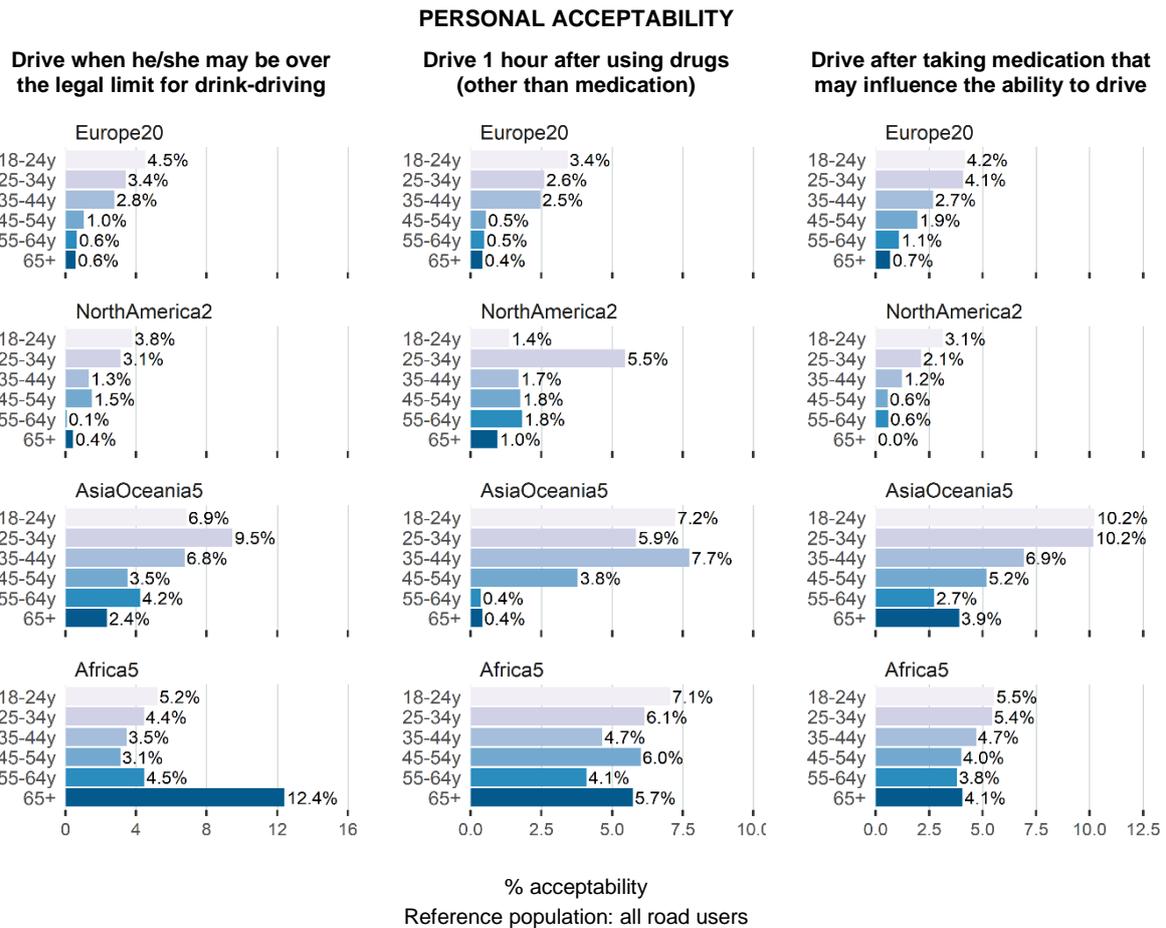
PERSONAL ACCEPTABILITY

Figure 7: Personal acceptability of impaired driving, by age group and type of impairing substances (% acceptability; scores 4 and 5 on a 5-point scale from 1 'unacceptable' to 5 'acceptable').

The general impression given by Figure 7 is that the older the respondents, the lower is the personal acceptability of impaired driving. A striking exception is the high acceptance rate of drink-driving among people aged 65 and over in Africa. However, it is important to note that in Africa, the sample in this age category is very small and therefore the results should be interpreted with caution. Furthermore, the internet penetration in these countries is very low, which might also have affected the representativity of the online sample for these countries (see also section 3.4 'Limitations of the data').

Another notable discrepancy which can be observed is the age-specific drug-driving acceptability rate in North America. The acceptability of such a behaviour is low (less than 1.9%) in all age categories, except in the category of 25 to 34 years (5.5%). The age-specific differences by region and impairing substance are statistically significant, except in Africa for the personal acceptability of drug-driving and of driving under the influence of medication.
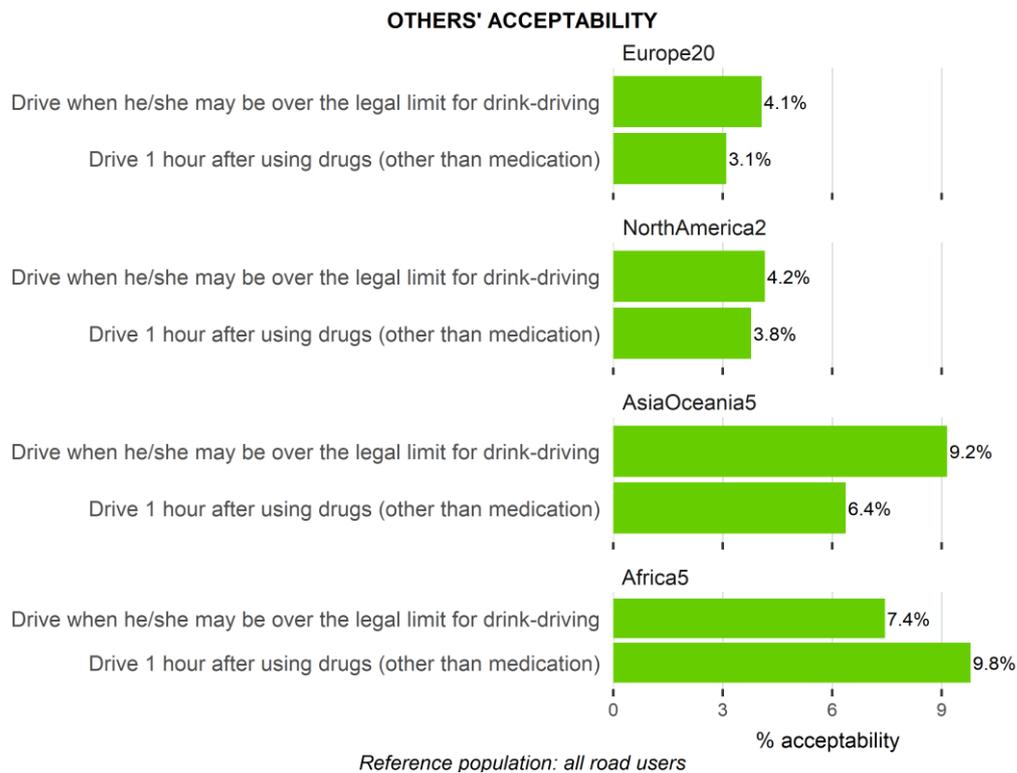
OTHERS' ACCEPTABILITY

Europe20

Drive when he/she may be over the legal limit for drink-driving — 4.1%

Drive 1 hour after using drugs (other than medication) — 3.1%

NorthAmerica2

Drive when he/she may be over the legal limit for drink-driving — 4.2%

Drive 1 hour after using drugs (other than medication) — 3.8%

AsiaOceania5

Drive when he/she may be over the legal limit for drink-driving — 9.2%

Drive 1 hour after using drugs (other than medication) — 6.4%

Africa5

Drive when he/she may be over the legal limit for drink-driving — 7.4%

Drive 1 hour after using drugs (other than medication) — 9.8%

% acceptability

Reference population: all road users

Figure 8: Social acceptability of impaired driving, by region and type of impairing substances (% acceptability; scores 4 and 5 on a 5-point scale from 1 'unacceptable' to 5 'acceptable').

As Figure 8 shows, the highest rates of social acceptability can be found in Africa for drug-driving (9.8%) and in the Asian and Oceanian region for driving when he/she may be over the legal limit for drinking and driving (9.2%). Europe and North America have the lowest values referring to the others' acceptability of drink-driving (4.1% and 4.2% respectively) as well as of drug-driving (3.1% and 3.8% respectively).

When comparing Figure 8 (social acceptability) with Figure 4 (personal acceptability), we observe that the respondents seem to believe that other people somewhat find impaired driving behaviours more acceptable than they personally do: the percentages of persons answering that 'others' find it acceptable to drive under the influence of alcohol or drugs ranged between 3.1% and 9.8%.

The social and personal acceptability of drink-driving and drug-driving have a similar response pattern by region and impairing substance (see Figure 4 and Figure 8). As was the case for personal acceptability, the proportions of people claiming that the others may find it (rather) acceptable to drive when they may be over the legal limit for drinking and driving are the highest in the Asian and Oceanian region (6.1%), followed by Africa (4.8%). These results significantly differ from each other and from the rates in Europe (1.9%) and North America (1.6%). The results for Europe and North America do not differ significantly. The strength of the association of the social acceptability of this behaviour and the region is rather small (Cramer's V: 0.089).
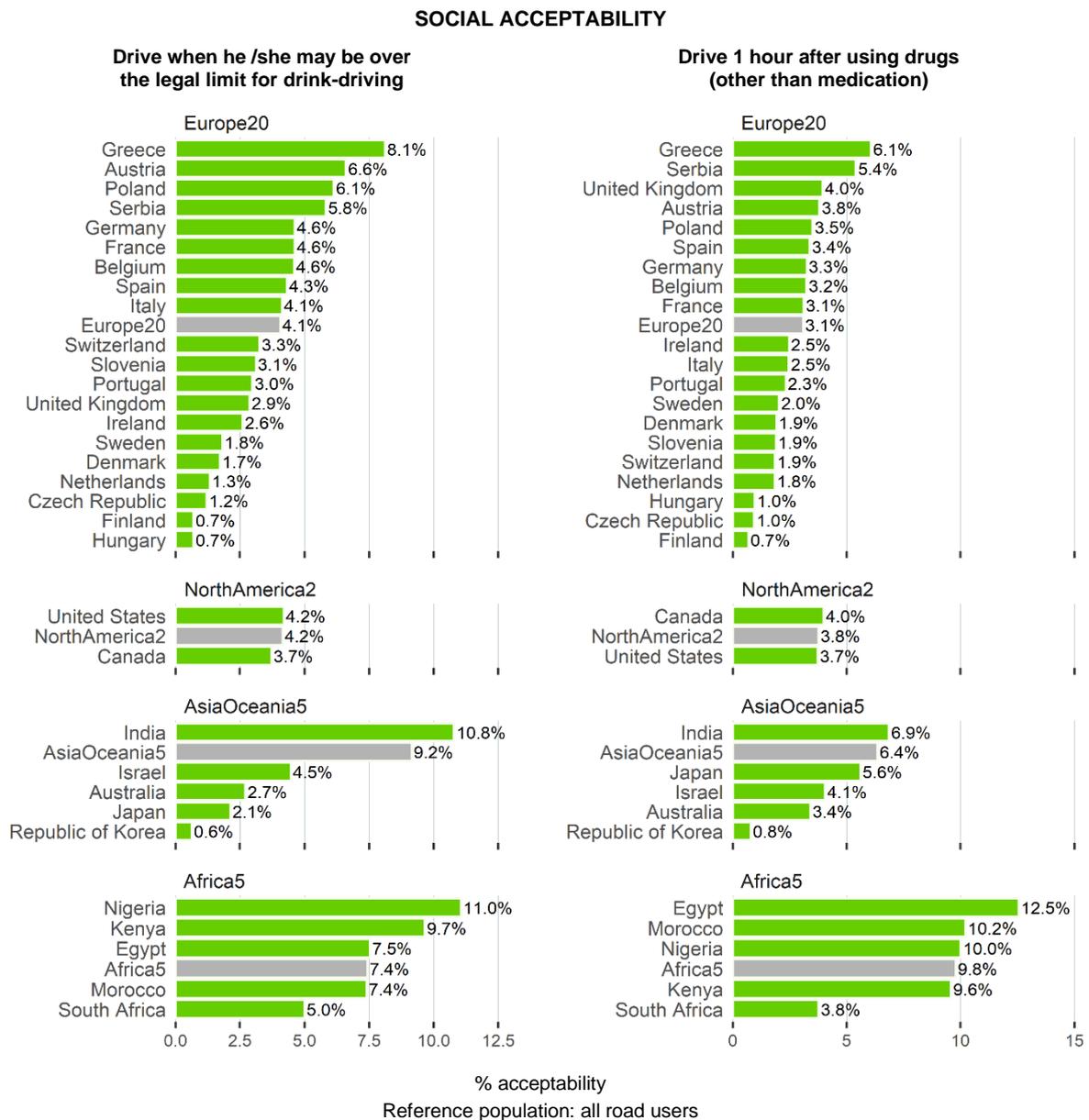
SOCIAL ACCEPTABILITY

Figure 9: Social acceptability of impaired driving, by country, region and type of impairing substances (% acceptability; scores 4 and 5 on a 5-point scale from 1 'unacceptable' to 5 'acceptable').

In most countries, the respondents consider that other people somewhat more readily accept drink-driving or drug-driving than they themselves do (see Figure 9).

In Europe, Greek respondents are the most likely to believe that drink-driving as well as drug-driving are accepted by others (8.1% and 6.1% respectively). Most countries that had personal acceptability rates of impaired driving above the European mean also have high social acceptability rates. Serbia is an exception, with rather low levels of personal acceptability, but high levels of social acceptability.

The social acceptability of impaired driving is heterogeneous not only in Europe, but also in the Asian and Oceanian region and in Africa. It is much more homogeneous in North America.

In Africa, we note that Nigeria and Kenya have the highest proportions of respondents who believe that drinking and driving is socially accepted (11.0% and 9.7% respectively). However, they both have lower personal acceptability rates for drink-driving than the African average ('Africa5').

3.1.3   Attitudes and beliefs towards drink-driving

The survey also includes several questions on attitudes, opinions, normative beliefs or intentions related to drink-driving (see Q15 and the nine sub-questions on drink-driving of the questionnaire in Appendix 1). In order to stay within the scope of the thematic report, we have decided to present only two of the nine sub-questions. One of these relates to the perceived behaviour control (here: self-efficacy) and is formulated as follows "I trust myself to drive after having a glass of alcohol". This question is particularly interesting, because it is closely linked to the question on self-reported drink-driving. The second sub-question presented focuses on another important aspect, namely the respondents' intentions regarding drinking and driving: "I will do my best not to drive after drinking alcohol in the next 30 days".

ATTITUDES

% agreement
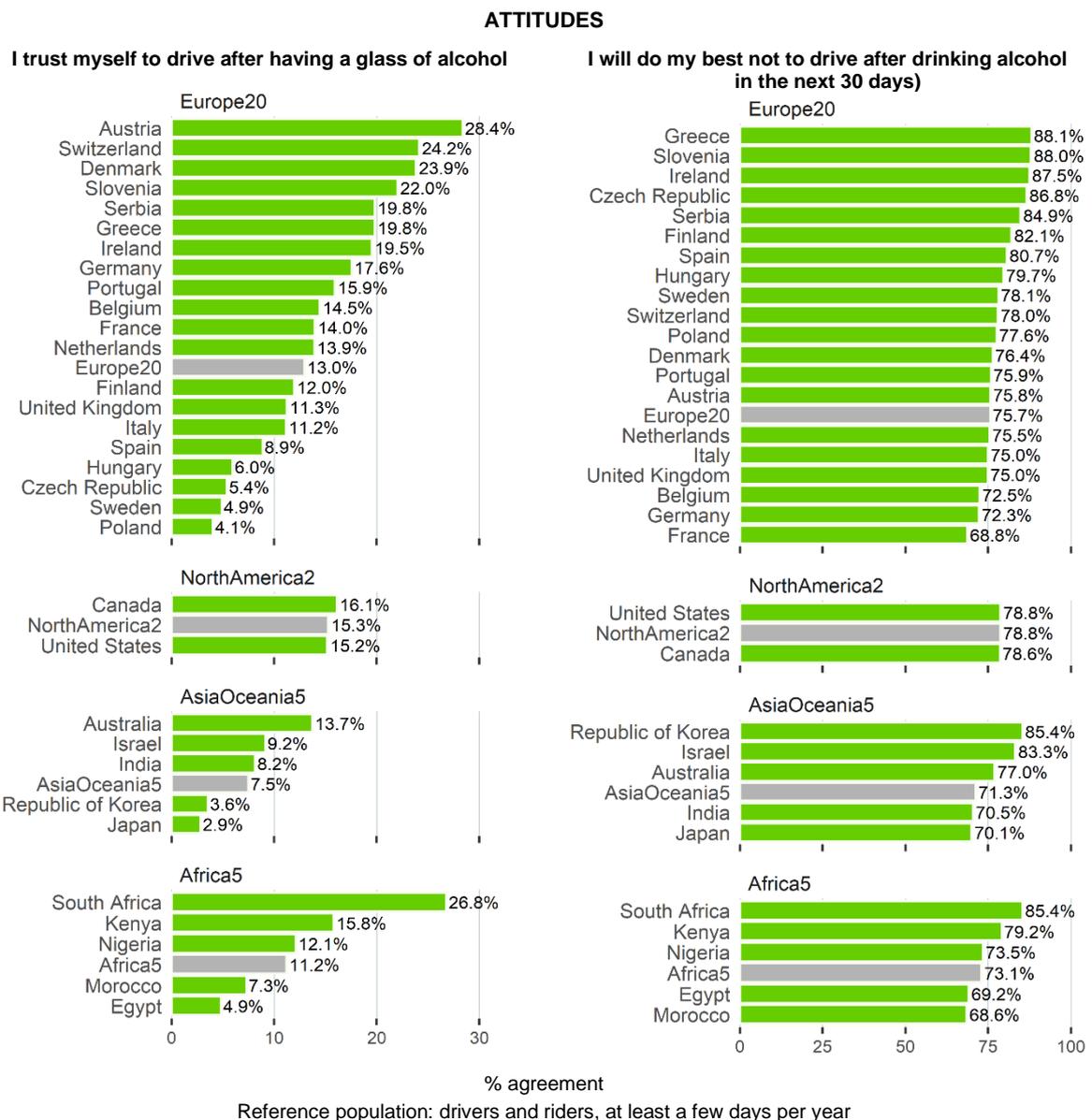Reference population: drivers and riders, at least a few days per year

Figure 10: Attitudes (Perceived behaviour control and intentions in relation to drink-driving, by country and region (% agreement; scores 4 and 5 on a 5-point scale from 1 'disagree to 5 'agree).

The region with the highest proportion of respondents trusting themselves to drive after having a glass of alcohol is, as can been seen in Figure 10 (left graph), North America (15%), followed by Europe (13%) and Africa (11%). The lowest proportion was found in Asia/Oceania (8%). Proportions were significantly different between all pairs or regions (p-value < 0.01): The strength of the association of this perceived behaviour control question and the region was small (Cramer's V: 0.066).

Large disparities between countries can be observed in Europe and Africa, and to a lesser extent in Asia. There are almost no differences between Canada and the United States.

In Europe, the proportion of respondents answering that they trust themselves to drive after having a glass of alcohol is particularly high in Austria, Switzerland, Denmark and Slovenia (22% and more) while very low rates can be found in Poland, Sweden, the Czech Republic and Hungary (6% and less). It should be noted that in these last four countries, the BAC limits are lower than the 0.5 g/l limit that is in force in most of the other European countries: 0 g/l in the Czech Republic and Hungary and 0.2 g/l in Poland and Sweden (WHO, 2018a).

In Asia/Oceania and Africa, the countries with the lowest proportions of respondents indicating that they trust themselves to drive after having a glass of alcohol also tend to be countries with low BAC limits (0.3 g/l in Japan) or particularly strict regulations on alcohol consumptions, respectively with very low level of alcohol consumptions (Morocco and Egypt). As a matter of fact, the WHO-Global Status Report on Alcohol and Health 2018 indicates that in 2016, the alcohol consumption per capita of the population aged 15 years and older (in litres of pure alcohol, recorded and unrecorded) was 0.6 l in Morocco and 0.4 l in Egypt.

With regard to the question "I will do my best not to drive after drinking alcohol in the next 30 days (see Figure 10, right graph), the answering pattern is relatively homogenous between the regions, as well as between the countries within the regions. Overall, at least two thirds of the respondents declare the intention not to drive after drinking alcohol in the next 30 days. The region with the lowest proportion of drivers indicating this intention is Asia/Oceania (71%) and the region with the highest proportion is North America (79%). The proportions of those that answered that they will do their best not to drive after drinking depend significantly on the region (chi-square = 60.07; df = 3; p-value < 0.001). Proportions were significantly different between all pairs or regions (p-value < 0.01, except between Asia/Oceania and Africa. The strength of the association of the declared intention not to drink-drive within the next 30 days and the region was small (Cramer's V: 0.046).

While at the regional level, we might see a relationship between the level of self-declared drink-driving and the proportion of drivers indicating their intention not to drink and drive within the next 30 days (the higher the former, the higher the latter), this association is not obvious at the national level. Particularly in Europe, such a relationship does not seem to exist: countries with high rates of self-reported drink-driving are not the countries with high rates of respondents who express a willingness not to drive while alcohol-impaired in the next 30 days. Among the countries with the lowest proportions of drivers declaring themselves willing not to drive while alcohol-impaired in the next 30 days are rather countries with high levels of self-reported drink-driving (i.e. France, Belgium). The relationship observed at the regional level, on the other hand, applies very well to Africa. In Morocco and Egypt, the corresponding rates are low in both cases, and in South Africa, they are high in both cases.

ATTITUDES

I trust myself to drive after having a glass of alcohol   **I will do my best not to drive after drinking alcohol in the next 30 days)**

% agreement
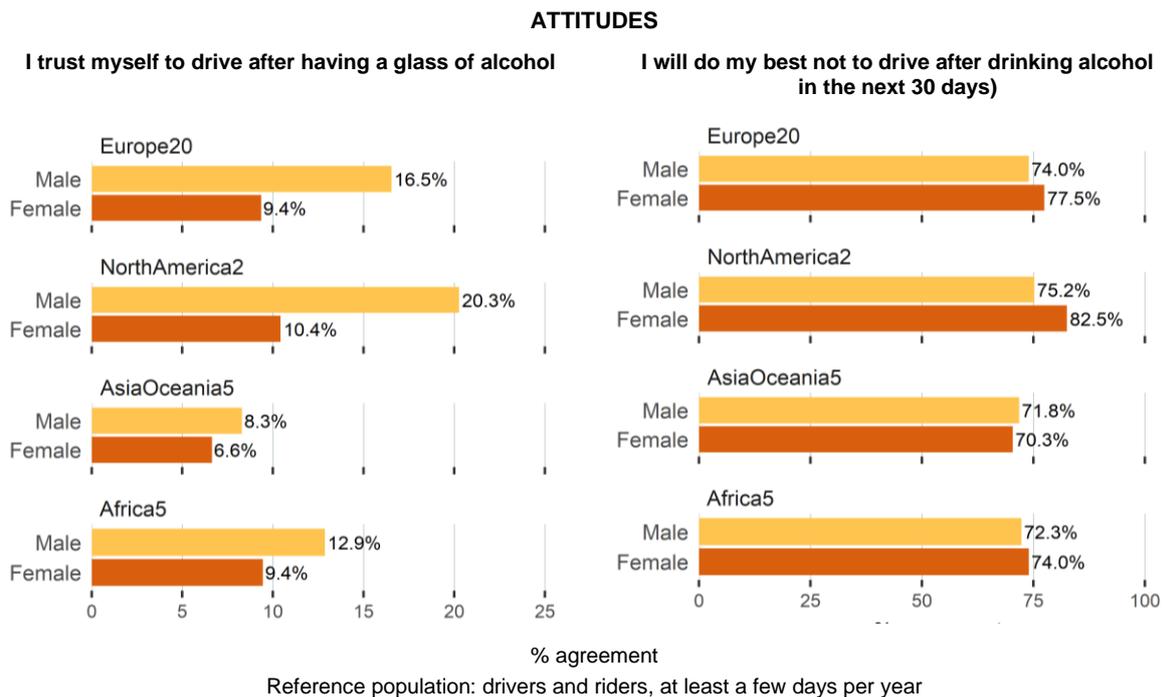Reference population: drivers and riders, at least a few days per year

Figure 11: Attitudes (perceived behaviour control and intentions in relation to drink-driving, by gender (% agreement; scores 4 and 5 on a 5-point scale from 1 'disagree to 5 'agree).
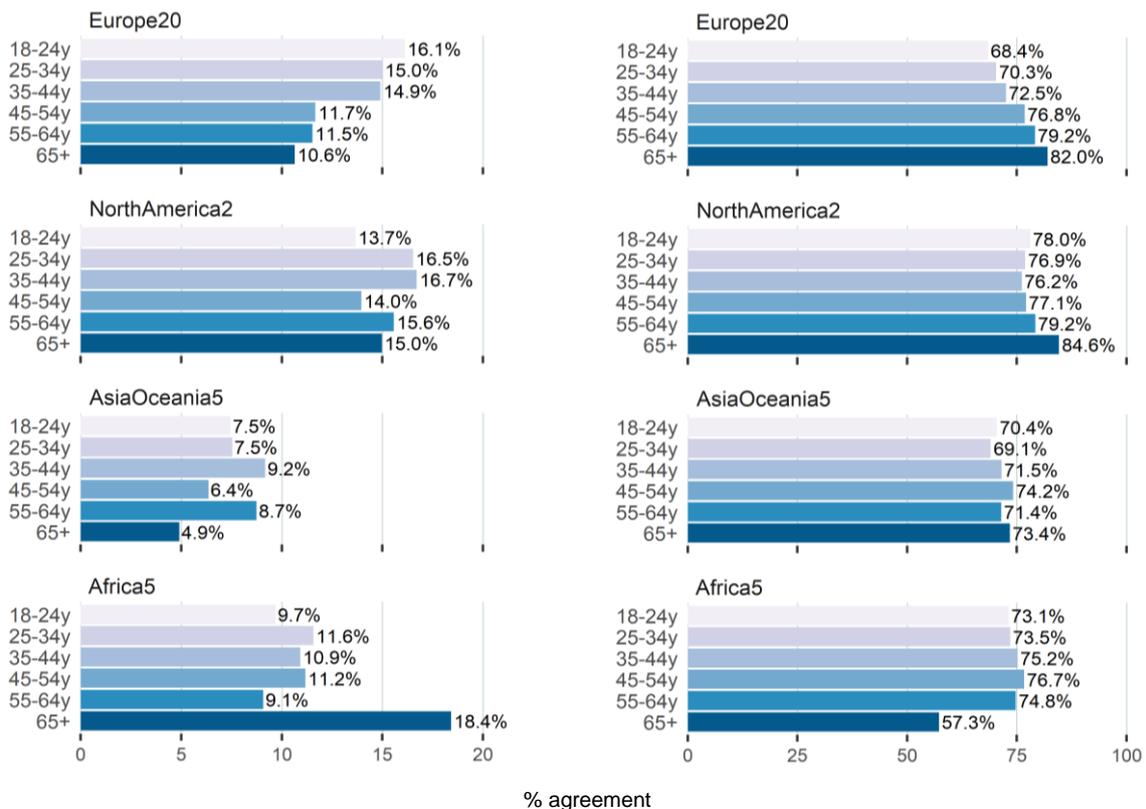
As we can see, in all regions more men than women trust themselves to drive after having a glass of alcohol (see Figure 11, left graph). However, the differences between men and women are considerably higher in Europe and North America than in the other two regions. They are all statistically significant, even in Asia/Oceania (chi-square = 4.42; df = 1; p-value = 0.035).

Overall, women tend to express greater willingness not to drive while alcohol-impaired in the next 30 days than men, except in Asia/Oceania (see Figure 11, right graph). Only the gender differences found in Europe and North America are statistically significant though.

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Figure 12: Attitudes (Perceived behaviour control and intentions in relation to drink-driving, by age group (% agreement; scores 4 and 5 on a 5-point scale from 1 'disagree to 5 'agree).

The regional results broken down by six age groups, show diverse response patterns (especially left graph of Figure 12).

In Europe, we can observe a clear relationship between the reported confidence with which a person drives after having drunk alcohol and his or her age. The older the drivers, the less they trust themselves to drive after having a glass of alcohol (chi-square = 66.20; df = 5; p-value < 0.001). However, the differences are statistically significant only between drivers under age 45 and 45 and older. The answer patterns by age are rather erratic in the three other regions (the differences are in most cases not statistically significant). The particularly high proportion of African drivers aged 65 and over who indicate that they trust themselves to drive after having a glass of alcohol probably has a methodological reason (very small sample in this age category, plus low internet penetration in these countries; see also section 3.4 'Limitations of the data').

The question "I will do my best not to drive after drinking alcohol in the next 30 days" seems to depend on age in Europe, but hardly in the other regions. In Europe, the older the drivers, the more likely they are to report that they intend not to drive while alcohol-impaired in the next 30 days (chi-square = 224.94; df = 5; p-value < 0.001); the degree of association between this intention and the age groups can be described as moderate (Cramer's V: 0.111).

3.1.4   Risk perception of alcohol and drugs

In the survey, the respondents had to indicate how often they think 7 possible causes of a road crash involving a car are present, answering on a six-point scale, ranging from never to (almost) always (see Figure 13 and Q17 of the questionnaire in Appendix 1).

CAUSES OF A ROAD CAR CRASH

Europe20

Cause	%
Using hands-free phone while driving	50.9%
Using hand-held phone while driving	75.8%
Inattentiveness or day-dreaming while driving	72.7%
Driving while tired	74.4%
Driving faster than speed limit	74.8%
Driving after taking drugs (other than medication)	74.8%
Driving after drinking alcohol	80.6%

NorthAmerica2

Cause	%
Using hands-free phone while driving	45.6%
Using hand-held phone while driving	70.8%
Inattentiveness or day-dreaming while driving	66.5%
Driving while tired	68.9%
Driving faster than speed limit	71.6%
Driving after taking drugs (other than medication)	67.1%
Driving after drinking alcohol	74.6%

AsiaOceania5

Cause	%
Using hands-free phone while driving	47.4%
Using hand-held phone while driving	52.6%
Inattentiveness or day-dreaming while driving	52.9%
Driving while tired	52.8%
Driving faster than speed limit	56.8%
Driving after taking drugs (other than medication)	51.4%
Driving after drinking alcohol	54.6%

Africa5

Cause	%
Using hands-free phone while driving	47.5%
Using hand-held phone while driving	61.9%
Inattentiveness or day-dreaming while driving	65.0%
Driving while tired	64.3%
Driving faster than speed limit	68.1%
Driving after taking drugs (other than medication)	63.2%
Driving after drinking alcohol	68.5%

% often/frequently

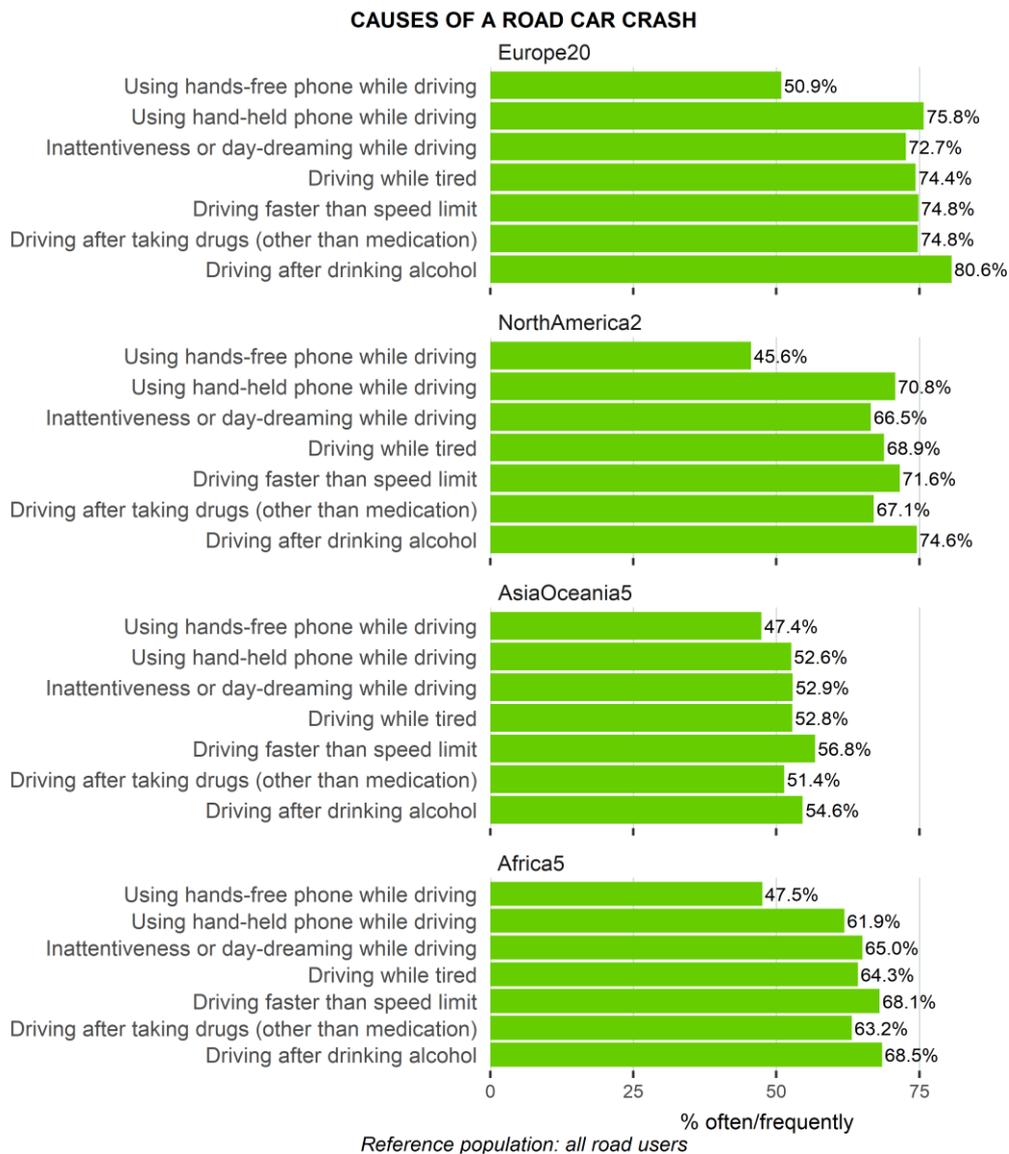*Reference population: all road users*

Figure 13: Risk perception of alcohol and drugs compared to other causes of road a car crash by region (% often/frequently; scores 4 to 6 on a 6-point scale from 1 'never' to 6 '(almost) always').

Figure 13 shows the risk perception of alcohol and drugs in relation to other possible causes of a car crash. In all regions, except in the Asian and Oceanian region, drink-driving was the most frequently mentioned cause for a road car crash out of 7 proposed, with the highest proportion in Europe (81%). In the Asian and Oceanian region, drink-driving was the second most frequently mentioned cause of accident with a proportion of 55%, just behind driving at excessive speed (57%).

Driving under the influence of drugs is less often considered as a possible cause of a road crash involving a car. While driving under the influence of drugs is the third most frequently reported cause of accidents

in Europe (75%), in North America and Africa, it is ranked 5th and in the Asia and Oceania region, even in the penultimate (=6th) position, just before 'using hands-free phone while driving'.

Overall, the respondents in Europe tend to estimate the different possible causes of a road accident involving a car as more frequent (between 51% and 81%) than the respondents in other regions. In the Asian and Oceanian region, the proportions of respondents considering the different causes as rather frequent where the lowest (between 47% and 57%).

3.1.5   Support for policy measures

Respondents had to indicate if they support or oppose a legal obligation with respect to three policy measures related to drink-driving (see Figure 14 and Q18 of the questionnaire in Appendix 1). They had to answer on a five-point scale ranging from 1 'oppose' to 5 'support'. For the purpose of the analysis, the values 4 to 5 were coded as support, and values 1 to 3, as oppose and neutral.
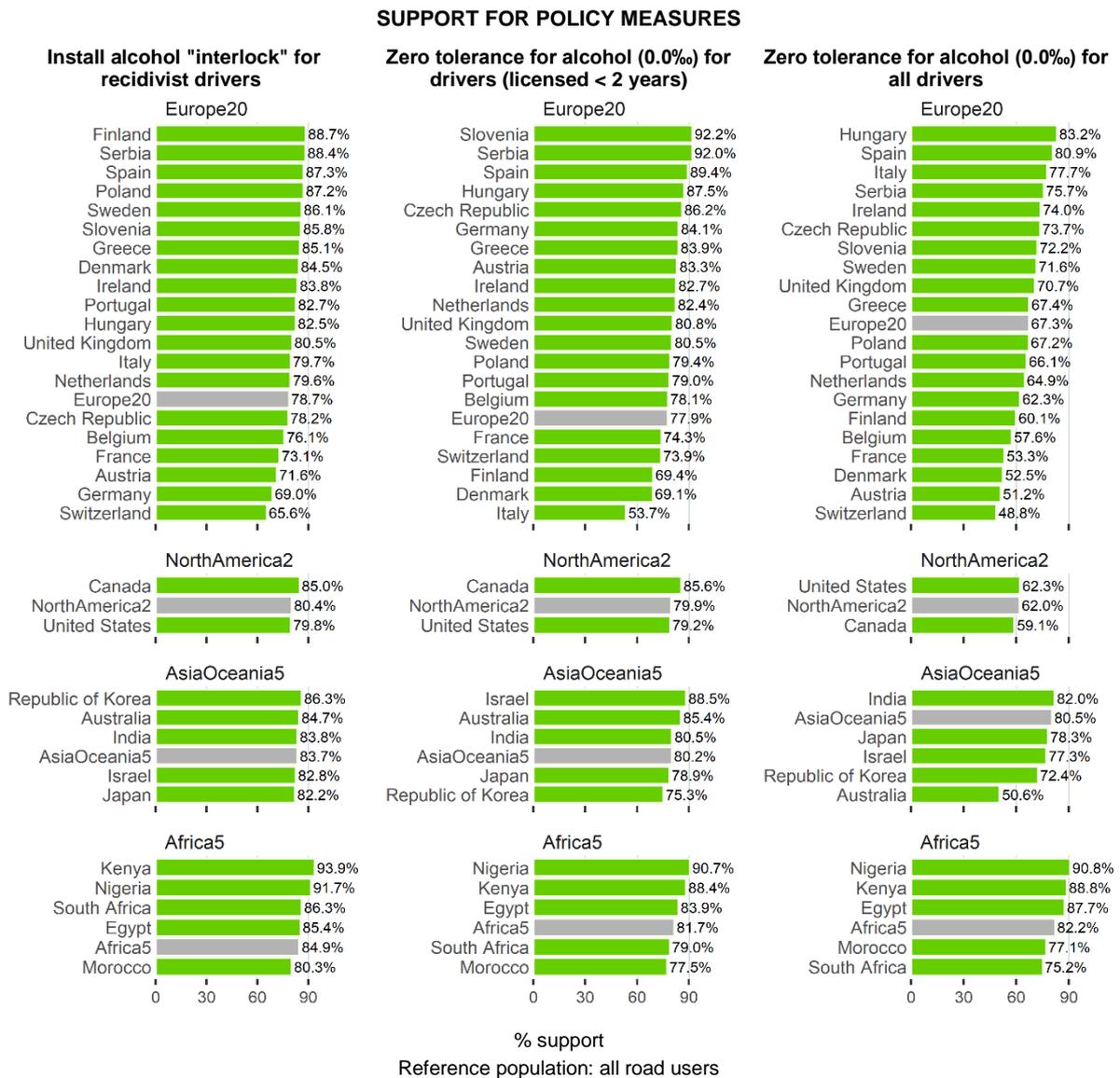
SUPPORT FOR POLICY MEASURES
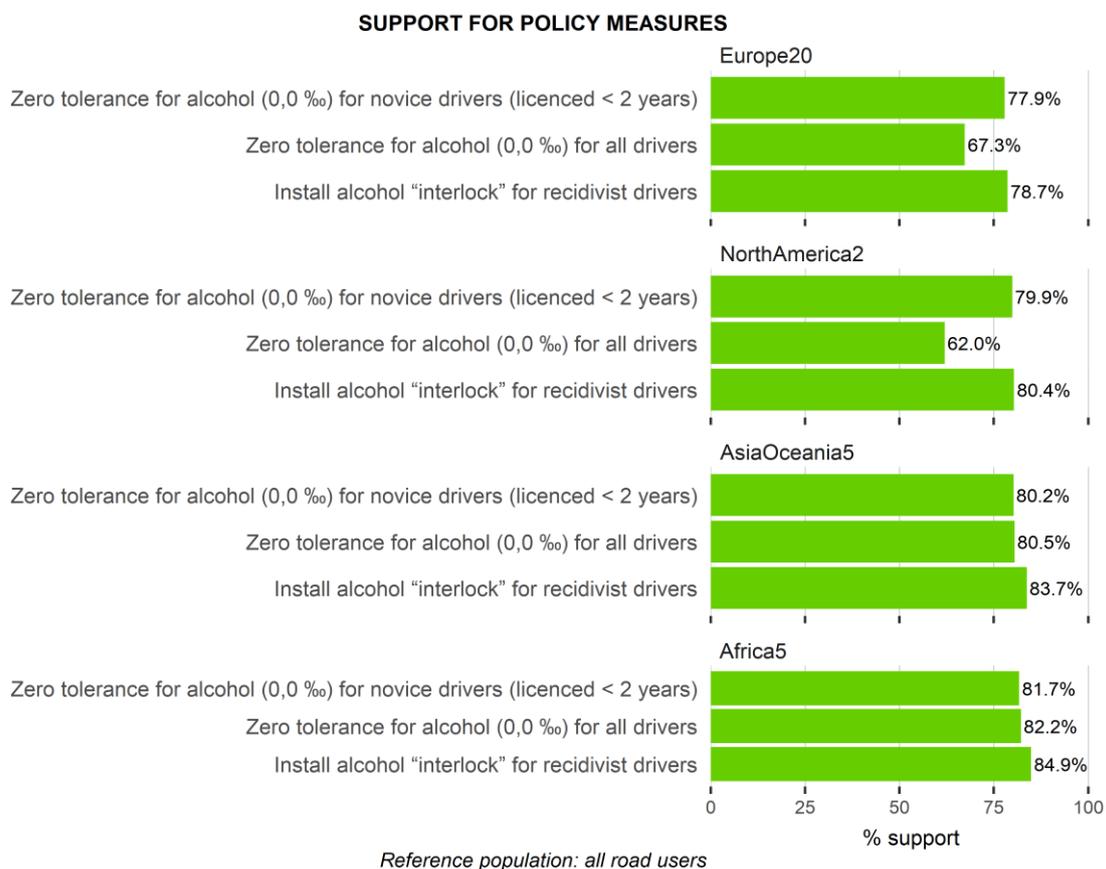
Figure 14: Support for three policy measures related to drink-driving, by region (% support; scores 4 and 5 on a 5-point scale from 1 'oppose' to 5 'support').

Figure 14 shows that the three alcohol-related policy measures have high support among the respondents. The proportion of respondents in favour of these different measures is at least 62%.

For all three measures, the largest support can be found in Africa and in the Asian and Oceanian region. Depending on the specific measure, the proportion of respondents in favour of it is the lowest in Europe ('zero tolerance for alcohol for novice drivers' and 'install an alcohol interlock for recidivist drivers') or in North America ('zero tolerance for alcohol (0.0‰) for all drivers').

The highest support in all four regions can be found for an obligation to install an alcohol 'interlock' for drivers who have been caught drink-driving on more than one occasion (between 79% and 85%).

The least supported measure is 'zero tolerance for alcohol (0.0‰) for all drivers'. The proportion of respondents in favour of this measure is 62% in North America, 67% in Europe and slightly above 80% in the other two regions. The differences between the regions are statistically significant, except between Africa and the Asian and Oceanian region (chi-square = 739.65; df = 3; p-value <0.001).

SUPPORT FOR POLICY MEASURES

Install alcohol "interlock" for recidivist drivers

Europe20

Finland	88.7%
Serbia	88.4%
Spain	87.3%
Poland	87.2%
Sweden	86.1%
Slovenia	85.8%
Greece	85.1%
Denmark	84.5%
Ireland	83.8%
Portugal	82.7%
Hungary	82.5%
United Kingdom	80.5%
Italy	79.7%
Netherlands	79.6%
Europe20	78.7%
Czech Republic	78.2%
Belgium	76.1%
France	73.1%
Austria	71.6%
Germany	69.0%
Switzerland	65.6%

NorthAmerica2

Canada	85.0%
NorthAmerica2	80.4%
United States	79.8%

AsiaOceania5

Republic of Korea	86.3%
Australia	84.7%
India	83.8%
AsiaOceania5	83.7%
Israel	82.8%
Japan	82.2%

Africa5

Kenya	93.9%
Nigeria	91.7%
South Africa	86.3%
Egypt	85.4%
Africa5	84.9%
Morocco	80.3%

Zero tolerance for alcohol (0.0‰) for drivers (licensed < 2 years)

Europe20

Slovenia	92.2%
Serbia	92.0%
Spain	89.4%
Hungary	87.5%
Czech Republic	86.2%
Germany	84.1%
Greece	83.9%
Austria	83.3%
Ireland	82.7%
Netherlands	82.4%
United Kingdom	80.8%
Sweden	80.5%
Poland	79.4%
Portugal	79.0%
Belgium	78.1%
Europe20	77.9%
France	74.3%
Switzerland	73.9%
Finland	69.4%
Denmark	69.1%
Italy	53.7%

NorthAmerica2

Canada	85.6%
NorthAmerica2	79.9%
United States	79.2%

AsiaOceania5

Israel	88.5%
Australia	85.4%
India	80.5%
AsiaOceania5	80.2%
Japan	78.9%
Republic of Korea	75.3%

Africa5

Nigeria	90.7%
Kenya	88.4%
Egypt	83.9%
Africa5	81.7%
South Africa	79.0%
Morocco	77.5%

Zero tolerance for alcohol (0.0‰) for all drivers

Europe20

Hungary	83.2%
Spain	80.9%
Italy	77.7%
Serbia	75.7%
Ireland	74.0%
Czech Republic	73.7%
Slovenia	72.2%
Sweden	71.6%
United Kingdom	70.7%
Greece	67.4%
Europe20	67.3%
Poland	67.2%
Portugal	66.1%
Netherlands	64.9%
Germany	62.3%
Finland	60.1%
Belgium	57.6%
France	53.3%
Denmark	52.5%
Austria	51.2%
Switzerland	48.8%

NorthAmerica2

United States	62.3%
NorthAmerica2	62.0%
Canada	59.1%

AsiaOceania5

India	82.0%
AsiaOceania5	80.5%
Japan	78.3%
Israel	77.3%
Republic of Korea	72.4%
Australia	50.6%

Africa5

Nigeria	90.8%
Kenya	88.8%
Egypt	87.7%
Africa5	82.2%
Morocco	77.1%
South Africa	75.2%

% support
Reference population: all road users

Figure 15: Support for three policy measures related to drink-driving, by country and region (% support; scores 4 and 5 on a 5-point scale from 1 'oppose' to 5 'support').

The largest variability in the support rates by country can be observed in Europe (Figure 15). The support rates for a law that would oblige repeat offenders to install interlock systems in their vehicles range from 66% (Switzerland) to 89% (Finland), a difference of more than 20 percentage points. The question of whether to support a law prohibiting novice drivers (licenced < 2 years) from consuming alcohol reveals even wider disparities between European countries. Italy stands out with a particularly low approval rate of 54%, followed by Denmark with a rate of 69%. The country with the highest approval rate is Slovenia with 92%. The difference between the lowest and highest rates is therefore

almost 40 percentage points. The general ban on alcohol for all drivers is widely supported in some European countries, such as Hungary, Spain, Italy or Serbia (support rate above 75%) and considerably less in other countries such as France, Denmark or Austria where just over half the population supports it, and would even be rejected in Switzerland (49%). Between the lowest and the highest approval rates the difference is of 34 percentage points.

In North America, there are no substantial discrepancies between the support rates in Canada and the United States (differences of less than 8 percentage points).

In Asia and Oceania, the variability in the support rates by country is rather low, except for the measure 'zero tolerance for alcohol (0.0 ‰) for all drivers' where the proportions of respondents in favour of it is especially high in India (82%) and especially low in Australia (51%), a difference of 31 percentage points.

In Africa, the differences between the highest and lowest support rates by country range from 14 to 16 percentage points. In Kenya and Nigeria, the support of the alcohol-related policy measures are especially high. In Morocco, the support is below the African average, but still higher than in several European countries.

With regard to gender-specific characteristics, it can be said that the female respondents had higher support rates for nearly all policy measures in all regions.

3.1.6   Opinions towards traffic rules and penalties

Three questions in ESRA2 (see Figure 16 and Q19 of the questionnaire in Appendix 1) are related to the opinion towards traffic rules and penalties. Possible answers were either 'agree' or 'disagree'. A high level of agreement for item 1 and 3 (the traffic rules/penalties should be stricter, respectively are not being checked sufficiently) and a low level of agreement for item 2 (the traffic rules/penalties are too severe) indicate a rather critical attitude towards drinking and driving regulations that are in force. They may be perceived, for example, as too lax. A thematic report on enforcement with ESRA2-results is planned for autumn 2019. The main results, broken down by country, are presented here. Detailed results (by gender and age group) will be supplied in the thematic report 'Enforcement' mentioned above.

DRIVING/RIDING UNDER THE INFLUENCE OF ALCOHOL

Europe20

Traffic rules/penalties should be stricter	74.5%
Traffic rules/penalties are too severe	20.6%
Traffic rules are not being checked sufficiently	77.4%

NorthAmerica2

Traffic rules/penalties should be stricter	71.1%
Traffic rules/penalties are too severe	18.3%
Traffic rules are not being checked sufficiently	70.5%

AsiaOceania5

Traffic rules/penalties should be stricter	93.8%
Traffic rules/penalties are too severe	34.1%
Traffic rules are not being checked sufficiently	78.9%

Africa5

Traffic rules/penalties should be stricter	48.9%
Traffic rules/penalties are too severe	43.6%
Traffic rules are not being checked sufficiently	54.2%

% agreement

Reference population: all road users

Figure 16: Opinions towards traffic rules and penalties related to drink-driving, by region (% agreement, 'agree' or 'disagree').

As shown in Figure 16, the levels of agreement for the three statements are similar in all regions except in Africa. In Europe, North America and Asia/Oceania, a large proportion of the population is of the opinion that the traffic rules are not being checked enough and that these rules as well as penalties should be stricter in their regions (between 70% and 94% of the population, depending on the region and the regulations, agreed with these statements). Accordingly, only a minority considers that the traffic rules or penalties are too severe (between 18% and 34%).

By contrast, a relatively high proportion of respondents in Africa do not seem to perceive drinking and driving regulations as too lax. About half of them were of the opinion that the traffic rules and penalties should not be stricter and that the traffic rules are sufficiently checked. At the same time, 44% consider that the rules and penalties for drink-driving are too severe.

Asia/Oceania is the region with the highest proportion of people in favour of tightening up drinking and driving regulations: 94% agreed with the proposition 'The traffic rules/penalties should be stricter', and 79% answered that the traffic rules are not being checked sufficiently.

For the first item 'The traffic rules/penalties should be stricter', the differences are significant between all regions (Chi-Square = 2608.18, df = 3, p-value < 0.001). As for the statement that the traffic rules/penalties for drink-driving are too severe, the percentages of agreement differ significantly, except between Europe and North America (Chi-Square = 1328.18, df = 3, p-value < 0.001). Respondents from Europe and Asia/Oceania do not differ in their view that the traffic rules are not being checked sufficiently whereas those in North America and Africa differ significantly (Chi-Square =1195.25, df = 3, p-value < 0.001).

TRAFFIC RULES/PENALTIES

Traffic rules/penalties should be stricter	Traffic rules are not being checked sufficiently	Traffic rules/penalties are too severe

Europe20

	Should be stricter	Not checked sufficiently	Too severe
Greece	85.0%	94.8%	
Sweden	82.8%	85.0%	
Finland	81.8%		
Italy	81.3%	85.8%	
Spain	81.1%		
Serbia	80.5%	81.3%	
United Kingdom	79.7%		
Netherlands	78.8%	80.3%	
Hungary	75.6%		
Czech Republic	75.2%		
Europe20	74.5%	77.4%	20.6%
Poland	73.6%	81.4%	16.8%
Slovenia	71.8%	78.4%	33.7%
Ireland	71.4%	76.3%	23.8%
Germany	71.0%	75.1%	16.6%
Belgium	69.9%	73.4%	24.9%
Portugal	67.6%	74.7%	26.7%
Denmark	65.4%	68.9%	9.3%
France	64.5%	69.1%	35.8%
Austria	63.6%	68.4%	16.1%
Switzerland	54.1%	56.2%	30.4%
Finland		79.0%	10.6%
Spain		78.8%	27.7%
United Kingdom		78.5%	12.8%
Netherlands			13.2%
Czech Republic		75.8%	16.3%
Hungary		71.6%	26.1%
Belgium			24.9%
Serbia			23.9%
Greece			23.0%
Italy			17.5%
Sweden			9.3%

(Note: Too severe column — France 35.8%, Slovenia 33.7%, Switzerland 30.4%, Spain 27.7%, Portugal 26.7%, Hungary 26.1%, Belgium 24.9%, Serbia 23.9%, Ireland 23.8%, Greece 23.0%, Europe20 20.6%, Italy 17.5%, Poland 16.8%, Germany 16.6%, Czech Republic 16.3%, Austria 16.1%, Netherlands 13.2%, United Kingdom 12.8%, Finland 10.6%, Sweden 9.3%, Denmark 9.3%)

NorthAmerica2

	Should be stricter	Not checked sufficiently	Too severe
Canada	74.0%	72.8%	16.5%
NorthAmerica2	71.1%	70.5%	18.3%
United States	70.8%	70.2%	18.5%

AsiaOceania5

	Should be stricter	Not checked sufficiently	Too severe
Republic of Korea	97.2%	85.3%	6.7%
India	94.9%	78.2%	38.7%
AsiaOceania5	93.8%	78.9%	34.1%
Japan	89.7%	83.9%	15.6%
Israel	84.2%	82.4%	10.9%
Australia	66.0%	59.5%	20.1%

Africa5

	Should be stricter	Not checked sufficiently	Too severe
Nigeria	93.0%	89.7%	16.5%
Kenya	91.7%	83.9%	17.5%
South Africa	82.2%	87.6%	22.9%
Africa5	48.9%	54.2%	43.6%
Morocco	48.4%	49.7%	45.5%
Egypt	14.4%	27.7%	63.4%

% agreement
Reference population: all road users

Figure 17: Opinions towards traffic rules and penalties related to drink-driving, by country and region (% agreement, 'agree' or 'disagree').

Figure 17 shows that opinion on traffic rules and sanctions varies extremely from one country to another. While almost the entire population of the Republic of Korea supports the assertion that traffic rules and sanctions should be stricter, only 14% of the Egyptian population share this view. The proportion of people who believe that the rules are not sufficiently checked is highest in Greece (95%) and lowest in Egypt (28%). It is also in Egypt that the proportion of people who believe that the traffic rules and penalties are too severe is highest (63%). The Republic of Korea, where only 7% of the population are of this opinion, is situated at the other extreme.

If we look more closely into the results of the countries within the four regions, we notice significant contrasts, except in North America, where the opinions on drink-driving regulations differ little between the population of Canada and of the United States.

In Europe, it is in Greece, Sweden, Finland and Italy that the populations seem to be most critical of their countries' drinking and driving regulations. They have a relatively high proportion of respondents

who believe that traffic rules and penalties should be stricter (between 81% and 85%) and, at the same time, a relatively low proportion of respondents who consider them as too severe (between 9% and 23%). The people living in Switzerland, but also in France, appear much less convinced of the need to tighten up the regulations on drinking and driving. In both countries, there is a relatively low proportion of respondents who believe that traffic rules and penalties should be stricter (between 54% and 65%) and, at the same time, a relatively high proportion of respondents who consider them as too severe (between 30% and 36%). The fact that the Swiss population sees less need to tighten drinking and driving regulations than that of other European countries can be explained by the numerous measures taken in recent years to improve road safety (Adminaite et al., 2017). The action programme "Via sicura" has entered into force on a step-by-step basis since 2013 and encompasses twenty measures, several of which concern alcohol (zero tolerance for novice and professional drivers the obligation for drivers caught with a blood-alcohol level above 1,6 g/l to undergo an assessment of suitability to drive a motor vehicle, both introduced in 2014 and the evidential alcohol breath tests, introduced in 2016).

Finally, it should be noted that in Denmark, Austria and Germany, the proportion of people who believe that traffic rules and penalties should be stricter is lower than the European average, and the proportion of those who rated the traffic rules and penalties as too severe is also lower than the European average.

We observe great disparities among countries in the Asian and Oceanian region and especially in Africa. In Asia/Oceania, the Australians seem the least convinced of the need to tighten up the regulations on drinking and driving, while India has the highest proportion of respondents who consider traffic rules and penalties for drink-driving to be too severe (39%). At the other end of the scale, almost the entire population of the Republic of Korea is in favour of strengthening drinking and driving regulations. In addition, less than 10% believe that the traffic rules and penalties are too severe.

A closer look at African countries reveals a sharp contrast between Morocco and Egypt, in the north, and that further south, such as Nigeria, Kenya and South Africa. While there is clear support for stronger drinking and driving regulations in the southern countries, respondents from the northern countries tend to consider their traffic rules and sanctions against drinking and driving to be sufficient. It should be noted that both in Morocco and Egypt, alcohol consumption is extremely low. In Morocco, alcohol consumption is even prohibited. According to the WHO-Global Status Report on Alcohol and Health 2018, the alcohol consumption per capita of the population aged 15 years and older (in litres of pure alcohol, recorded and unrecorded) in 2016 was 0.6 in Morocco and 0.4 in Egypt. In the three other African countries, the corresponding alcohol consumption per capita (15+) was 3.4 in Kenya, 13.3 in Nigeria and 9.3 in South Africa. Moreover, the WHO report (2018a) indicates a much lower rate of alcohol-attributable deaths in road traffic per 100 000 inhabitants (15+) in Morocco and Egypt (respectively 136 and 229) than in Kenya, Nigeria or South Africa (respectively 2223, 15 365 and 3614). Of all the African countries participating in the survey, Nigeria reports the largest proportion of people in favour of tightening drink-driving regulations. Possible reasons might be the awareness of the high level of alcohol consumption and the great number of alcohol-related road accidents in the country, experience with enforcement and perceived likelihood for getting caught.

In the survey, the respondents had to indicate how many times they had been subjected to alcohol, or drug checks in the last 12 months (see Figure 18 as well as Q21 and Q22 of the questionnaire in Appendix 1). They were also questioned about their perceived likelihood of being checked for drink-driving or drug-driving and had to answer on a seven-point scale ranging from 1 'very unlikely' to 7 'very likely'. For the purpose of the analysis, the values 5 to 7 were coded as 'likely', and values 1 to 4, as 'unlikely/neutral'. As mentioned earlier, a thematic report on enforcement with ESRA2 results will be

published in autumn 2019. It will examine this subject in more detail, including gender and age of respondents. The analyses presented in this report focus on country results.

ENFORCEMENT

| Checked by the police for using alcohol while DRIVING A CAR (i.e., being subjected to a Breathalyser test) | Checked by the police for the use of drugs (other than medication) while DRIVING A CAR |
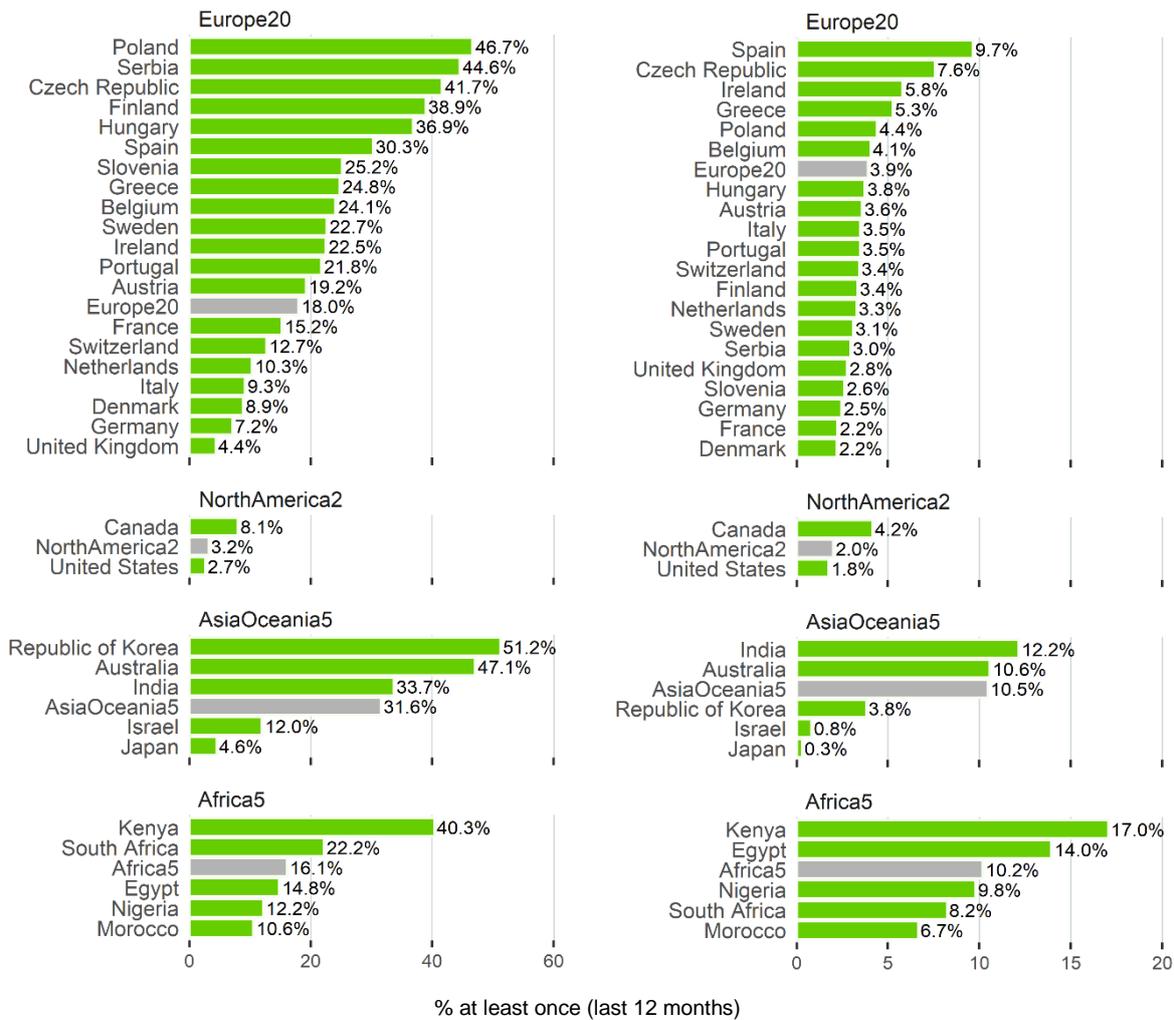
Figure 18: Experience with checks by police for drink-driving and drug-driving, by country and region (% of car drivers … at least once in the last 12 months).

As shown in Figure 18, there are large differences between regions. While in Asia and Oceania, nearly one third of the respondents reported that they had been checked for drink-driving (32%), only 3% were tested for alcohol in North America. The differences between all regions are significant (Chi-Square = 679.10, df = 3, p-value < 0.001). The degree of association between the experienced alcohol checks and the regions can be described as moderate (Cramer's V: 0.166).

With regard to drug checks, the differences between regions are less pronounced, ranging from 2% in North America to 11% in Asia/Oceania. Respondents from Asia and Oceania as well as Africa are clearly more often subjected to drug checks (other than medication) than their counterparts in Europe and North America. Between all regions, the differences are significant, except between Asia/Oceania and

Africa (Chi-Square = 430.35, df = 3, p-value < 0.001). Even if the degree of association between the experienced drug checks and the regions is smaller (Cramer's V: 0.132) than between the experienced alcohol checks and the regions; the strength of association can still be qualified as moderate.

The proportion of car drivers who report having been tested for alcohol or for drugs at least once in the last 12 months varies considerably from one country to another.

In Europe, the countries with the highest proportions of drivers tested for alcohol are Poland, Serbia, the Czech Republic, Hungary and Spain (between 30% and 47%) and the countries with the lowest proportions are the United Kingdom, Germany and Denmark (between 4% and 9%). It seems that the countries with the highest density of alcohol checks also have more or less the highest density of drug checks and vice-versa. We also observe that in all countries, alcohol checks are apparently more frequent than drug checks. The countries with the highest proportions of drivers tested for drugs are Spain, the Czech Republic and Ireland (between 6% and 10%), and the countries with the lowest proportions are Denmark, France and Germany (between 2% and 3%).

According to respondents, alcohol and drug checks in North America are two to three times more frequent in Canada than in the United States.

In Asia/Oceania, the proportion of car drivers who report having been tested for drugs is particularly low in Japan and Israel (less than 1%). In both countries, the proportion of drivers tested for alcohol is lower than the regional average. In the Republic of Korea, we observe that 51% of the car drivers have been tested for alcohol at least once in the last 12 months.

In Africa, the country with the highest proportions of drivers tested for alcohol as well as for drugs is Kenya, and the country with the lowest proportions is Morocco.

ENFORCEMENT

Likelihood of being checked by the police for alcohol	Likelihood of being checked by the police for the use of illegal drugs

Europe20

Country	%
Poland	53.0%
Serbia	44.5%
Czech Republic	38.6%
Spain	35.0%
Slovenia	32.1%
Hungary	32.0%
Portugal	26.5%
Austria	23.6%
Europe20	22.5%
Belgium	21.7%
Greece	20.8%
Italy	20.5%
Ireland	19.6%
Switzerland	17.3%
Netherlands	16.0%
Sweden	15.9%
Finland	15.6%
France	15.1%
Germany	14.0%
United Kingdom	12.0%
Denmark	10.9%

Europe20

Country	%
Spain	26.0%
Poland	22.6%
Czech Republic	19.1%
Italy	16.5%
Hungary	16.1%
Serbia	16.0%
Belgium	14.3%
Europe20	14.2%
Portugal	13.9%
Netherlands	13.0%
Ireland	11.3%
Greece	11.2%
Slovenia	11.0%
Sweden	10.8%
Switzerland	10.6%
Austria	10.5%
Germany	10.1%
United Kingdom	9.5%
France	9.5%
Denmark	8.0%
Finland	7.3%

NorthAmerica2

Country	%
Canada	13.7%
NorthAmerica2	10.5%
United States	10.2%

NorthAmerica2

Country	%
Canada	11.9%
NorthAmerica2	9.3%
United States	9.0%

AsiaOceania5

Country	%
India	33.2%
AsiaOceania5	31.1%
Australia	30.0%
Japan	21.2%
Republic of Korea	19.1%
Israel	15.6%

AsiaOceania5

Country	%
India	24.5%
AsiaOceania5	22.8%
Australia	17.1%
Japan	16.9%
Republic of Korea	9.8%
Israel	8.5%

Africa5

Country	%
Kenya	41.4%
Egypt	31.7%
Africa5	27.8%
South Africa	25.8%
Morocco	24.8%
Nigeria	20.8%

Africa5

Country	%
Egypt	29.8%
Nigeria	25.5%
Kenya	24.8%
Africa5	23.3%
Morocco	21.7%
South Africa	14.4%

% likely

Reference population: car drivers at least a few days a month

Figure 19: Perceived likelihood of being checked for impaired driving, by country and region (% likely, scores 5 until 7 on a 7-point scale from 1 'very unlikely' to 7 'very likely').

The perceived likelihood of getting caught for driving under the influence of alcohol or drugs is considered as an important issue. This perception may be influenced by implementing high-visibility road checks when enforcing drink-driving laws (Vanlaar, 2007). "General deterrence theory predicts that the actual and perceived likelihood (fear) for getting caught are important motivators for people to comply with the law" (Ross, 1992, in Vanlaar, 2007).

Figure 19 shows that in the general car driver population, the perceived likelihood of being checked for impaired driving under the influence of alcohol or drugs is not especially high: the mean scores range from 9% (in North America for drug checks) to 31% (in Asia/Oceania for alcohol checks). In all regions, the perceived likelihood of being checked is greater for alcohol than for drugs.

In most countries, the proportion of car drivers who consider an alcohol or a drug check as likely is higher than the corresponding proportion of car drivers who report having been checked for alcohol or

drugs (see Figure 23). In Europe, for example, more than half (53%) of the Polish respondents consider an alcohol check as likely, whereas 47% report having been tested for alcohol in the last 12 months. Of the 32 countries surveyed, Poland has the highest score for the perceived likelihood of being subject to alcohol checks and the United States report the lowest (10%).

The relationship between the experienced alcohol checks and the perceived likelihood of being checked for alcohol at country level is analysed more in detail in the section 'Advanced analyses'

The highest proportions of drivers considering a drug check as likely are found in Egypt (30%), followed by Spain (26%). The lowest proportions are found in Finland and Denmark (between 7% and 8%).

3.2 Advanced analyses

This section comprises two kinds of analyses. On the one hand, we examine the extent to which explanatory factors are associated with self-reported DUI of alcohol or drugs. On the other hand, we compare some results at country level in two-dimensional graphs. Thanks to the first analysis, for example, it is possible to determine how strongly self-reported DUI of alcohol or drugs is associated with the age, the sex or the attitudes towards impaired driving of the respondent. In the second type of analysis, we can, for example, investigate whether the countries where the rate of respondents indicating that they drink-drive is high, are also those where the social acceptability rate of drink-driving is high.

3.2.1   Factors associated with self-declared impaired driving

Two binary logistic regression models were developed. In each model, the outcome is a binary variable indicating the absence (0 = never) or presence (1 = at least once) of self-reported drink-driving, or self-reported drug-driving over the last 30 days. Only car drivers driving at least a few days per month were considered in this analysis (=25 535 out of the 35 036 ESRA2 respondents). Categories in which very few people had been questioned were either assembled with other categories (such as 'no education' or 'primary education' which were grouped with 'secondary education') or excluded from the analysis (such as gender=other, which corresponds to 76 car drivers driving at least a few days per month). Finally, 25 459 respondents were included in the models.

Personal characteristics such as gender, age or level of education were included as explanatory factors together with the country in which the respondents live as well as their attitudes towards DUI, etc. The results at the country level, controlled for other factors, are presented in separate tables (see Table 3 and Table 5). In these binary logistic regression models, we obtained measures of association in terms of odds ratios (OR) and 95% confidence intervals. If $p < 0.05$, the association is considered as significant.

Table 2: Logistic regression model for drink-driving in the last 30 days; part 1 (Model 1).

Factors (reference category)	Dependent variable: self-reported drink-driving	
	Odds Ratio	**[95% CI]**
Gender (ref. Male)		
Female	0.738***	(0.677 - 0.804)
Age group (ref. 18-24)		
25-34	1.424***	(1.208 - 1.677)
35-44	1.470***	(1.246 - 1.734)
45-54	1.488***	(1.257 - 1.761)
55-64	1.836***	(1.541 - 2.187)
65+	2.147***	(1.818 - 2.535)
Level of education (ref. secondary education or lower)		
bachelor s degree or similar	1.039	(0.944 - 1.143)
master s degree or higher	1.253***	(1.108 - 1.416)
Frequency of driving a car (ref. a few days a month)		
1 to 3 days a week	1.322***	(1.130 - 1.548)
at least 4 days a week	1.622***	(1.411 - 1.864)
Self-efficacy score (ref. disagree-neutral: 1-3)[1]	2.474***	(2.329 - 2.629)
Habits score (ref. disagree-neutral: 1-3)[2]	3.027***	(2.763 - 3.315)
'I will do my best not to drink & drive' (ref. disagree-neutral: 1-3)		
(Rather) agree (4-5)	0.868*	(0.783 - 0.961)
'How often is drink-driving the cause of a road crash?' (ref. not that often-not frequently: 1-3)		
often/frequently (4-6)	1.143*	(1.029 - 1.27)
Support of measures score (ref. oppose/neutral (1-3)[3]	0.673***	(0.643 - 0.705)
Support of enforcement score[4]	0.823**	(0.716 - 0.947)
How many times have you been checked by the police for alcohol (ref. never)		
At least once (1-100)	1.251***	(1.127 - 1.389)
Socially desirable responding score[5]	0.954***	(0.945 - 0.963)
$R^2_{Nagelkerke}$ (pseudo R^2)	0.46	

Note: esra32_sample weight; * p<0.05, ** p<0.01, *** p<0.001

[1] **Self-efficacy score**: average of response category values within the items "I trust myself to drive after having a glass of alcohol", "I have the ability to drive when I am a little drunk after a party" and "I am able to drive after drinking a large amount of alcohol (e.g. half a liter of wine)".

[2] **Habits score**: average of response category values within the items "I often drive after drinking alcohol". "Even when I am a little drunk after a party, I drive" and "It sometimes happens that I drive after consuming a large amount of alcohol (e.g. a liter of beer or half a liter of wine).

[3] **Support of measures score**: average of response category values within the items "Install an alcohol "interlock" for drivers who have been caught drunk driving on more than one occasion", "Zero tolerance for alcohol (0,0 ‰) for novice drivers (licence obtained less than 2 years)" and "Zero tolerance for alcohol (0,0 ‰) for all drivers".

[4] **Support of enforcement score**: average of response given to the question "What do you think about the current traffic rules and penalties in your country for driving or riding under the influence of alcohol, with the items "The traffic rules should be stricter", "The traffic rules are not being checked sufficiently" and "The penalties are too severe".

[5] **Socially desirable responding score**: sum of response category values of the six items of question 28 (see appendix 1).

Possible factors affecting self-declared drink-driving (except countries) are presented in Table 2.

We see the odds for self-declared drink-driving of female car drivers in comparison with male car drivers decrease significantly when controlling for all the other factors mentioned (OR= 0.74; p<0.001). This means that women are less likely to report that they drink and drive than men.

The likelihood of drink-driving increases with the age of the drivers. In comparison with the 18 to 24-year-old group, the odds ratios are respectively 1.42, 1.47, 1.49, 1.84 and 2.15 (all p<0.001) for the age groups 25-34, 35-44, 45-54, 55-64 and 65 years and more.

Compared to car drivers with a secondary or lower education, the odds of drink-driving increase by 25% for drivers with a master's degree or higher (OR=1.25; p<0.001). According to this model, the likelihood of (self-declared) drink-driving is lower among drivers with a lower level of education. Similar results were found in the binary logistic regression models based on ESRA1 data for 17 European countries (Achermann Stürmer, 2016).

The likelihood of drink-driving also increases with the driving frequency. In comparison with the persons who drive only a few days a month, the odds ratios are respectively 1.32 and 1.62 for persons who drive 1 to 3 days a week and at least 4 days a week.

Respondents who believe that they have high self-efficacy (i. e. they trust themselves to drive after having a glass of alcohol, are confident that they have the ability to drive when a little drunk after a party or after drinking a large amount of alcohol) are much more likely to report that they drive under the influence of alcohol (OR=2.48; p<0.001).

If car drivers indicate having habits such as 'I often drive after drinking alcohol', 'Even when I am a little drunk after a party, I drive' or 'It sometimes happens that I drive after consuming a large amount of alcohol', they are three times more likely to report drink-driving (OR=3.03, p<0.001). This result is not surprising, as such habits are strongly associated with the question if they have driven under the influence of alcohol over the last 30 days.

The odds of self-reported drink-driving decrease for respondents who have the intention to do their best not to DUI of alcohol in the next 30 days (OR=0.87, p<0.05).

Car drivers who consider drink-driving as a rather frequent cause of a road crash are about 14% more likely to declare that they drive under the influence of alcohol than those who think that drink-driving is not that often the cause of an accident.

Respondents giving large support to measures or to enforcement related to drink-driving are less inclined to declare driving under the influence of alcohol (OR=0.67, p<0.001, respectively OR=0.82, p<0.01).

Drivers who have been checked by the police for alcohol at least once in the last 12 months are more likely to report that they drink and drive (OR= 1.25; p<0.001).

Finally, respondents with a high socially desirable responding score are less likely to report that they drink and drive (OR=0.954; p<0.001). The socially desirable responding score has been calculated on the base of the 6 items of question 28 (see appendix 1). It gives valuable insights into the response behaviours of the participants. Apparently, a high socially desirable responding score has an effect on the likelihood of self-reported drink-driving (odds decrease of 5%), suggesting that answers related to drink-driving are subject to social desirability (see also section 3.4 'Limitations of the data').

Table 3: Logistic regression model for drink-driving in the last 30 days, part 2 (Model 1).

Countries	Dependent variable: self-reported drink-driving	
	Odds Ratio	[95% CI]
Reference country: Austria	1	
BE	1.311	(0.961 - 1.788)
CH	1.368*	(1.008 - 1.855)
DE	0.553***	(0.397 - 0.772)
DK	1.260	(0.925 - 1.716)
EL	1.285	(0.938 - 1.760)
ES	1.268	(0.921 - 1.744)
FI	0.312***	(0.213 - 0.457)
FR	1.227	(0.899 - 1.674)
IE	0.390***	(0.272 - 0.561)
IT	0.513***	(0.370 - 0.711)
NL	1.064	(0.770 - 1.470)
PL	0.243***	(0.159 - 0.371)
PT	1.996***	(1.483 - 2.686)
SE	0.322***	(0.213 - 0.488)
SI	1.176	(0.858 - 1.611)
UK	0.869	(0.616 - 1.226)
CA	1.269	(0.926 - 1.739)
CZ	0.210***	(0.133 - 0.334)
HU	0.213***	(0.135 - 0.334)
IL	0.558**	(0.391 - 0.795)
KR	0.407***	(0.274 - 0.605)
US	0.899	(0.651 - 1.241)
AU	1.212	(0.887 - 1.658)
RS	0.879	(0.626 - 1.235)
JP	0.132***	(0.075 - 0.231)
IN	0.383***	(0.262 - 0.562)
EG	0.618*	(0.412 - 0.928)
KE	0.927	(0.645 - 1.332)
NG	0.687*	(0.478 - 0.988)
MA	0.475***	(0.321 - 0.703)
ZA	1.310	(0.955 - 1.798)

Note: esra32_sample weight; * p<0.05, ** p<0.01, *** p<0.001

Compared to Austria (reference category in the logistic regression model of Table 3), the odds of self-declared drink-driving increase by 37% in Switzerland and by 100% in Portugal (p< 0.05, respectively p<0.001). In other words, the probability of self-declared drink-driving is twice as high in Portugal as in Austria. The countries where the likelihood of self-declared drink-driving is significantly lower than in Austria are Germany (OR= 0.55), Finland (OR= 0.31), Ireland (OR= 0.39), Italy (OR= 0.51), Poland (OR= 0.24), Sweden (OR= 0.32), the Czech Republic (OR= 0.21), Hungary (OR= 0.21), Israel (OR= 0.56), the Republic of Korea (OR= 0.41), Japan (OR= 0.13), India (OR= 0.38), Egypt (OR= 0.62), Nigeria (OR= 0.69) and Morocco (0.48).

Table 4: Logistic regression model for drug-driving in the last 30 days, part 1 (Model 2).

Factors (reference category)	Dependent variable: self-reported drug-driving	
	Odds Ratio	[95% CI]
Gender (ref. Male)		
Female	0.603***	(0.539 - 0.674)
Age group (ref. 18-24)		
25-34	1.086	(0.916 - 1.288)
35-44	0.980	(0.821 - 1.171)
45-54	0.685***	(0.562 - 0.835)
55-64	0.616***	(0.490 - 0.773)
65+	0.688***	(0.560 - 0.845)
Level of education (ref. secondary education or lower)		
bachelor s degree or similar	0.848*	(0.746 - 0.965)
master s degree or higher	1.085	(0.920 - 1.280)
Level of urbanisation (ref. urban)		
semi-urban and rural	1.211**	(1.076 - 1.363)
Frequency of driving a car (ref. a few days a month)		
1 to 3 days a week	0.962	(0.813 - 1.137)
at least 4 days a week	0.776**	(0.669 - 0.900)
Social acceptance of drug-driving (ref. unacceptable-neutral: 1-3)		
acceptable (4-5)	3.078***	(2.539 - 3.731)
Personal acceptance of drug-driving (ref. unacceptable-neutral: 1-3)		
acceptable (4-5)	6.740***	(5.323 - 8.533)
How often is drug-driving the cause of a road crash? (ref. not that often-not frequently: 1-3)		
often/frequently (4-6)	0.506***	(0.452 - 0.566)
How likely will you be checked by the police for drug-driving? (ref. unlikely-neutral: 1-4)		
likely (5-7)	1.532***	(1.340 - 1.751)
How many times have you been checked by the police for drugs (other than medication)? (ref. never)		
At least once (1-100)	3.598***	(3.067 - 4.221)
Socially desirable responding score	0.935***	(0.925 - 0.946)
R^2 Nagelkerke (pseudo R^2)	0.262	

Note: esra32_sample weight; * p<0.05, ** p<0.01, *** p<0.001

Possible factors affecting self-declared drug-driving (except countries) are presented in Table 4. Table 5 provides the odds ratios for country.

Compared to men, women are less likely to report that they drug-drive (OR= 0.60; p<0.001).

There is a strong association between age and drug-driving only for drivers older than 44 years. Compared to drivers below 25 years, the odds are 0.69 (p<0.001) for the 45 to 54-year-old drivers, 0.616 (p<0.001) for the 55 to 64-year-old drivers and 0.69 (p<0.001) for the drivers aged 65 years and more. This means that the likelihood of self-reported drug-driving rather decreases with the age of the car drivers.

Compared to drivers with a secondary or lower education, the odds of drug-driving decrease by 15% for drivers with a bachelor's degree or similar (OR=0.85; p<0.05). There is no significant effect on drug-driving if the respondents have a master's degree or higher.

Respondents living in a semi-urban or rural region indicate a 21% higher probability of drug-driving compared to those from urban areas.

The frequency of driving a car has an effect on the likelihood of self-declared drug-driving. The more frequently the respondents drive, the less likely they report drug-driving. People driving at least 4 days a week indicate a 22% lower likelihood of DUI of drugs (other than medication) compared to those who drive only a few days a month (OR= 0.78 p<0.01).

The car drivers who answered that drug-driving is personally and socially acceptable report 3 to 7 times more often that they drive under the influence of drugs compared to drivers that think that this behaviour is not acceptable (OR= 3.08; p<0.001 and OR= 6.74; p<0.001).

If drivers consider drug-driving as a rather frequent cause of a road crash, they have a 50% lower likelihood of (self-declared) drug-driving in the last 30 days.

The odds of drug-driving increase for car drivers who think that the probability of being checked by the police for DUI of drugs (other than medication) is high compared to those who think that it is low (OR= 1.53; p<0.001).

Drivers who have been checked by the police for DUI of drugs (other than medication) at least once in the last 12 months are more than 3 times more likely to declare that they drug-drive (OR= 3.60; p<0.001).

As was the case with drink-driving (see Table 2), there is a significant effect of the socially desirable responding score on drug-driving (OR= 0.94, p< 0.001). Respondents with a high socially desirable responding score have a 6% lower likelihood to declare that they drug-drive. This effect suggests that not only the answers related to drink-driving, but also those related to drug-driving are subject to social desirability.

Table 5: Logistic regression model for drug-driving in the last 30 days, part 2 (Model 2).

Countries	Dependent variable: self-reported drug-driving	
	Odds Ratio	**[95% CI]**
Reference country: Austria		
BE	1.108	(0.685 - 1.795)
CH	0.731	(0.432 - 1.237)
DE	0.523*	(0.301 - 0.907)
DK	0.662	(0.386 - 1.133)
EL	1.433	(0.895 - 2.293)
ES	0.929	(0.566 - 1.524)
FI	0.332**	(0.166 - 0.662)
FR	1.175	(0.720 - 1.917)
IE	1.076	(0.662 - 1.749)
IT	0.819	(0.494 - 1.356)
NL	0.806	(0.481 - 1.350)
PL	0.418**	(0.232 - 0.755)
PT	0.908	(0.551 - 1.499)
SE	0.825	(0.488 - 1.393)
SI	0.699	(0.407 - 1.199)
UK	1.272	(0.775 - 2.087)
CA	2.327***	(1.492 - 3.631)
CZ	0.398**	(0.208 - 0.762)
HU	0.330**	(0.171 - 0.639)
IL	0.657	(0.384 - 1.125)
KR	0.545*	(0.312 - 0.953)
US	2.566***	(1.656 - 3.978)
AU	0.940	(0.574 - 1.539)
RS	0.812	(0.468 - 1.407)
JP	1.679*	(1.063 - 2.652)
IN	2.962***	(1.905 - 4.606)
EG	2.177**	(1.390 - 3.409)
KE	2.644***	(1.684 - 4.152)
NG	4.937***	(3.214 - 7.583)
MA	2.511***	(1.607 - 3.924)
ZA	2.088**	(1.348 - 3.237)

Note: esra32_sample weight; * p<0.05, ** p<0.01, *** p<0.001

The countries where the likelihood of self-declared drug-driving is significantly higher than in Austria (reference country) are Canada (OR= 2.33), USA (OR= 2.57), Japan (OR= 1. 68), India (OR= 2.96) and all African countries (Egypt, Kenia, Nigeria, Morocco, South Africa). Strikingly, drivers from Nigeria have a 5 times higher likelihood of self-declared drug-driving compared to drivers from Austria (OR= 4.94; p<0.001). The countries where the likelihood of self-declared drug-driving is significantly lower than in Austria are Germany (OR= 0.52), Finland (OR= 0.33), Poland (OR= 0.42), the Czech Republic (OR= 0.40), Hungary (OR= 0.33) and the Republic of Korea (OR= 0.55).

3.2.2   Comparison of countries in two-dimensional graphs

In order to explore and visualize the link between two variables at the level of the different countries, two-dimensional graphs were produced. Thanks to these bivariate analyses, we can for example observe to which extent the proportion of car drivers who reported drink-driving at least once over the last 30 days is associated with social acceptability, subjective norms or perceived behaviour control (self-efficacy) in the different countries.
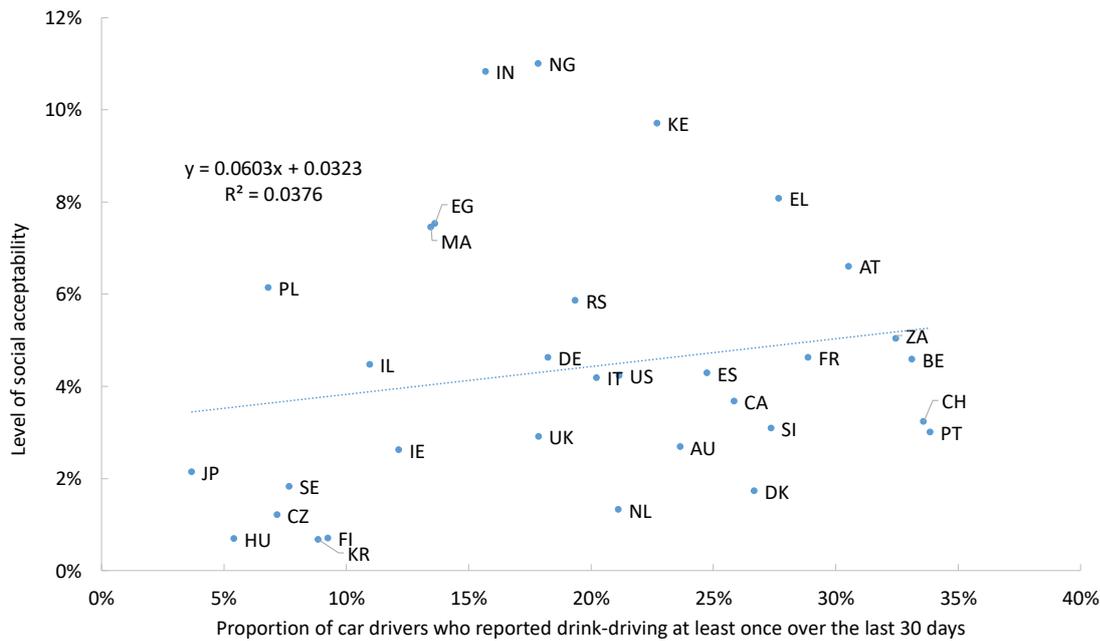
Figure 20: Relationship between the level of social acceptability and the proportion of drivers who report drink-driving.

Figure 20 indicates that there is apparently a very weak link between the level of social acceptability and the proportion of car drivers who reported driving under the influence of alcohol in the different countries (the correlation coefficient is r=0.195).

However, we observe that in countries where the level of social acceptability of drink-driving is particularly low (like in Hungary, the Republic of Korea, Finland and the Czech Republic), the proportion of car drivers who reported drink-driving is also low.
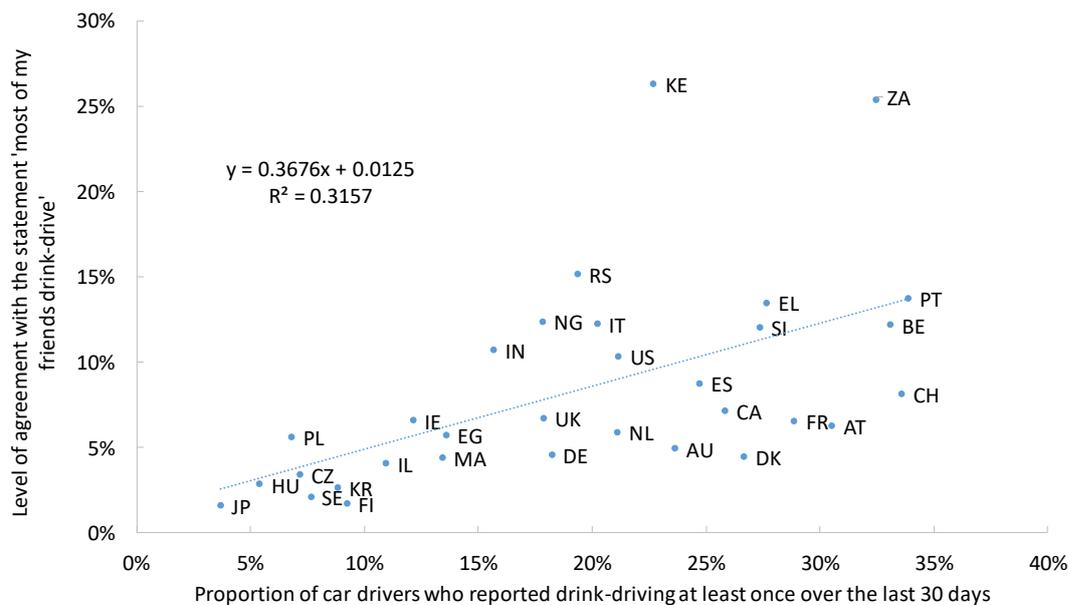
Figure 21: Relationship between the level of agreement with 'Most of my friends would drive after having drunk alcohol' and the proportion of drivers who report drink-driving.

In countries where the proportion of car drivers who reported drink-driving is high, the level of agreement for the subjective norm 'most of my friends drink-drive' tends to be high too and vice-versa (see Figure 21). Especially in South Africa and to a lesser extent in Portugal and Belgium, both variables are rather high. At the other end, we find countries with a low proportion of car drivers who report drink-driving and a low level of agreement with the statement 'most of my friends drink-drive'. These countries are Japan, Hungary, Poland, the Czech Republic, Sweden, the Republic of Korea and Finland.

In Switzerland, Austria and France, this relationship seems less obvious: in these countries, the proportion of car drivers who reported driving under the influence of alcohol is high, while the level of agreement for the subjective norm is rather low.
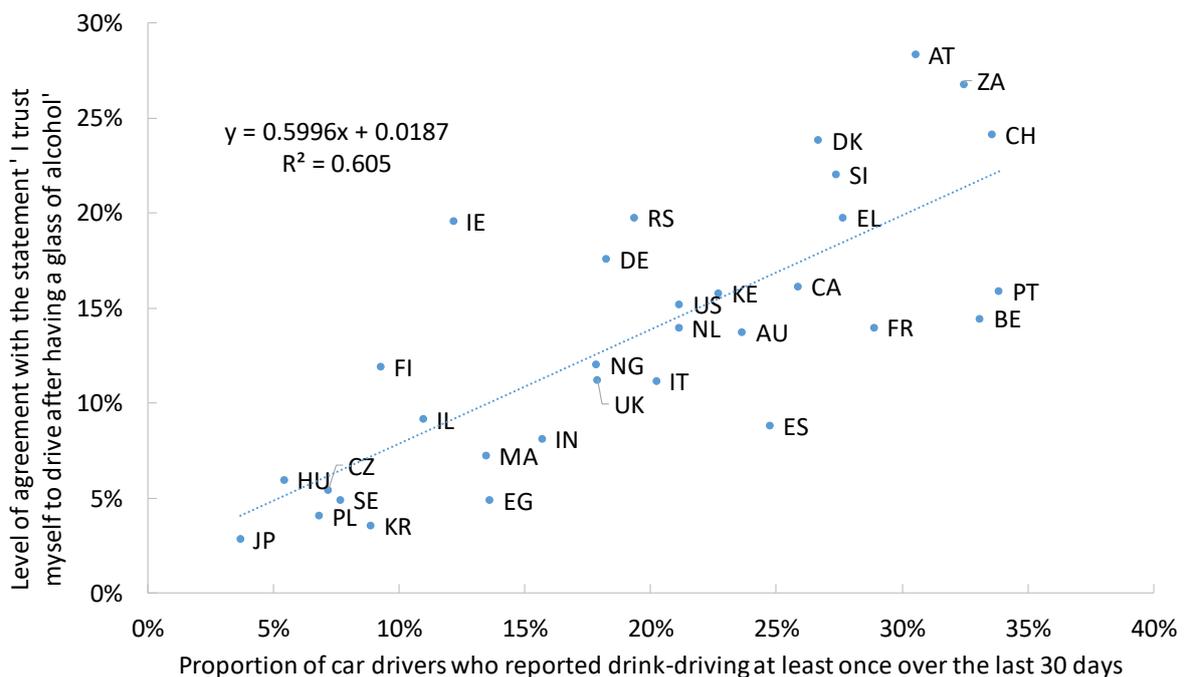
Figure 22: Relationship between the level of agreement with 'I trust myself to drive after having a glass of alcohol' and the proportion of drivers who report drink-driving.

As revealed in Figure 22, there is a rather strong relationship between the proportion of car drivers who reported drink-driving at least once over the last 30 days and the level of perceived behaviour control in the different countries. Here, the perceived behaviour control is operationalized with the statement 'I trust myself to drive after having a glass of alcohol'.

If in a country the proportion of car drivers who reported drink-driving is high, the level of agreement with the statement mentioned above is also high. This is particularly true for Switzerland, South Africa and Austria and, to a lesser extent, for Portugal and Belgium. At the other end, Japan, Hungary, Poland, the Czech Republic, Sweden and the Republic of Korea have a low rate of car drivers indicating that they drive under the influence of alcohol as well as a low rate of agreement with the statement 'I trust myself to drive after having a glass of alcohol'.

The chart shows a scatter plot with:
- Y-axis: "Proportion of car drivers who have been checked for alcohol at least once in the last 12 months" ranging from 0% to 60%
- X-axis: "Proportion of car drivers who perceived it as (rather) likely to be checked for alcohol" ranging from 0% to 60%
- Equation: y = 0.958x - 0.004, R² = 0.4875
- Data points labeled: KR, AU, PL, RS, CZ, KE, FI, HU, IN, ES, EL, BE, ZA, PT, SE, IE, SI, AT, FR, EG, IL, CH, NG, NL, MA, DK, IT, CA, DE, JP, UK, US
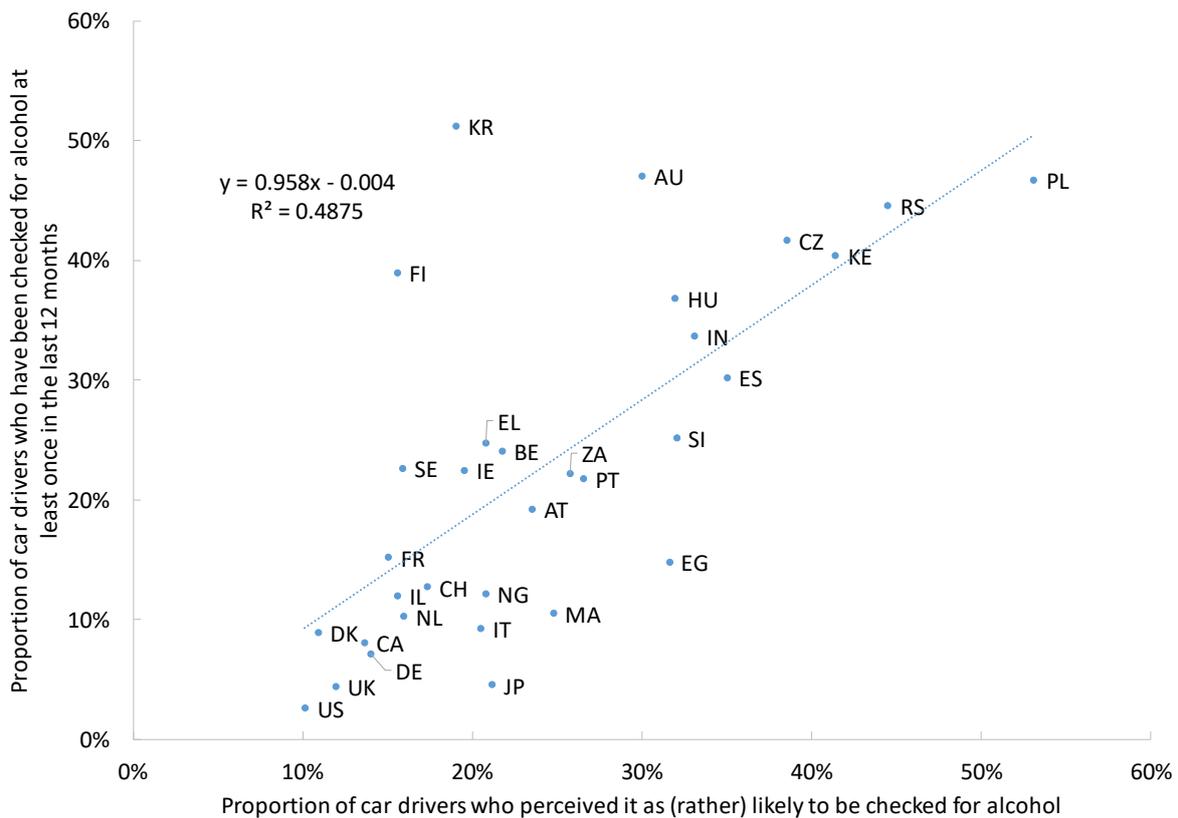
Figure 23: Relationship between the perceived likelihood of being checked for alcohol and the alcohol checks in the countries.

As shown in Figure 23, the relationship between the perceived probability of being checked for alcohol by the police and the experienced alcohol checks is not as strong as might be expected. The correlation coefficient is 0.700 (R^2= 0.488). Overall, in countries where the proportion of car drivers who have been checked for alcohol at least once in the last 12 months is high, the proportion of those who perceive it as (rather) likely to be checked for alcohol is also high. This is the case in Poland, Serbia, Kenia and the Czech Republic.

There are also many countries where both proportions are low, such as the United States, the United Kingdom, Denmark, Germany, Canada, the Netherlands, Israel, France and Switzerland

However, in some countries, checks appear to be frequent, but a relatively large proportion of drivers do not expect to be tested for alcohol (the Republic of Korea, Australia and Finland). In Finland for example, 39% of the car drivers have answered that they have been checked for alcohol at least once in the last 12 months, but only 16% perceived it as (rather) likely to be checked for alcohol, which means that 84% don't really expect to be checked for alcohol.

In some other countries, the proportion of car drivers reporting that they have been tested for alcohol is rather low and the proportion of those who perceive it (rather) likely to be checked for alcohol is quite high, as in Japan, Morocco and Egypt.

As noted in Section 3.1.6, car drivers are motivated to comply with the law not only because of frequent police checks for alcohol, but also if their perceived likelihood of getting caught is relatively high. The latter thus plays an important role in preventing drink-driving (Meesmann et al., 2015; Krüger & Schöch, 1995 in Cavegn et al., 2008, Vanlaar, 2007).

3.3   Comparison with other findings

In the thematic report "Driving under the influence of alcohol and drugs" based on the ESRA1 results of the first wave (2015), we compared data on impaired driving in European countries with results from roadside surveys conducted within the DRUID-Project between January 2007 and July 2009 (Achermann Stürmer, 2016, Howing et al., 2011). At that time, 9 countries had participated in DRUID roadside surveys as well as in ESRA1.

The surveys realised in the ESRA and DRUID projects constitute two different approaches for assessing the extent of the consumption of impairing substances among drivers. In the ESRA survey, the information is obtained through self-reports of driving under the influence of alcohol or drugs while in the DRUID project, fluid samples provided by drivers on the road are analysed in order to determine the prevalence of impairing substances.

On the one hand, household survey data provide valuable information on the extent of DUI of alcohol or drugs and on the characteristics of those who report doing so, the disadvantage of this method being that self-reported behaviours can be biased by social desirability and inaccurate memories (OECD and ITF, 2010). On the other hand, roadside surveys may be considered as the most valid source of data, because they are based on objective measurements from fluid samples delivered by drivers. However, several factors have an impact on the quality of road survey results, such as the method (i. e. collection of blood, oral fluid or urine samples; at a specific time of day or week versus every day, at any time, etc.). Another important issue is the non-response rate. If it is high, it is important to check if the drivers who refused to provide a sample are more likely to have consumed an impairing substance than the drivers who participated in the survey in order to estimate to which extent the results may be biased (OECD and ITF, 2010).

In the DRUID roadside surveys, drivers of passenger cars or vans were stopped by the police according to a procedure defined in the context of the research. The drivers that had been stopped were invited to participate in the survey on a voluntary basis, except for Italy where participation was mandatory (Howing et al., 2011). Interviews with the drivers were realised and their saliva or blood collected. In total, the toxicological laboratories in the 13 participating countries analysed 48 542 samples in which 23 substances were considered with predefined analytical cut-offs (Howing et al., 2011). The surveys in the different countries took place at all hours of the day and at all days of the week. The non-response rates differed widely in the different countries, from 0% in Italy (where the survey was mandatory) to 52% in Belgium. For the countries with relatively high non-response rates, the risk of having a non-response bias has been evaluated (Howing et al., 2011, pp. 27-30). In countries where the distribution of socio-demographic characteristics of respondents and non-respondents was similar and where the reason for most of the drivers not participating at the survey was 'lack of time', the non-response bias has been considered as rather low.

We are aware that the DRUID and ESRA2 projects lie 10 years apart and that the data collected in an online household survey differ from those of a roadside survey. Nevertheless, we decided to realise graphs linking the results of DRUID and ESRA2 in order to analyse the relationship between the self-reported rates of DUI of alcohol, drugs and medication and the corresponding prevalence rates in the different countries. We were particularly interested in the ranking of countries on the basis of both types of data. Moreover, since the last thematic report was realized in 2016, the results of two more countries (the Czech Republic and Hungary) have become available, bringing the total to 11 out of the 13 countries that had participated at the DRUID roadside surveys.

The following graphs consider the self-reported behaviours over the last 30 days for all three types of substances (alcohol, drugs and impairing medicines). In ESRA1, the corresponding questions (and graphs) referred to the last 12 months. As shown in appendix 3, Figure 34, the relationship between the proportions of car drivers who reported drink-driving at least once over the last 12 months and over the last 30 days (both axes ESRA2) is very strong (correlation coefficient is nearly 1). Additionally, Figure 35 in appendix 3 shows the relationship between self-declared drink-driving over the last 12 months in ESRA1 and ESRA2 (only for European countries). The association is also very strong (correlation coefficient of 0.891). Overall, the proportion of car drivers that report that they drink-drive tends to decrease in the different countries over time. However, this does not necessarily mean that a change in behaviour has occurred. For example, the results may reflect a shift in the social desirability bias, influenced by a change in the social norms, so that people are less willing to admit their behaviour (see also the chapter "limitations of the data").
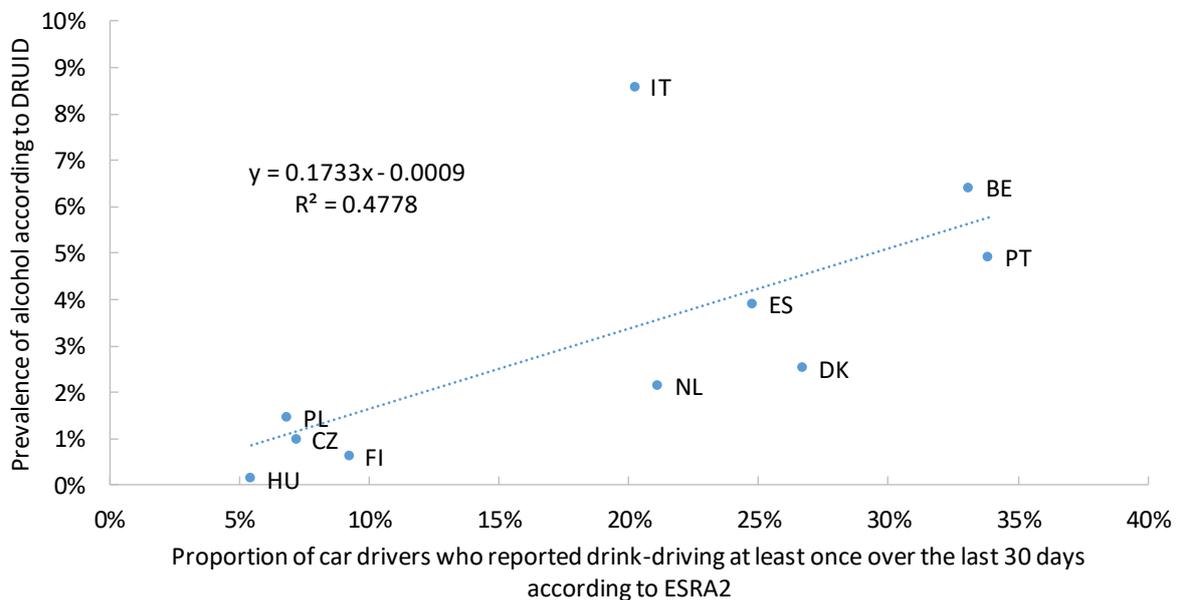
Figure 24: Self-declared drink-driving at least once over the last 30 days according to ESRA2 and prevalence of alcohol according to DRUID.

As shown in Figure 24, there is a clear relationship between the self-reported drink-driving rate and the prevalence of alcohol in 10 countries (in Sweden, the roadside survey provides results for drugs and medication, but not for alcohol). In the countries where the self-reported drink-driving rate is high, the prevalence of alcohol in the roadside survey also tends to be high (Belgium, Portugal), and in the countries where the self-reported drink-driving rate is low, the prevalence of alcohol is also low (Hungary, Poland, the Czech Republic and Finland). The correlation coefficient indicates a clear association (0.691). It should be noted that compared to the other countries, Italy stands out with a particularly high prevalence of alcohol in the roadside survey. This may be due to the fact that the participation in the study was compulsory in this country only.
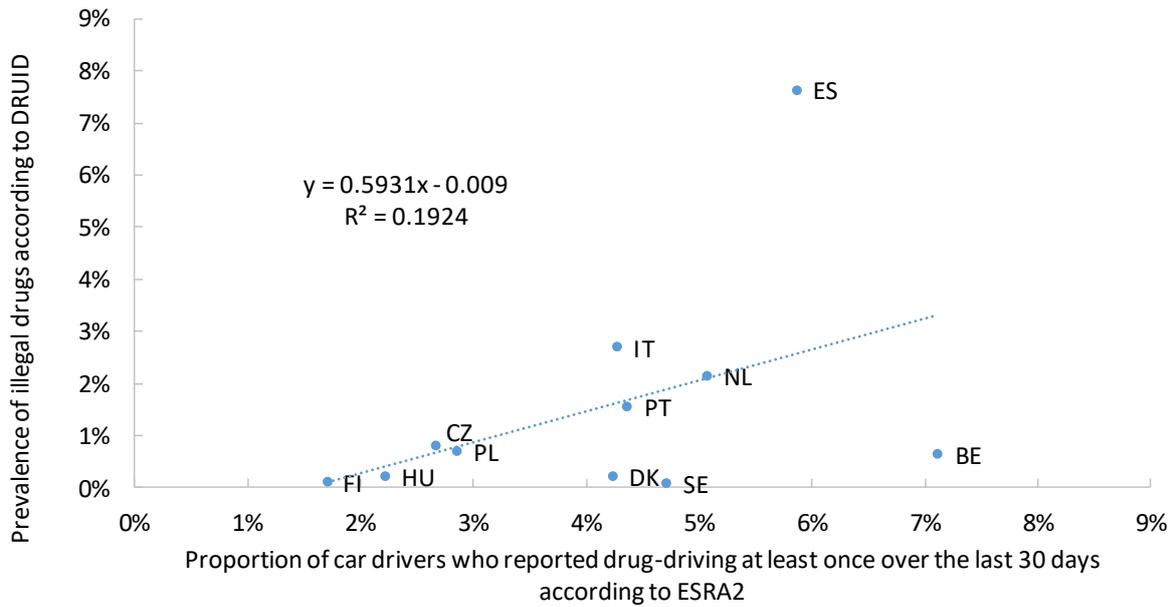
Figure 25: Self-declared drug-driving at least once over the last 30 days according to ESRA2 and prevalence of illegal drugs according to DRUID.

There is also a positive, although weaker, relationship between the rate of self-declared drug-driving and the prevalence of illegal drugs in roadside surveys (Figure 25). The correlation coefficient for these variables is 0.438. As for alcohol, both the rate of drug-driving and the prevalence of drugs were particularly low in Finland, Hungary, the Czech Republic and Poland. In Denmark, Sweden, and especially Belgium, we note that the data are not congruent. While drug prevalence measured in roadside surveys is very low in these countries, the rate of self-declared drug-driving is relatively high. Besides, compared to the previous report, the self-reported drug-driving rate has decreased considerably in Spain and Poland, while it has increased in Belgium. The Belgium evolution is in line with results of other national surveys such as e.g. the national unsafety survey of Vias institute (2019).
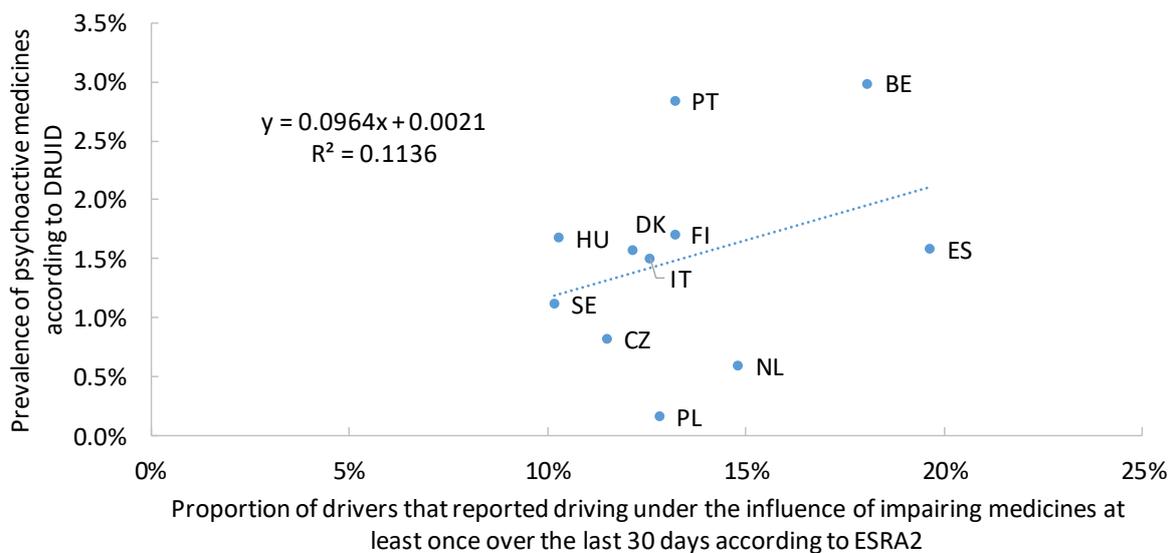
Figure 26: Self-declared DUI of impairing medicines at least once over the last 30 days according to ESRA2 and prevalence of psychoactive medicines according to DRUID.

As shown in Figure 26, a rather weak positive relationship can be observed between the proportion of car drivers who reported DUI of medication that may impair the driving ability and the prevalence of psychoactive medicines in the different countries (correlation coefficient of 0.338). In this case, the relationship is strongly influenced by the results in Belgium, where both the rates of self-declared DUI of impairing medicines and the prevalence of such substances are rather high. In Sweden, Hungary, the Czech Republic, Denmark, Italy and Finland, both rates are rather low. In Portugal, Poland, the Netherlands and Spain, the data are not quite congruent.

It is also interesting to link the ESRA2 results to other data. Therefore, we extracted several data from the WHO Global Status Report on Alcohol and Health 2018: the legal BAC limits, the estimated quantity of pure alcohol consumed per capita and the alcohol-attributable deaths in the road traffic per million inhabitants for the different countries in the world and compared them with the proportion of car drivers who reported driving under the influence of alcohol. It should be noted that the comparability of data on alcohol-related deaths may be questioned. The methods of data collecting on alcohol-related road accidents differ from one country to another. In many countries, official statistics are affected by under-reporting of alcohol-related accidents. In addition, the definitions of what constitutes an alcohol-related road accident are different among the countries (OECD and ITF, 2017).
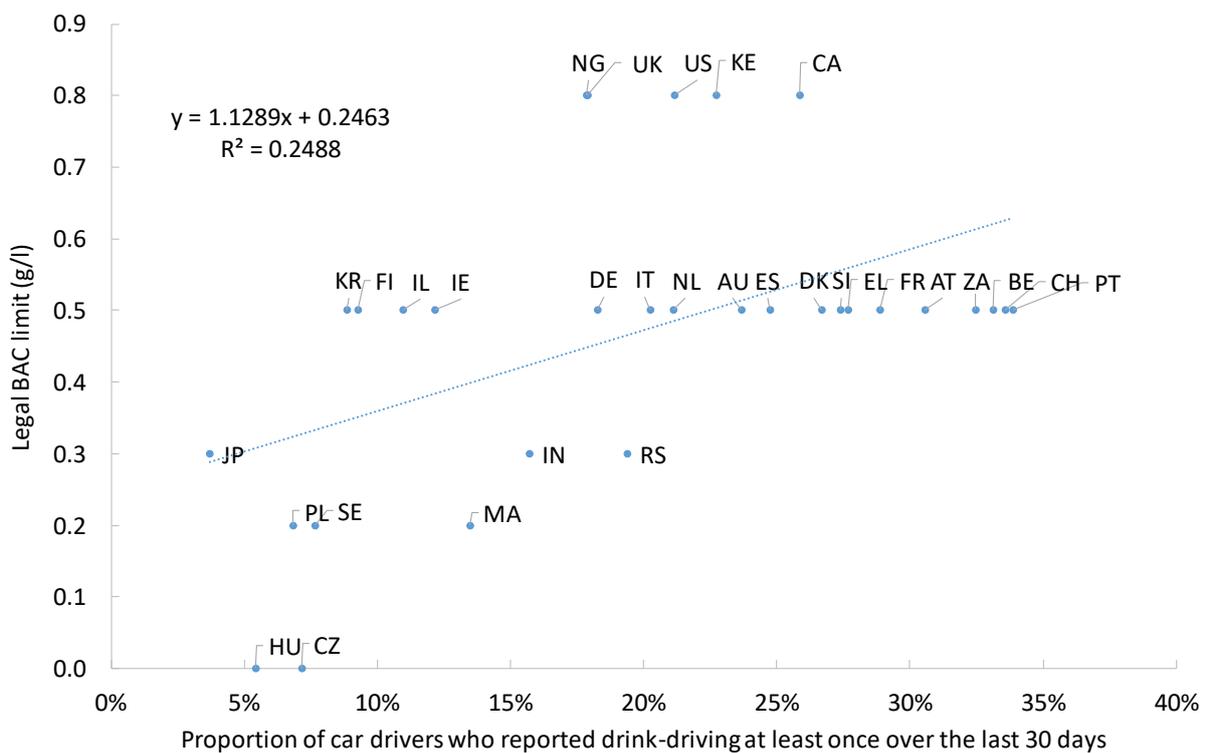
Figure 27: Relationship between self-declared drink-driving and the legal BAC limits (g/l) in the countries.

As shown in Figure 27, there is a small, but positive relationship between the legal BAC limits and the proportion of car drivers who reported driving under the influence of alcohol in the different countries. In countries where the legal BAC limits are very low (0 or 0.2 g/l), the proportion of car drivers reporting drink-driving is low too (Hungary, the Czech Republic, Poland, Sweden and Morocco). This proportion was no more than 13%.

In the countries with high legal BAC limits (i. e. 0.8 g/l), the self-reported drink-driving rates are higher but not the highest; they range from 18% (Nigeria) to 26% (Canada).

The majority of countries have legal BAC limits of 0.5 g/l and among these countries, there is a wide disparity in the proportion of car drivers reporting drink-driving, ranging from 9% (the Republic of Korea) to 34% (Portugal). In several of these countries, this proportion is higher than in countries with BAC limits of 0.8 g/l.

This result is not really surprising, as drivers in countries with relatively high legal BAC limits (at least 0.5 g/l) may be in compliance with the law, even if they drive after drinking, while in countries with very low legal BAC limits, the drivers commit an offence if they drink-drive.
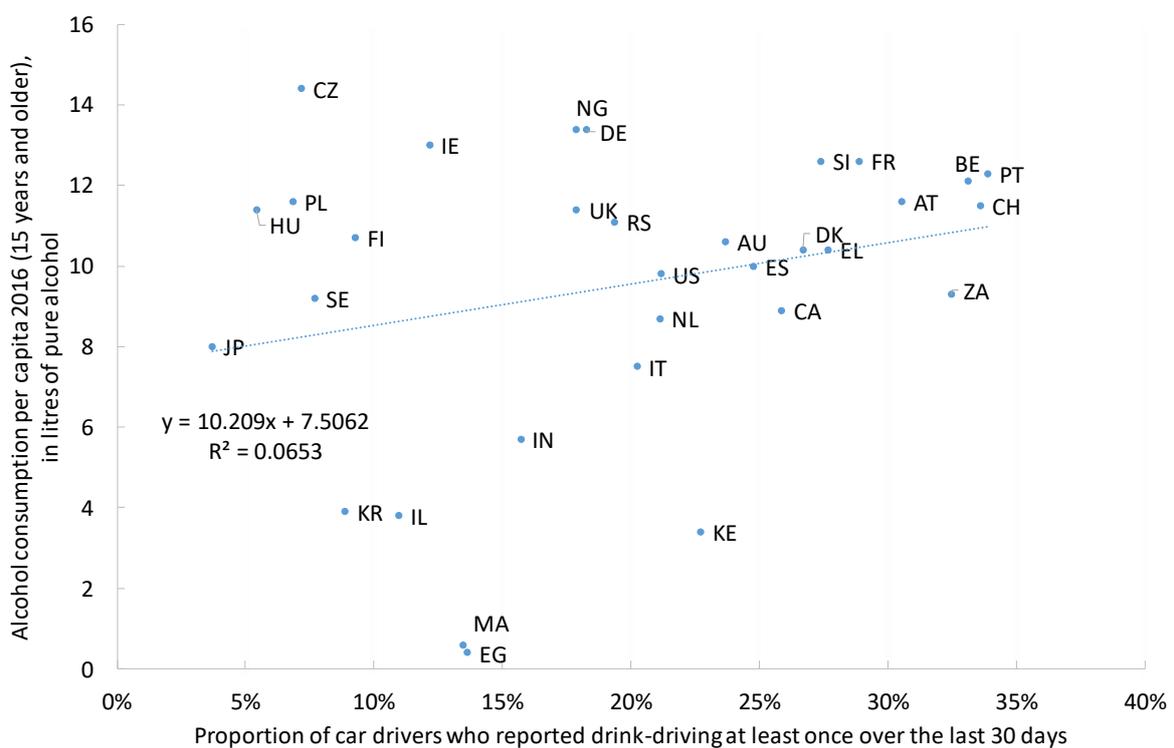
Figure 28: Relationship between self-declared drink-driving and the alcohol consumption per capita (15 years and older).

Figure 28 indicates that there is a weak relationship between the alcohol consumption per capita and the drink-driving rates in the different countries, suggesting that in countries with high level of alcohol consumption, the probability that the drivers drive under the influence of alcohol is not higher than in countries with a low level of alcohol consumption.
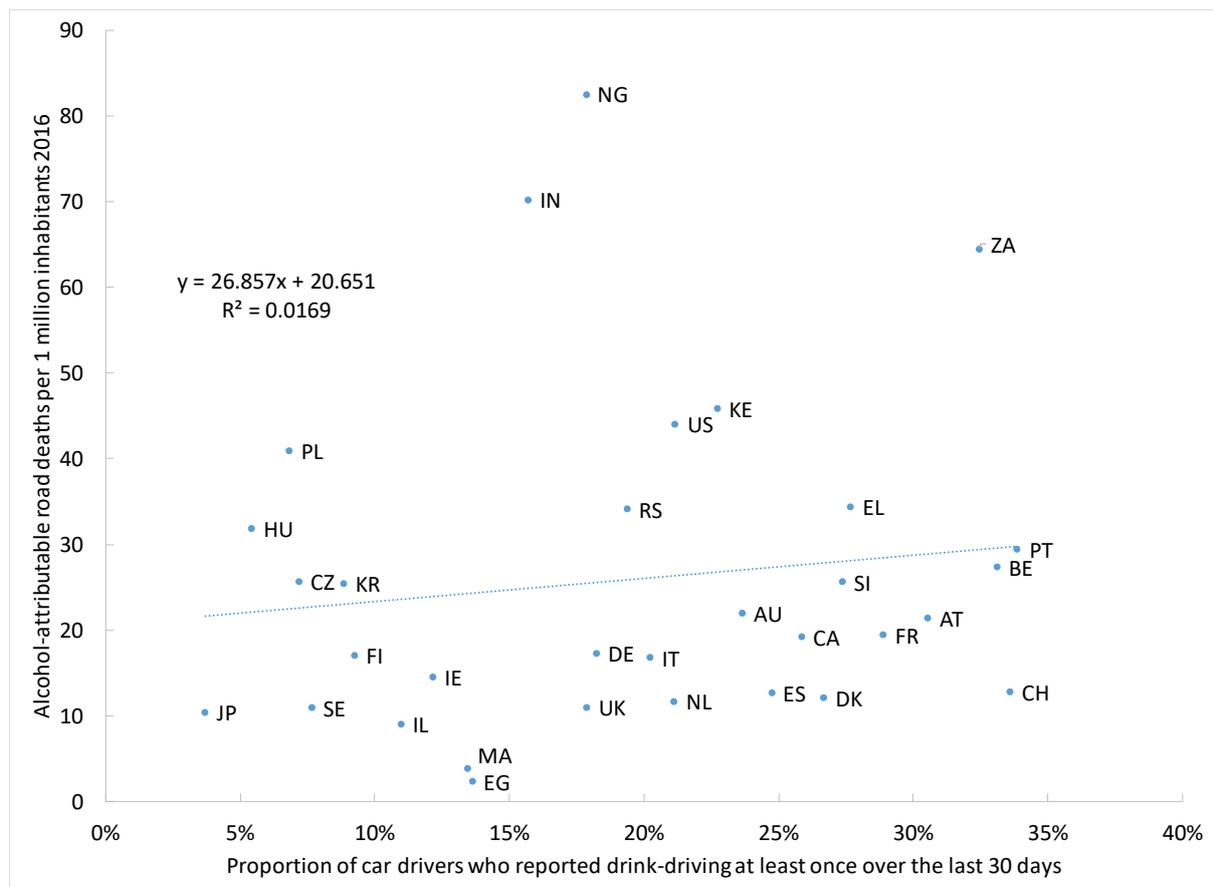
Figure 29: Relationship between self-declared drink-driving and the alcohol-attributable road deaths per 1 million inhabitants.

Apparently, a high proportion of car drivers reporting drink-driving is not linked with a high level of alcohol-attributable road deaths per 1 million inhabitants (Figure 29). In Switzerland for example, there is a high proportion of car drivers indicating that they drink-drive, but the number of alcohol-attributable road deaths per 1 million inhabitants is rather low. On the other hand, countries like Poland, Hungary, the Czech Republic or the Republic of Korea have a low proportion of drivers reporting DUI of alcohol, but a relatively high number of alcohol-attributable road deaths per 1 million inhabitants. In Nigeria and India, the number of alcohol-attributable road deaths per 1 million inhabitants is particularly high and the proportion of self-reported drink-driving rather moderate.
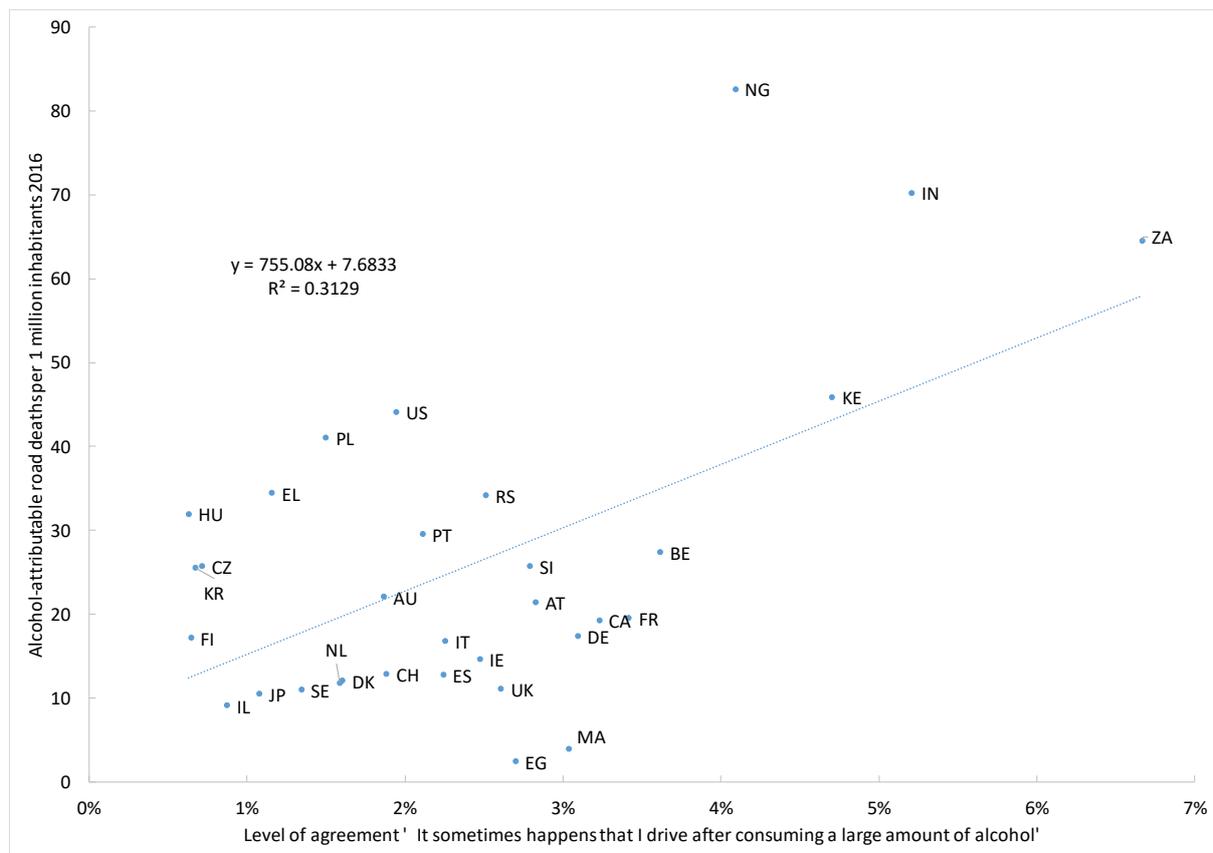
Figure 30: Relationship between the level of agreement to 'It sometimes happens that I drive after consuming a large amount of alcohol' and the alcohol-attributable road deaths per 1 million inhabitants.

The number of alcohol-attributable road deaths per 1 million inhabitants in the different countries seems to be more linked to the proportion of car drivers who admit that they drive sometimes after consuming a large amount of alcohol (see Figure 30). Countries like South Africa, India and Nigeria have the largest proportion of drivers admitting such behaviours and the highest number of alcohol-attributable road deaths per 1 million inhabitants.

3.4   Limitations of the data

In general, self-report data are vulnerable to a number of biases, including (Choi & Pak, 2005; Krosnick and Presser, 2010): desirability bias – the tendency of respondents to provide answers which present a favourable image of themselves, e.g. individuals may over-report good behaviour or under-report bad, or undesirable behaviour; bias through misunderstanding of questions (e.g. questions with difficult words, long questions); or recall error – unintentional faulty answers due to memory errors.

Results of logistic regression were adjusted for the Social Desirability Scale (SDS), but descriptive results were not. The effect of the SDS on the self-declared behaviours was negative (OR between 0.93-0.955 for both models) showing that the higher the score of the SDS, the lower the likelihood to declare the behaviour. These results indicate that the real percentages of unsafe behaviours may be higher than the reported percentages of the self-declared behaviours.

Despite the advantages of online surveys, the representativeness of the surveyed populations may be a problem, mainly for countries with low rates of internet use. That is the case of some of the countries

of ESRA2 survey where the percentage of population using the internet is low (lower than 30% in Kenya and Nigeria, and lower than 50% in India and Egypt).

The number of African respondents aged 65 or older was quite low, so that the answers of this particular age group in African countries cannot be considered to be representative.

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.

4 Summary, discussion and recommendations

Major findings

The research questions can be answered – based on the ESRA2-results - as follows:

In which countries and regions is there a high prevalence of impaired driving due to alcohol, drugs or medication that may influence the ability to drive (defined in terms of self-declared behaviours)?

- The three countries with the highest prevalence rates for drink-driving (at least once in the last 30 days) are all situated in Europe: Portugal (34%), Switzerland (34%) and Belgium (33%).
- The largest proportions of self-declared drug-driving (once or more in the last month) are found in Africa and in Asia/Oceania: Nigeria (24%), India and Egypt (both 20%).
- The countries with the highest prevalence of driving under the influence of medication (at least once in the last 30 days) are spread over 3 continents: India (26%), followed by France and South Africa (both 23%).

Is there a great variability of such behaviours across countries and regions?

- In Europe, the proportion of car drivers who report driving after drinking alcohol varies widely from one country to another. It ranges from 5% in Hungary to 34% in Portugal, which represents a difference of 31 percentage points. In contrast, the response profile for drug-driving is most homogeneous. The difference between the lowest (1.7% in Finland) and the highest (7.5% in the United Kingdom) values amounts to only 6 percentage points.
- In North America, the proportions of self-reported impaired driving are very similar in Canada and the United States.
- There are large disparities between the countries of Asia and Oceania. The country with the highest proportion of car drivers who report drink-driving is Australia (24%), and the country with the lowest proportion is Japan (4%). With respect to DUI of drugs or medication, India is the country with the highest (20%, resp. 26%) and Israel with the lowest values (3%, resp. 6%).
- Among the African countries, South Africa shows an especially high proportion of self-declared drink-driving (32%), while in Morocco and Egypt, the prevalence rates are more than two times lower (below 15%). Nigeria has the highest proportion of self-reported drug-driving of all 32 countries (24%). The African country with the lowest drug-driving rate is South Africa (13%).

Do the attitudes and risk perceptions with respect to impaired driving considerably differ across countries and regions?

- The acceptability rates for driving under the influence of an impairing substance are higher in Asia/Oceania and Africa (between 4.9% and 7.2%) than in Europe and North America (between 1.2% and 2.2%).
- The countries with the highest acceptability rates for impaired driving are India (drink-driving: 7.2% and driving under the influence of medication: 8.5%) and Egypt (drug-diving: 8.7%).
- The highest proportions of respondents indicating that they trust themselves to drive after having a glass of alcohol are found in Europe (Austria, 28%; Switzerland, 24%; Denmark, 24% and Slovenia, 22%), with one exception: South Africa (27%).
- In almost all countries, the majority of respondents replied that they were in favour of stricter traffic rules for drink-driving. The countries with the largest agreement rates are the Republic of Korea (97%), India (95%), Nigeria (93%) and Kenya (92%). Only in Egypt (14%) and Morocco (48%), there is a minority of respondents who consider that the rules for drink-driving should be stricter.
- In all regions, except in the Asian and Oceanian region, drink-driving was the most frequently mentioned cause for a road car crash. In the Asian and Oceanian region, drink-driving was the second most frequently mentioned cause of accident, just behind driving at excessive speed.

- Drug-driving is less often considered as a possible cause of a road crash involving a car. While DUI of drugs is the third most frequently reported cause of accidents in Europe, in North America and Africa, it is ranked 5th and in the Asia and Oceania region, even in the penultimate (=6th) position, just before 'using hands-free phone while driving'.
- Overall, the respondents in Europe tend to estimate the different possible causes of a road accident involving a car as more frequent than the respondents of the other regions.

Which countries have the highest/lowest proportion of respondents having been checked by the police for drink-driving or drug-driving and is the expectation of being checked by the police in line with the control intensity?

- The proportion of respondents who were checked for drink-driving in the last 12 months is the highest in the Republic of Korea, Australia, Poland and Serbia (about 50%) and the lowest in the United States, the United Kingdom and Japan (no more than 5%).
- The countries with the highest rates of police checks for drug-driving are Kenya (17%), Egypt (14%) and India (12%). At the other end of the scale, we find Japan, Israel and the United States, with no more than 2% of respondents reporting having been checked at least once in the last 12 months.
- The relationship between the perceived probability of being checked for alcohol by the police and the experienced alcohol checks is not as strong as might be expected. The correlation coefficient is 0.700 (R^2= 0.488). Overall, in countries where the proportion of car drivers who have been checked for alcohol at least once in the last 12 months is high, the proportion of those who perceive it as (rather) likely to be checked for alcohol is also high, and vice-versa.
- However, in some countries, although the proportion of people checked is quite high, the perceived probability of being checked is low (the Republic of Korea, Australia and Finland). In Finland, for example, 39% of car drivers replied that they had been tested for alcohol at least once in the past 12 months, but only 16% perceived it as (rather) likely to be tested for alcohol.

What is the influence of gender and age on these behaviours and attitudes?

- Overall, men report more often DUI of alcohol and of drugs (other than medication) than women. Young drivers are more likely than older drivers to report drug-driving; the relationship between the age and driving under the influence of alcohol or medication is less clear.
- The level of personal acceptability of impaired driving (alcohol, drugs and medication) is generally lower among women than among men. In Asia and Oceania, the opposite is true. However, only the acceptability of drug-driving is statistically significant (female: 5.8% and male: 4.0%). In addition, the following trend emerges with respect to the age of respondents. The older they are, the less likely they are to accept behaviours such as impaired driving.

Which explanatory variables are associated with self-reported drink-driving?

- Women are less likely to report that they drink and drive than men. The odds are reduced by 26%.
- The likelihood of drink-driving increases with the age of the drivers. In comparison with the 18 to 24-year-old group, the odds ratios are respectively 1.42, 1.47, 1.49, 1.84 and 2.15 for the age groups 25-34, 35-44, 45-54, 55-64 and 65 years and more.
- Compared to car drivers with a secondary or lower education, the odds of drink-driving increase by 25% for drivers with a master's degree or higher.
- The likelihood of drink-driving also increases with the driving frequency. In comparison with the persons who drive only a few days a month, the odds ratios are respectively 1.32 and 1.62 for persons who drive 1 to 3 days a week and at least 4 days a week.
- Respondents who believe that they have a high self-efficacy (i. e. they trust themselves to drive after having a glass of alcohol, are confident that they have the ability to drive when a little drunk after a party or after drinking a large amount of alcohol) are much more likely to report that they drink-drive. The odds increase by 2.48.

- If car drivers indicate having habits such as 'I often drive after drinking alcohol', 'Even when I am a little drunk after a party, I drive' or 'It sometimes happens that I drive after consuming a large amount of alcohol', they are three times more likely to report drink-driving.
- The odds of self-reported drink-driving decrease by 13% for respondents who have the intention to do their best not to DUI of alcohol in the next 30 days.
- Car drivers who consider drink-driving as a rather frequent cause of a road crash are about 14% more likely to declare that they drive under the influence of alcohol than those who think that drink-driving is not that often the cause of an accident.
- Respondents giving large support to measures or to enforcement related to drink-driving are less inclined to declare DUI of alcohol. The odds are reduced by 33%, respectively by 18%.
- Drivers who have been checked by the police for alcohol at least once in the last 12 months are more likely to report that they drink and drive. The odds are increased by 25%.
- Finally, respondents for which a high socially desirable responding score has been calculated are less likely to report that they drink and drive. For every one-point increase in the score, the odds of drink-driving are reduced by 5%.
- Compared to Austria (reference category in the logistic regression model), the odds of self-declared drink-driving increase by 38% in Switzerland and by 100% in Portugal. In all other countries, the likelihood of drink-driving is either similar or significantly lower.

Which explanatory variables are associated with self-reported drug-driving?

- Compared to men, women are 40% less likely to report that they drug-drive.
- There is a strong association between age and drug-driving only for drivers older than 44 years. Compared to drivers below 25 years, the odds decrease by 31% for the 45 to 54-year-old drivers, 38% for the 55 to 64-year-old drivers and 31% for the drivers aged 65 years and more.
- Compared to drivers with a secondary or lower education, the odds of drug-driving decrease by 15% for drivers with a bachelor's degree or similar. There is no significant effect on drug-driving if the respondents have a master's degree or higher.
- Respondents living in a semi-urban or rural region indicate a 21% higher probability of drug-driving compared to those from urban areas.
- The more frequently the respondents drive, the less likely they report drug-driving. People driving at least 4 days a week indicate a 22% lower likelihood of DUI of drugs (other than medication) compared to those who drive only a few days a month.
- The car drivers who answered that drug-driving is personally and socially acceptable report 3 to 7 times more often that they drive under the influence of drugs compared to drivers that think that this behaviour is not acceptable.
- If drivers consider drug-driving as a rather frequent cause of a road crash, they have a 50% lower likelihood of (self-declared) drug-driving in the last 30 days.
- The odds of drug-driving increase by 53% for car drivers who think that the probability of being checked by the police for DUI of drugs (other than medication) is high compared to those who think that it is low.
- Drivers who have been checked by the police for DUI of drugs (other than medication) at least once in the last 12 months are more than 3 times more likely to declare that they drug-drive.
- As it was the case with drink-driving, respondents for which a high socially desirable responding score has been calculated are less likely to report that they drug-drive. For every one-point increase in the score, the odds of drug-driving are reduced by 6%.
- The countries where the likelihood of self-declared drug-driving is significantly higher than in Austria (reference country) are Canada (OR= 2.33), USA (OR= 2.57), Japan (OR= 1. 68), India (OR= 2.96) and all African countries (Egypt, Kenia, Nigeria, Morocco, South Africa). Strikingly, drivers from Nigeria have a 5 times higher likelihood of self-declared drug-driving compared to drivers from Austria (OR= 4.94).

Discussion

- A large part of the population is aware of the inappropriateness of driving after having consumed an impairing substance: no more than 9% of the surveyed persons in a given country expressed the opinion that driving under the influence of an impairing substance is acceptable or rather acceptable. In most countries, this proportion was below 3%.
- The level of acceptability for such behaviours is clearly lower among women than men and among the older age group than the younger.
- Moreover, there is a large support for policy or enforcement measures related to drink-driving (at least 75% of respondents in favour of such measures in most countries).
- In addition, the risk or danger that road users associate with this type of behaviours is (rather) high. Drink-driving was the most frequently mentioned cause for a road car crash in three of four regions, with the highest proportion in Europe (81%). Even if DUI of drugs is less often considered as a possible cause of a road crash involving a car, the proportion of respondents who believe it as a possible cause ranges between 51% in Asia/Oceania and 75% in Europe).
- Despite a low acceptance, large support of safety measures and high risk perception concerning impaired driving, there is still a relatively high percentage of car drivers all over the world who seem not to be able to prevent from DUI of alcohol, drugs or medication that may influence the driving ability.

Recommendations

The efforts made in the past decades in order to reduce road casualties due to impaired driving must continue. The potential for reducing road traffic accidents due to impaired driving differ however greatly between the countries. Further research is needed for a better understanding of the influence that illegal and medicinal drugs may have on driving ability and to estimate the prevalence in the course of time of drugs among the driving population. Moreover, it is expected that with the ageing population in Europe, there will in the future be an increasing proportion of persons driving under the influence of medicines that may impair the driving ability.

Policy recommendations at national and regional level

- Establish an impaired driving strategy that is based on a combination of measures, such as legislative initiatives, enforcement practices, awareness campaigns through media (if possible combined with deterrence through enforcement) and further research.
- Raise awareness of the impact of impaired driving on road safety and the need of alcohol and drugs controls.
- Have a nationwide system for random breath testing and random drug testing of drivers.
- Conduct awareness-raising campaigns on the risks of impaired driving and the legal consequences of drink/drug-driving, combined with more frequent police controls, primarily in the countries where a relatively large proportion of drivers are drink-driving and/or drug-driving.
- Mandatory installation of ignition interlocks in cars of drivers who have already been convicted for drink-driving.
- Test for alcohol and drugs for all drivers involved in fatal crashes.

Specific recommendations to particular stakeholders

- *[To Non-Governmental Organizations (NGOs)]* Contribute to education and awareness raising campaigns and events against impaired driving.
- *[To physicians and pharmacists]* Always explicitly mention the risks of driving under the influence of the medication they prescribe/deliver.
- *[To pharmaceutical companies]* Improve the information in the patient information leaflet on the potential impairing effect of the drug on driving ability.

- *[To vehicle manufacturers and other companies]* Develop low cost solutions to be incorporated in vehicles that can detect or prevent impaired driving.

Closing remarks

The initial aim of ESRA was to develop a system for gathering reliable and comparable information about people's attitudes towards road safety in a number of 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 46 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 initiative on a triennial basis, retaining a core set of questions in every wave allowing the development of time series of road safety performance indicators.

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Appendix 1: ESRA2_2018 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. Thank you for your contribution!

Socio-demographic information

Q1) In which country do you live? _____

Q2) Are you ... male – female – other (only in country who officially recognizes another gender)

Q3a) In which year were you born? Dropdown menu

Q3b) In which month were you born? Dropdown menu

Q4_1) 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

Q4_2) What is the highest qualification or educational certificate that your mother has obtained? none - primary education - secondary education - bachelor's degree or similar - master's degree or higher - I don't know

Q5a) Which of the following terms best describes your current professional occupation? white collar or office worker (excluding executive)/employee (public or private sector) →Q5b - blue collar or manual worker/worker →Q5b - executive →Q5b - self-employed/independent professional →Q5b - currently no professional occupation →Q5c

Q5b) Do you have to drive or ride a vehicle for work? (Please indicate the job category that is most appropriate for you) yes, I work as a taxi, bus, truck driver, … - yes, I work as a courier, mailman, visiting patients, food delivery, salesperson, … - no

Q5c) You stated that you currently have no professional occupation. Which of the following terms best describes your current situation? I am … a student - unemployed, looking for a job – retired - not fit to work - a stay-at-home spouse or parent - other

Q6) What is the postal code of the municipality in which you live? _____

Q7) In which region do you live? Drop down menu

Q8a) How far do you live from the nearest bus stop, light rail stop, or metro/underground station? less than 500 metres → Q8b - between 500 metres and 1 kilometre → Q8b - more than 1 kilometre → skip Q8b

Q8b) What is the frequency of your nearest bus stop, light rail stop, or metro/underground station? at least 3 times per hour - 1 or 2 times per hour - less than 1 time per hour

Mobility & exposure

Q9) Do you have a car driving licence or permit (including learner's permit)? yes - no

Q10) 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): walk minimum 100m (pedestrian; including jogging, inline skate, skateboard, …) - cycle (non-electric) - cycle on an electric bicycle/e-bike/pedelec - drive a moped (≤ 50 cc or ≤ 4 kW; non-electric - drive a motorcycle (> 50 cc and > 4 kW non-electric) - drive an electric moped (≤ 4 kW) - drive an electric motorcycle (> 4 kW) - drive a powered personal transport device such as an electric step, hoverboard, solowheel,… - drive a car (non-electric or non-hybrid) - drive a taxi - drive a bus as a driver - drive a truck/lorry - drive a hybrid or

electric car - take a taxi or use a ride-hail service (e.g. Uber, Lyft) - take the train - take the bus - take the tram/streetcar - take the subway - take the aeroplane - take a ship/boat or ferry - be a passenger in a car - use another transport mode

Q11) Over the last 30 days, have you transported a child (<18 years of age) in a car? yes - no
Items: below 150cm - above 150cm

Self-declared safe and unsafe behaviour in traffic

Q12_1a) Over the last 12 months, 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 all items: at least once (2-5) - never (1)
Items (random):
- drive after drinking alcohol
- drive faster than the speed limit outside built-up areas (but not on motorways/freeways)
- read a text message or email while driving

Q12_1b) 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 all items: at least once (2-5) - never (1)
Items (random):
- drive when you may have been over the legal limit for drinking and driving
- drive after drinking alcohol
- drive 1 hour after using drugs (other than medication)
- drive after taking medication that carries a warning that it may influence your driving ability
- drive faster than the speed limit inside built-up areas
- drive faster than the speed limit outside built-up areas (but not on motorways/freeways)
- drive faster than the speed limit on motorways/freeways
- drive without wearing your seatbelt
- transport children under 150cm without using child restraint systems (e.g. child safety seat, cushion)
- transport children over 150cm without wearing their seatbelts
- talk on a hand-held mobile phone while driving
- talk on a hands-free mobile phone while driving
- read a text message/email or check social media (e.g. Facebook, twitter, etc.) while driving
- drive when you were so sleepy that you had trouble keeping your eyes open

Q12_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 all items: at least once (2-5) - never (1)
Item:
- travel without wearing your seatbelt in the back seat

Q12_3) Over the last 30 days, how often did you as a MOPED DRIVER 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 all items: at least once (2-5) - never (1)
Items (random):
- ride when you may have been over the legal limit for drinking and driving
- ride faster than the speed limit outside built-up areas (but not on motorways/freeways)
- ride a moped or motorcycle without a helmet
- read a text message/email or check social media (e.g. Facebook, twitter, etc.) while riding a moped or motorcycle

Q12_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 all items: at least once (2-5) - never (1)
Items (random):

- 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 text message/email or check social media (e.g. Facebook, twitter, etc.) while cycling
- cycle on the road next to the cycle lane

Q12_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 all items: at least once (2-5) - never (1)
Items (random):
- listen to music through headphones as a pedestrian while walking in the streets
- read a text message/email or check social media (e.g. Facebook, twitter, etc.) while walking in the streets
- cross the road when a pedestrian light is red
- cross the road at places other than at a nearby (distance less than 30m) pedestrian crossing

Acceptability of safe and unsafe traffic behaviour

Q13_1) 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):
- drive when he/she may be over the legal limit for drinking and driving
- drive 1 hour after using drugs (other than medication)
- drive faster than the speed limit outside built-up areas (but not on motorways/freeways)
- not wear a seatbelt while driving
- transport children in the car without securing them (child's car seat, seatbelt, etc.)
- talk on a hand-held mobile phone while driving
- read a text message/email or check social media (e.g. Facebook, twitter, etc.) while driving

Q14_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)
- drive when he/she may be over the legal limit for drinking and driving
- drive 1 hour after using drugs (other than medication)
- drive after taking a medication that may influence the ability to drive
- drive faster than the speed limit inside built-up areas
- drive faster than the speed limit outside built-up areas (but not on motorways/freeways)
- drive faster than the speed limit on motorways/freeways
- not wear a seatbelt while driving
- 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 hand-free mobile phone while driving
- read a text message/email or check social media (e.g. Facebook, twitter, etc.) while driving
- drive when they're so sleepy that they have trouble keeping their eyes open

Attitudes towards safe and unsafe behaviour in traffic

Q15) 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):
Normative believes & subjective norms (including injunctive norms from Q13)
- Most of my friends would drive after having drunk alcohol.
- Most of my friends would drive 20 km/h over the speed limit in a residential area.
Behaviour believe & 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.
- For short trips, it is not really necessary to use the appropriate child restraint.
- 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 (here: self-efficacy)

- I trust myself to drive after having a glass of alcohol.
- 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. half a liter of wine).
- I trust myself when I drive significantly faster than the speed limit.
- I am able to drive fast through a sharp curve.
- I trust myself when I check my 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.
- Even when I am a little drunk after a party, I drive.
- It sometimes happens that I drive after consuming a large amount of alcohol (e.g. a liter of beer or half a liter of wine).
- I often drive faster than the speed limit.
- I like to drive in a sporty fast manner through a sharp curve.
- It happens sometimes that I write a message on the mobile phone while driving.
- I often talk on a hand-held mobile phone while driving.
- I often check my messages on the mobile phone while driving.

Intentions

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

Quality control items

- Indicate number 1 on the answering scale.
- Indicate number 4 on the answering scale.

Subjective safety & risk perception

Q16) 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 Q10 are displayed.

Q17) 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)

- driving after drinking alcohol
- driving after taking drugs (other than 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 day-dreaming while driving
- driving while tired

Support for policy measures

Q18) Do you oppose or support a legal obligation to …? 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 (random)

- install 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 the legal limit)
- have zero tolerance for alcohol (0,0 ‰) for novice drivers (licence obtained less than 2 years)
- have zero tolerance for alcohol (0,0 ‰) for all drivers

- install Intelligent Speed Assistance (ISA) in new cars (which automatically limits the maximum speed of the vehicle and can be turned off manually)
- install Dynamic Speed Warning signs (traffic control devices that are programmed to provide a message to drivers exceeding a certain speed threshold)
- have a seatbelt reminder system for the front and back seats in new cars
- require all cyclists to wear a helmet
- require cyclists under the age of 12 to wear a helmet
- require all moped drivers and motorcyclists to wear a helmet
- require pedestrians to wear reflective material when walking in the streets in the dark
- require cyclists to wear reflective material when cycling in the dark
- require moped drivers and motorcyclists to wear reflective material when driving in the dark
- have zero tolerance for using any type of mobile phone while driving (hand-held or hands-free) for all drivers
- not using headphones (or earbuds) while walking in the streets
- not using headphones (or earbuds) while riding a bicycle

Q19_1) What do you think about the current traffic rules and penalties in your country for driving or riding under the influence of alcohol? agree – disagree
Items:
- The traffic rules should be stricter.
- The traffic rules are not being checked sufficiently.
- The penalties are too severe.

Q19_2) What do you think about the current traffic rules and penalties in your country for driving or riding faster than the speed limit? agree – disagree
Items: Q19_1

Q19_3) What do you think about the current traffic rules and penalties in your country for using a mobile phone while driving or riding? agree – disagree
Items: Q19_1

Enforcement

Q20_1) On a typical journey, how likely is it that you (as a CAR DRIVER) will be checked by the police 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)
- ... alcohol, in other words, being subjected to a Breathalyser test
- ... the use of illegal drugs
- ... respecting the speed limits (including checks by a police car with a camera, fixed cameras, mobile cameras, and section control systems)
- ... wearing your seatbelt
- ... the use of hand-held mobile phone to talk or text while driving

Q21_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 - I prefer not to respond to this question
Binary variable: at least once - never (removing "I prefer not to respond to this Q)

Q22_1) In the past 12 months, how many times have you been checked by the police for the use of drugs (other than medication) while DRIVING A CAR? never – 1 time – at least 2 times - I prefer not to respond to this question
Binary variable: at least once - never (removing "I prefer not to respond to this Q)

Involvement in road crashes

Introduction: 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.

Q23_1a) In the past 12 months, how many times have you personally been involved in road crashes in which you or somebody else had to be taken to the hospital? ___ times (number; max. 10) if 0 → Q23_2a; if >0 → Q23_1b → Q23_2a
Binary variable: at least once - never

Q23_1b) Please indicate the transport modes you were using at the time of these crashes.
Items indicated by the respondent in Q10 are displayed; Threshold = 'at least a few days a year'.
Number to be indicated after each transport mode; note the sum should be equal to the number indicated in Q23_1a

Q23_2a) In the past 12 months, how many times have you personally been involved in road crashes with only minor injuries (no need for hospitalisation) for you or other people? ___ times (number; max. 10) if 0 → Q23_3a; if >0 → Q23_2b → Q23_3a
Binary variable: at least once - never

Q23_2b) = Q23_1b

Q23_3a) In the past 12 months, how many times have you personally been involved in road crashes with only material damage?
___ times (number; max. number 10) if 0 → skip Q23_3b; if >0 → Q23_3b → next Q
Binary variable: at least once - never

Q23_3b) = Q23_1b

Vehicle automation

I2) Introduction: The following questions focus on your opinion about automated passenger cars. We talk about two different levels of vehicle automation:
Semi-automated passenger cars: Drivers can choose to have the vehicle control all critical driving functions, including monitoring the road, steering, and accelerating or braking in certain traffic and environmental conditions. These vehicles will monitor roadways and prompt drivers when they need to resume control of the vehicle.
Fully-automated passenger cars: The vehicle controls all critical driving functions and monitoring all traffic situations. Drivers do not take control of the vehicle at any time.

Q24) How interested would you be in using the following types of automated passenger car? You can indicate your answer on a scale from 1 to 7, where 1 is "not at all interested" and 7 is "very interested". The numbers in between can be used to refine your response.
Binary variable: interested (5-7) - not interested/neutral (1-4)
Items:
- semi-automated passenger car
- fully-automated passenger car

Q25_1) How likely do you think it is that the following benefits will occur if everyone would use a semi-automated passenger car? 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):
- fewer crashes
- reduced severity of crash
- less traffic congestion
- shorter travel time
- lower vehicle emissions
- better fuel economy
- time for functional activities, not related to driving (e.g. working)
- time for recreative activities, not related to driving (e.g. reading, sleeping, eating)

Q25_2) How likely do you think it is that the following benefits will occur if everyone would use a fully-automated passenger car? 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.

Items (random) = Q25_1

Bonus question to be filled in by national partner

Q26) ....? You can indicate your answer on a scale from 1 to 5, where 1 is "...." and 5 is "....". The numbers in between can be used to refine your response.
Items (random; 4 items)

Q27) ....? You can indicate your answer on a scale from 1 to 5, where 1 is "...." and 5 is "....". The numbers in between can be used to refine your response.
Items (random; 4 items)

Social desirability scale

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

Q28) To what extent are the following statements true? You can indicate your answer on a scale from 1 to 5, where 1 is "very untrue" and 5 is "very true". The numbers in between can be used to refine your response.
Items (random):
- I always respect the highway code, even if the risk of getting caught is very low.
- I would still respect speed limits at all times, even if there were no police checks.
- I have never driven through a traffic light that had just turned red.
- I do not care what other drivers think about me.
- I always remain calm and rational in traffic. (if needed pop-up: rational = non-emotional)
- I am always confident of how to react in traffic situations.

Appendix 2: ESRA2 weights

The following weights are used to calculate representative means on national and regional level. They are based on UN population statistics (United Nations Statistics Division, 2019). 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, 65y+). 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, 65y) distribution in a country as retrieved from the UN population statistics.
Europe20 weight	European weighting factor based on all 20 European countries participating in ESRA2_2018, considering individual country weight and population size of the country as retrieved from the UN population statistics.
NorthAmerica2 weight	North American weighting factor based on all 2 North American countries participating in ESRA2_2018, considering individual country weight and population size of the country as retrieved from the UN population statistics.
AsiaOceania5 weight	Asian and Oceanian weighting factor based on all 5 Asian and Oceanian countries participating in ESRA2_2018, considering individual country weight and population size of the country as retrieved from the UN population statistics.
Africa5 weight	African weighting factor based on all 5 African countries participating in ESRA2_2018, considering individual country weight and population size of the country as retrieved from the UN population statistics.

Appendix 3: Additional results

SELF-DECLARED BEHAVIOUR AS A CAR DRIVER

Drive after drinking alcohol	Drive 1 hour after using drugs (other than medication)	Drive after taking a medication that may influence the ability to drive

% at least once (last 30 days)
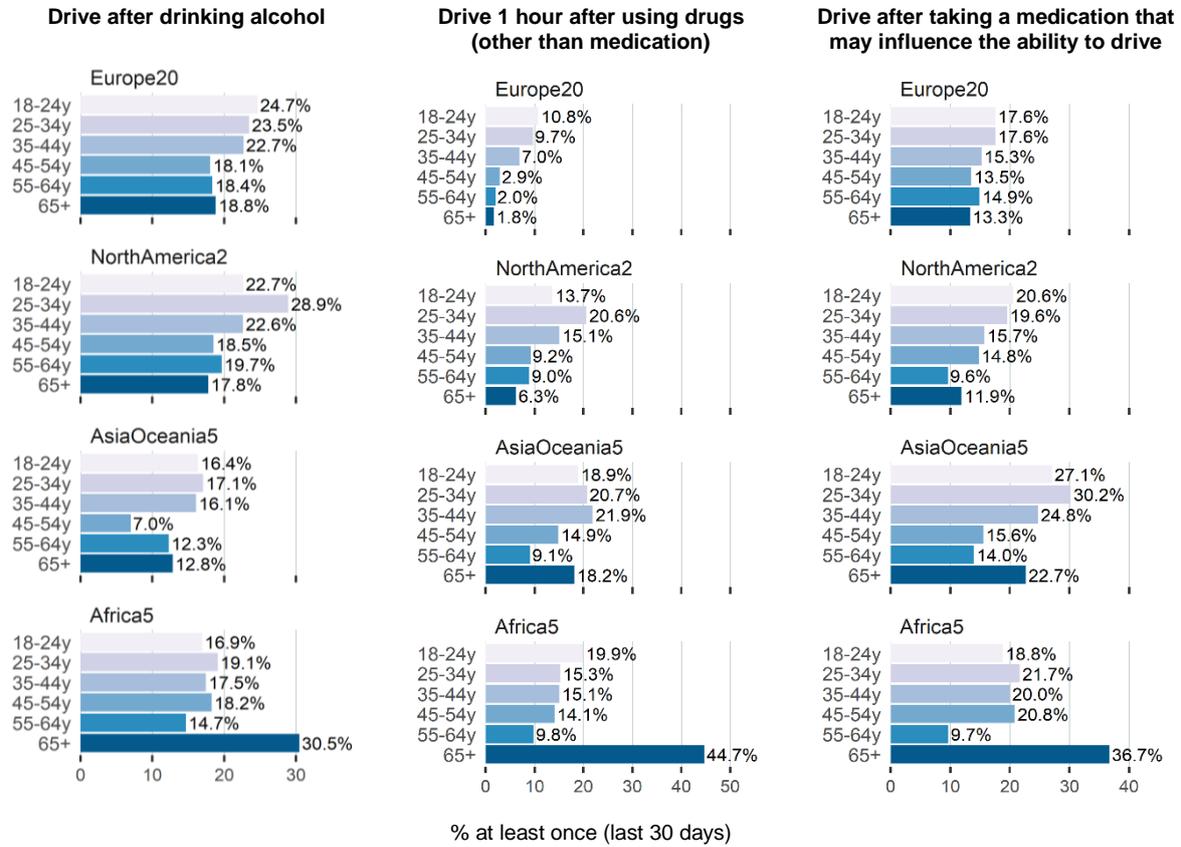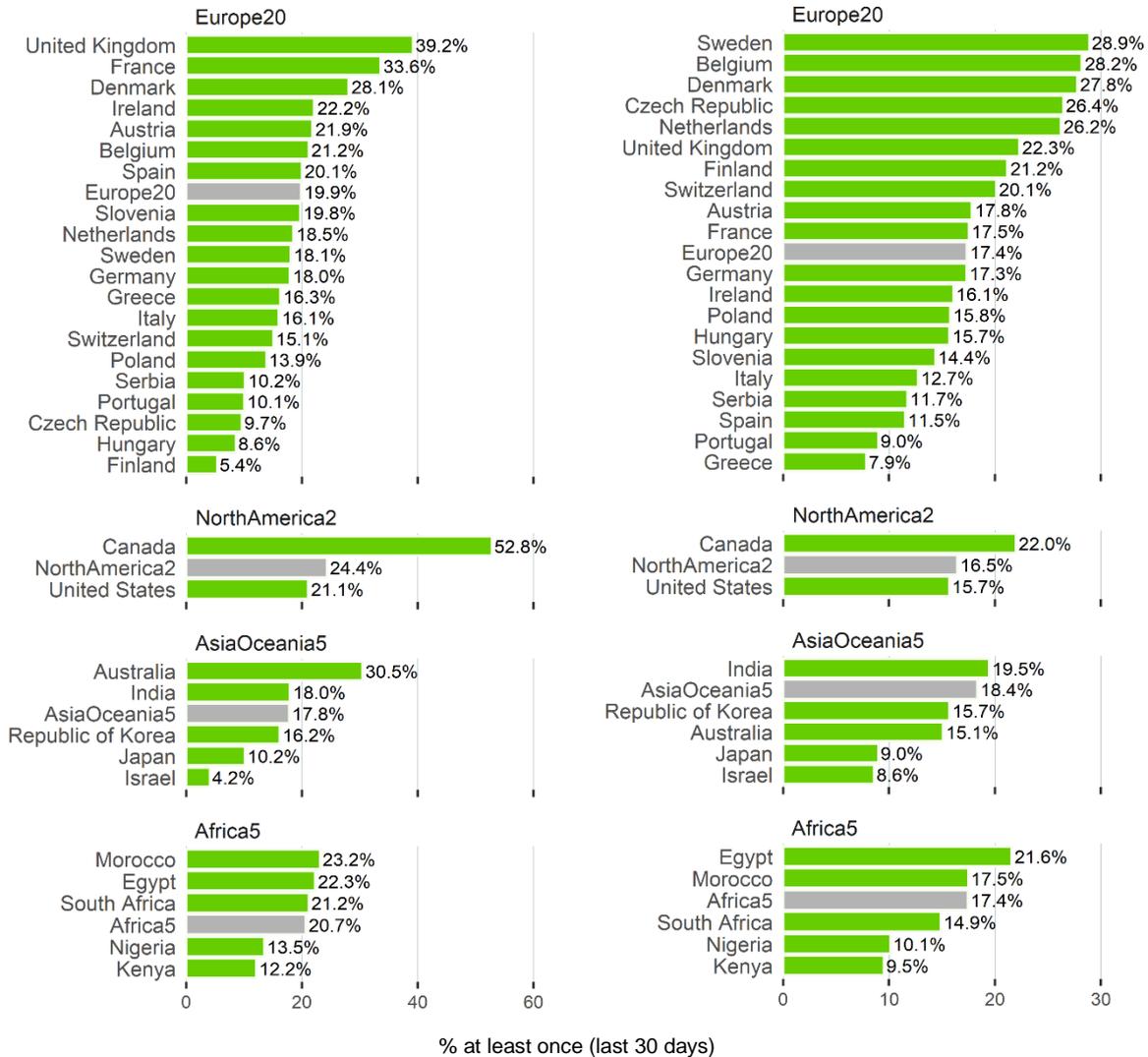Reference population: car drivers, at least a few days a month

Figure 31: Self-declared behaviours on DUI, by age group and type of impairing substances (% of car drivers that did it at least once ... in the past 30 days).

SELF-DECLARED BEHAVIOUR

As a moped driver or motorcyclist, ride when you may have been over the legal limit for drinking and driving

As a cyclist, cycle when you think you may have had too much to drink

Europe20

United Kingdom	39.2%
France	33.6%
Denmark	28.1%
Ireland	22.2%
Austria	21.9%
Belgium	21.2%
Spain	20.1%
Europe20	19.9%
Slovenia	19.8%
Netherlands	18.5%
Sweden	18.1%
Germany	18.0%
Greece	16.3%
Italy	16.1%
Switzerland	15.1%
Poland	13.9%
Serbia	10.2%
Portugal	10.1%
Czech Republic	9.7%
Hungary	8.6%
Finland	5.4%

Europe20

Sweden	28.9%
Belgium	28.2%
Denmark	27.8%
Czech Republic	26.4%
Netherlands	26.2%
United Kingdom	22.3%
Finland	21.2%
Switzerland	20.1%
Austria	17.8%
France	17.5%
Europe20	17.4%
Germany	17.3%
Ireland	16.1%
Poland	15.8%
Hungary	15.7%
Slovenia	14.4%
Italy	12.7%
Serbia	11.7%
Spain	11.5%
Portugal	9.0%
Greece	7.9%

NorthAmerica2

Canada	52.8%
NorthAmerica2	24.4%
United States	21.1%

NorthAmerica2

Canada	22.0%
NorthAmerica2	16.5%
United States	15.7%

AsiaOceania5

Australia	30.5%
India	18.0%
AsiaOceania5	17.8%
Republic of Korea	16.2%
Japan	10.2%
Israel	4.2%

AsiaOceania5

India	19.5%
AsiaOceania5	18.4%
Republic of Korea	15.7%
Australia	15.1%
Japan	9.0%
Israel	8.6%

Africa5

Morocco	23.2%
Egypt	22.3%
South Africa	21.2%
Africa5	20.7%
Nigeria	13.5%
Kenya	12.2%

Africa5

Egypt	21.6%
Morocco	17.5%
Africa5	17.4%
South Africa	14.9%
Nigeria	10.1%
Kenya	9.5%

% at least once (last 30 days)

Reference population: car drivers, at least a few days a month

Figure 32: Self-declared behaviours on drink-driving, by country, regions and type of two-wheelers (% of two-wheelers that did it at least once ... in the past 30 days).
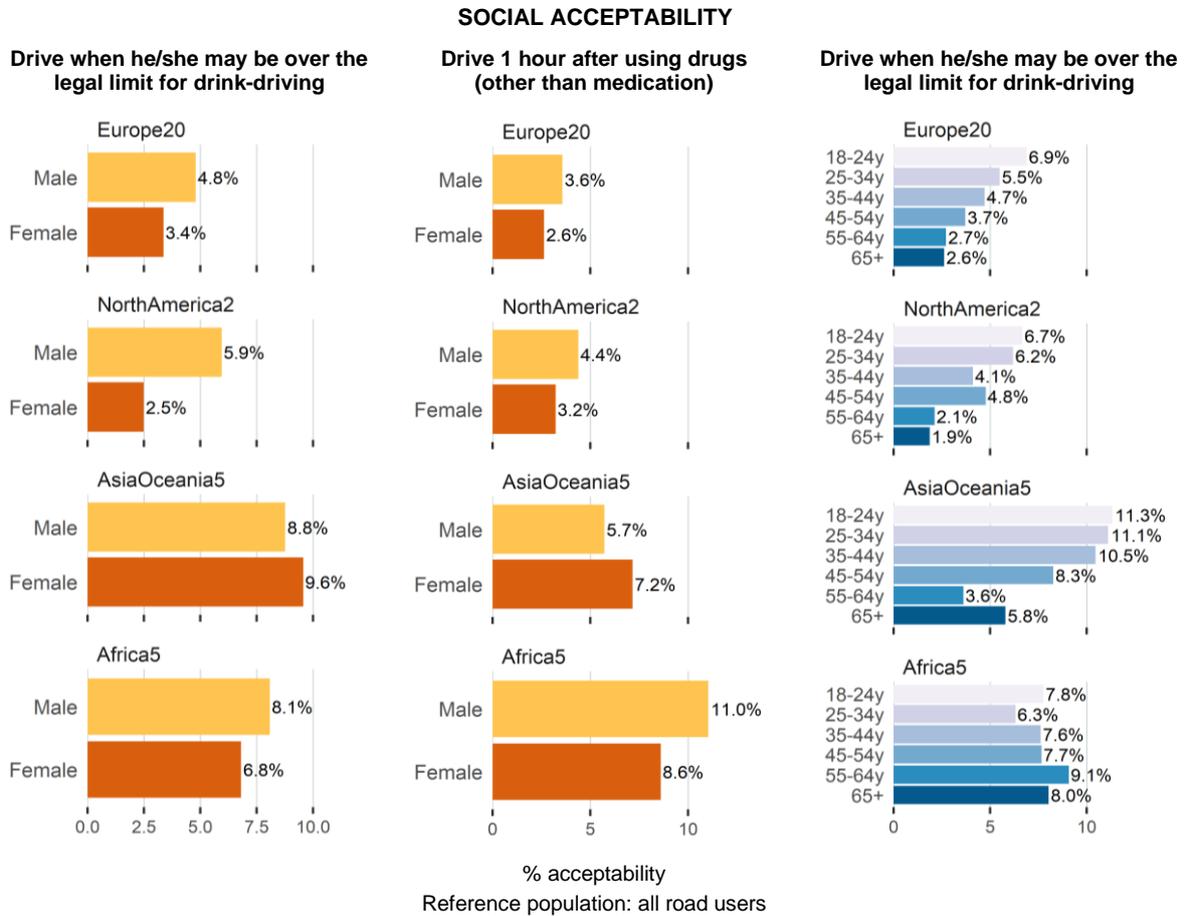
SOCIAL ACCEPTABILITY

Figure 33: Social acceptability of impaired driving, by gender and age group of impairing substances (% acceptability; scores 4 and 5 on a 5-point scale from 1 'unacceptable' to 5 'acceptable').
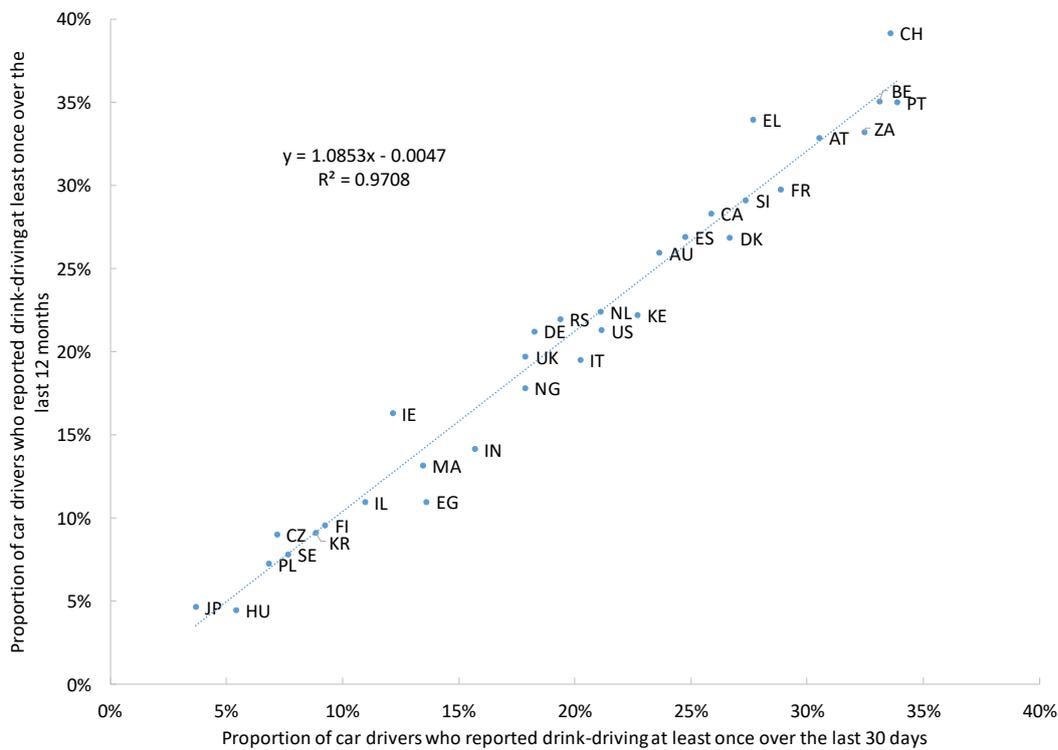
Figure 34: Relationship between self-declared drink-driving over the last 12 months and over the last 30 days
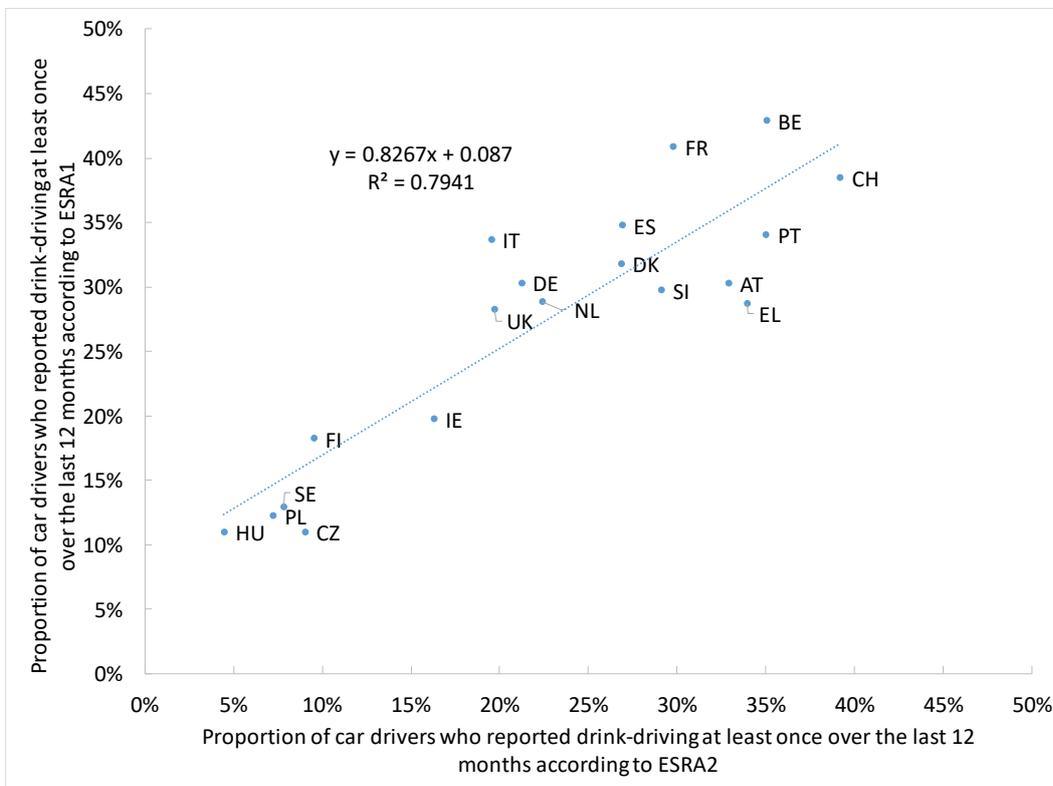

Figure 35: Relationship between self-declared drink-driving over the last 12 months in ESRA1 and ESRA2 (only European countries)

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