

Calidad y gestión de un sistema integral de datos de seguridad vial

10 al 21 de abril 2023

The Baseline project: Road Safety KPIs in the EU

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Esta actividad contribuye a los ODS:



Introduction

- The **EU Road Safety Policy Framework 2021-2030**:
Next steps towards "Vision Zero" highlights the need of measuring road safety KPIs at European level
- National Experts Group established 8 Road Safety KPIs directly related to the **prevention of road crash fatalities and serious injuries**
- The **Baseline project** (EU co-financed) aims to:
 - assist authorities of EU Member States in the **collection and harmonized reporting of KPIs for road safety** and
 - contribute to building the capacity of those MS that have not yet collected the relevant data
- A consortium of **28 partners** from 18 EU Member States
- Project duration: **27 months** (July 2020–October 2022)

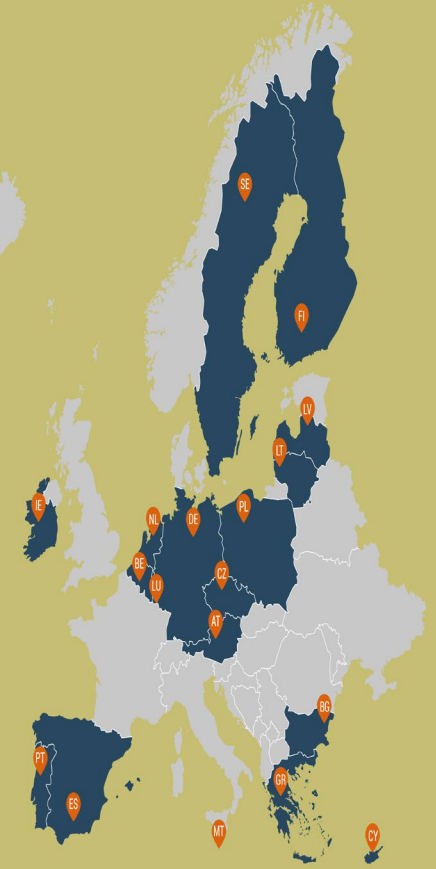
https://road-safety.transport.ec.europa.eu/statistics-and-analysis/data-and-analysis/key-performance-indicators-kpis_en



Baseline
Partners

18
EU members

28
partners



Baseline

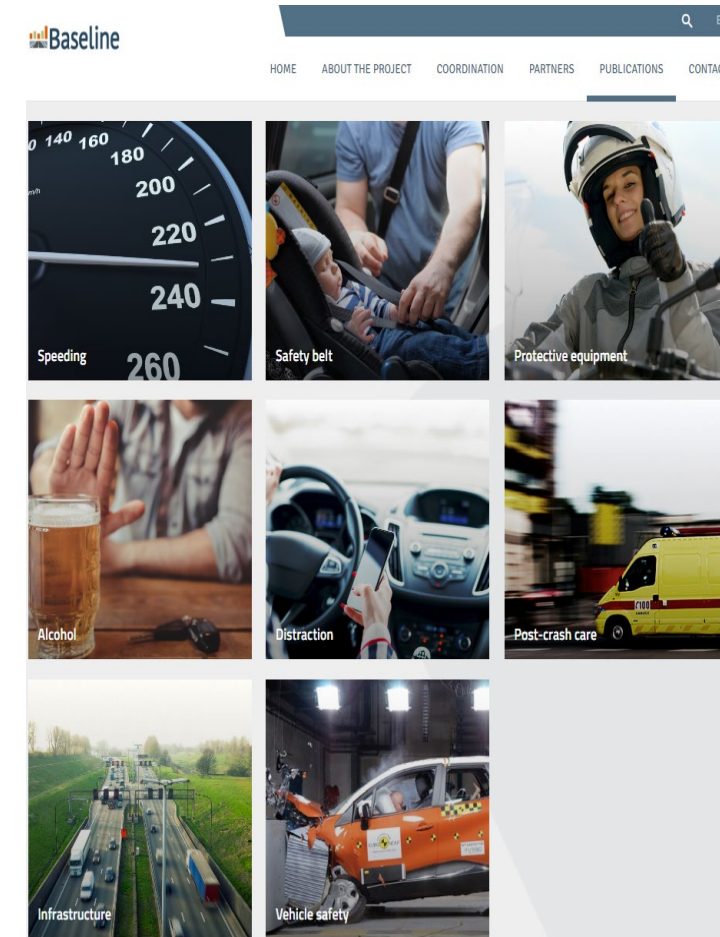
<https://www.baseline.vias.be/en/>

EU Road Safety Key Performance Indicators

KPI area	KPI definition (European Commission 2019)
Speed	Percentage of vehicles travelling within the speed limit
Safety belt	Percentage of vehicle occupants using the safety belt or child restraint system correctly
Protective equipment	Percentage of riders of PTWs and bicycles wearing a protective helmet
Alcohol	Percentage of drivers driving within the legal limit for blood alcohol content (BAC)
Distraction	Percentage of drivers not using a handheld mobile device
Vehicle Safety	Percentage of passenger cars with a Euro NCAP safety rating equal or above a threshold
Infrastructure	Percentage of distance driven over roads with a rating above an agreed threshold
Post-crash care	Time elapsed between the emergency call following a collision resulting in personal injury and the arrival at the scene of the collision of the emergency services

Common methodological framework

- Key **definitions** and **operational specifications**: SWD 283
- “**Behavioural**” KPIs vs “**Technical**” KPIs:
 - Behavioural: sampling, roadside observations/ measurements
 - Non-behavioural: exploitation of existing databases
- Detailed **methodological guidelines** for each KPI:
 - Key concept: percentage respecting rules => refers to total of kilometers driven
 - Key aspects: sampling methods and size, measurement tools, definitions
 - Minimum vs recommended requirements
 - Balancing exercise: feasibility / reliability-exploitability
- **Quality assurance** procedures:
 - Considerations for sampling weights
 - Common database format (including confidence intervals and metadata)
 - Quality control procedures



<https://www.baseline.vias.be/en/>

Data Collection

➤ **Data collection:**
Jan 2020 - Oct 2022

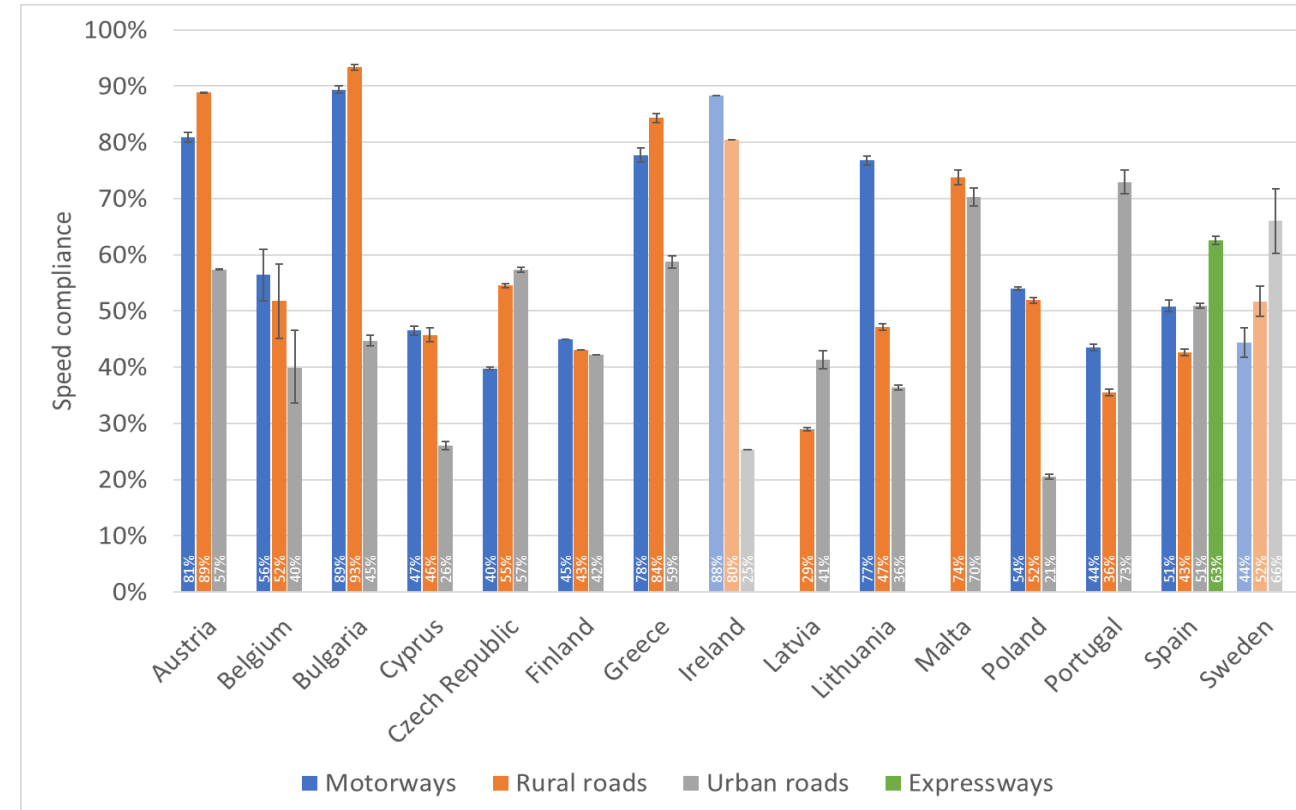
➤ **Publication:**
March 2023

Country	Speed	Safety belt	Helmet	Alcohol	Distraction	Vehicle	Infrastructure	Post-crash Care
Austria	x	x	x	x	x	x		x
Belgium	x	x	x	x	x	x		x
Bulgaria	x	x	x	x	x	x		
Cyprus	x	x	x		x	x		x
Czech Rep.	x	x	x	x	x	x		x
Finland	x			x	x	x	x	x
Germany		x	x	x	x			x
Greece	x	x	x	x	x	x		x
Ireland	x	x	x	x				
Latvia	x	x	x	x	x	x	x	x
Lithuania	x	x			x	x	x	x
Luxembourg				x	x			
Malta	x	x	x		x		x	
Netherlands	x	x		x		x		
Poland	x	x	x	x	x			
Portugal	x	x	x	x	x	x	x	x
Spain	x	x	x	x	x	x		
Sweden	x	x	x	x	x	x	x	x
Total	16	16	14	15	16	13	6	11

KPI Speed (1/2)

- KPI: percentage of **free flow traffic respecting speed limits**
- Analysed per **road type** and **vehicle type**
- KPIs on **average speed** and **V85** reported
- **17 Member States** provided KPIs
- The KPI on **motorways** is lowest in the Czech Republic (40%) and highest in Bulgaria (89%)
- The KPI on **rural roads** is lowest in Latvia (29%) and highest in Bulgaria (93%)

Speed compliance by passenger cars during weekday/daytime

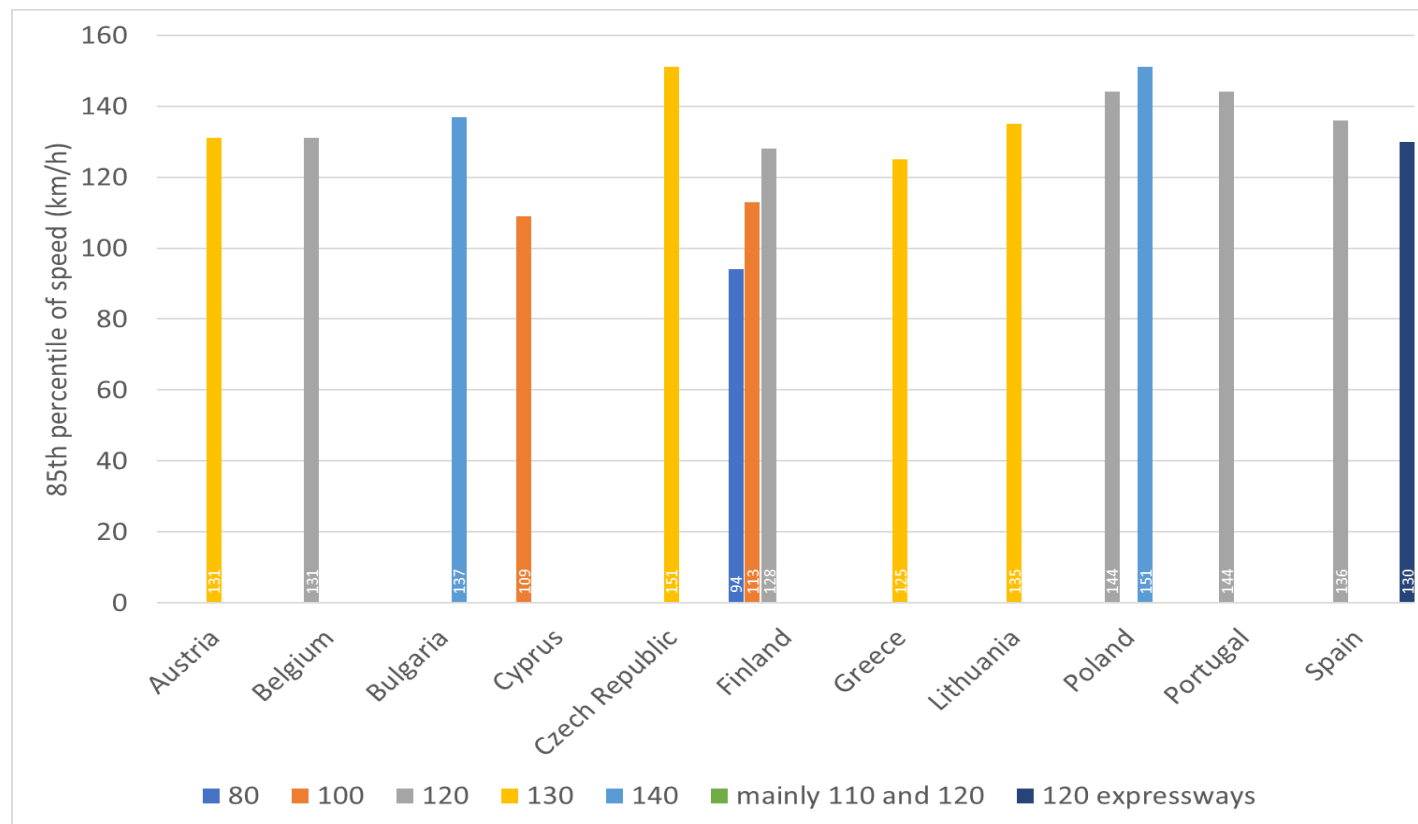


- The KPI on **urban roads** is lowest in Poland (21%) and highest in Portugal (73%), Malta (70%) and Sweden (66%)

KPI Speed (2/2)

- Main points of attention:
 - **Higher speed limit** on the same road type usually means a higher share of drivers driving within the speed limit
 - **Very high percentage of non-compliance**

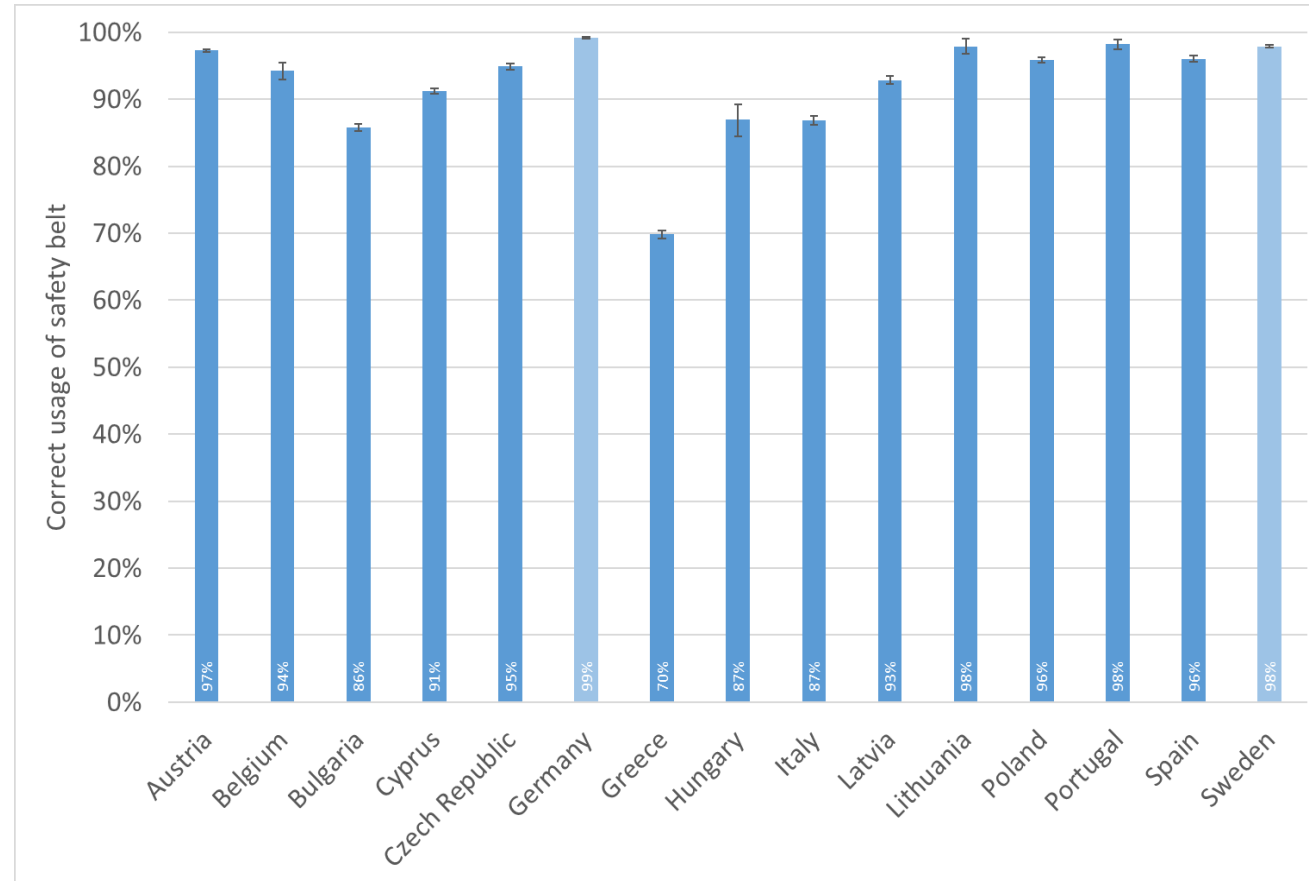
85th percentile of speed (km/h) on motorways



KPI Seat belt & CRS use (1/2)

- **16 MS** provided data; direct observations on the roadside
- Focus is given on **weekday/ daytime**
- Significant **factors**:
 - Drivers vs passengers
 - Rear vs front
- The share of drivers using a seat belt ranges from **70%** in Greece to **98%** in Portugal
- For front passengers, KPI ranges from **77%** in Bulgaria to **98%** in Austria and Sweden

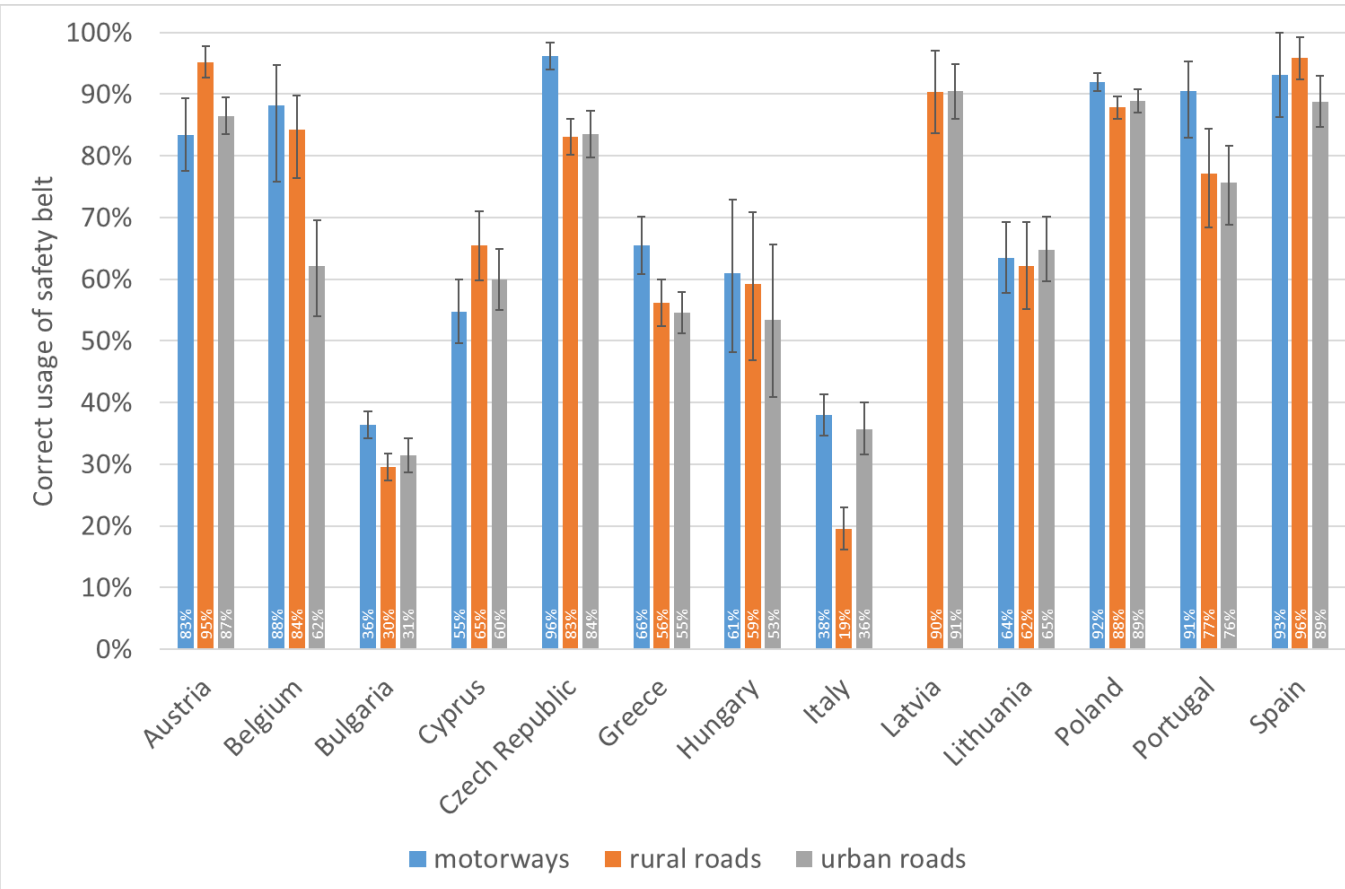
Seat belt use rates for passenger car drivers



KPI Seat belt & CRS use (2/2)

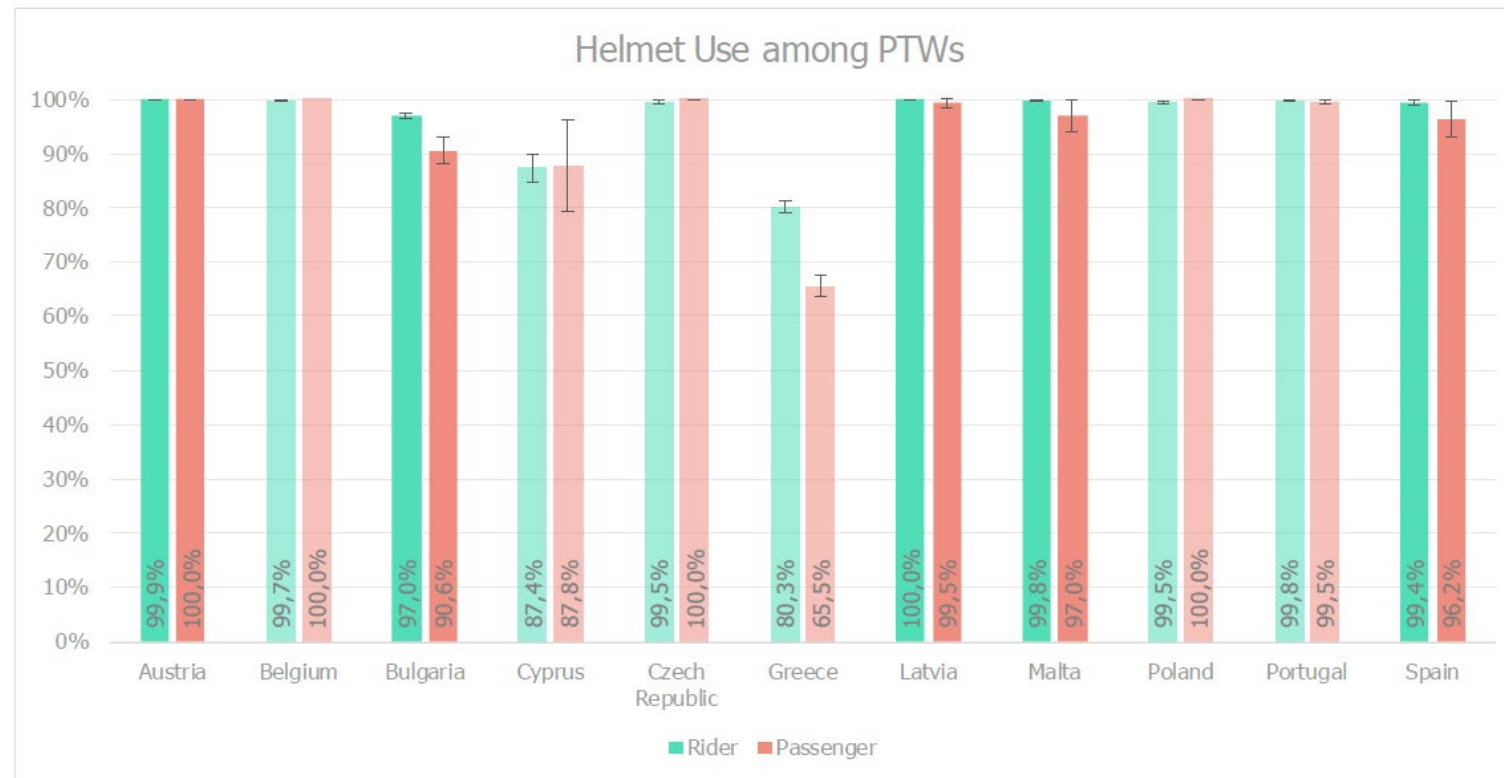
- KPI for **rear occupants** is lower than that of any front occupants.
- KPIs for drivers and rear occupants in passenger cars are **highest on motorways** and least on urban roads
- The share of children correctly using **Child Restraint Systems** starts at just above **35%**

Seat-belt use rates for rear passengers by road type



KPI Helmet - PTWs

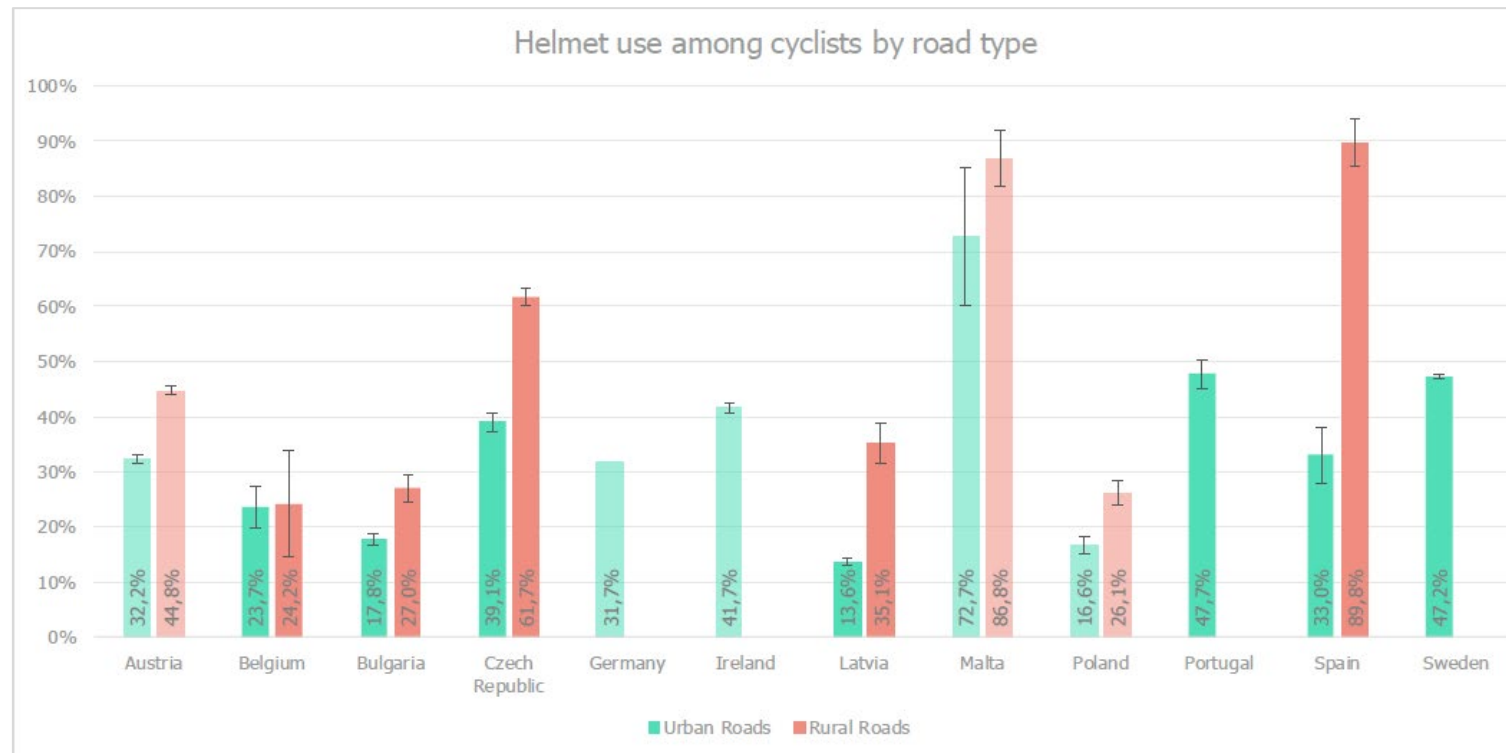
- **12 countries** provided KPIs on helmet use; data collected through observations on the roadside
- Helmet use for PTWs is **mandatory** in all MS
- **Methodological variations** sometimes important (min. sample size, sampling methods, etc.)



- KPIs for PTW riders are **above 90%** for almost all countries
- KPI on **urban roads is lower** compared to the other road types in a few countries

KPI Helmet - Cyclists

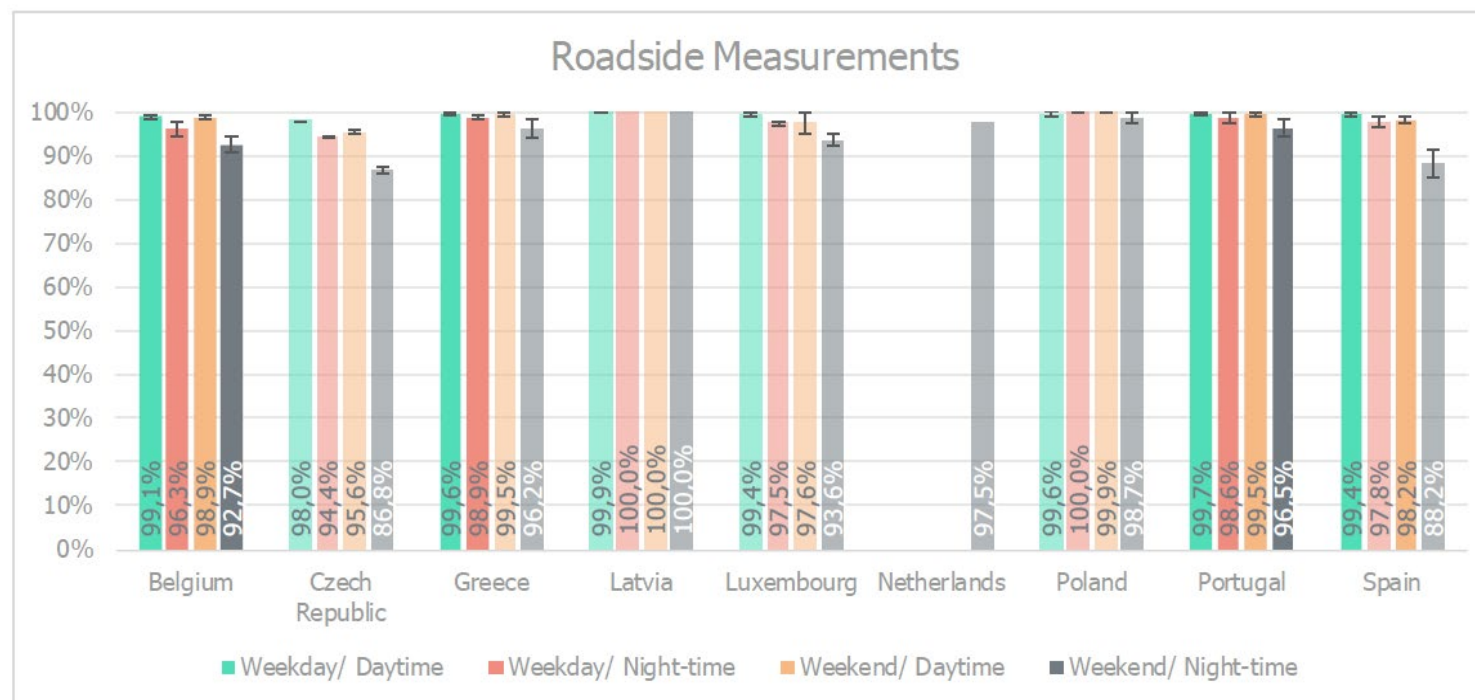
- Helmet use for cyclists is **not mandatory**, except specific cases (e.g., children, on rural roads, e-bikes) in some MS
- Methodological **variations** sometimes important



- KPIs for **cyclists** are significantly lower (17,9% - 52,6%) compared to PTWs
- KPI is **higher on rural roads** compared to urban roads

KPI Alcohol (1/2)

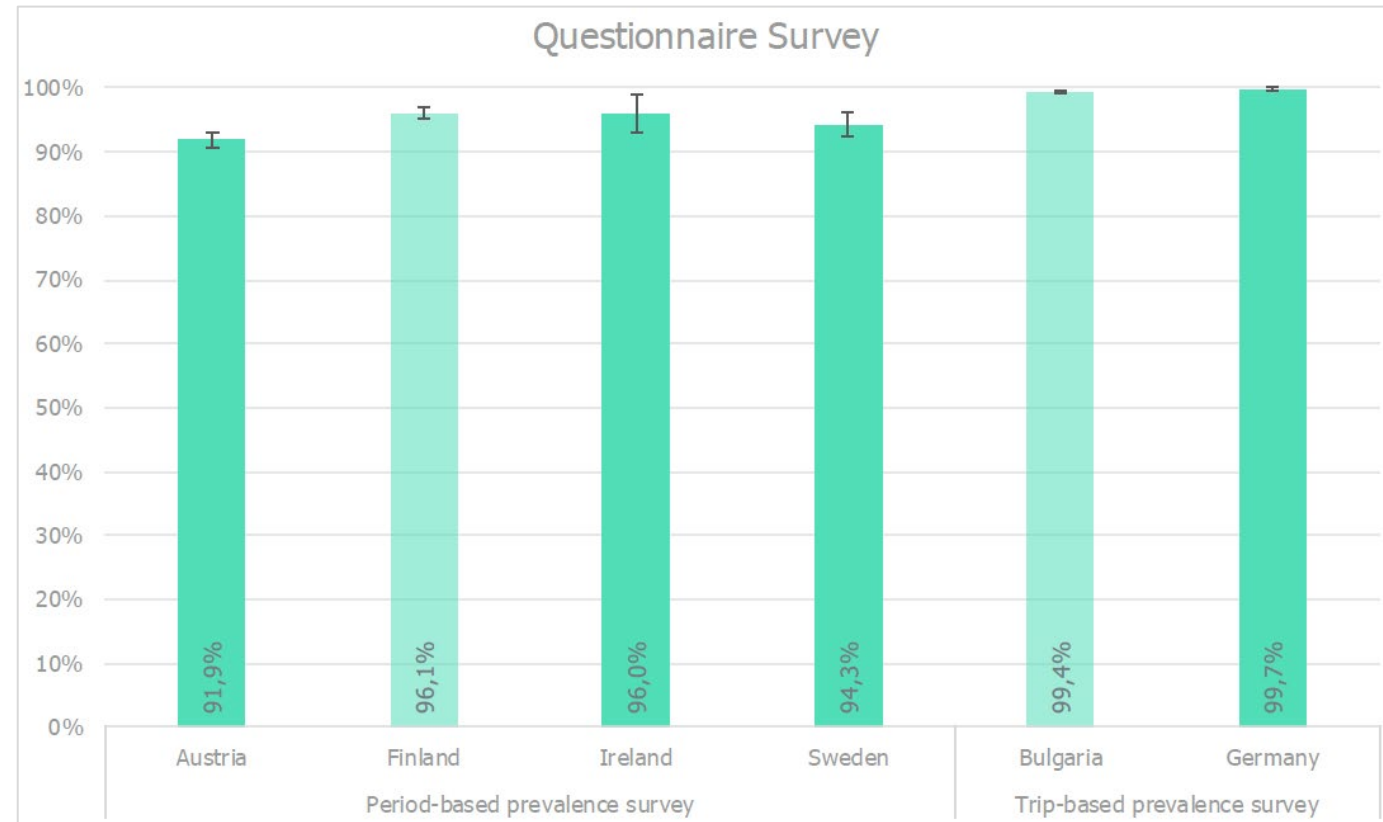
- KPIs were delivered by **15 MS**
- 8 MS: roadside measurements by the Police (random breath testing)
- 6 MS: self-reported behaviour
- 1 MS: alcohol testing results from enforcement actions (not random)
- Significant **effect of time period**



- The KPI values are **lower during night-time** for all countries, with the lowest KPIs being observed at weekends compared to weekdays for all countries
- During daytime, **fewer drivers** are driving within the legal BAC limits **at weekends** compared to weekdays in some countries

KPI Alcohol (2/2)

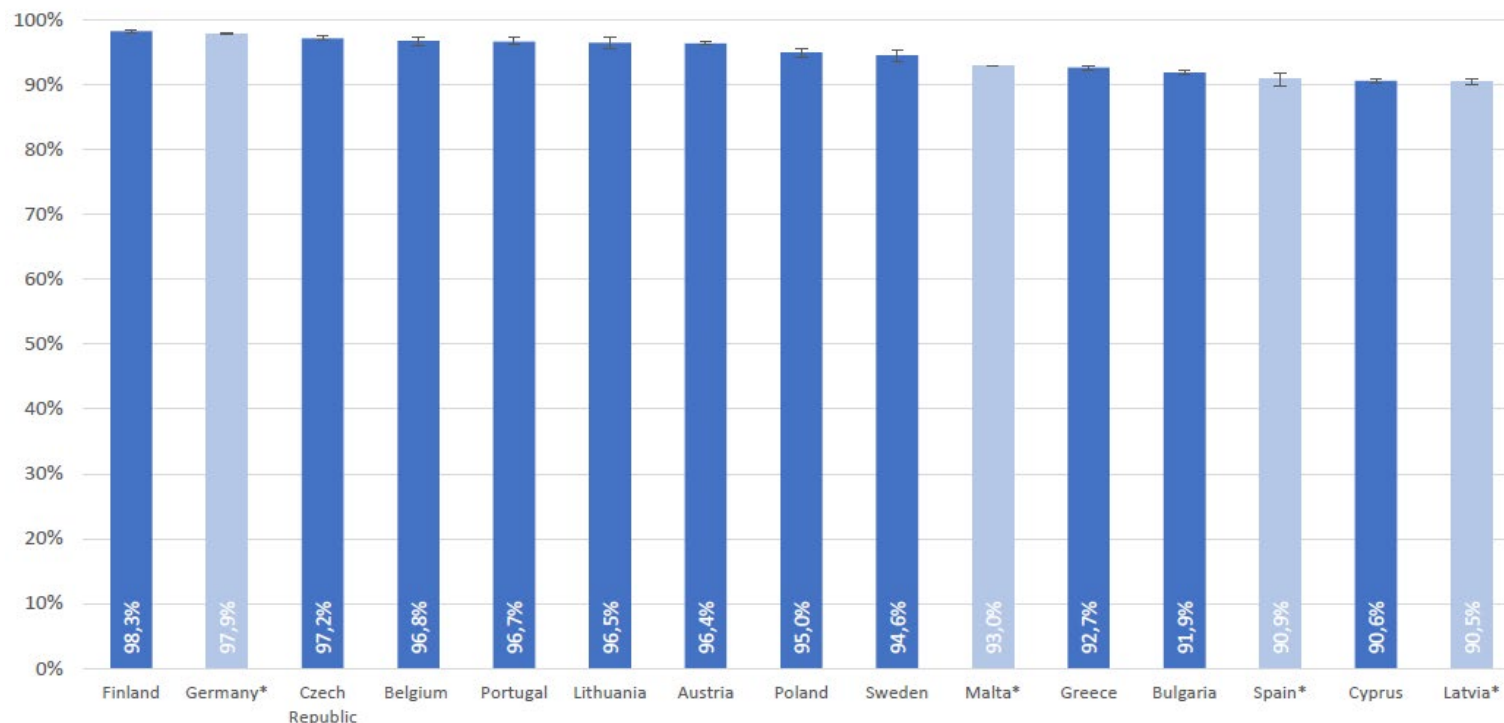
- ESRA Attitudes Survey data on **period-based prevalence** (30 days, Sweden: 12 months)
- Ad hoc surveys for **trip-based prevalence**
- Methodological choice partly determined by **legal framework**



KPI Distraction

- KPIs were provided by **15 MS**, based on fieldwork between 2019 and 2022
- 13 MS used **observers along the road**, and 2 MS used camera images.
- KPI sometimes refers to not using **handheld phone** (instead of device)

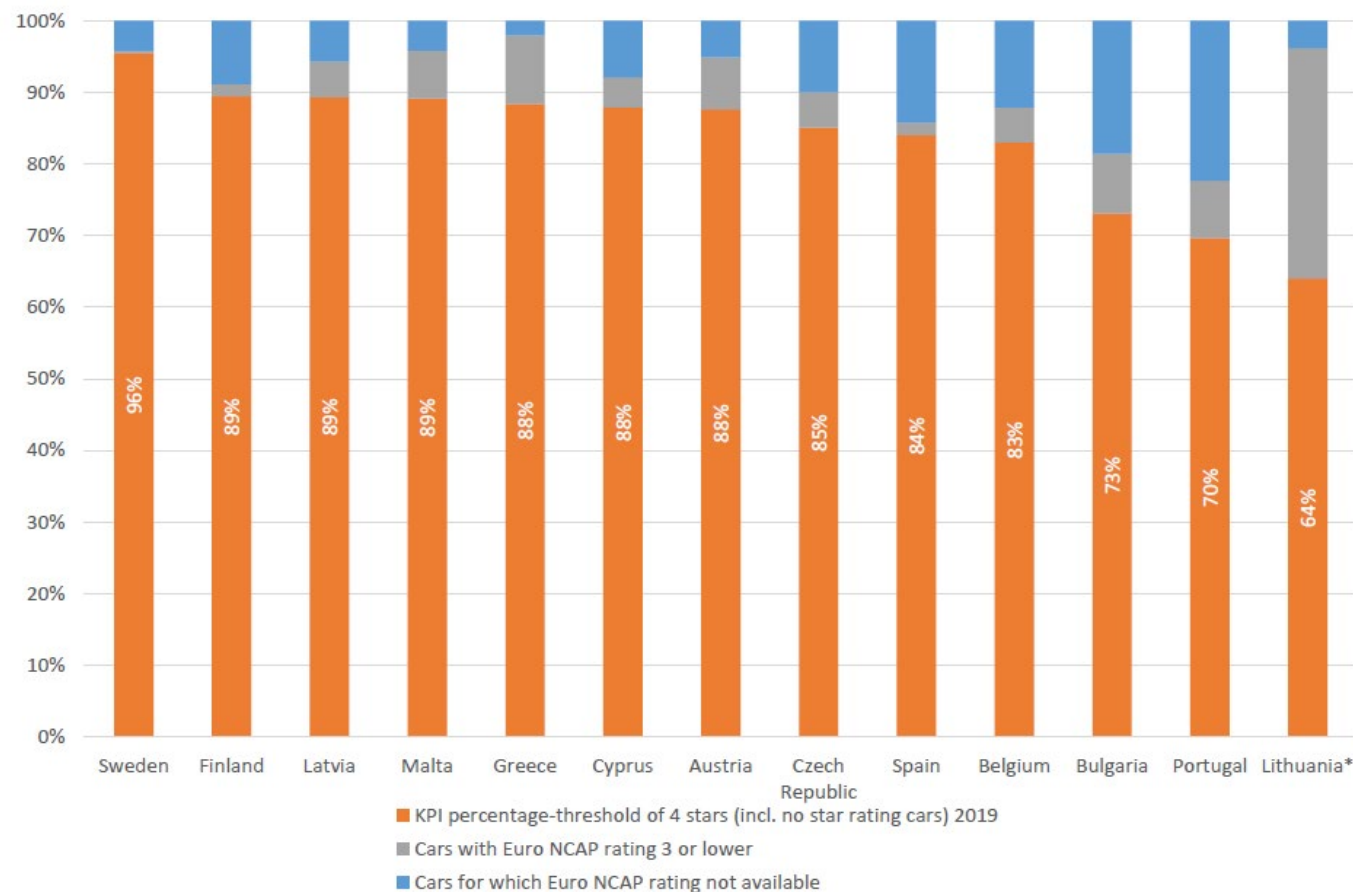
National KPI Distraction: % drivers NOT using a handheld mobile device
(3 modes, all road types, weekdays)
Light colours: deviations



- More than **90% of the drivers** in the participating MS do not use a handheld device while driving
- KPIs range between **90,6%** in Cyprus to **98,3%** in Finland
- Drivers of **light goods vehicles** more often use a handheld mobile device than car and bus drivers

KPI Vehicle Safety

- KPI limited to **newly registered vehicles**
- Main KPI: the percentage of newly registered passenger cars with a **Euro NCAP rating ≥ 4 stars in 2019**
- KPI ranges between **64%** in Lithuania and **98%** in Spain
- For all countries except three, this percentage is **above 80%**



KPI Infrastructure

- **Motorways:** KPI = 100% for all countries
- Interpretation of the results is difficult due to **lack of clear definitions**
- New framework to be developed based on **network-wide road safety assessments** (proactive and reactive) in line with the EU RISM Directive

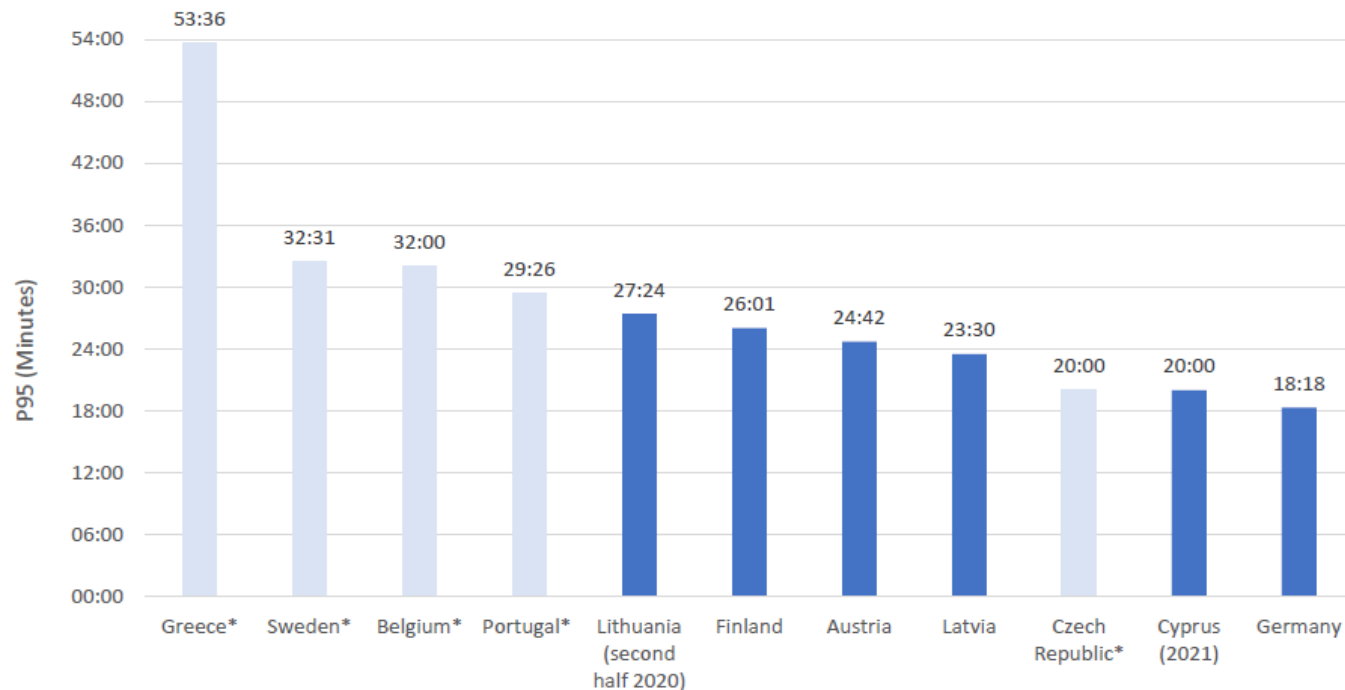
KPIs for rural roads

	Finland	Latvia	Lithuania	Malta	Portugal	Sweden
KPI(1)	70,4%					
KPI(2)	48,7%					
KPI(3)*	31,3%					64,3%
KPI(4)*	19,0%	4,4%	53,77%	39,2%	27,8%	

- KPI(4): Percentage of the **road network length of roads** either with opposite traffic separation (by barrier or area) or with a speed limit equal to or lower than xx (rural: 70km/h) in relation to the total road network length

KPI Post Crash Care

- **11 countries** provided KPI estimates
- The shortest 95th percentile of response times corresponds to **20 minutes**
- The response times are **longest on rural roads** compared to urban roads and motorways



* Representativeness of data and/or comparability with other countries not guaranteed

- In terms of period of the week, the response times are **shortest at daytime during weekdays**
- The ranking of the countries is not very different when based on the **50th percentile** compared to the 95th percentile

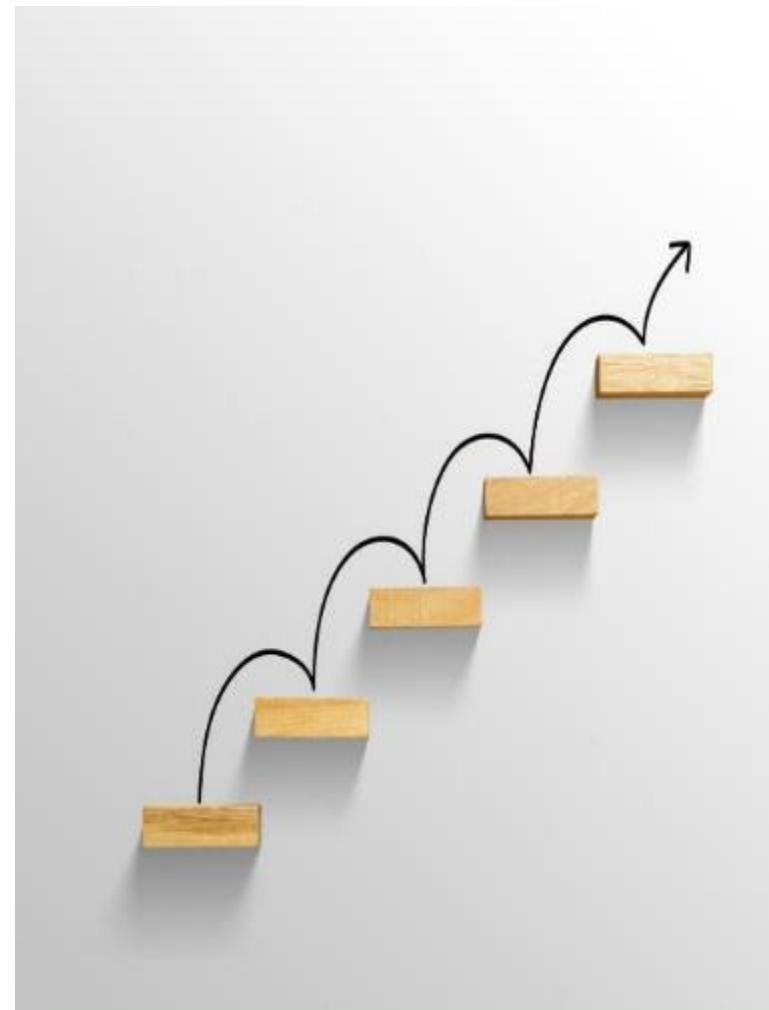
Example - KPIs in Greece

- **Roadside observations** were carried out for 5 Road Safety Key Performance Indicators (Spring 2022):
 - Speed
 - Safety belt use
 - Protective equipment use
 - Driving under the alcohol influence
 - Distraction
- Data from **national databases** were extracted for the indicators:
 - Vehicle Safety
 - Post-crash care



Roadside Observations

- Road observations were conducted in **14 regions at 150 locations** (May - June 2022)
- Suitable locations were selected **by road type**:
 - Urban Roads
 - Rural Roads (excluding motorways)
 - Motorways
- Roadside observations were conducted on **weekdays** and **weekends** in normal traffic and good weather conditions
- The duration of the observation sessions was **3 hours** for all KPIs
- For **speed**, suitable locations were selected in free-flowing traffic conditions
- Measurements on **DUI of alcohol** were carried out in cooperation with Traffic Police



Speeding

- The sample includes **36,346 vehicles**:
 - Urban roads: 39.5%, rural roads: 39.0%, motorways: 21.5%
 - Weekday: 79.0%, Weekend: 21.0%
 - Passenger cars: 73.7%, motorcycles: 6.3%, light trucks: 13.2%, buses/heavy trucks: 6.8%

Road Type (speed limit)	KPI (95% CI)	Average Speed (km/h)	Standard Deviation (km/h)	V85 (km/h)
Urban Roads (50 km/h)	55.8% (55.0% - 56.6%)	48.4	9.3	57.0
Rural Roads (90 km/h)	84.0% (83.4% - 84.6%)	66.7	11.0	77.1
Motorways (130 km/h)	76.9% (77.2% - 79.2%)	103.3	14.9	117.3

- In the **urban network**, the lowest percentage of vehicles travelling within the speed limits is observed (55.8%)

Seat belt use

- The sample includes **47,563 occupants**:
 - 37,0460 drivers, 8,525 co-drivers, 1,992 rear passengers
 - Urban roads: 40.5%, Rural roads: 32.7%, Motorways: 26.8%
 - Weekday: 78.7%, Weekend: 21.3%
 - Passenger Cars: 80.5%, Good vehicles: 19.5%
- Seatbelt use by **rear passengers** is **significantly lower** (55.8%) compared to drivers and front passengers (71.0% και 71.8% respectively)
- There is a seat belt use **increase on weekends** compared to weekdays for all occupants

Road Type	KPI (95% CI)		
	Driver	Front Passenger	Rear Passenger
Urban Roads	71.2% (70.4% - 72.0%)	72.4% (71.7% - 73.1%)	54.6% (51.3% - 58.0%)
Rural Roads	70.3% (69.4% - 71.2%)	70.8% (70.0% - 71.6%)	56.2% (52.4% - 59.9%)
Motorways	83.5% (82.6% - 84.4%)	85.3% (84.6% - 86.1%)	65.5% (60.8% - 70.2%)
Total	71.0% (70.5% - 71.5%)	71.8% (71.4% - 72.3%)	55.8% (53.5% - 58.0%)

Time Period	KPI (95% CI)		
	Driver	Front Passenger	Rear Passenger
Weekday	69.8% (69.2% - 70.4%)	70.6% (70.1% - 71.2%)	52.4% (49.4% - 55.0%)
Weekend	73.6% (72.5% - 74.7%)	74.5% (73.6% - 75.4%)	63.1% (58.6% - 67.6%)
Total	71.0% (70.5% - 71.5%)	71.8% (71.4% - 72.3%)	55.8% (53.5% - 58.0%)

Helmet use among PTWs

- The sample includes **4,079 motorcyclists**:
 - 3,464 riders and 615 passengers
 - Urban roads: 72.6%, Rural roads: 22.3%, Motorways: 5.2%
 - Weekday: 78.1%, Weekends: 21.9%
- Helmet use is **lower on urban roads** compared to rural roads and motorways

Road Type	KPI (95% CI)	
	Rider	Passenger
Urban Roads	75.5% (73.8% - 77.2%)	60.5% (55.9% - 65.0%)
Rural Roads	83.7% (81.1% - 86.3%)	68.7% (61.4% - 76.0%)
Motorways	94.9% (91.7% - 98.0%)	91.7%
Total	80.3% (79.0% - 81.6%)	65.5% (61.8% - 69.3%)

DUI of Alcohol

- The sample includes **4,658 drivers**:
 - Urban roads: 52.7%, Rural roads: 22.4%, Motorways: 24.9%
 - Weekday day: 35.4%, Weekday night: 39.8%, Weekend day: 14.6%, Weekend night: 10.2%
- KPI on DUI on Alcohol is **lower on weekends** compared to weekdays

Time Period	KPI (95% CI)
Weekday day	99,7% (99,4% - 100,0%)
Weekday night	98,7% (98,2% - 99,3%)
Weekend day	99,7% (99,3% - 100,1%)
Weekend night	96,0% (94,2% - 97,7%)
Total	98,8% (98,5% - 99,2%)

Driver Distraction

- The sample includes **38,020 drivers**:
 - Urban Roads: 39.8%, Rural roads: 32.8%, Motorways: 27.4%
 - Weekday: 79.3%, Weekend: 20.7%
 - Passenger Cars: 76.4%, Light Trucks: 15.1%, Buses: 8.5%
- The KPI is **lower for drivers of passenger cars** (92.1%) compared to light trucks (93.8%) and buses (94.7%)
- The use of mobile phone while driving is **lower on weekdays** compared to weekends

Road Type	KPI (95% CI)		
	Passenger Cars	Light Trucks	Buses
Urban Roads	90.8% (90.3% - 91.3%)	93.8% (92.9% - 94.8%)	93.5% (91.4% - 95.7%)
Rural Roads	94.0% (93.6% - 94.5%)	94.0% (93.0% - 95.0%)	98.6% (97.1% - 100.0%)
Motorways	93.1% (92.5% - 93.7%)	93.7% (92.9% - 94.5%)	90.6% (86.7% - 94.5%)
Total	92.1% (91.8% - 92.4%)	93.8% (93.3% - 94.4%)	94.7% (93.3% - 96.1%)

Time Period	KPI (95% CI)		
	Passenger Cars	Light Trucks	Buses
Weekday	91.6% (91.3% - 92.0%)	95.8% (95.3% - 96.3%)	95.3% (93.8% - 96.7%)
Weekend	93.6% (93.0% - 94.2%)	87.3% (85.4% - 89.2%)	93.6% (89.7% - 97.4%)
Total	92.1% (91.8% - 92.4%)	93.8% (93.3% - 94.4%)	94.7% (93.3% - 96.1%)

KPI Vehicle Safety

- The **average age** of total vehicle fleet is 16.8 and 17.4 years for 2019 and 2020 respectively
- **88.4%** of new passenger cars in 2019 are rated with at least 4 stars in the EuroNCAP scale
- The percentage for new passenger cars rated with 5 stars EuroNCAP for 2019 is 60.0%

	2019	2020
Percentage of new passenger cars with at least 4 EuroNCAP stars (excluding new vehicles without star rating)	90.3%	92.4%
Percentage of new passenger cars with at least 4 EuroNCAP stars	88.4%	89.2%
Percentage of new passenger cars with 5 EuroNCAP stars (excluding new vehicles without star rating)	61.3%	69.9%
Percentage of new passenger cars with 5 EuroNCAP stars	60.0%	67.5%

	2019	2020
Average age of total vehicle fleet (years)	16.8	17.4
Percentage of vehicles with a major or dangerous deficiency during the technical inspection (%)	5,1%	4,5%

Usefulness of Road Safety KPIs

- For the first time, data on the **safety performance** of drivers, roads and vehicles were collected in Greece.
- Through the KPIs, specific critical problems (speed, alcohol, distraction, seat belt, helmet) per type of driver, road and vehicle and the corresponding **road safety actions and measures** were documented.
- The **comparison** of road safety performance in Greece with the European countries' performances highlights the road safety areas that need improvement.
- **Targets** for the improvement of the road safety KPIs have been set in the Greek National Road Safety Plan 2021-2030.



Targets for Improving Road Safety KPIs

National Road Safety Strategic Plan 2021-2030

Key Performance Indicators	Baseline year 2022	Target 2025	Target 2030
1. Speeding	29%	<20%	<15%
2. Seat-belt use	71%	>90%	>95%
3. Helmet use	79%	>90%	>95%
4. Driving under the influence of alcohol	1.2%	0.8%	0.6%
5. Mobile phone use	7%	<5%	<2%
6. Percentage of new passenger cars with 5 Euro NCAP stars	89%	95%	>99%
7. Percentage of TEN-T network (≥3 stars i-RAP/EC)	50%*	65%	80%
8. Emergency response time (minutes)	49**	39	32

*Estimation to be confirmed after the relevant Network-wide road safety assessment

** Baseline year 2020

Conclusions

➤ **Baseline KPI results:**

➤ **Benchmarking:**

- Strong international variations in KPI performance
- Depending on KPI huge to very huge potential for improvement
- Contextual explaining factors yet to take into account

➤ **Target setting:**

- Foundations laid for defining objectives
- Targets yet to be set (take Km driven in infraction into account)

➤ **Monitoring:**

- Cf. national practices in several countries
- At EU level: “Trendline” measurements planned for 2023-2024

➤ **Adaptation of methodological guidelines:**

- KPI definitions and specifications to be developed more in detail
- Severity of infractions (cf. degree of risk) to be integrated in KPIs
- Methodological improvements recommended: direct or indirect observations, sampling locations, sample size, minimum requirements for weighting and confidence interval calculation



Next Steps

- **Trendline** is the follow-up project (EU co-financed) of the Baseline project (October 2022 – December 2025)
- **Participating countries:**
 - 25 EU Member States (out of 27)
 - 4 Observers: Estonia, Malta, Norway & Switzerland
- Trendline also focusses on **8 KPIs** defined by the EC
- Existing methodologies will be **reviewed** and **refined**
- **New experimental indicators** and complementary methods will be selected
- In Trendline, there will be more emphasis on the use of the KPIs in **policy monitoring activities**





¡Muchas gracias por su atención!