Subjective Safety of Vulnerable Road Users from a European Perspective – Insights from ESRA3

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Why Subjective Safety Matters

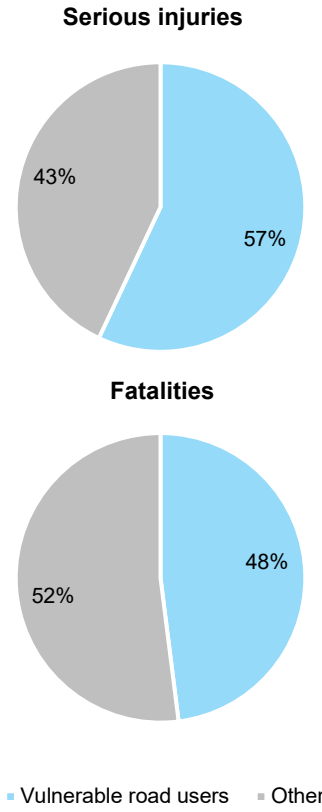
- Besides crash and fatality data (objective safety), also subjective safety, i.e., how safe road users feel in everyday traffic, is a relevant aspect of safety performance

- Vulnerable road users (VRUs), i.e., pedestrians, cyclists, motorcyclists, and e-scooter riders, face higher objective crash risk and often experience reduced subjective safety → but play central role in achieving modal shift targets and Vision Zero objectives

- Walking, cycling and riding the e-scooter became more popular in recent years accompanied by an increase in crashes –> VRUs currently account for 57% of serious injuries and 48% of fatalities in Europe

- Subjective safety influences mobility choices, willingness to walk or cycle, and acceptance of road-safety policies → understanding subjective safety essential for designing safe, inclusive and sustainable transport systems in particular for VRUs

Distribution of police-reported serious injuries and fatalities by road user type in the EU 2023



Source: ERSO, 2025

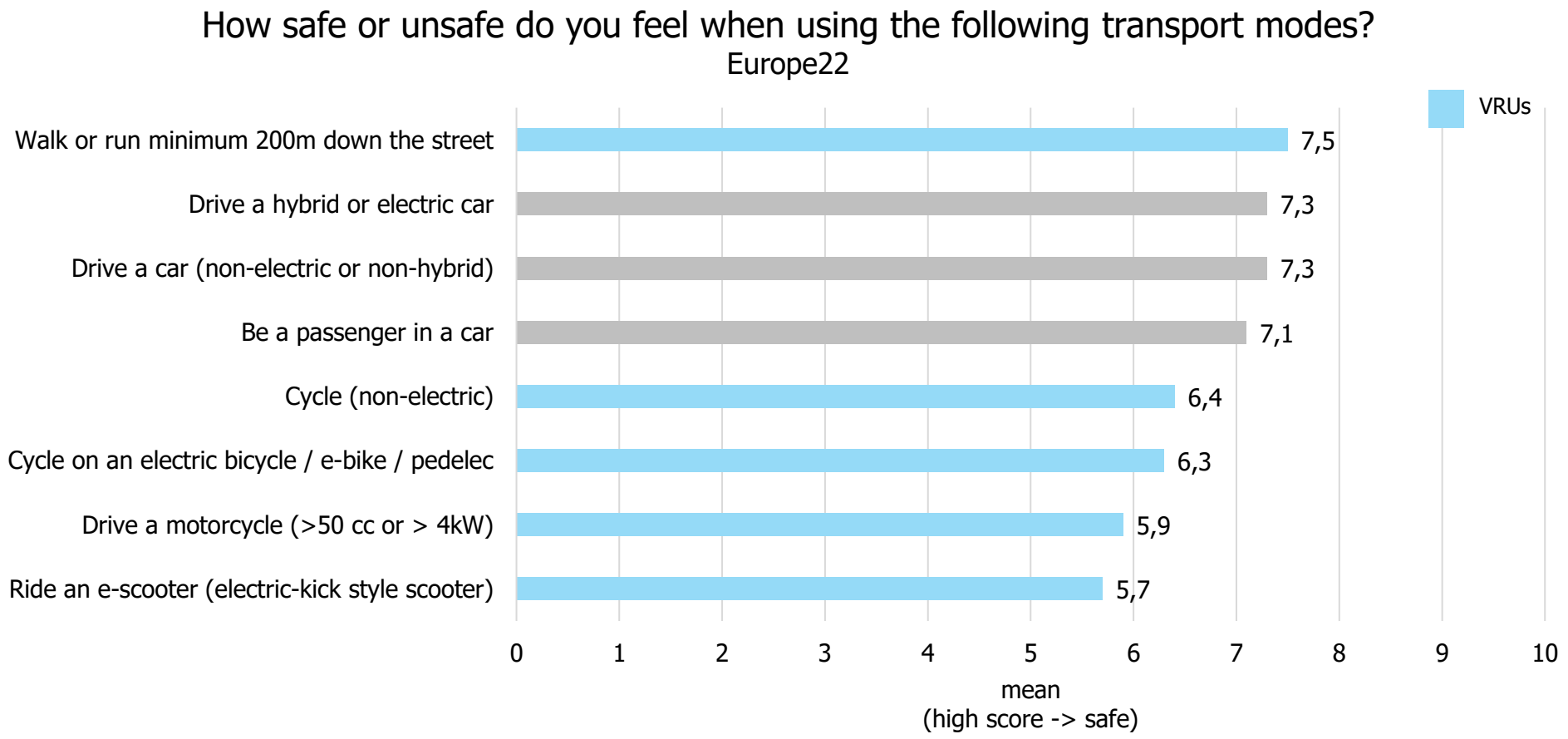
Data and Methodology

- Investigation of subjective safety of vulnerable road users in different countries in Europe

- Based on ESRA3 survey (E-Survey of Road users' Attitudes)
  - Data from 22 countries in Europe
  - Online panel surveys using a representative sample (n=1,000 per country) of the national adult population

- 3 core questions
  1. How safe do Europeans feel when using different transport modes, particularly those involving physical exposure (VRUs) as well as how safe they feel when using different infrastructure?
  2. How do gender, age, and national context influence these perceptions?
  3. How do subjective feelings of safety relate to objectively measured fatality rates across European countries?

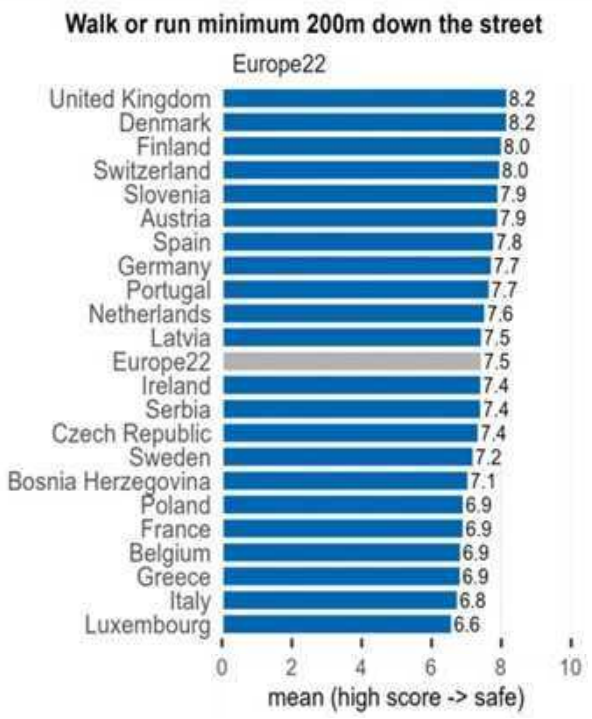
Perceived Safety by Transport Mode

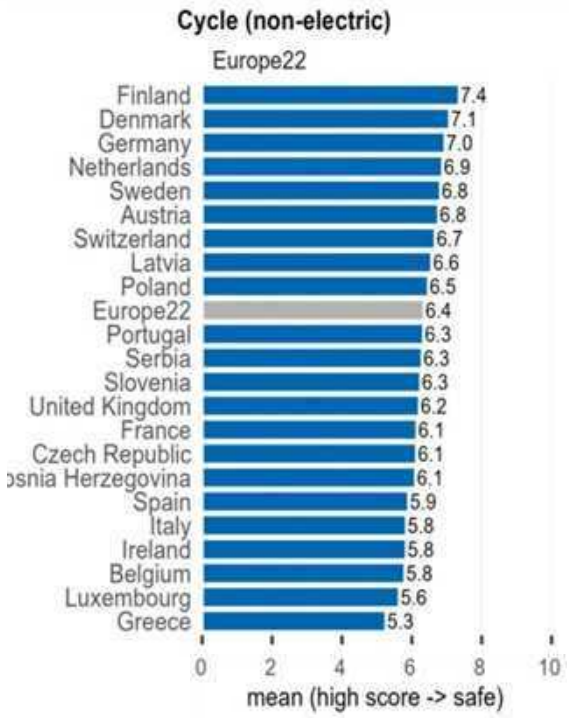


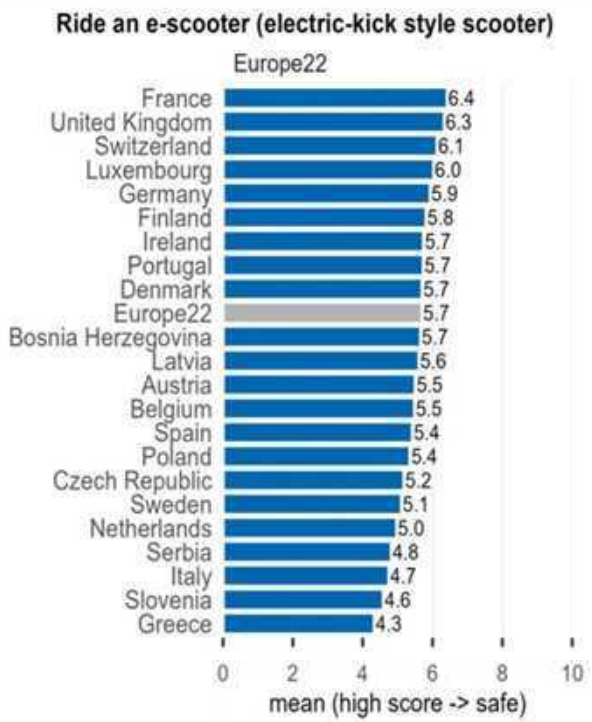
Reference population: all road users who used this specific transport mode in the past 12 months

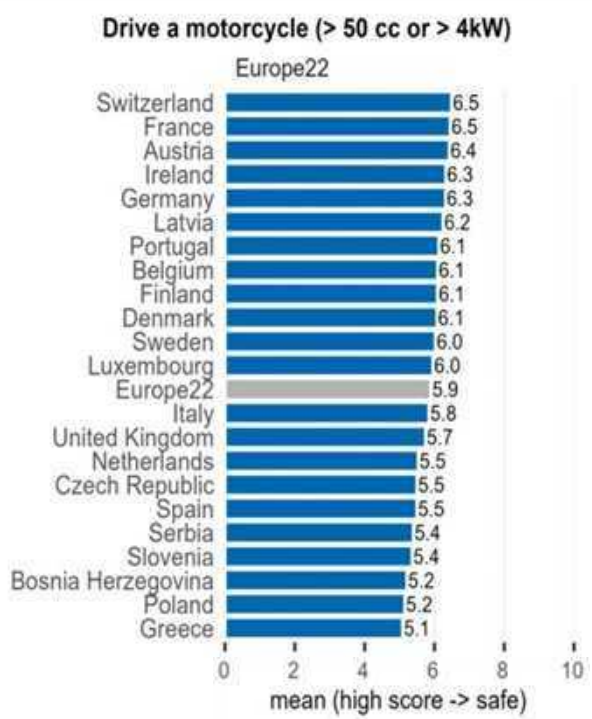
Country Differences in Perceived Safety

How safe or unsafe do you feel when using the following transport modes?







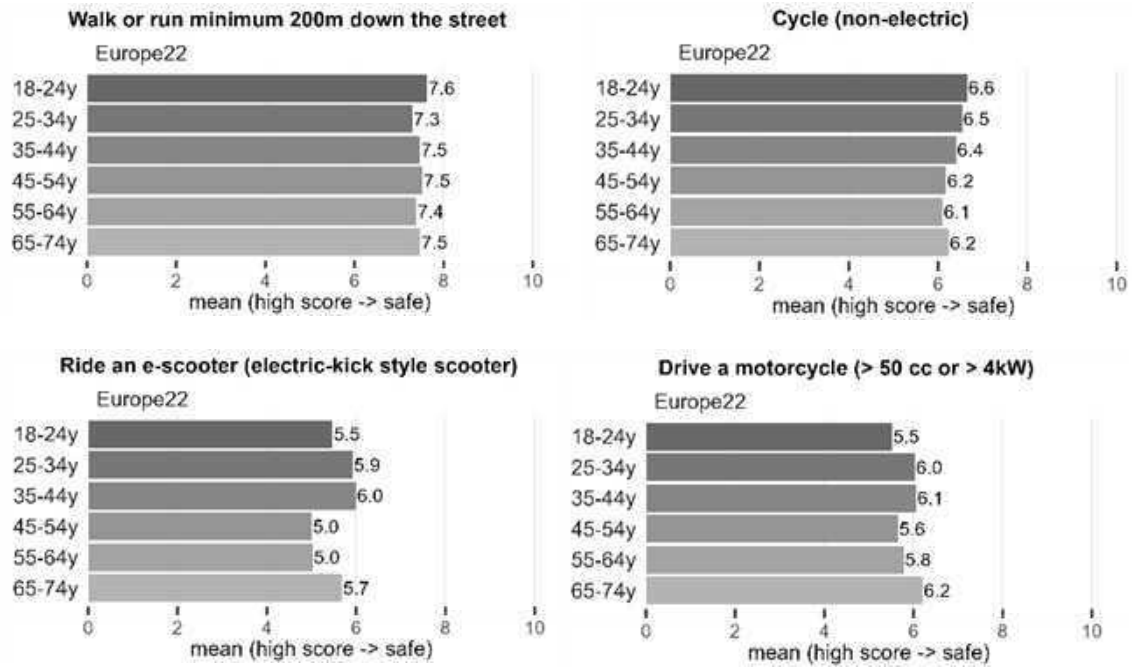


Reference population: all road users who used this specific transport mode in the past 12 months

Age and Gender Differences in Perceived Safety

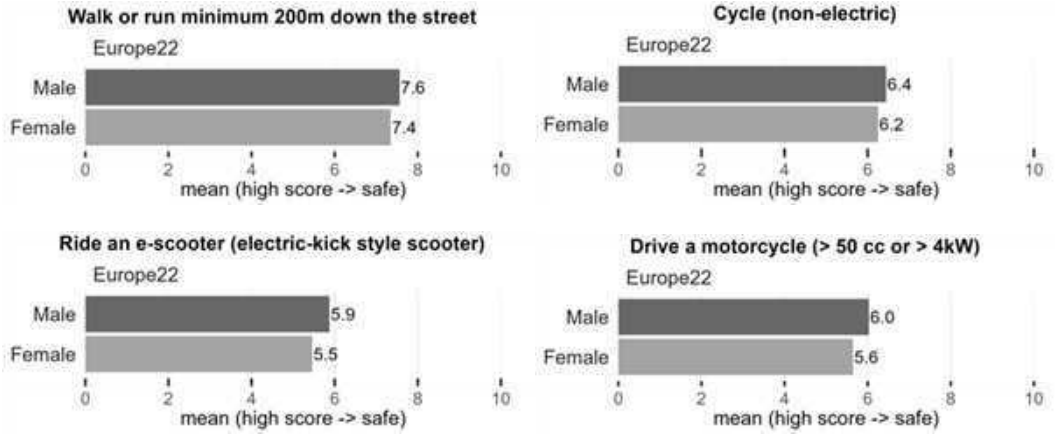
How safe or unsafe do you feel when using the following transport modes?

Age groups



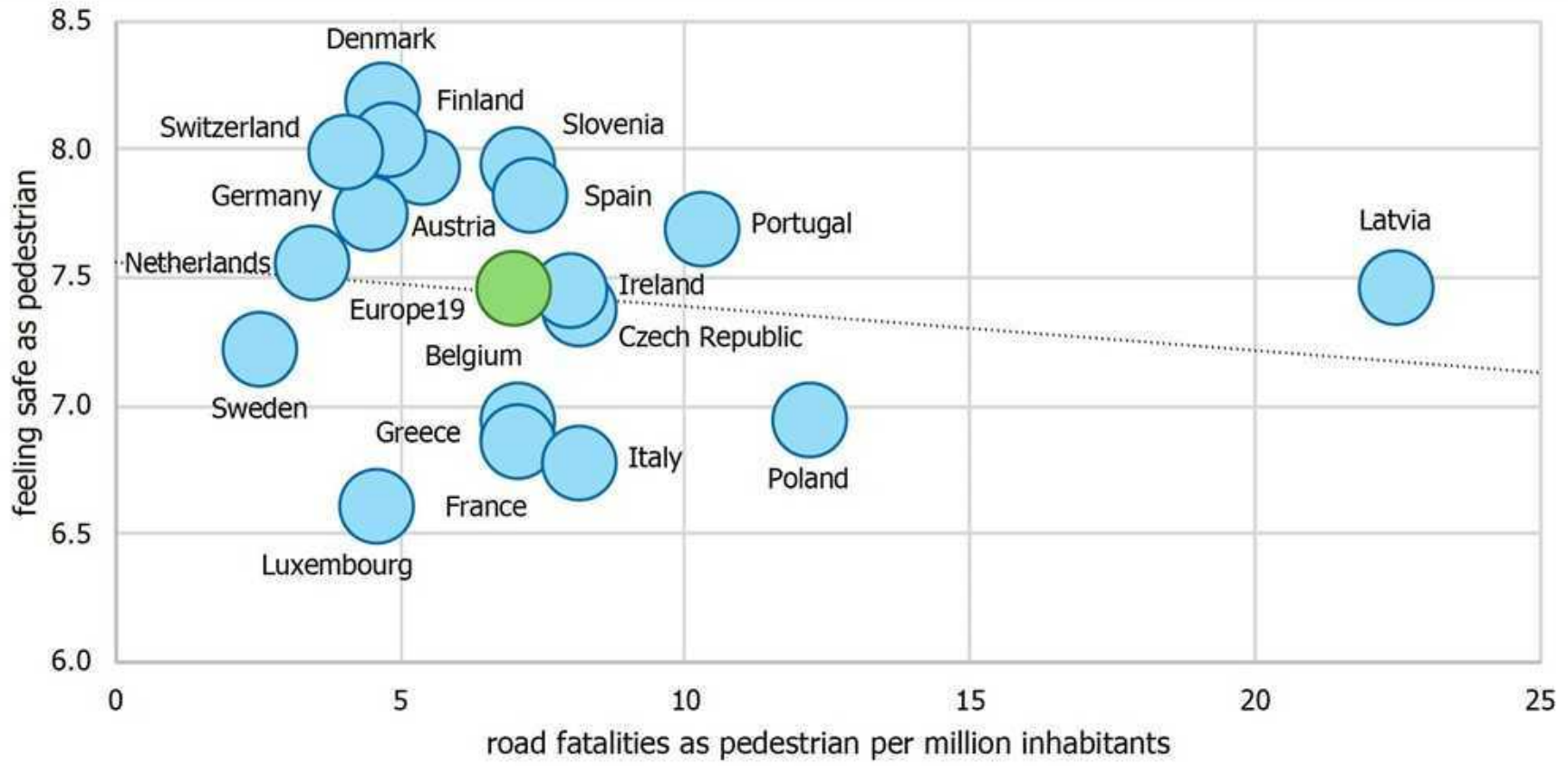
Reference population: all road users who used this specific transport mode in the past 12 months

Gender

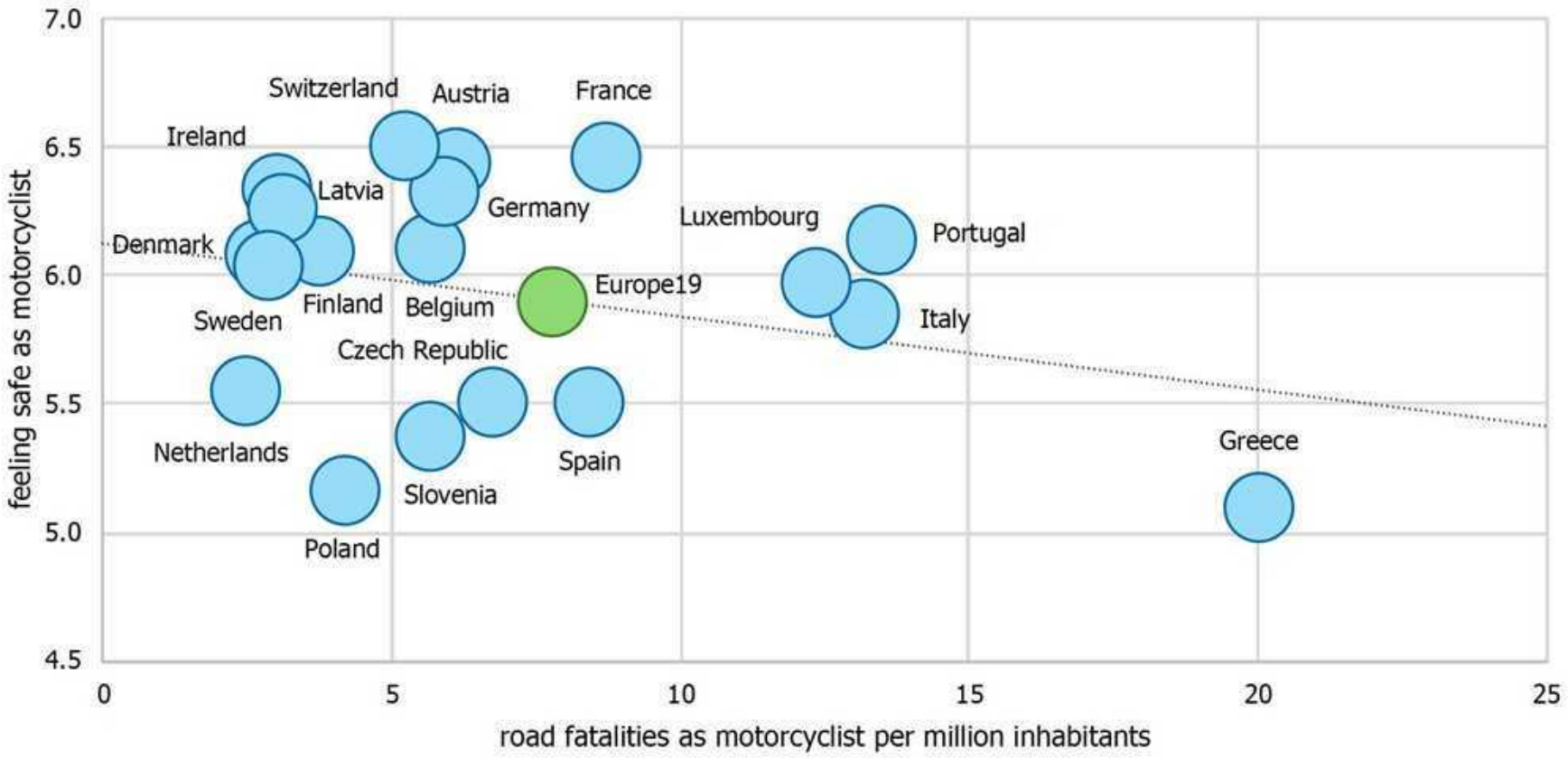


Reference population: all road users who used this specific transport mode in the past 12 months

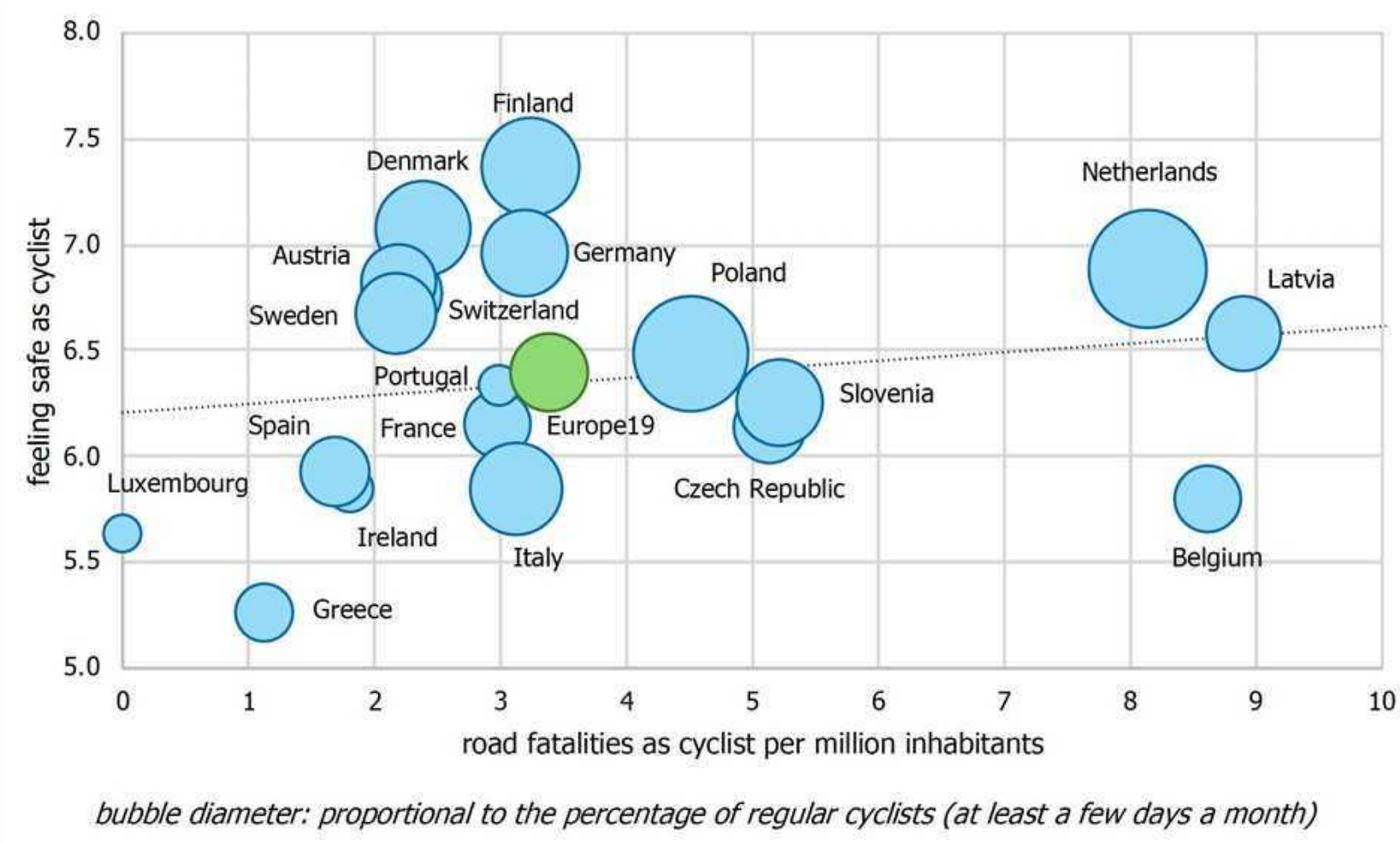
Pedestrians: Perceived vs. Actual Safety



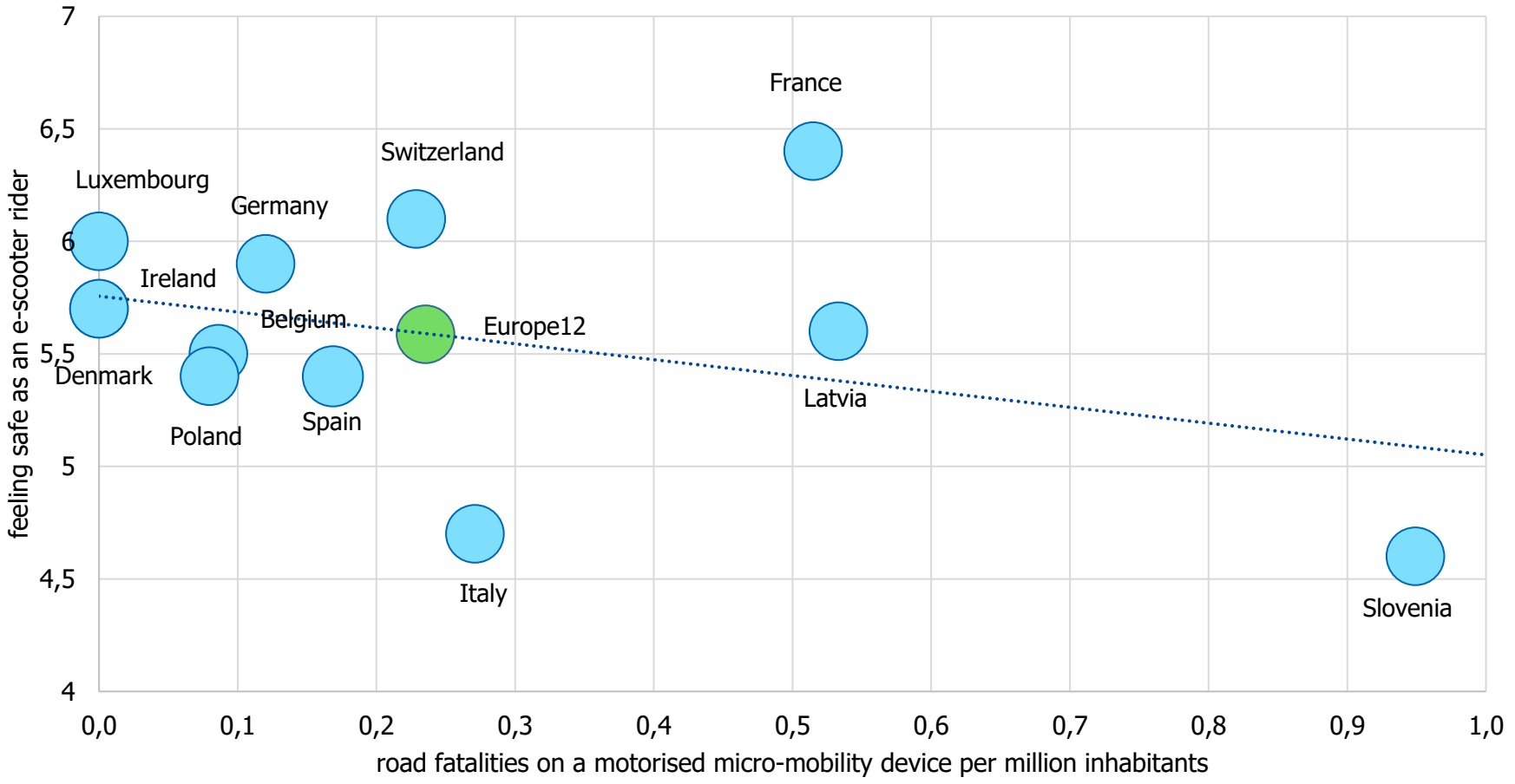
Motorcyclists: Perceived vs. Actual Safety



Cycling: Perceived vs. Actual Safety



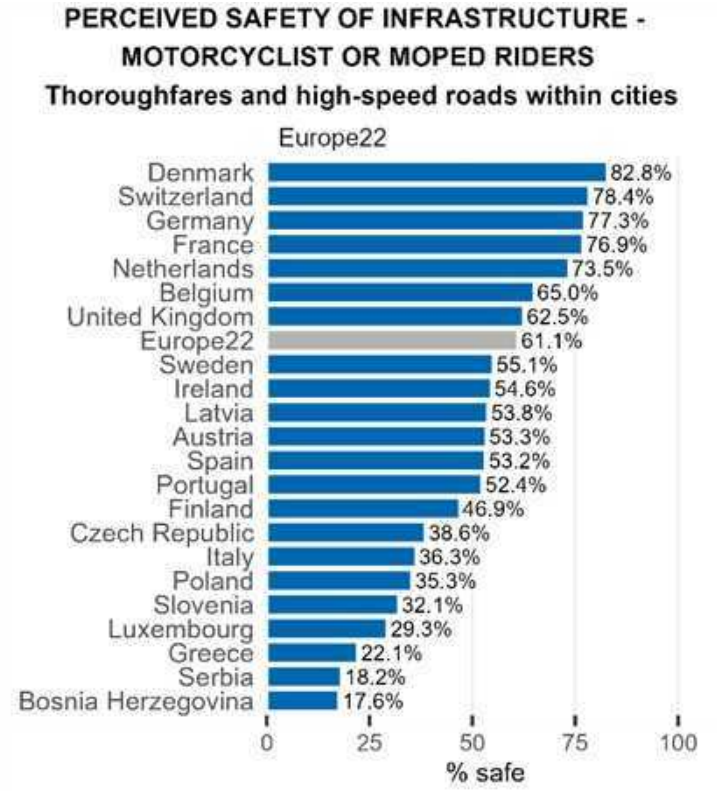
E-Scooters: Perceived vs Actual Safety

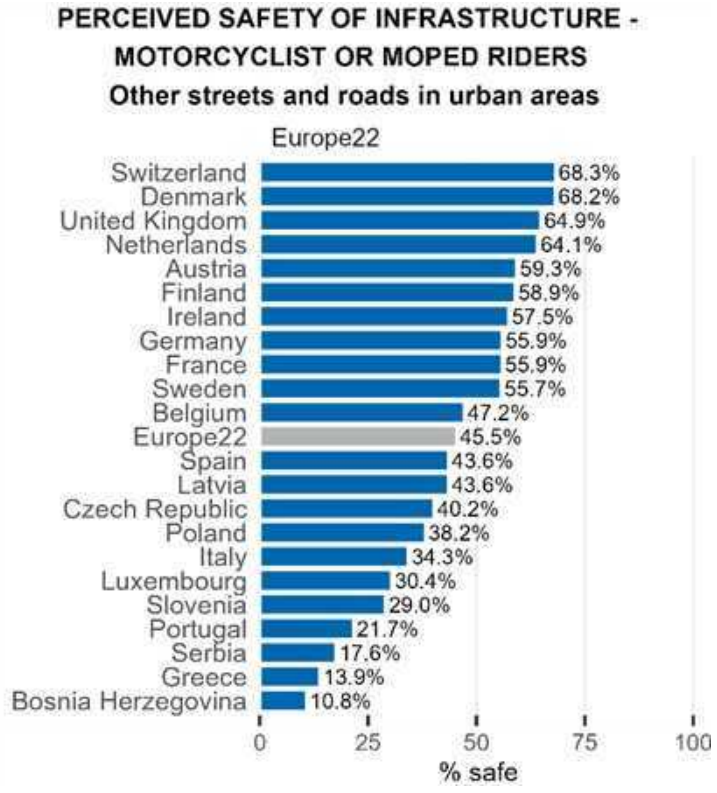


Note: A motorised, micro-mobility device includes devices such as an e-micro-scooter, but also segway, a monowheel or a self-balancing unicycle. The device should have at least one wheel, be designed for one person, and have an electric motor that can achieve a maximum speed of up to 25 km/h.

Infrastructure Safety: Motorcyclists

As a motorcyclist or moped rider, how would you rate the roads that you regularly use in terms of safety?

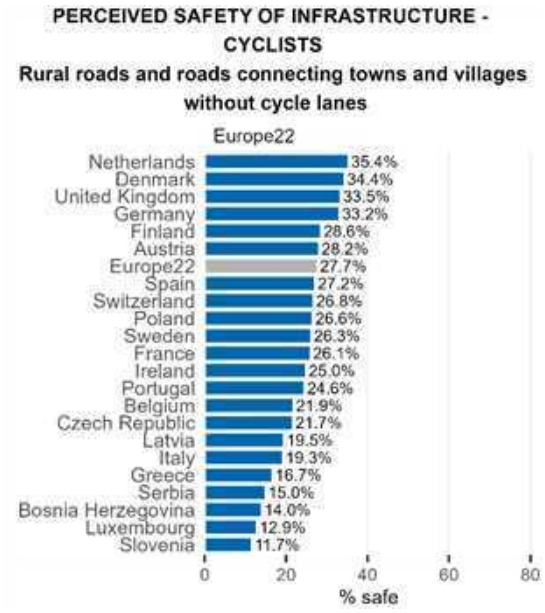


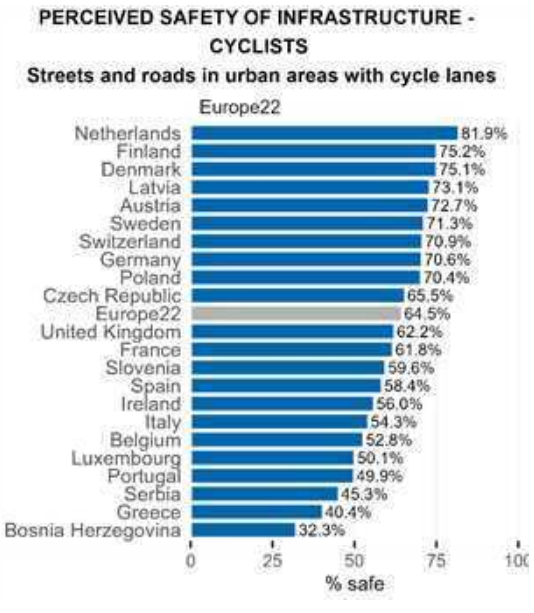


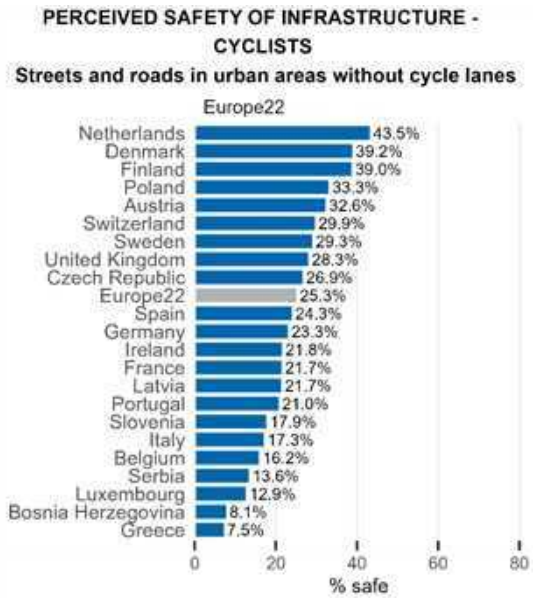
Reference population: motorcyclists and moped riders at least a few days a year who regularly use this specific infrastructure

Infrastructure Safety: Cyclists

As a cyclist, how would you rate the roads/cycle lanes that you regularly use in terms of safety?



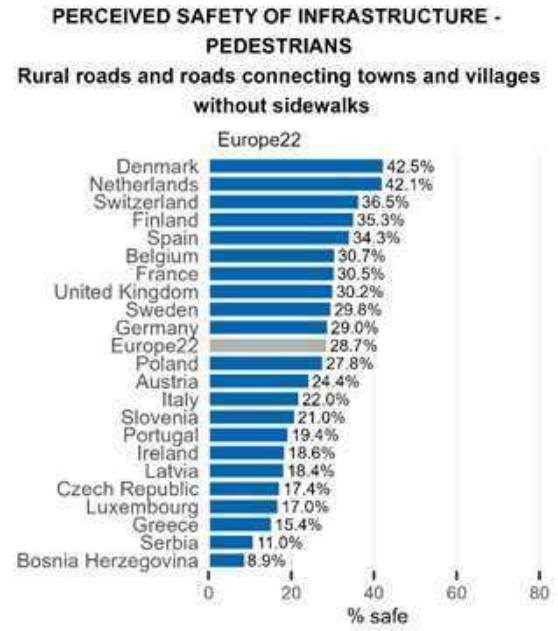


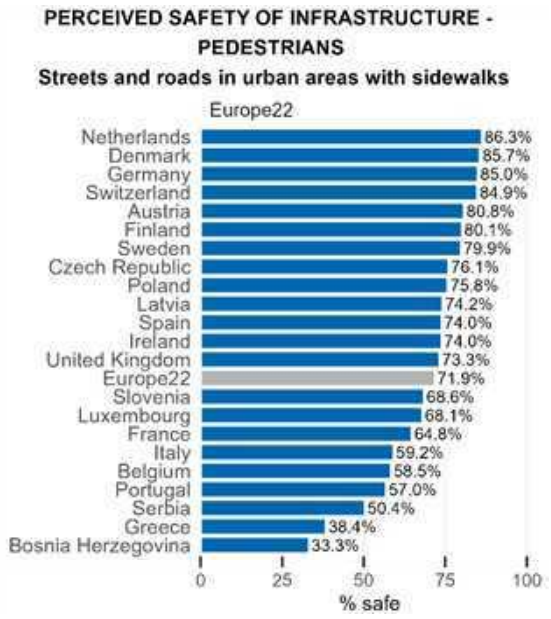


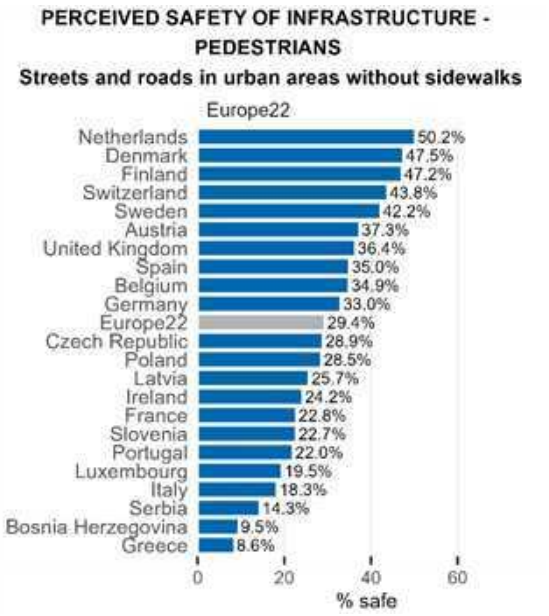
Reference population: cyclists at least a few days a year who regularly use this specific infrastructure

Infrastructure Safety: Pedestrians

As a pedestrian, how would you rate the roads/sidewalks that you regularly use in terms of safety?







Reference population: pedestrians at least a few days a year who regularly use this specific infrastructure

Key Findings

- VRUs – and cyclists, motorcyclists and e-scooter riders in particular – in Europe perceive substantially lower safety than occupants of enclosed vehicles, with pedestrians feeling safest and motorcyclists and e-scooter riders feeling least safe (in line with ESRA1 and ESRA2)

- Female VRUs feel less safe than male VRUs; perceived safety for cycling and riding an e-scooter decreased with age – for cycling this is line with ESRA2 also indicating in this direction as well as also shown for Germany in the latest German Cycling survey (Sinus Institute, 2023)

- Subjective safety correlates negatively with fatality rates for pedestrians and motorcyclists; for cyclists an inverse relationship is observable (which is in line with ESRA2) and countries with greater cycling exposure (and more advanced cycling infrastructure) show higher perceived safety despite higher per-capita fatality rates

- Level of perceived safety by cyclists and pedestrians on urban and rural roads is lower if pedestrian and cycle infrastructure, i.e., cycle lanes and sidewalks, are not present (for cyclists this is also shown for Germany in the latest German Cycling survey (Sinus Institute, 2023); motorcyclists feel least safe on urban roads

Conclusions and Policy Implications

- Riding an e-scooter and driving a motorcycle are across the least safe transport modes in Europe and perceived safety for VRUs (aside from pedestrians) is substantially lower than for car drivers
- Higher level of perceived safety by cyclists for urban and rural roads with cycle lanes as well as by pedestrians for urban and rural roads with sidewalks
- Future focus: increasing safety of cyclists (and e-scooter riders) especially by facilitating bicycle infrastructure (e.g., cycle lanes, cycle paths) for cyclists as well as further increasing safety for pedestrians by attractive infrastructure design, particularly at rural roads
- Subjective safety indicators can usefully complement traditional crash statistics, i.e., insights into confidence and risk awareness among VRUs → continuous monitoring and longitudinal assessment to better understand temporal trends and impact of interventions needed → ESRA4

Thank you!

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