

# The **BASELINE** project:

## Harmonized measurement of road safety Key Performance Indicators

High level group on road safety, March 28th 2023

Peter Silverans, Vias institute



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# Introduction

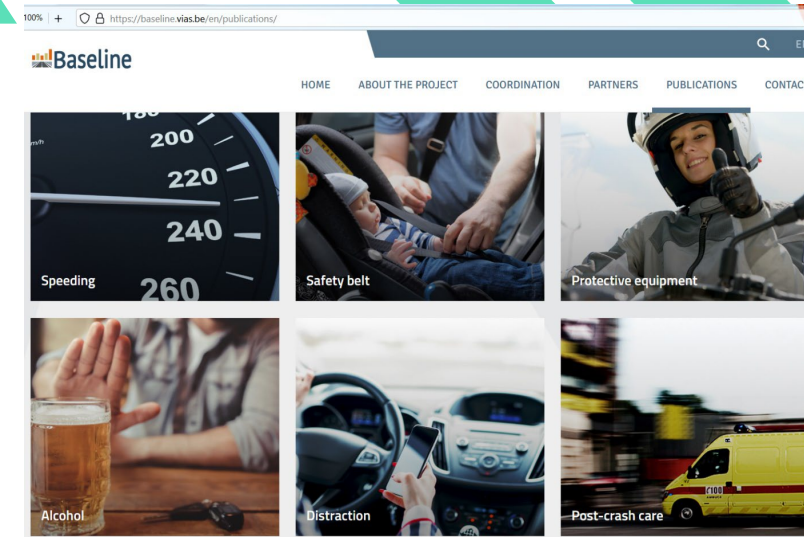
- ▶ **EU Road Safety Policy Framework 2021-2030 - Next steps towards "Vision Zero"**: highlights the need of measuring **road safety KPIs** at European level
- ▶ **8 KPIs directly related to the prevention of road accident fatalities and serious injuries** (approved by High Level Group)

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
- Differentiation between "behavioural KPI" and "technical" KPIs (vehicle, infrastructure, post-crash):
  - Behavioural => sampling, direction observation
  - Non-behavioural => complete databases, 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
  - Minimal vs recommended requirements
  - Balancing exercise: feasibility / reliability-exploitability
- Quality assurance procedures:
  - Considerations for sampling weights
  - Common database format (including confidence intervals and meta-data)
  - Quality control procedures
- Data collection: Jan 2020 -> Oct 2022
- Publication: March 2023



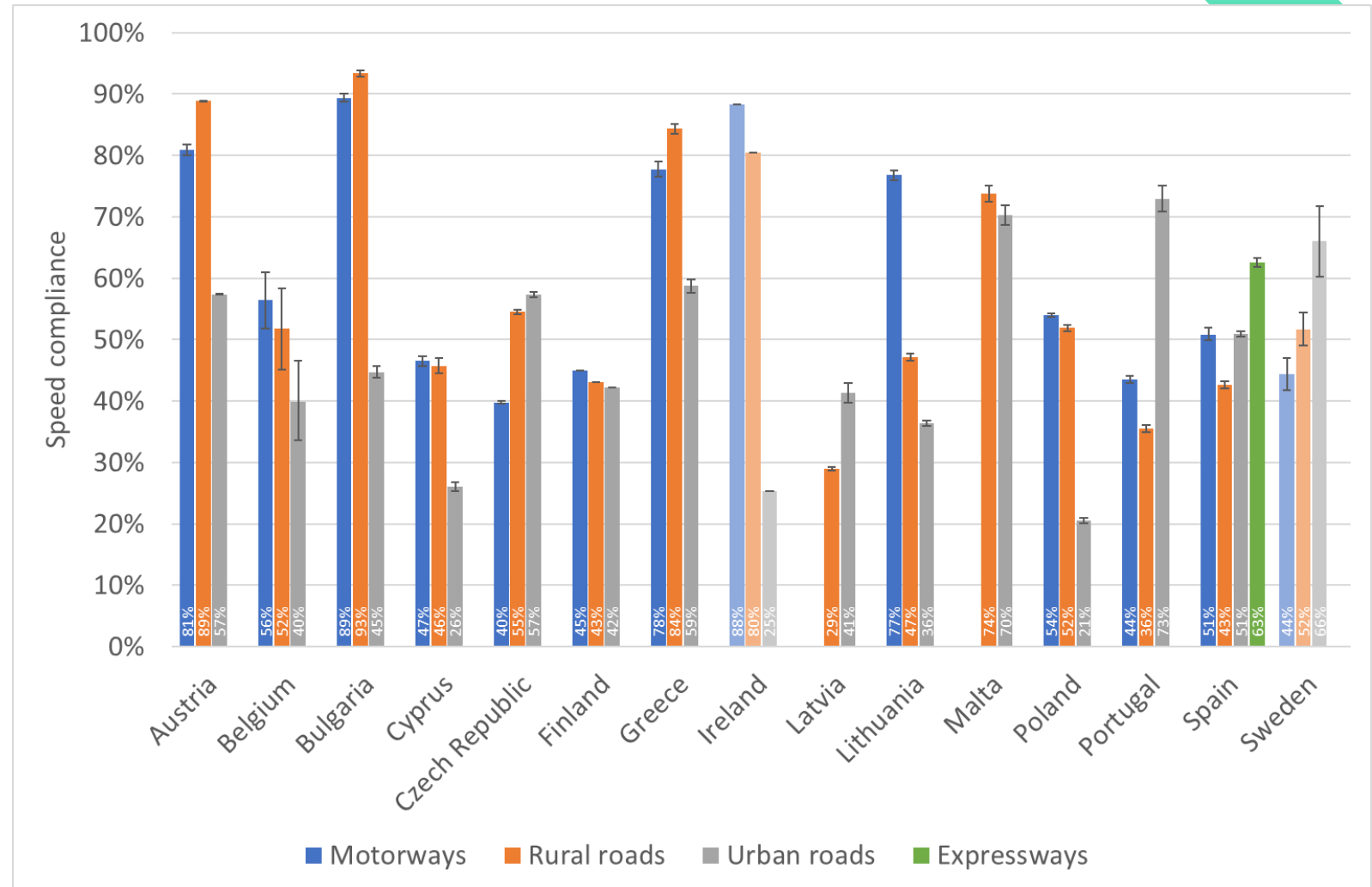
BASELINE - Speed									
Minimum Level (required)									
Time period	Road Type	Vehicle Type	Nr of Locations	N	Traffic Counts	Weight proportion	Average Speed	SE1	CI (95%) - lower bound1
weekday/daytime	motorways	passenger cars							
weekday/daytime	rural roads	passenger cars							
weekday/daytime	urban roads	passenger cars							
weekday/daytime	(All roads)	passenger cars-Total							
Minimum level (recommended options)									
Time period	Road Type	Vehicle Type	Nr of Locations	N	Traffic Counts	Weight proportion	Average Speed	SE1	CI (95%) - lower bound1
weekday/daytime	motorways	passenger cars							
weekday/daytime	motorways	vans, small trucks							
weekday/daytime	motorways	trucks/ buses/ heavy goods vehicles							
weekday/daytime	motorways	motorcycles							
weekday/daytime	motorways-Total	(All vehicles)							
weekday/daytime	rural roads	passenger cars							
weekday/daytime	rural roads	vans, small trucks							
weekday/daytime	rural roads	trucks/ buses/ heavy goods vehicles							
weekday/daytime	rural roads	motorcycles							
weekday/daytime	rural roads-Total	(All vehicles)							
weekday/daytime	urban roads	passenger cars							
weekday/daytime	urban roads	vans, small trucks							



# KPI 1: Speed

## Free flow speed of passenger cars, measured

- ▶ **KPI: percentage of free flow traffic respecting speed limits**
  - ▶ Analysed per road type and vehicle type
  - ▶ KPIs on average speed and v85 reported
- ▶ **Main points of attention:**
  - ▶ Impact of variance in speed setting
  - ▶ Very high percentage of non-compliance
- ▶ **ERSO:**
  - ▶ Direct cause of 30% of all fatalities
  - ▶ => huge potential for accident reduction



# KPI 1: Speed v85

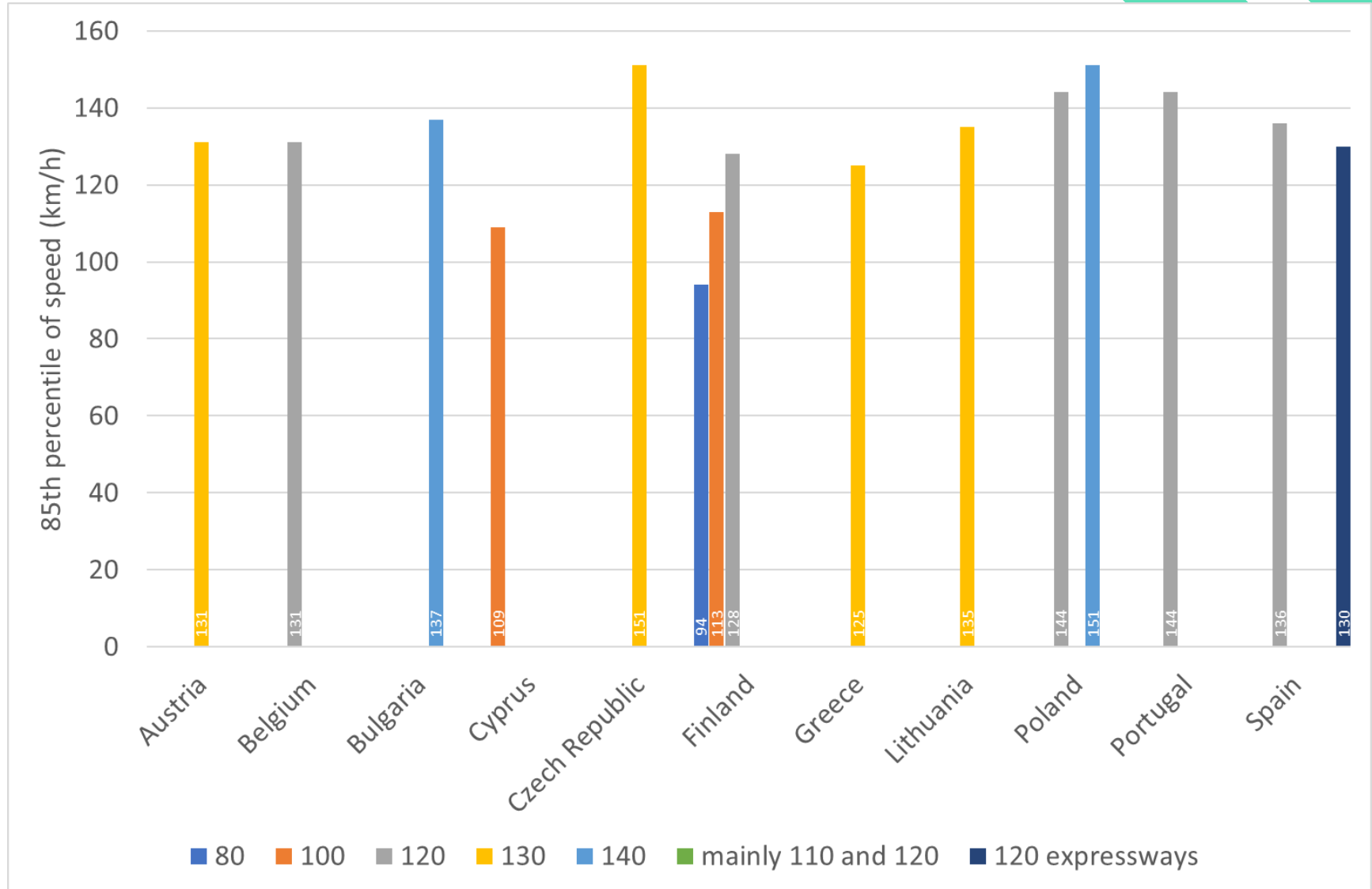


Baseline report on the KPI Speeding  
January 2023

Baseline

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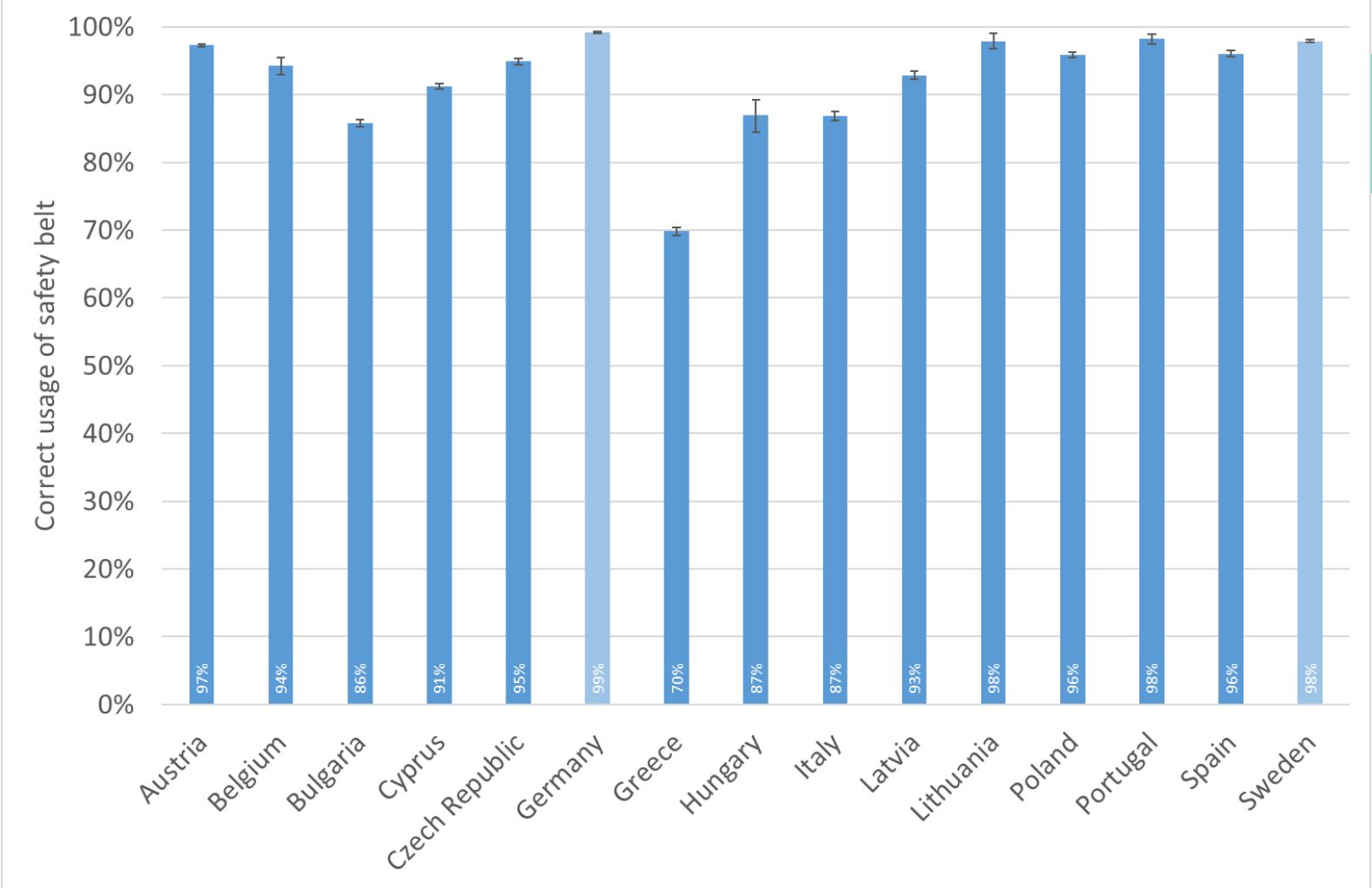
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# KPI 2: seatbelt (and CRS) Percentage of correct use (drivers)

- ▶ **Direct observation**
- ▶ **Focus on weekday/daytime**
- ▶ **Significant factors:**
  - ▶ Drivers vs passengers
  - ▶ Rear vs front
- ▶ **ERSO:**
  - ▶ 25% to 50% of fatally injured car occupants not wearing seatbelt
  - ▶ 900 deaths per year could be avoided in the EU if 99% wearing rate



# KPI 2: Seatbelt Rear seat passengers

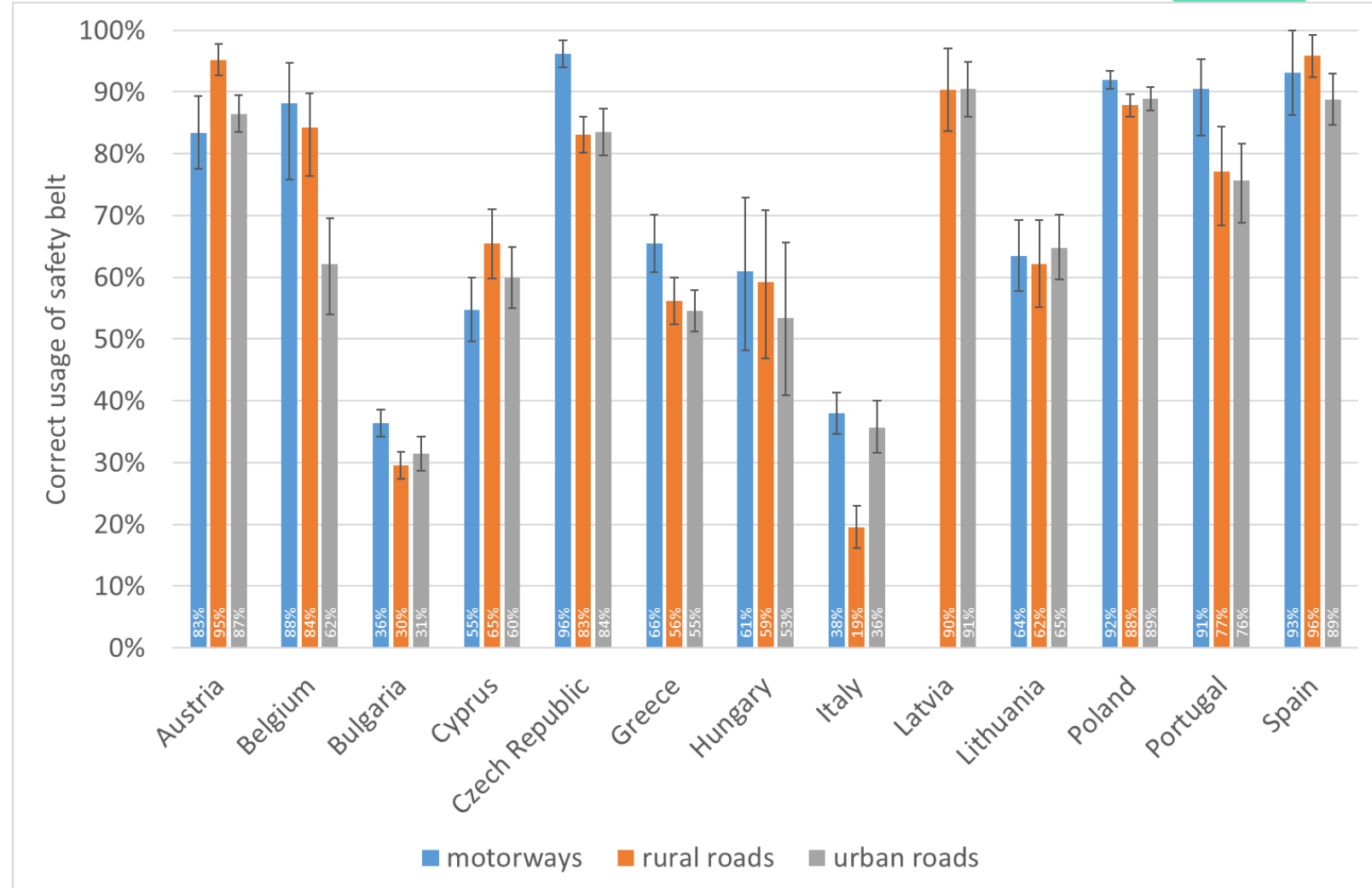
## ► Rear seat usage by road type

 **Baseline**



Baseline report on the KPI Safety Belt and Child Restraint Systems  
January 2023

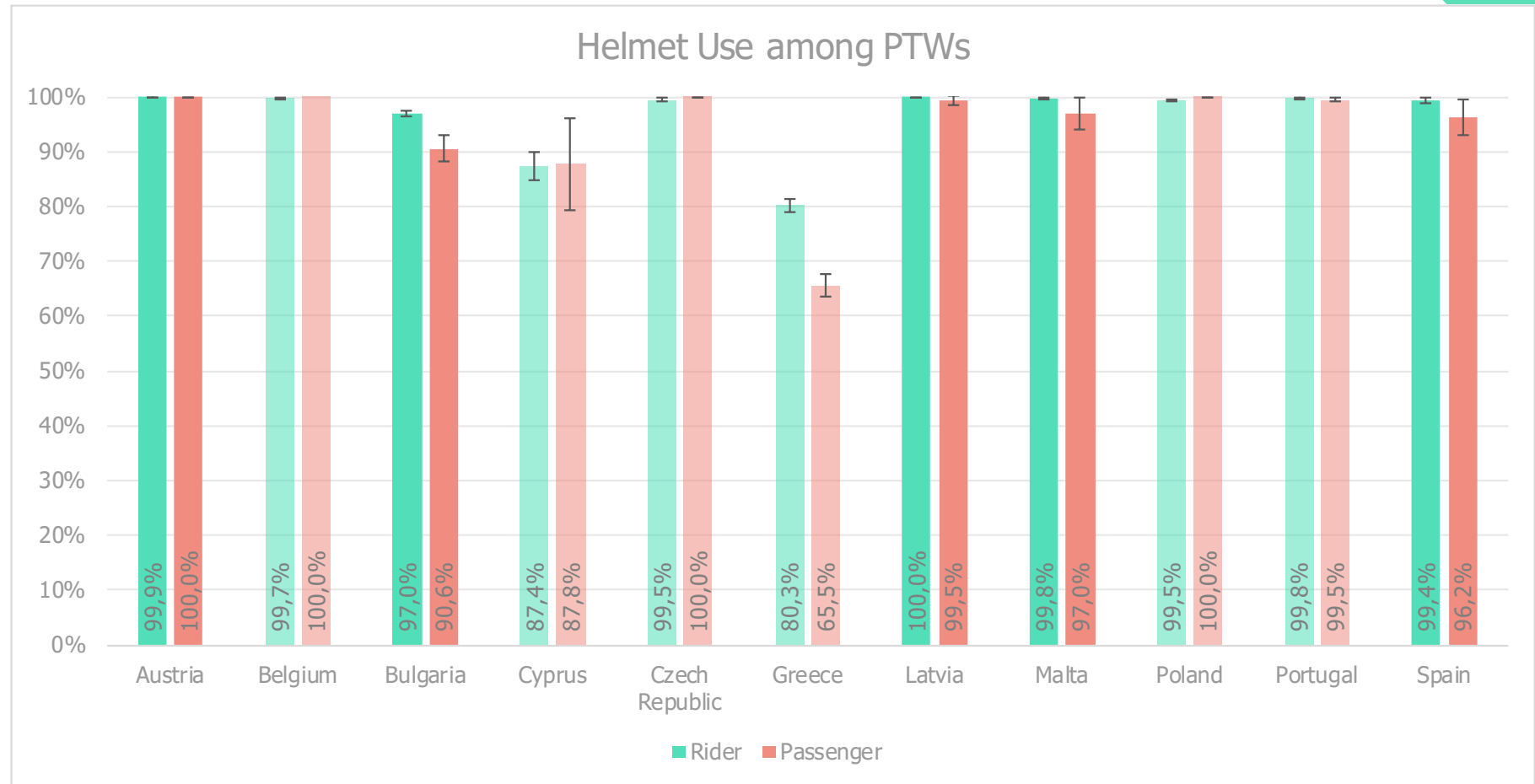
 **Baseline** Belgium | Austria | Bulgaria | Cyprus | Czech Republic | Finland | Germany | Greece | Ireland | Latvia | Lithuania | Luxembourg | Malta | Netherlands | Poland | Portugal | Spain | Sweden  
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# KPI 3a: motorcycle helmet Percentage of use



- ▶ Direct observation
- ▶ Uniform obligation
- ▶ Methodological variations sometimes important (min. sample size, sampling methods, ...)





# KPI 3b: Bicycle helmet Percentage of use

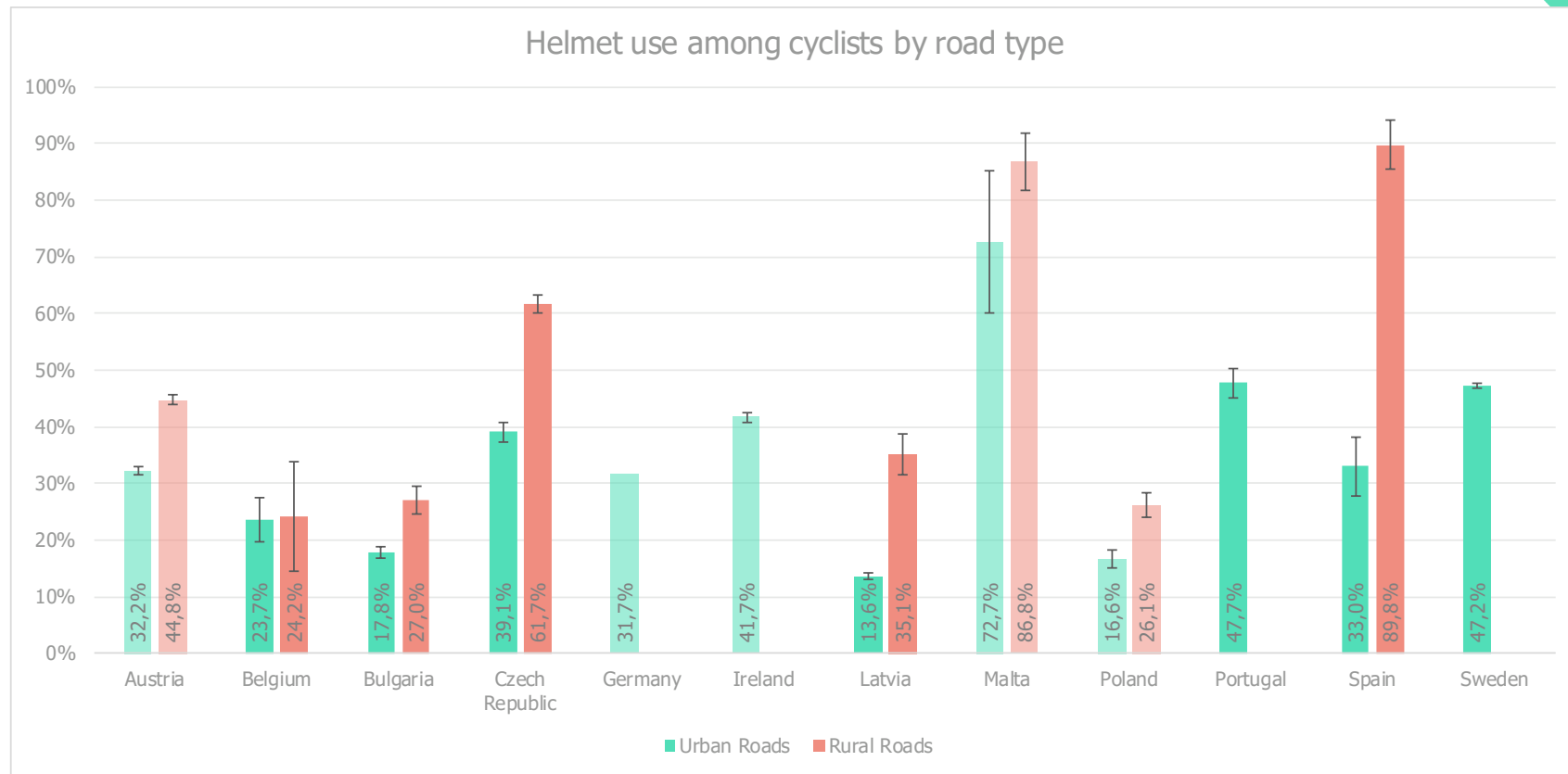
- ▶ Cyclist: variance in legal obligation to wear helmets
- ▶ Methodological variations



## Baseline



Baseline report on the KPI Helmet use among Cyclists and PTWs  
January 2023



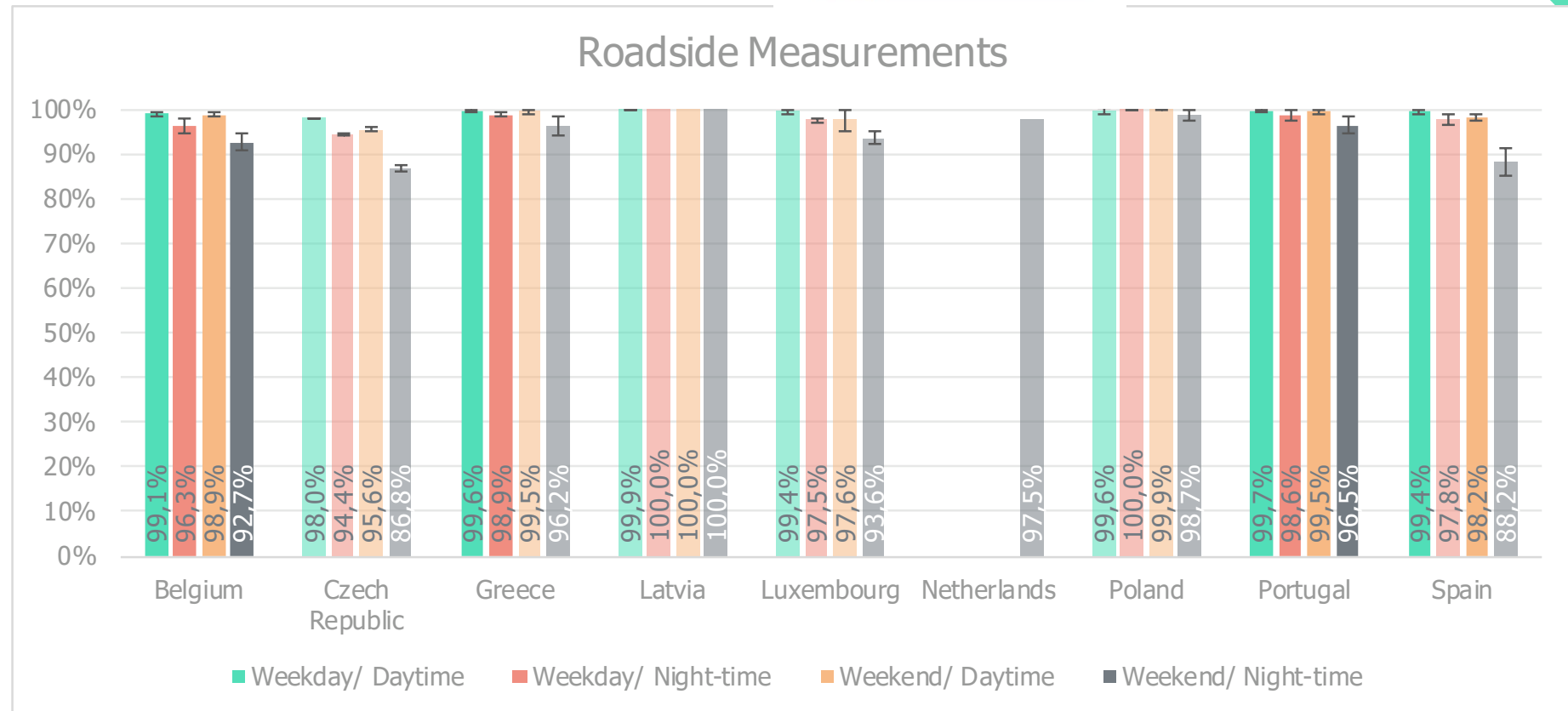
# KPI 4: Alcohol Percentage below BAC limit



Baseline report on the KPI Driving under the Influence of Alcohol  
January 2023



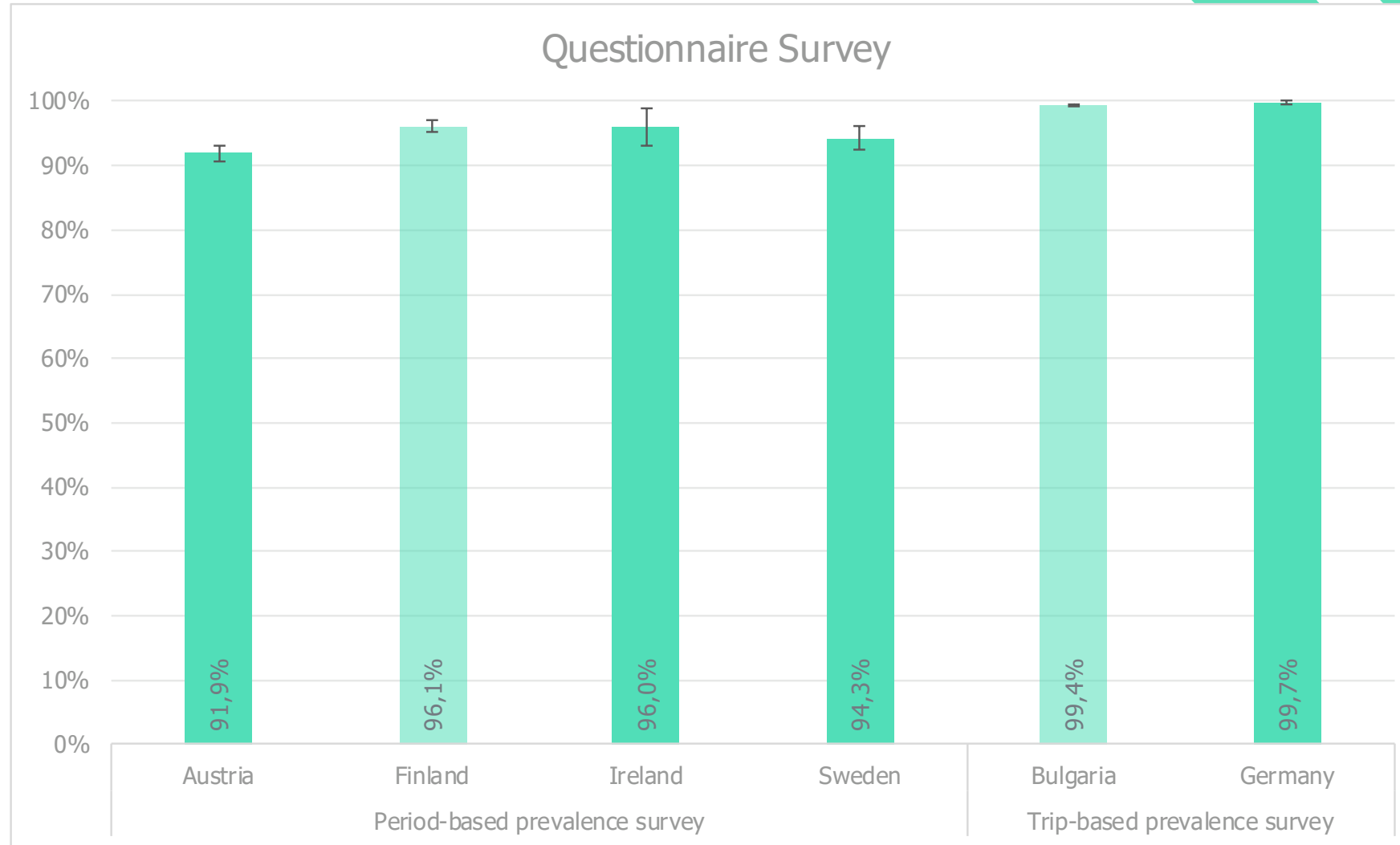
- ▶ Only behavioural KPI for which indirect KPI measure is allowed: survey data (next slide)
- ▶ Significant effect of time period
- ▶ 25% of all traffic fatalities (ETSC) ~ alcohol
- ▶ 1.5%-2% DUI represents billions of kms of DUI / year, involving millions of drivers
- ▶ Cf. ESRA self-report: 13% DUI past 30 days (EU average)



# KPI 4: Alcohol Percentage NOT over limit



- ▶ **ESRA 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 5: distraction

## Percentage NOT using handheld device

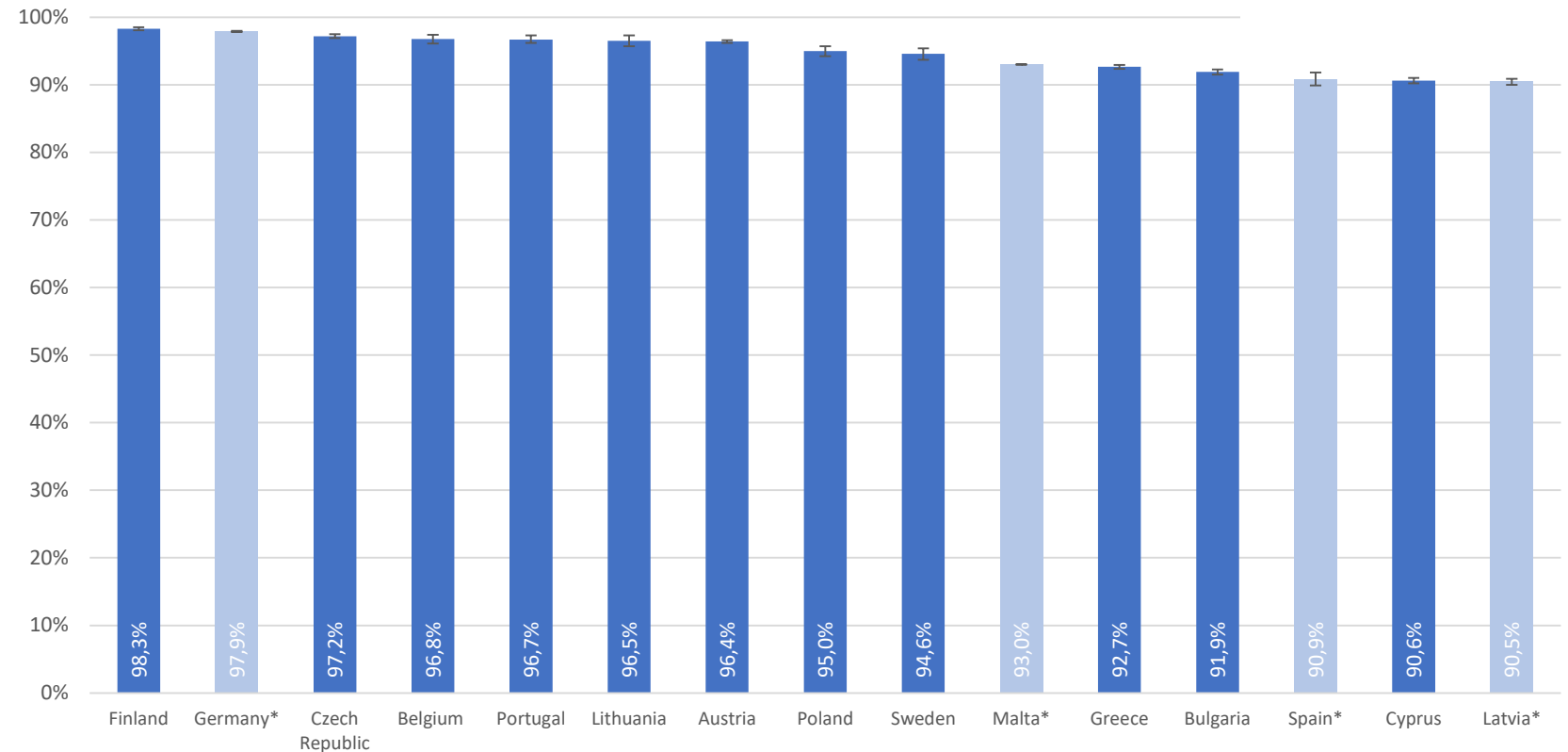
- ▶ Direct observation
- ▶ Drivers, weekdays, passenger cars
- ▶ KPI sometimes refers to not using handheld phone (instead of device, cf. info on national legislation in report)



Baseline report on the KPI Distraction  
January 2023



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





# KPI 6: Vehicle safety

## Rating of newly registered passenger cars

- ▶ KPI limited to newly registered vehicles
- ▶ Future KPIs should take entire vehicle fleet into account
- ▶ Requires rescaling of cars older than 6 years

### Baseline

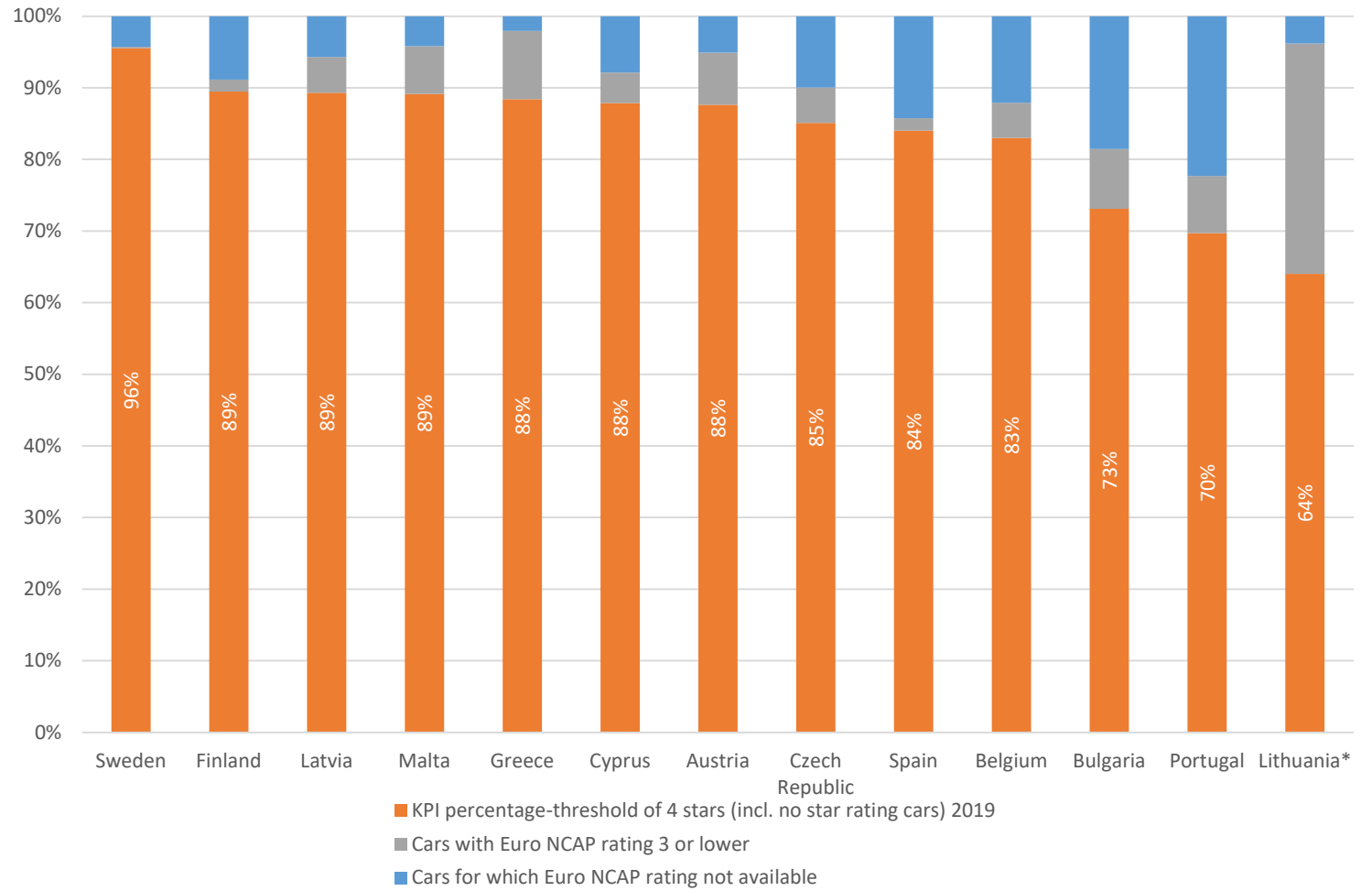


Baseline report on the KPI Vehicle Safety  
January 2023

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# KPI 7: Road infrastructure (several KPI definitions)

► 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: 70) km/h in relation to the total road network length

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%	



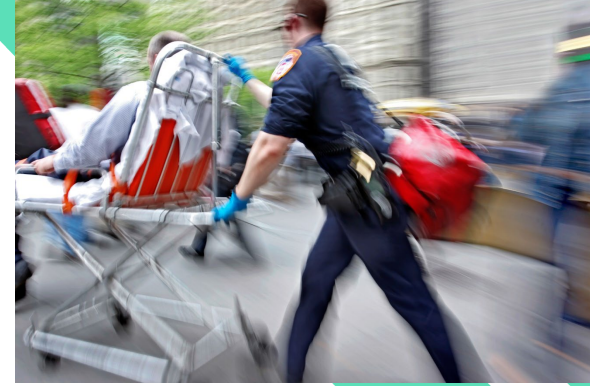
Baseline report on the KPI Infrastructure  
January 2023



- Motorways: KPI = 100% for all countries
- Interpretation 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



# KPI 8: post crash care emergency response times (95<sup>th</sup> percentile)



## **Baseline**



Baseline report on the KPI Post-crash care

January 2023

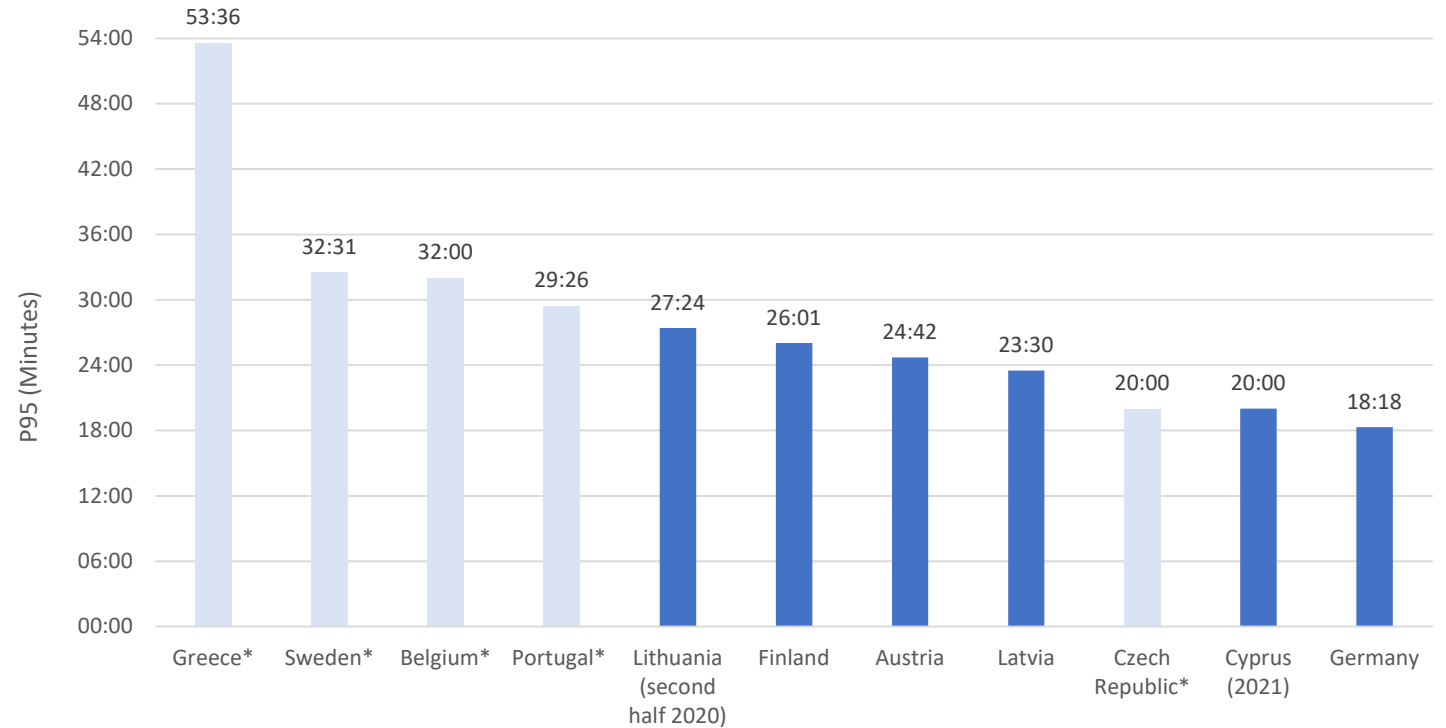
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\* Representativeness of data and/or comparability with other countries not guaranteed

# Conclusion and recommendations

## ▶ **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

## ▶ **Future perspectives:**

- ▶ Scope of KPIs: identification of not yet defined KPIs (e.g. enforcement, fatigue,...)
- ▶ Baseline for monitoring future trends: Trendline

Programme Support Action (PSA)  
to support Member States  
in collecting Key Performance Indicators (KPIs)  
for road safety

Grant Agreement No. MOVE/C2/SUB/2019-558/CEF/PSA/Sl2.835753  
KPIs collection for Road Safety



Baseline conclusions and recommendations

January 2023

