European Commission

Safety Performance Indicator (SPI)

Protective equipment

Mobility and Transport

The purpose of the Safety Performance Indicator reports is to provide an overview of recent statistics on road safety performance indicators that are linked to traffic safety.

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Contents

1. Summary

Many different factors contribute to the outcome of road crashes. The use of protective equipment such as helmets, seat belts and child restraint systems can save lives and mitigates crash consequences. This report provides an overview of available data und road traffic participants' use of protective equipment for EU Member States and EFTA countries. Moreover, it provides additional information on legislation and complements the ERSO thematic report on the same topic.

The presented SPI are defined as:

- SPI Bicycle helmets: *Percentage of cyclists wearing a bicycle helmet.*
- SPI Motorcycle helmets: *Percentage of motorcyclists (moped and motorcycle drivers) wearing a motorcycle helmet.*
- SPI Seat belts: *Percentage of vehicle occupants using the safety belt (correctly).*
- SPI Child restraint system: *Percentage of children in passenger cars (correctly) using the CRS.*

For this report, data from the ESRA project (survey data) and the Baseline project (roadside observations) are used. Based on these data sources the following conclusions can be reached:

1. The percentage of observed cyclists wearing a bicycle helmet lies between 18% to 81%, with higher rates on rural than on urban roads.
2. Cyclists who reported having ridden a bicycle *without* wearing a helmet in the past 30 days vary between 46% and 87%.
3. For Powered Two Wheelers helmet wearing rates range from 80% close to 100%, based on roadside observations. The percentages for moped versus motorcycle drivers are very close to one another, with motorcyclists showing slightly higher rates.
4. Self-reported rates of *not* wearing crash helmets when having driven a moped or motorcycle in the past 30 days lie between 4% and 42%.
5. The percentage of passenger car drivers correctly wearing a seat belt ranges from 70% to 99%, based on roadside observations. Not using the seat belt is more common among rear occupants of passenger cars, with shares going as low as 24%.
6. The percentage of passenger car drivers that reported *not* having worn a seat belt in the past 30 days ranges from 6% to 34%.
7. Vehicle inspections indicate that 46 to 92% of children are seated (correctly) in child restraint systems in passenger cars.

2. Introduction

2.1 Safety Performance Indicators (SPIs)

The most common indicators used for evaluating traffic safety are the number of traffic crashes, or the number of fatal/serious injuries due to a traffic crash. However, these numbers insufficiently reflect the actual problem and the underlying factors that lead to the crash. Moreover, crashes are relatively rare events, and are under-registered. Therefore, alternative proactive approaches have been adopted to evaluate road safety. For example, events/behaviors/attitudes which have a recognized relationship with crash frequency, and that are sensitive to policy measures, can be used as a proactive approach to evaluate safety. Since the 90's these so-called safety performance indicators (SPIs) are increasingly used to develop traffic safety policies.

The following *SPIs* are detailed in ERSO SPI reports:

- Speeding
- Distraction
- Fatigue
- Driving under the influence of alcohol and drugs
- Protection – the use of seat belts, helmets, and child restraint systems
- Support for policy measures
- Subjective safety and risk perception

Speeding, distracted driving, and using protective equipment are behaviours which can be observed, through roadside observations or measurements. For the SPI driving under the influence of alcohol and/or drugs, police-assisted random breath testing during roadside alcohol checks provides potentially the best data.

On the other hand, fatigued driving, support for policy measures or subjective risk perception are (practically) not observable. For those ones, well-designed questionnaire surveys may provide valuable data on road safety performance.

2.2 Aim of the ERSO SPI reports

The ERSO SPI reports provide an overview of the available data in the EU Member States as well as EFTA countries for each listed SPI. The reports aim to give insight into the differences between (groups of) countries regarding their road user behaviour or attitude. Where feasible, the reports look at whether SPIs are related to existing policies and regulations, providing possible effective interventions to increase safe behaviour, or discourage unsafe behaviour. In addition to

identifying relevant interventions, SPI data can be used to evaluate these measures and interventions.

For most SPI topics an ERSO thematic report exists as well. In these reports background information of risks, effects and causes are provided (see: Thematic reports (europa.eu)).

2.3 SPI Protective equipment

This report is on the prevalence and the road safety effects of road users' use or non-use of:

- Bicycle helmets
- Motorcycle helmets
- Seat belts
- Child Restraint Systems (CRS)

The **SPI Bicycle helmets** is defined as:
Percentage of cyclists wearing a bicycle helmet.

The **SPI Motorcycle helmets** is defined as:
Percentage of motorcyclists (moped and motorcycle drivers) wearing a motorcycle helmet.

The **SPI Seat belts** is defined as:
Percentage of vehicle occupants using the safety belt (correctly).

The **SPI CRS** is defined as:
Percentage of children in passenger cars (correctly) using the CRS.

SPIs are defined 'positively', that is the percentages of drivers that perform the behaviour that is considered safe. However, presenting the percentages of unsafe behaviour conveys a better picture of the differences between the countries. Therefore, percentages of road users who are not using certain protective equipment (correctly) are also presented in this report. See the Thematic Report for background information about protective equipment.

2.4 Overview of Data Sources

Data on protective equipment presented in this report are based on two data sources: ESRA (E-Survey of Road users' Attitudes) (https://www.esranet.eu/en/), and the European project Baseline (https://www.baseline.vias.be/en/).

2.4.1 Baseline

The EU has made funding available to support the EU Member States in the collection and analysis of the mentioned SPIs. Eighteen Member

States participated in a common project, called Baseline, with the aim to support Member State authorities to collect and report SPI data in a harmonized way, helping to gain more insight in the underlying factors of traffic safety. Based on the findings, future European goals and targets can be set. Baseline ended in 2023. Its successor is the Trendline project (trendlineproject.eu), which started in 2022 and will continue until 2025.

The Baseline data on the use of protective equipment of various road users was collected through roadside observations[1] by researchers.
In total, nineteen countries collected data on two or more of the indicators (Table 1). For more details on the sampling methodology see Yannis & Folla (2022) as well as Van den Broek, Aarts & Silverans (2022).

Table 1. *Data availability of EU27 countries for protective equipment indicators*

Country	Helmet use of cyclists	Helmet use of motorcyclists and moped drivers	Seat belt use in passenger cars (drivers & rear occupants)	CRS
Austria	✓	✓	✓	✓
Belgium	✓	✓	✓	✓
Bulgaria	✓	✓	✓	✓
Cyprus	-	✓	✓	✓
Czech Republic	✓	✓	✓	✓
Germany	✓	-	✓	✓
Greece	-	✓	✓	-
Hungary	-	-	✓	✓
Ireland	✓	-	-	-
Italy	✓	✓	✓	✓
Latvia	✓	✓	✓	✓
Lithuania	-	-	✓	✓
Malta	✓	✓	-	-
Netherlands	-	-	-	✓
Poland	✓	✓	✓	✓
Portugal	✓	✓	✓	✓
Spain	✓	✓	✓	✓
Sweden	✓	-	only drivers	-

2.4.2 ESRA

Within ESRA a joint international initiative of road safety institutes, research centres, public services, and private sponsors, comparable data on road safety performance, in particular on aspects of road safety

[1] For collecting data on seat belt and CRS use in the Netherlands researchers additionally conducted observations while moving along with traffic.

culture and behaviour of road users worldwide, have been collected and analysed.

ESRA data are collected by means of online panel surveys, providing a representative sample of the national adult population in each participating country (at least N = 1,000 per country). The extensive survey was conducted in 68 participating countries, covering six continents. Data on the use of protective systems were collected between 2018 and 2019 across 24 European countries, 22 of which are among the European Union and/or EFTA countries. In this report, the ESRA data for these 22 European countries are presented, i.e., Austria, Belgium, Bulgaria, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, Slovenia, Spain, Sweden, and Switzerland. For details on the methodology of the data collection and analysis see: Meesmann et al. (2023).

3. The occurrence of road users' use of protective systems in Europe

3.1 Helmet use among cyclists

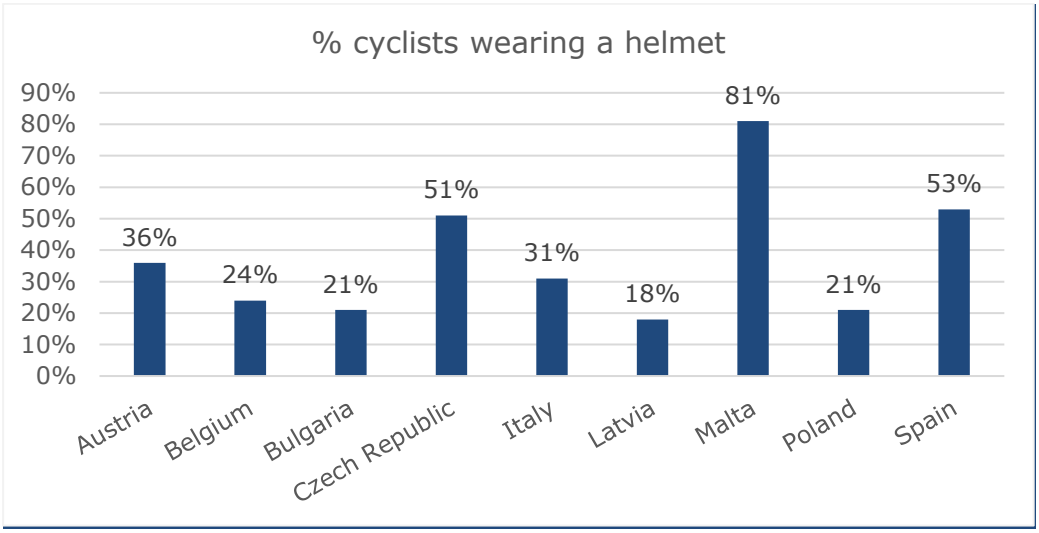
Both the ESRA project and the Baseline project collected data on helmet wearing rates among cyclists. The results in this section are presented per data source.

3.1.1 Roadside observations (Baseline)

Figure **1** shows the percentage of observed cyclists wearing a bicycle helmet in nine EU countries. Note that the presented data do not include passengers on the bicycles (children in dedicated seats). The indicator is combining roadside observations on rural and urban roads as well as during weekdays and weekends. For disaggregated results per road type see 3.1.1.1.

A higher-than-average rate of cyclists wearing helmets was observed in Malta (81%). The lowest percentages of helmet wearing was recorded in Latvia (18%), Bulgaria (21%) and Poland (21%).

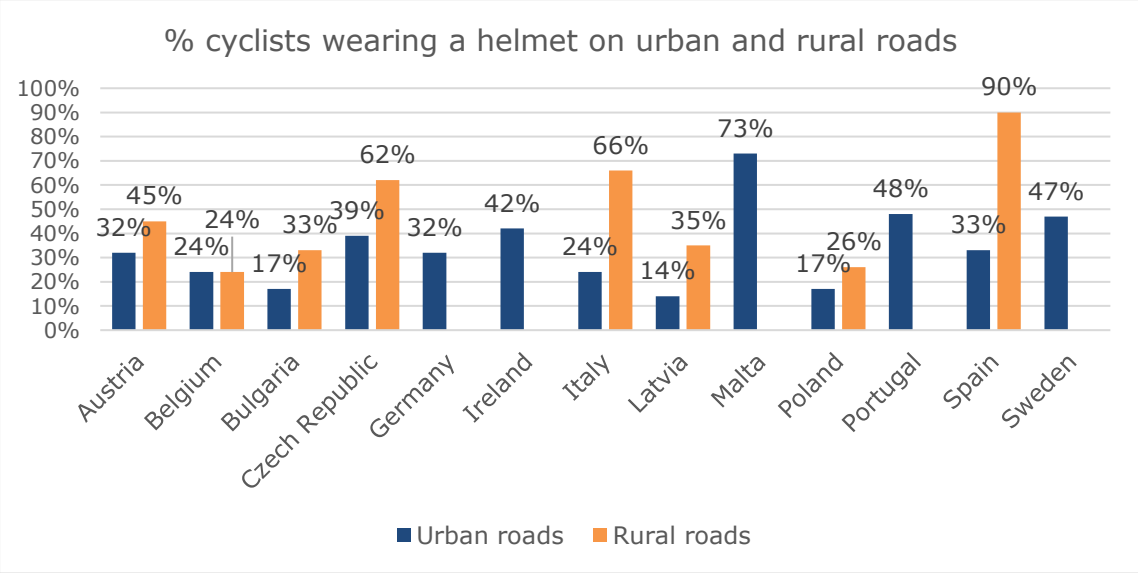
Figure 1. *Percentage of cyclists wearing a bicycle helmet (Source: https://www.baseline.vias.be)*



3.1.1.1 Differences per road type

Figure 2 shows the percentage of cyclists observed wearing a cycling helmet on urban roads as well as on rural roads for countries with available data. Higher rates of helmet wearing behaviour were observed on rural roads. The discrepancy between the two road types is negligible in Belgium and especially pronounced in Italy, Spain and Latvia where cyclists on rural roads were observed to wear a bicycle helmet more than twice as often compared to urban roads. In Germany, Ireland and Portugal, data was collected only on urban roads while Malta did not meet the criteria for minimum sampling size.

Figure 2. *Percentage of cyclists wearing a bicycle helmet on urban and rural roads. (Source: https://www.baseline.vias.be)*



3.1.1.2 *Differences per vehicle type*

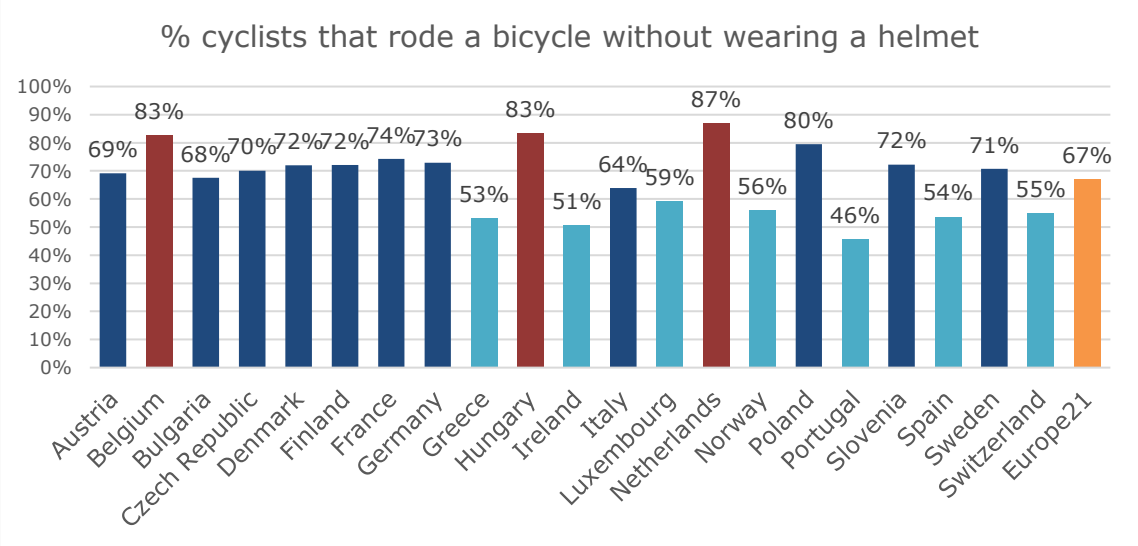
Five of the countries collected information on the type of bicycle. E-bike riders clearly show higher helmet wearing rates than riders of conventional bikes in Austria (62% vs. 35%), Belgium (31% vs. 22%), Czech Republic (65% vs. 49%) and Germany (56% vs 27%). This trend is the other way around in Portugal (32% for E-bike riders vs. 54% for riders of conventional bike).

3.1.2 Survey data (ESRA)

Within the ESRA survey respondents were asked: 'In the past 30 days, how often did you as a cyclist, cycle without a helmet?'. The answer options ranged from 1 'never' to 5 '(almost) always'. Figure 3 shows the percentages of cyclists that indicated having ridden a bicycle without wearing a helmet at least once during the past month. Please note the reversed form of presentation compared to the Baseline data (where percentages of road users are displayed who did wear a helmet).

On average, 67% of European cyclists reported to have ridden a bike without wearing a helmet. Highest rates of not using protective equipment were reported by cyclists from the Netherlands, Belgium and Hungary. Portuguese cyclists indicated the lowest rate of not wearing a helmet (46%), followed by Ireland and Greece. Out of the 21 countries, seven countries were five percentage points or more below the average (bars in light blue), and three countries scored five percentage points or more above the European average (bars in red).

Figure 3. *Percentage of cyclists that indicated having ridden a bicycle without wearing a helmet during the past 30 days. Deviations of five percentage points or more from the average are indicated in red and light blue bars. (Source: https://www.esranet.eu/)*



3.1.2.1 Gender and age differences

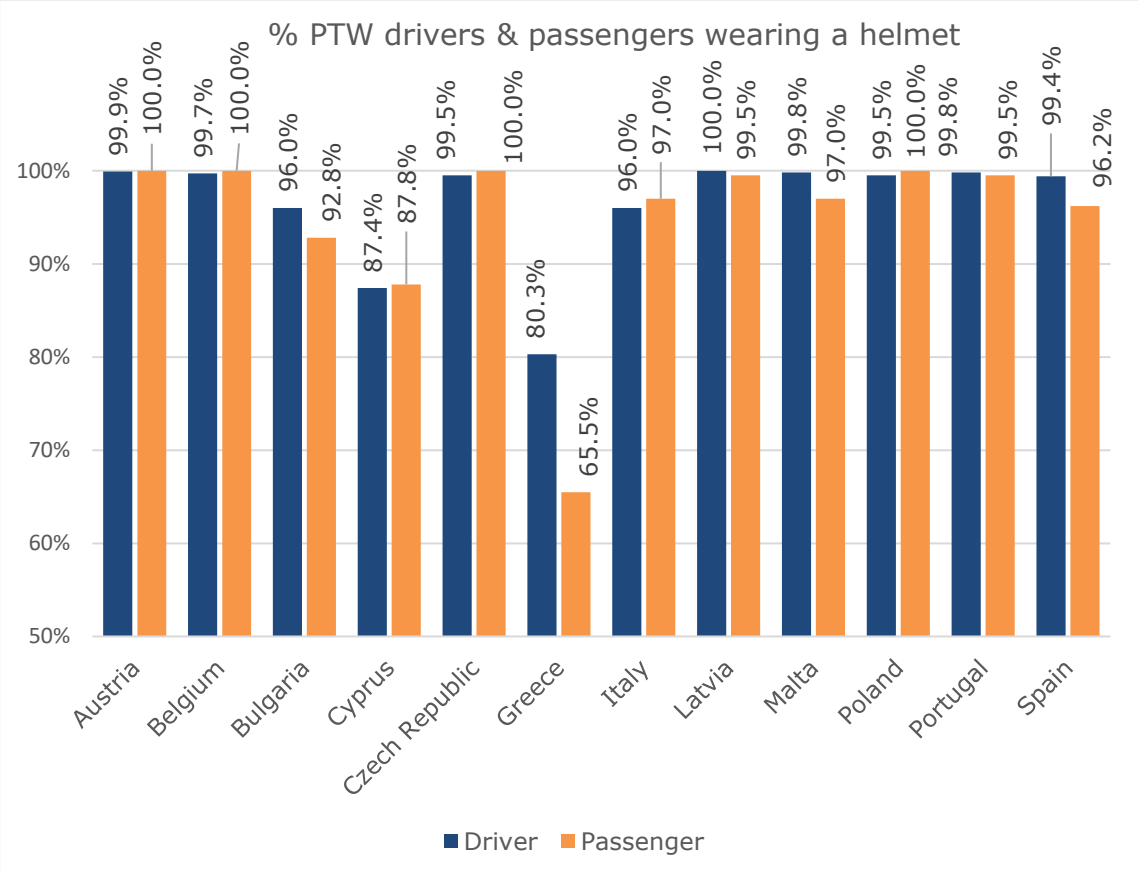
Females and males reported about the same rates of not having worn helmets (69% for both genders). Regarding age, the youngest group of survey respondents (18 to 24 years) show the highest rates of not using a helmet (76%) and the cohort of 45 to 54 years show the lowest rate (66%), meaning they used a helmet while cycling more often.

3.2 Helmet use among moped drivers and motorcyclists

3.2.1 Roadside observations (Baseline)

Figure 4 shows the rate of moped and motorcycle drivers and passengers who were observed wearing a motorcycle helmet. This rate is high with 95% and more road users wearing helmets in Austria, Belgium, Czech Republic, Italy, Latvia, Malta, Poland, Portugal and Spain. In almost all of the countries, the helmet wearing rates for drivers is slightly higher than for passengers. A more pronounced difference was found in Greece with 80% of drivers wearing helmets and 66% of passengers.

Figure 4. *Percentage of PTW (drivers and passengers) wearing a motorcycle helmet. (Source: https://www.baseline.vias.be)*



3.2.1.1 Differences per vehicle type

Research teams of five of the countries which collected data on helmet wearing rates of powered two wheelers (PTW) (Austria, Belgium, Malta, Poland and Portugal), made a distinction between moped and motorcycle drivers. The observed rates of drivers wearing helmets are very close to one another, with a marginal difference in favour of motorcyclists wearing helmets even more often than moped drivers. The same applies to passengers of PTW.

3.2.1.2 Differences per road type

A difference per road type for helmet wearing rates was observed in Greece and Cyprus, where more drivers wore a motorcycle helmet on motorways compared to rural and urban roads.

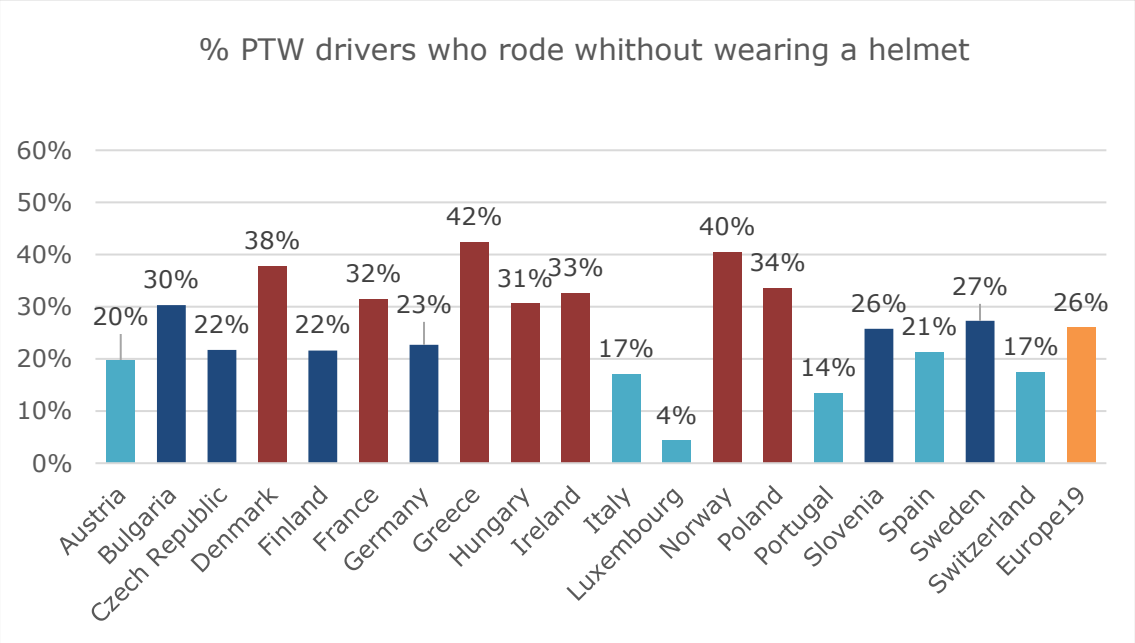
3.2.2 Survey data (ESRA)

Within the ESRA survey respondents were asked: 'Over the last 30 days, how often did you ride a moped or motorcycle without wearing a helmet?', with answer options ranging from 1 'never' to 5 '(almost) always'.

Figure **5** shows the percentages of drivers that indicated having ridden a PTW without wearing a motorcycle helmet at least once during the past month.

With 4% this rate is very low in Luxembourg. The values for all other included countries are at least 14% (Portugal) or higher. The highest self-reports of not wearing a moped or motorcycle helmet were found in Greece (42%), Norway (40%) and Denmark (38%).

Figure 5. *Percentage of moped and motorcycle drivers that indicated having ridden a PTW without wearing a helmet during the past 30 days. Deviations of five percentage points or more from the average are indicated in red and light blue bars. (Source: https://www.esranet.eu/)*



3.2.2.1 Gender and age differences

A lower percentage of females (20%) than males (29%) reported to have ridden a PTW without wearing a helmet in the 30 days before responding to the ESRA survey. Self-reported helmet wearing rates tend to also be higher in older people compared to younger people.

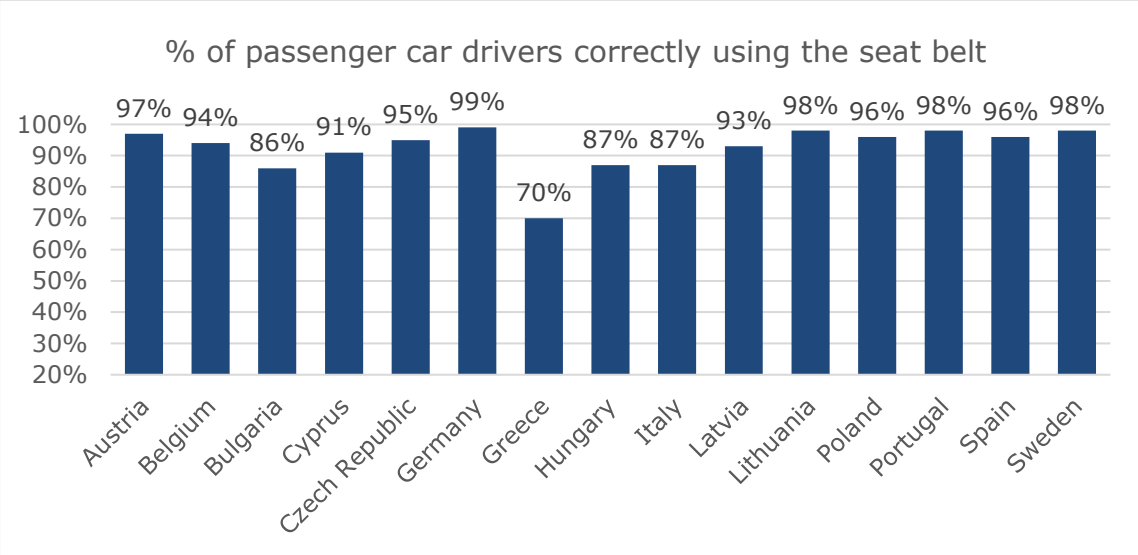
3.3 Seatbelt use among passenger car drivers and occupants

3.3.1 Roadside observations (Baseline)

Seat belt wearing rates for passenger car drivers in 15 European countries are shown in

Figure **6**. The roadside observations took place during weekdays, during daytime and on all types of roads. In more than half of the countries, the seat belt wearing rate is as high as 95% or higher (Austria, Czech Republic, Germany, Lithuania, Poland, Portugal, Spain and Sweden). A comparatively low share of seat belt use was found in Greece (70%).

Figure 6. *Percentage of passenger car drivers (correctly) using the seat belt, observed during weekdays and daytime. (Source: https://www.baseline.vias.be)*

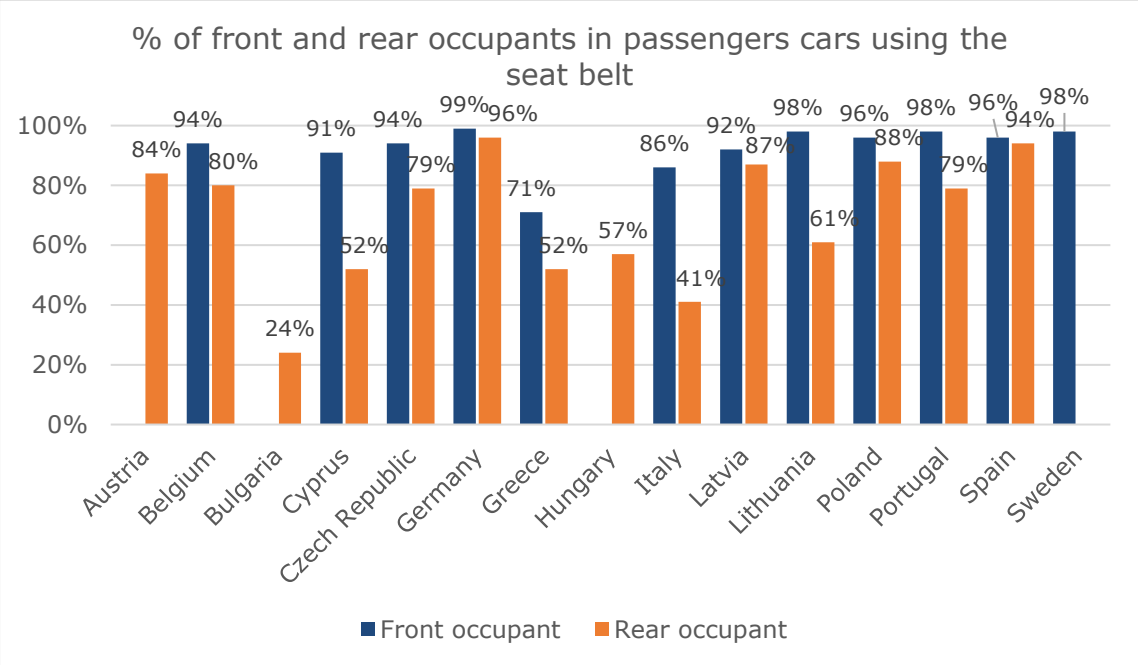


In Austria, Cyprus, Czech Republic, Germany, Greece, Poland and Portugal, observers also collected data on the seat belt use of car drivers in goods vehicles (during weekdays and daytime). Seat belt wearing rates are lower in all the countries for this road user group by between 6 (Germany) and 36 percentage points.

3.3.1.1 Differences between front and rear occupants

As is expected, a lower percentage of seat belt use was observed for rear occupants in passenger cars (see Figure 7). However, in some cases the seat belt wearing rate is almost as high for rear occupants as for front occupants, like in Spain (94% and 96%) or Germany (96% and 99%). Only about a quarter of rear occupants in cars were observed wearing a seat belt in Bulgaria (24%). But also in Italy, car occupants have been observed not wearing a seat belt in the back of the car more than twice as often than front occupants (41% versus 86%). No data on rear occupants was collected in Sweden and in Austria, Bulgaria as well as Hungary, data on front occupants was not provided.

Figure 7. *Percentage of front and rear occupants in passenger cars correctly using the seat belt observed during weekdays and daytime. (Source: https://www.baseline.vias.be)*



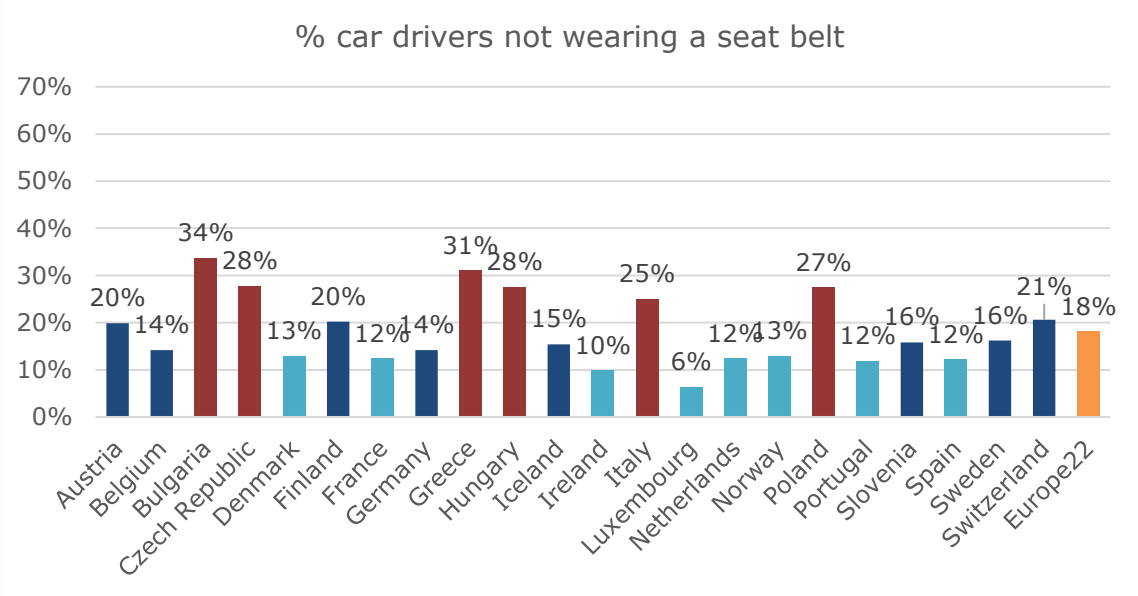
3.3.2 Survey data (ESRA)

Within the ESRA survey, two questions targeted the prevalence of passenger car occupants wearing seat belts or not: "Over the last 30 days, how often did you as a car driver / car passenger in the back seat travel without wearing your seat belt?". The answer options ranged from 1 'never' to 5 '(almost) always'. Figure 8 and

Figure **9** show the percentages of road users who declared to have travelled without wearing a seat belt at least once in the period mentioned (values 2 to 5).

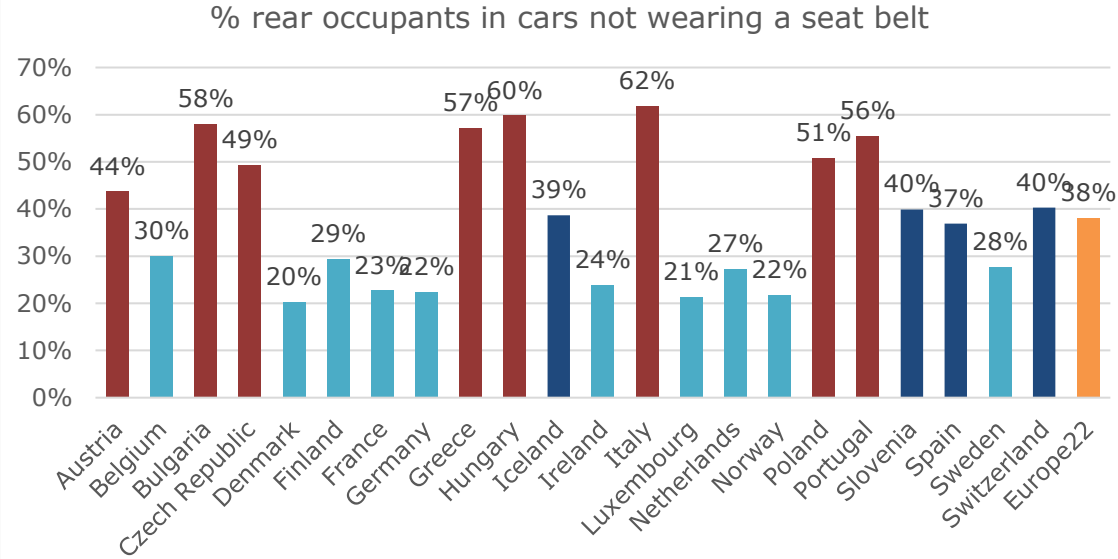
As expected, the rates for drivers not wearing a seat belt are lower than the ones for rear occupants. The range for drivers extends from 6% in Luxembourg to 34% in Bulgaria. Most of the countries deviate five percentage points or more from the European average of 18% (red and light blue bars).

Figure 8. *Percentage of car drivers that indicated having driven without wearing a seat belt during the past 30 days. Deviations of five percentage points or more from the average are indicated in red and light blue bars. (Source: https://www.esranet.eu/)*



The percentage of rear occupants declaring not having worn seat belts range from 20% in Denmark up to 62% in Italy. Another six countries record values around 50% or higher (Bulgaria, Czech Republic, Greece, Hungary, Poland and Portugal). None of the European ESRA countries show values below 20%.

Figure 9. *Percentage of car occupants that indicated having travelled without wearing a seat belt in the back seat during the past 30 days. Deviations of five percentage points or more from the average are indicated in red and light blue bars. (Source: https://www.esranet.eu/)*



For both of the indicators (driver seat and back seat), surveyed women show a higher compliance rate than men regarding wearing the safety belt (Nakamura et al., 2020).

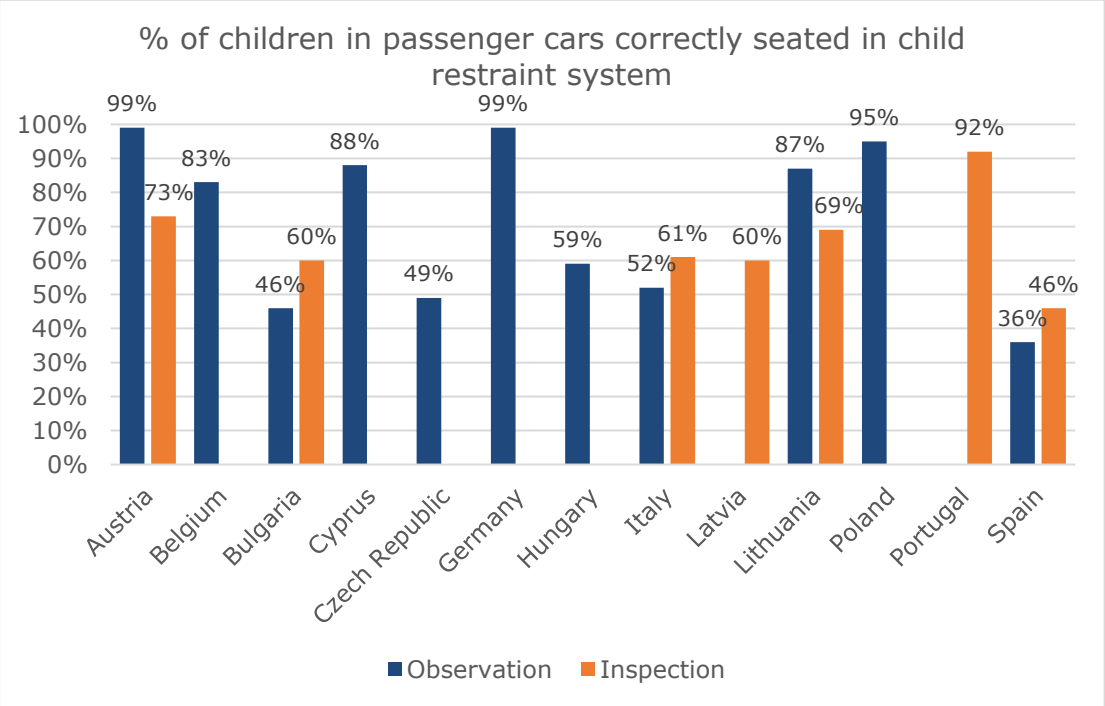
3.4 Child restraint system use

3.4.1 Roadside observations (Baseline)

For collecting data on the correct use of child restraint systems (CRS), two methods were applied: roadside observations (eleven countries) and in-vehicle inspections on e.g. parking lots (seven countries). The latter required consent of the drivers. See van den Broek, Aarts & Silverans (2022) for further details on the methods and their implications. Figure 10 shows the respective percentages of children in passenger cars (correctly) seated in CRS and the method applied.

The highest percentages of CRS use were observed in Austria and Germany (99% each) as well as in Poland (95%), while the values for Spain (36%), Bulgaria (46%) and Czech Republic (49%) are below half.

Figure 10. *Percentage of children in passenger cars in child restraint systems (correctly used), based on data from roadside observations and in-vehicle inspections. (Source: https://www.baseline.vias.be)*



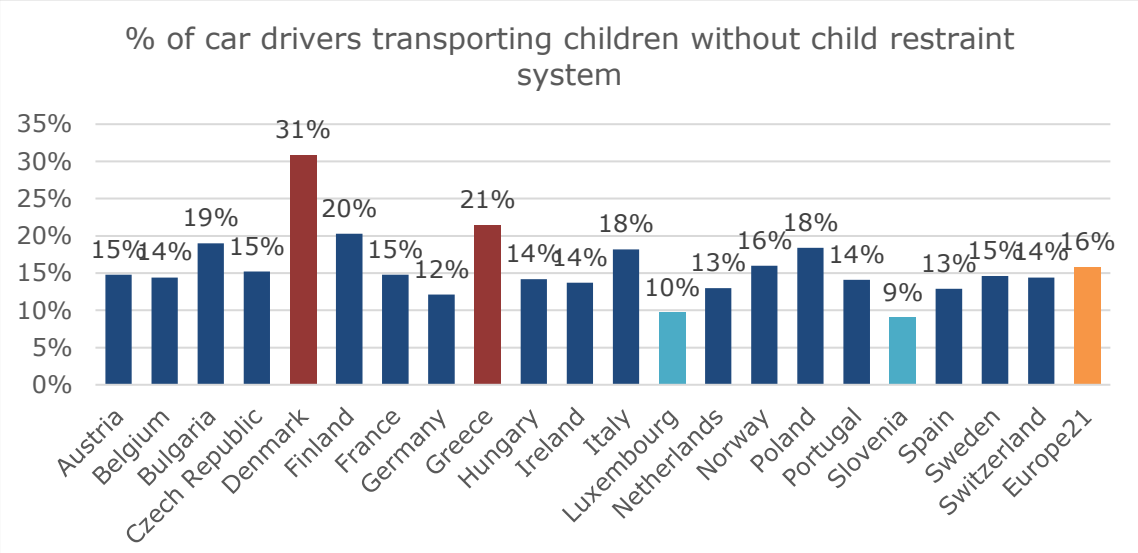
3.4.2 Survey data (ESRA)

ESRA respondents who indicated having transported children (under 150cm in height) in the past month were also asked how often they travelled with children without using a CRS (answer options 'never' to '(almost) always'). The percentages of drivers who declared to have shown this behaviour at least once during the past 30 days are illustrated in

Figure **11**.

On average 16% of European car drivers indicated to not having used a CRS when transporting children, with a range of 9% in Slovenia and 31% in Denmark. The latter is an outlier, and the second highest value ranks 10 percentage points below (21% in Greece). The values of most of the countries are in close proximity to each other, with only four countries deviating from the average more than five percentage points (red and light blue bars).

Figure 11. *Percentage of car drivers that indicated having transported children (<150cm) during the past 30 days without using a child restraint system. Deviations of five percentage points or more from the average are indicated in red and light blue bars. (Source: https://www.esranet.eu/)*



4. Consequences of not wearing protective equipment in traffic

4.1 Non-use of bicycle helmet

Many risk factors contribute to the outcome of bicycle crashes, such as the crash opponent, age or speed. One of the most crucial factors for preventing head injuries, however, is the use or non-use of a bicycle helmet at the time of the crash. A meta-analysis published in 2018 estimates bicycle helmets to reduce serious head injury by 60%, traumatic brain injury by 53% and the total number of seriously injured or killed cyclists by 34% (Høye, 2018).

4.2 Non-use of motorcycle helmet

The primary factor leading to fatalities in the majority of motorcycle accidents is head injuries. The use of motorcycle helmets decreases the likelihood of death in a collision and reduces the risk of severe head and brain injury. The estimates vary depending on the source and the analysis methods applied. It is estimated, that using a motorcycle helmet reduces the risk of being killed by more than six times and reduces the risk of brain injury by as much as 74% (WHO, 2023). A meta-analysis from 2016 indicates a risk reduction for fatal injuries by about 28% for large PTW (>500cc) and 64% for small PTW (typically <250cc) (Høye, 2016b).

4.3 Non-use of seat belt and CRS

Not using the safety belt and CRS or not using them correctly is a major risk factor for severe injuries and fatality at the time of a road crash. According to the WHO (2023), the failure to wear a seat belt makes up for most of the road traffic fatalities among vehicle occupants. Research results based on a meta-analysis indicate that the use of seat belts in light vehicles reduces the risk of being killed or severely injured in a crash by 60% for front occupants and by 44% for rear occupants (Høye, 2016a).

The effects of using CRS (correctly) in case of a traffic crash is greatest on younger children, especially for ages four and younger (WHO, 2023). However, research shows that the overall benefits of CRS vary depending also on the type of equipment. Overall, using a CRS correctly results in a 55% to 60% lower risk of injury or fatality (European Commission, 2022).

5. Legislation

5.1 Bicycle helmet

The rules regarding bicycle helmet requirements vary between Member States, and many European countries do not have national laws mandating the use of helmets for cyclists. Some countries require helmet use for specific groups, such as children or in certain areas. **Table 2** provides an overview of helmet use regulations.

Table 2. *Overview of legislation of mandatory bicycle helmet use in EU and EFTA countries. (Source: https://www.baseline.vias.be, Bicycle helmets (swov.nl))*

Country	Obligation to use bicycle helmet
Austria	Age 12 and younger
Belgium	No
Bulgaria	No
Croatia	Age 16 and younger
Czech Republic	Age 18 and younger
Denmark	No
Estonia	Age 16 and younger
Finland	Yes
France	Age 12 and younger
Germany	No
Greece	No
Iceland	Age 15 and younger
Ireland	No
Italy	No

Latvia	Age 12 and younger
Liechtenstein	No
Lithuania	Age 18 and younger
Luxembourg	No
Malta	For power assisted pedal cycles and for children under 10 travelling pillion in a safety seat
Netherlands	No
Norway	No
Poland	No
Portugal	No
Romania	No
Slovakia	Yes
Slovenia	Age 15 and younger
Spain	Age 15 and younger (all ages on rural roads)
Sweden	Age 15 and younger
Switzerland	No

5.2 Motorcycle helmet

Wearing a crash helmet when riding a PTW is mandatory in all EU Member States. European test standards apply regarding the size, shape, material and size of field of vision of the helmet. Fastening of the helmet, however, is not mandatory in all of the EU27 and EFTA countries (WHO, 2023).

5.3 Seat belts and CRS

The use of seat belts in all categories of vehicles and on all seats fitted with them has been mandatory in EU Members States since 2006 (Directive 2003/20/EC), while this did only apply to vehicles under 3.5 tonnes before. Equally, the mandatory use of restraint systems specially adapted for children (approved device adapted to their weight) was enacted in the same Directive. Member States have the discretion to permit children taller than 1.35 meters to utilize adult seat belts. The placement of rearward-facing child restraints on the front passenger seat is prohibited unless the airbag has been deactivated.

Precise and harmonised figures on the extent of enforcement in the EU Member States are not available. However, studies consistently show the positive impact of enforcement activities regarding seat belt use on road safety outcomes (Alfonsi, Meta & Ammari, 2017). See ETSC (2018) for the EU countries' set enforcement targets for CRS use.

6. Limitations

The failure to use protective equipment in road traffic is an important risk factor. However, data on the prevalence of use and non-use of such equipment are not harmonized among the European countries.

The two data sources used in this report are from the ESRA and Baseline projects. The ESRA data is based on self-reports collected on a larger scale than Baseline which provides information on observed use of protective systems. The data obtained through roadside observations[2] in the Baseline project are available for fewer countries.

There are limitations regarding the data sources used. The ESRA data based on self-reported data can have disadvantages, such as social desirability bias (the tendency of respondents to provide answers which present a favourable image of themselves), non-accurate recall, misunderstanding of questions or selective non-response bias (occurring when subjects who refuse to take part in a study, or who drop out before the study can be completed, are systematically different from those who participate).

The Baseline data are based on roadside observations and in-vehicle inspections, and therefore do not have these disadvantages. However, the limitation of the Baseline data is that they are not fully comparable among countries mainly due to various deviations from the minimum methodological requirements, small samples for specific strata or weighting of data.

7. References

Alfonsi, R., Meta, E., Ammari, A. (2017). Seatbelt law and enforcement, European Road Safety Decision Support System, developed by the H2020 project SafetyCube. Retrieved from: www.roadsafety-dss.eu [29.01.2024]

ETSC (2018). Reducing child deaths on european roads. PIN Flash Report, 34. Retrieved from: https://etsc.eu/wp-content/uploads/PIN-FLASH_34.pdf [29.01.2024]

ETSC (2022). How traffic law enforcement can contribute to safer roads.

European Commission (2022). Road safety thematic report – Seat belt and child restraint systems. European Road Safety Observatory. Brussels, European Commission, Directorate General for

[2] and in-vehicle inspections in the case of CRS in some countries

Transport
Goldenbeld, C. (2023). ERSO Thematic Report - Alcohol and drugs.
Meesmann, U., Torfs, K., Wardenier, N., & Van den Berghe, W. (2023). ESRA2 methodology. ESRA2 report Nr. 1 (updated version).
Høye, A. (2016a). How would increasing seat belt use affect the number of killed or seriously injured light vehicle occupants? Accident Analysis & Prevention, 88, 175-186.
Høye, A. (2016b). PTW Helmets. The Handbook of Road Safety Measures, Norwegian (online) version. Retrieved from: http://tsh.toi.no/doc685.htm#anchor_22474-90 [29.01.2024]
Høye, A. (2018). Bicycle helmets–To wear or not to wear? A meta-analyses of the effects of bicycle helmets on injuries. Accident Analysis & Prevention, 117, 85-97.
Nakamura, H., Alhajyaseen, W., Kako, Y. and Kakinuma, T. (2020): Seat belt and child restraint systems. ESRA2 Thematic report No. 7.
Van den Broek, B., Aarts, L., & Silverans, P. (2022). Baseline report on the KPI Safety belt and Child restraint systems. Baseline project, Brussels: Vias institute.
WHO (2023). Global status report on road safety 2023. Retrieved from: https://www.who.int/teams/social-determinants-of-health/safety-and-mobility/global-status-report-on-road-safety-2023 [29.01.2024]
Yannis, G., & Folla, K. (2022). Baseline report on the KPI Helmet use among Cyclists and Powered two-wheelers (PTWs). Baseline project, Brussels: Vias institute.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