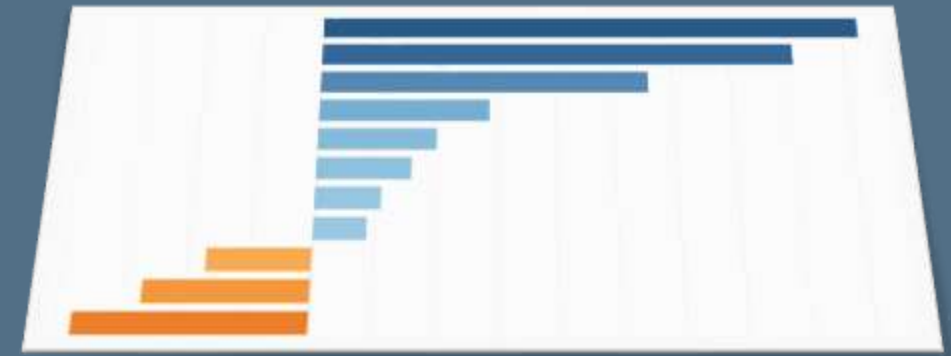




# Using safety performance indicators for monitoring and improving road safety



*Wouter Van den Berghe, Vias institute*

**Vision Zero for Sustainable Road Safety  
in the Baltic Sea Region**

**2-3 December 2020 (Riga - online)**

# What is Vias institute?



- Located in Brussels, Belgium
- About 130 staff, most of which are involved in road safety
- Previously called “Belgian Road Safety Institute”

- **Experience with SPIs/KPIs**

- Roadside measurements and generation of SPIs/KPIs since 20 years (speeding, drunk driving, seatbelt use, child restraints, distraction, fatigue, drugs)
- Attitude measurements since 20 years, including self-reported behaviour
- Initiator and coordinator of the ESRA initiative (involving 60 countries)
- Coordination of the BASELINE project on KPIs in the EU



## Some words about myself

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- **Research Director at Vias institute**
- **Main author of the UNRSC Guidelines on the UN global targets and indicators in road safety**
- **Project Coordinator for the Baseline project for the EC**
- **Project Director of the ESRA initiative**
- **Author of a book on KPIs (*in Dutch*)**
- **President of the Humanist research network on human factors in transport**

# What are KPIs / SPIs ?

- **Terminology**

- KPIs = “Key Performance Indicators” (used by EC)
- Many others use the term “safety performance indicators” (SPIs) or just ‘indicators’
- A KPI or an SPI is a number that provides information about a particular process or situation

- **Use in road safety**

- In road safety the terms KPIs or SPIs in general refer to the contributory factors of road safety such as the behaviour of road users, vehicle safety and infrastructure

- **Examples**

- Percentage of drivers exceeding the speed limit on rural roads
- Percentage of the vehicle fleet with a 5-star EuroNCAP rating



# Why use safety performance indicators?

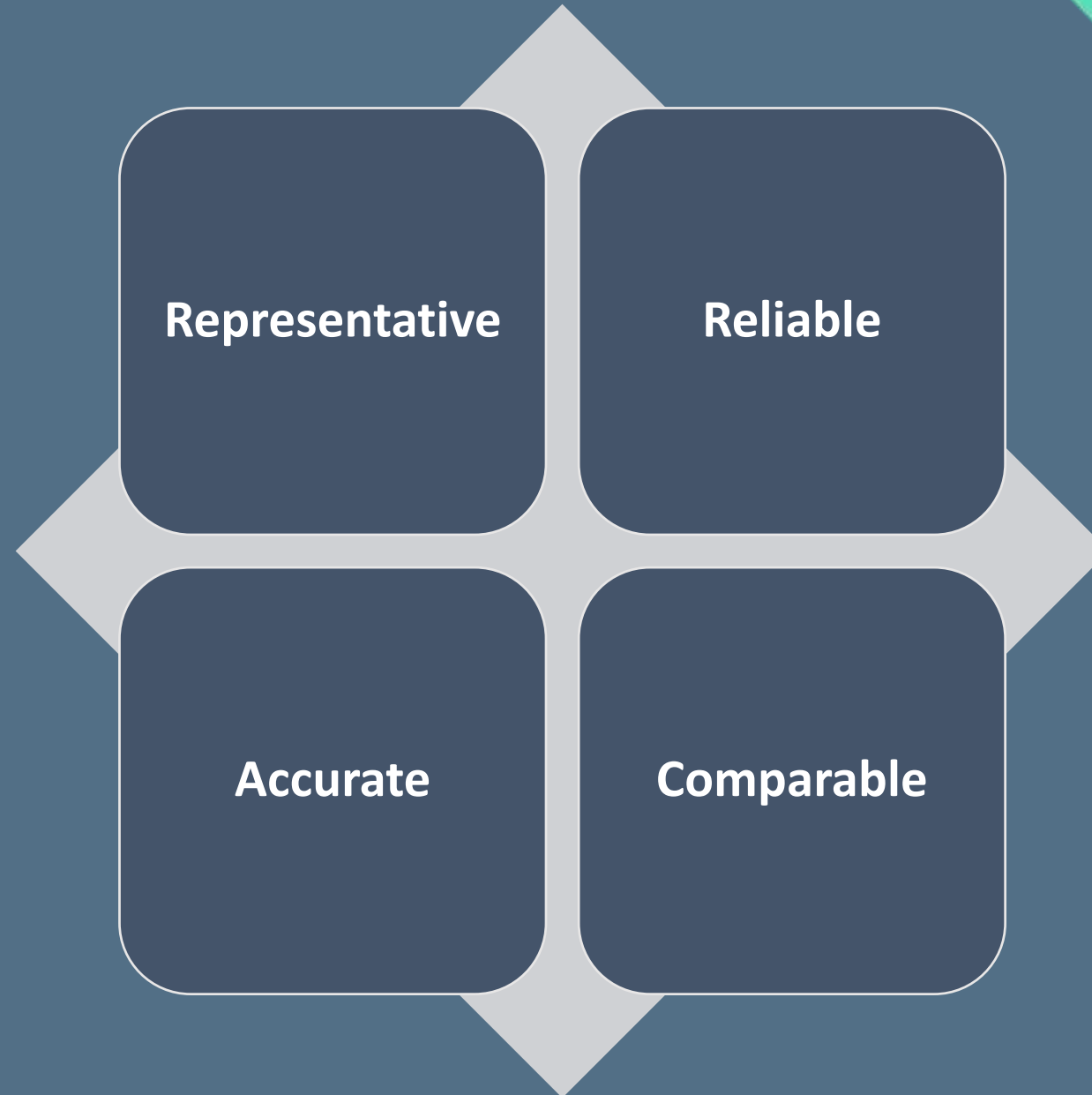
The key “output” indicators for road safety are based on the numbers of fatalities and injuries.

Such indicators do not provide insight on why the number of traffic victims is changing

Monitoring performance indicators provides insight in why injuries and fatalities increase/decrease

Performance indicators illustrate the effectiveness of policy measures and road safety initiatives

# Important requirements



## Representative

- For the geographical area
- Representative locations
- Need for weighting

## Reliable

- Scientific approach
- Reproducible
- Error prone

## Accurate

- Sample size sufficiently large
- Small error of uncertainty
- Still accurate for useful breakdowns

## Comparable

- Over time
- With other geographical areas
- With other indicators

# Some other points

## SPIs/KPIs can be used for target setting and monitoring

- For instance, the percentage of drivers speeding on rural roads

## It is not necessary to have KPIs every year

- Depends on how fast the situation can change
- Small variations between years could be due to random variations or measurement uncertainty

## Most international experience is available on KPIs for the tradition killers in road safety

- Speeding, Driving under the influence of alcohol, Seatbelt wearing, Helmet wearing

## Less experience available for other KPIs

- Distraction, Post-crash care, Vehicle safety, Infrastructure, Driving under the influence of drugs
- Behaviour of cyclists, Mopeds, Pedestrians



# Some relevant international developments and initiatives



- 1. UN Global targets and indicators**
  - 2. Baseline project of the European Commission (KPIs)**
  - 3. Global ESRA initiative**
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# The United Nations Voluntary Global Targets

Need for a global status on the contributory factors to road safety



Push from United Nations, in particular the WHO (World Health Organisation)



Strong support from UNRSC, the UN Road Safety Collaboration



End result: 12 global targets, 32 associated indicators



Need for guidance to Member States

# Guidance document for countries

## Towards the 12 voluntary global targets for road safety

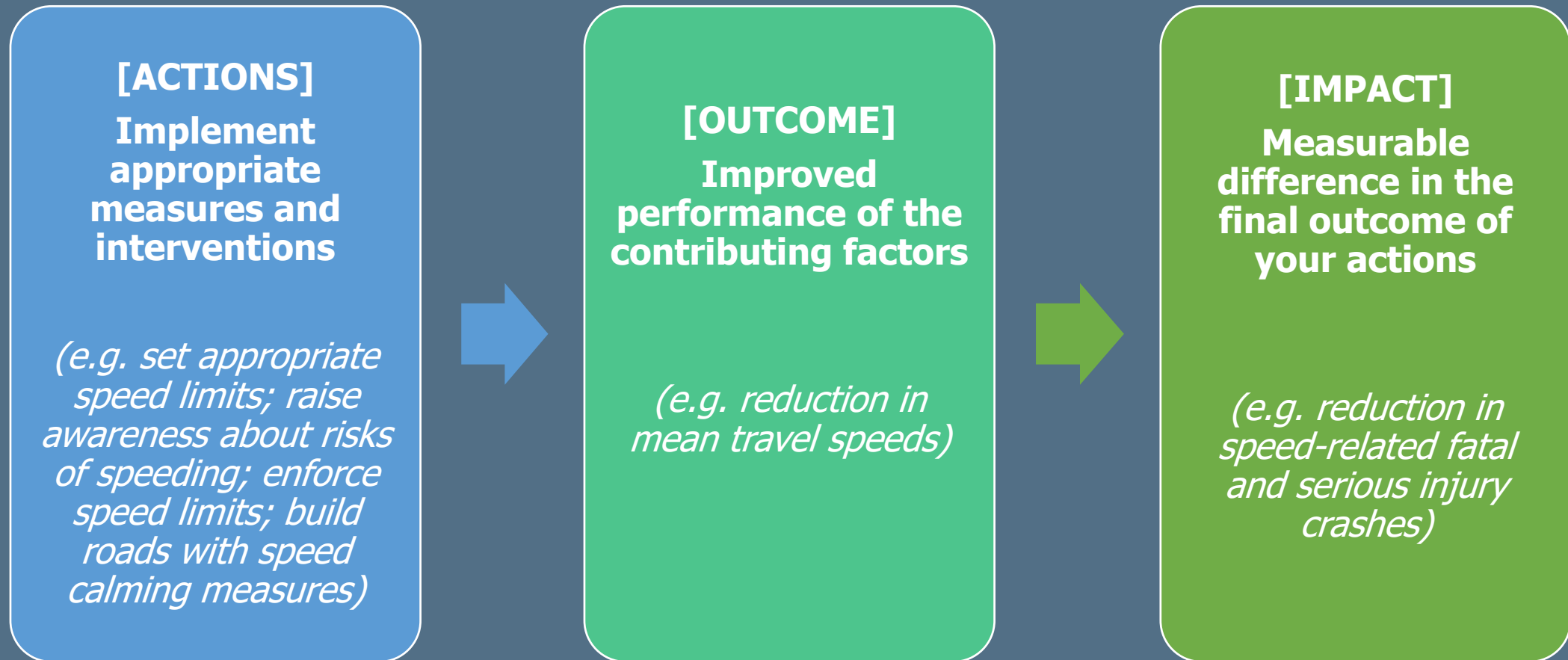
Guidance for countries on activities and measures to achieve the voluntary global road safety performance targets



GLOBAL  
ROAD SAFETY  
PARTNERSHIP



# Underlying concept: 3 stage logic



# Example: DUI and distraction

	Action	Outcome	Impact
<b>Driving under the influence</b>	<ul style="list-style-type: none"> <li>• Policy and legislation on drink driving management (DUI limits, enforcement, awareness)</li> <li>• Policy and legislation on drug impaired driving management</li> <li>• Enforcement of DUI limits and other alcohol related legislation</li> <li>• Enforcement of drug impaired driving laws</li> <li>• Implementation of data systems on driving under the influence of alcohol and/or other psychoactive substances</li> <li>• Regular public awareness activities on driving under influence of alcohol and psychoactive substances</li> </ul>	<p>Drivers comply with DUI alcohol limits</p> <p>Drivers do not use psychoactive substances before driving</p>	<p>Reduction in the number of road injuries and fatalities due to alcohol use by drivers</p> <p>Reduction of road injuries and fatalities due to psychoactive substance use by driver</p>
<b>Distraction by mobile phone</b>	<ul style="list-style-type: none"> <li>• Policy and legislation on the use of mobile phones while driving (phone mode, awareness, enforcement)</li> <li>• Enforcement of mobile phone legislation</li> <li>• Implementation of data systems on distraction by phone</li> <li>• Regular public awareness activities on the distracting effects of mobile phone use</li> </ul>	<p>Drivers are not distracted by mobile phones while driving</p>	<p>Reduction in the number of road injuries and fatalities caused by distraction from mobile phone use</p>

# How can this be measured?

	Action	Outcome	Impact
<b>Driving under the influence</b>	Existence of legislation specifying legal maximum blood alcohol concentration (BAC) levels	% of vehicle drivers complying with alcohol DUI limits	Number of road injuries and fatalities due to illegal alcohol level of driver
	Existence of legislation specifying legal maximum levels of psychoactive substances	% of vehicle drivers declaring to have drunk alcohol over the legal limit before driving (in the last 30 days)	Number of road injuries and fatalities due to psychoactive substance level of driver
	Existence of legislation specifying enforcement of BAC limits and other DUI legislation	% of vehicle drivers declaring to have used psychoactive substances before driving (in the last 30 days)	Proportion of alcohol consumption as a contributing factor within the total number of road injuries and fatalities
	Number of drivers checked for compliance with alcohol DUI limits		Proportion of driver-psychoactive substance use as a contributing factor within the total number of road injuries and fatalities
	Number of drivers tested for psychoactive substance use		
	Existence of data systems on driving under the influence of alcohol and/or other psychoactive substances		
	Existence of data systems on road injuries and fatalities caused by impaired driving		
<b>Distraction by mobile phone</b>	Budget spent on public awareness activities related to driving under influence of alcohol and psychoactive substances		
	Existence of legislation on the use of mobile phones while driving	% of vehicle drivers that are using their mobile phone (handheld) while driving	Number of road injuries and fatalities due to distraction by mobile phone
	Existence of legislation on enforcement of mobile phone use while driving	% of vehicle drivers declaring to have used their mobile phone for phoning while driving in the last 30 days	Proportion of distraction by phone as contributing factor within the total number of road injuries and fatalities
	Number of drivers checked for compliance with mobile phone legislation		
	Existence of data systems on distraction by phone		
	Existence of data systems on road injuries and fatalities caused by distraction by mobile phone	% of vehicle drivers declaring to have used their mobile phone for texting while driving in last 30 days	



# Baseline



# The development of eight European KPIs

**KPI = Key Performance Indicator**

**Equivalent to “Safety Performance indicator”**

## **Definition of eight KPIs**

- Long discussions with experts
- No consensus on infrastructure

**No target values for the indicators**

**2020 or 2021 will be baseline value**

**EU Member States expected to provide data for 2020 or 2021**

# List of EU KPIs

	Indicator	Definition
1	<b>Speed</b>	Percentage of vehicles travelling within the speed limit
2	<b>Safety belt</b>	Percentage of vehicle occupants using the safety belt or child restraint system correctly
3	<b>Protective equipment</b>	Percentage of riders of powered two wheelers and bicycles wearing a protective helmet
4	<b>Alcohol</b>	Percentage of drivers driving within the legal limit for blood alcohol content (BAC)
5	<b>Distraction</b>	Percentage of drivers NOT using a handheld mobile device
6	<b>Vehicle safety</b>	Percentage of new passenger cars with a EuroNCAP safety rating equal or above a predefined threshold
7	<b>Infrastructure</b>	Percentage of distance driven over roads with a safety rating above an agreed threshold
8	<b>Post-crash care</b>	Time elapsed in minutes and seconds between the emergency call following a collision resulting in personal injury and the arrival at the scene of the collision of the emergency services

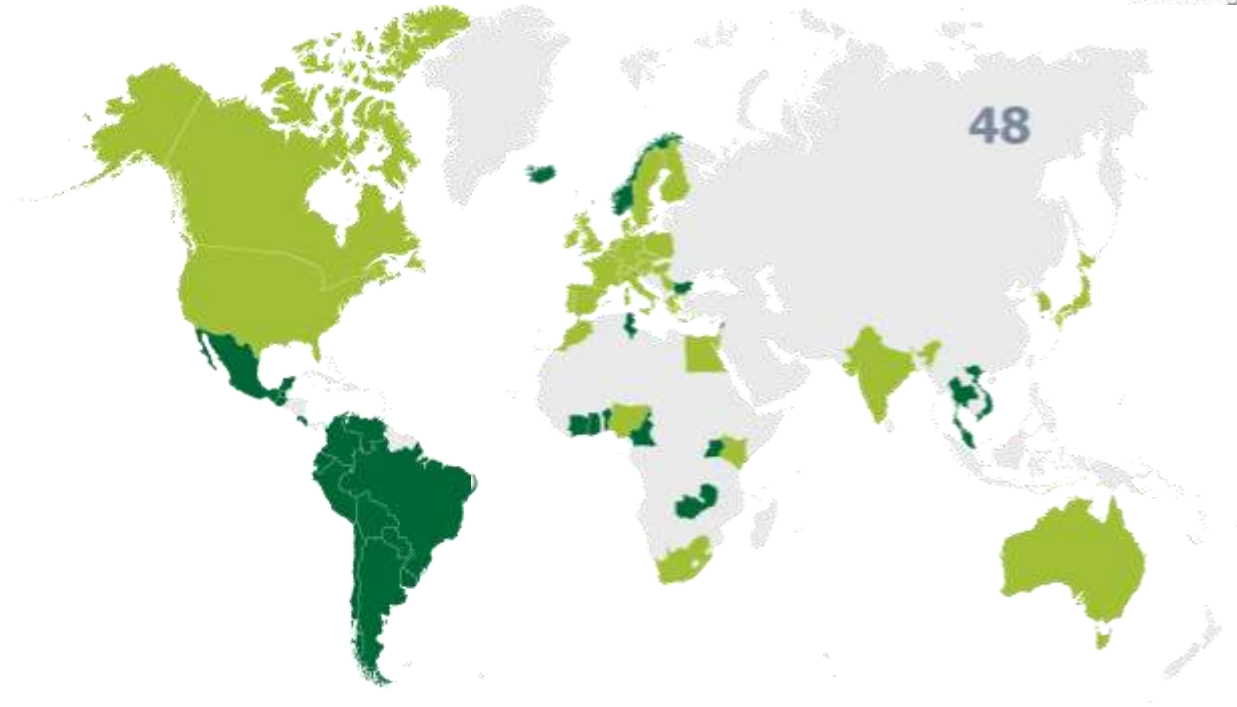
# Example of specifications for “distraction by mobile phone”

<b>Methodological aspects</b>	
<b>Aspect</b>	<b>Minimum methodological requirements</b>
Data collection method	Direct observation by trained observers on roadside or from moving vehicles. Other alternatives could be used if available, e.g. automatic detection. To be decided by Member States.
Road type coverage	The indicator should cover motorways, rural non-motorway roads and urban areas. The results may be presented separately for this three different road types.
Vehicle/user type	Cars, light goods vehicles, buses/coaches as a minimum. Other user types if possible (disaggregated by user type).
Location	Random sample (methodology for Member States to decide).
Time of day	Observations to take place during daylight.

# The ESRA initiative

## International network

- 60 countries – 6 continents
- 48 countries for ESRA2
- Website: [www.esranet.eu](http://www.esranet.eu)
- Coordinator: Vias institute



## Aim & objectives

- Provide **scientific support** for road safety policy at national and international levels
- Make internationally **comparable** data available on the current road safety situation in countries all over the world
- Develop a series of reliable, cost-effective and comparable **road safety performance indicators**
- Develop **time series** on road safety performance

# ESRA2 methodology

Online panel survey – identical method & questionnaire

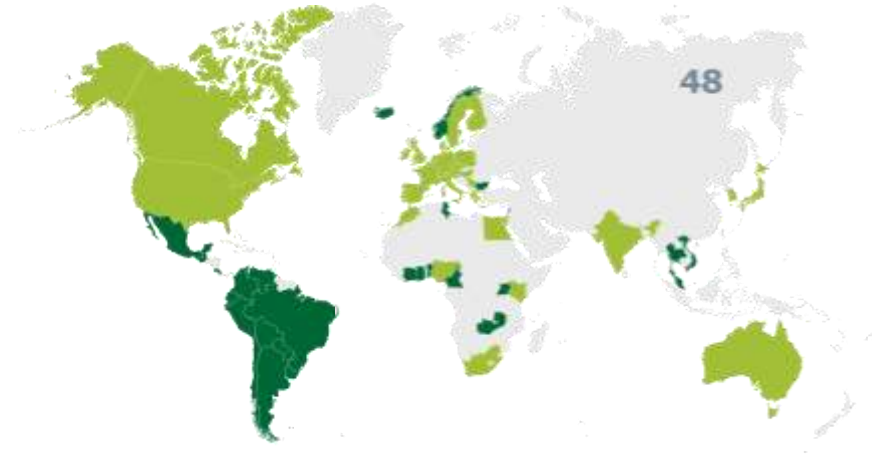
Coordinator: Vias institute

## ESRA2: 48 countries

- Total sample N > 45 000
- ≥1000 road users per country
- Representative sample of the national adult population (18+)  
Quota for gender\*age (18-24, 25-34, 35-44, 45-54, 55-64, 65+), regional spread monitored (UN, 2019)
- 62 national language versions
- 28 questions (>300 variables)
- LOI = 20 min

Funding: partners' own resources (or sponsors)

Calculation of weighted regional and national means



# ESRA2 main topics & themes

(over 300 variables collected)



support for road  
safety policy  
measures

self-reported  
behaviour in  
traffic

acceptability of  
safe and unsafe  
traffic behaviour

attitudes, towards  
safe and unsafe  
traffic behaviour

subjective safety  
and risk  
perception

involvement in  
road crashes

enforcement of  
traffic laws

vehicle  
automation (new)

2 bonus questions  
(new)



**Contextual data** from

- external databases
- expert survey



*Thank you for your attention!*

*For more information:  
wouter.vandenberghe@vias.be*