Naomi Wardenier

Trendline project. Report on KPI vehicle safety

Version: 3

Date: 14/10/2025

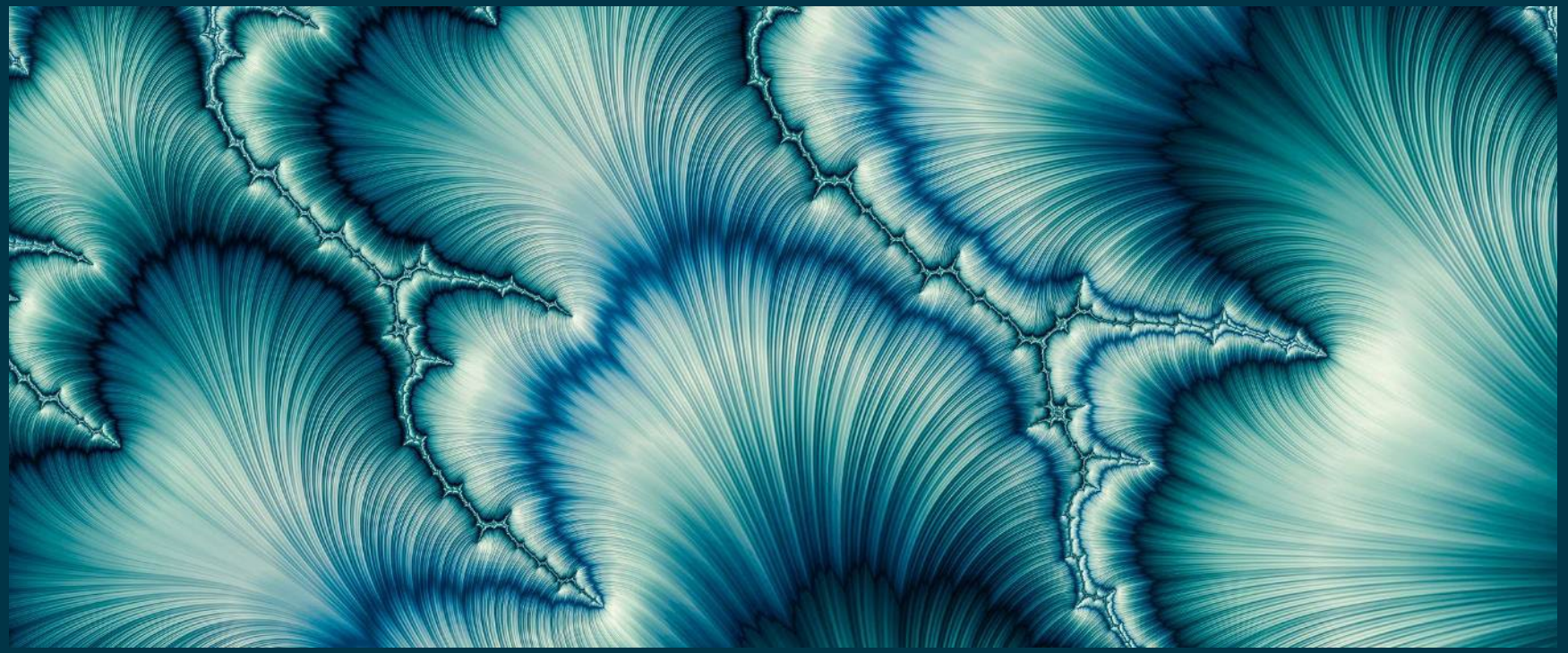
Co-funded by the European Union

Content

- Context
- Methodology and participants
- Key results
- Additional results
- Comparison with Baseline
- Recommendations
- References and further reading

Trendline

Context



Trend line

Purpose and objectives of Trendline

- The purpose of the Trendline project (2022-2025) is to promote the use of road safety KPIs (Key Performance Indicators) within the European Union.
- Collecting such KPI data on a regular basis will underpin and support road safety policies and interventions.
- By using common methodologies, the KPI values of countries can be compared with those of other countries.
- Trendline is supported by the European Commission, who funds 100% of the coordination costs and up to 50% of the costs for data collection and analysis in the EU Member States.
- Trendline is the successor project of "Baseline" (2020-2022).

Main components of Trendline

8

Data collection and analysis for the 8 initial KPIs

Define and test methodologies for 10 experimental indicators

Promote the use of road safety KPIs in road safety policies

Trendline

Countries participating in Trendline

- 25 EU countries (out of 27)
- 4 observers: Estonia, Malta, Norway and Switzerland

Trendline

The eight initial KPIs in Trendline

- Speeding
- Safety belt
- Helmets
- Drink driving
- Distraction
- Vehicle safety
- *Infrastructure**
- Post-crash

** Trendline did only support methodological development; no funding was available for data collection and analysis*

KPI Expert Group (KEG) for each initial KPI

- Purpose of the KEGs
  - to review and adapt the methodological guidelines developed within the Baseline project
  - to advice on the interpretation and possible deviations of the common guidelines
  - to verify the quality of the data collected
  - to draft and review the report on the KPI

- Members of the KEG Vehicle Safety:
  - Naomi Wardenier, Vias institute (Belgium)
  - Adrian Hellmann, BASt (Germany)
  - Pete Thomas, Loughborough University (UK)
  - Matteo Rizzi, STA (Sweden)
  - Katerina Folla, NTUA (Greece)
  - Diane Cleij, SWOV (Netherlands)
  - Richard Schram, Euro NCAP
  - Jean-François Gaillet, Vias institute (Belgium)

Trendline

Ten 'experimental' indicators

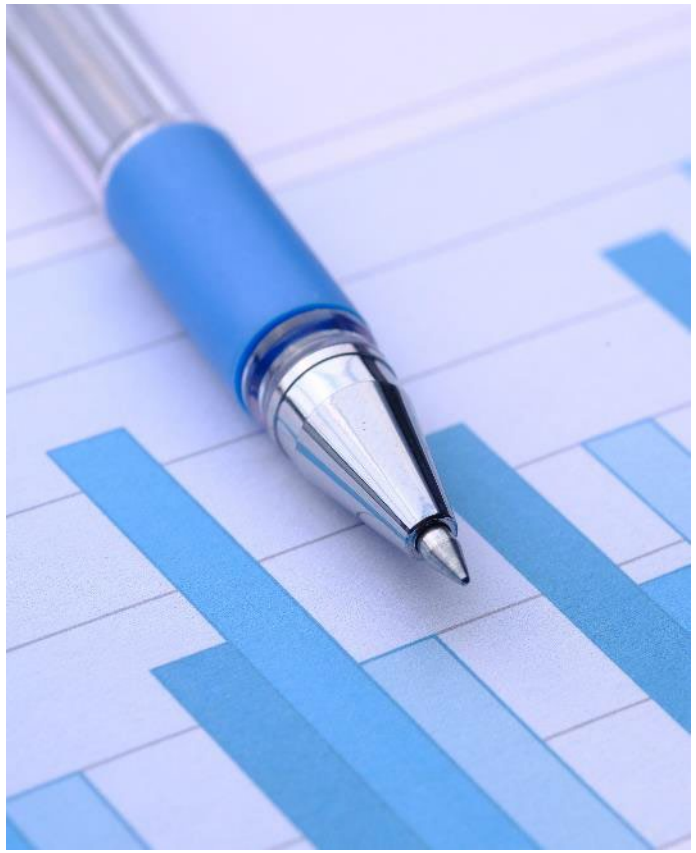
- Purpose: to examine whether the standard set of European indicators should be larger:
  - by extending the scope of existing indicators, or
  - by accepting alternative definitions, or
  - by extending the range of acceptable methodologies, or
  - by addressing new topics.

- Status
  - 10 possible new indicators have been selected.
  - KEGs (Key Expert Groups) have established methodological guidelines.
  - Pilots and tests have been conducted for each indicator in several Member States,
  - Final output are methodological guidelines, lessons learned, and recommendations.

Trendline

The ten experimental indicators

- Driving under the influence of drugs
- The part of 30km/h roads in urban zones
- Red-light negations by road users
- Compliance with traffic rules at intersections
- Helmet wearing by PMD riders (e.g., e-steps)
- Self-reported risky behaviour
- Attitudes towards risky behaviour
- Use of lights by cyclists in the dark
- Enforcement of traffic regulations
- Speed variation



Trendline

Methodology and participants KPI vehicle safety

Definition and scope

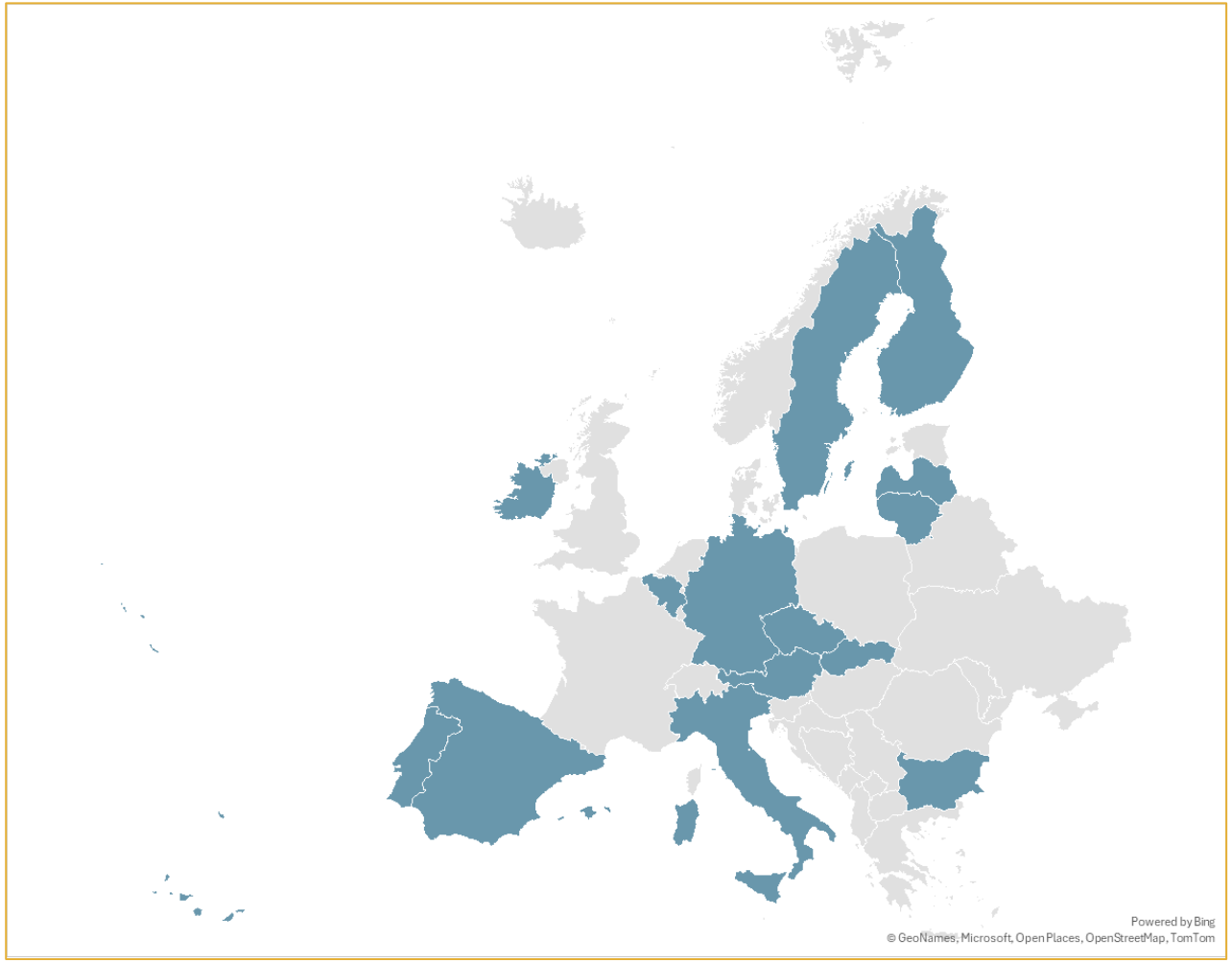
- Definition: ***Percentage of new passenger cars with a Euro NCAP safety rating equal or above a predefined threshold***
- **Standard KPI**: percentage of new passenger cars meeting or exceeding the threshold (4/5 stars), new cars registered in 2022 (mandatory)
- **Second indicator**: percentage of passenger cars with age 0-5 years in 2022 meeting or exceeding the threshold (4/5 stars) (recommended)
- Countries can also calculate both indicators for 2023

Methodological requirements

- Number of registered passenger cars (new or 0-5y) in 2022:
  - Total
  - With 0-3 stars
  - With 4 stars
  - With 5 stars
  - That could not be linked to Euro NCAP rating
- KPI percentages for 2022
  - Using threshold 4 stars and threshold 5 stars
  - Ignoring and including cars for which no star rating available
- Metadata

Countries collecting data on vehicle safety (14)

Country	Data collection period (y)
Austria	2022, 2023
Belgium	2022
Bulgaria	2022, 2023
Czechia	2022, 2023
Finland	2022, 2023
Germany	2022, 2023
Ireland	2022, 2023
Italy	2022, 2023
Latvia	2022, 2023
Lithuania	2022, 2023
Portugal	2022
Slovakia	2022, 2023
Spain	2022
Sweden	2022, 2023

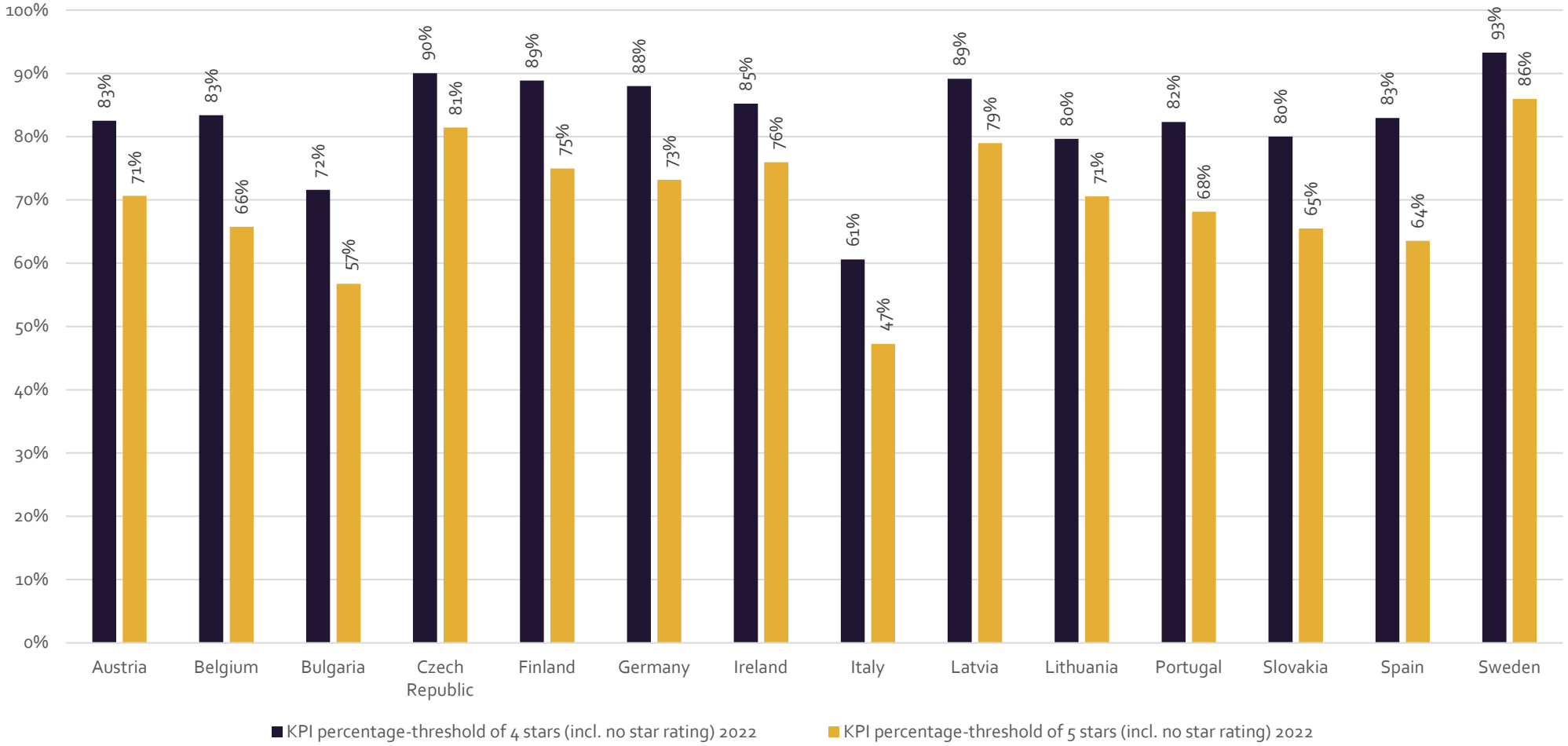


Trendline

Key results

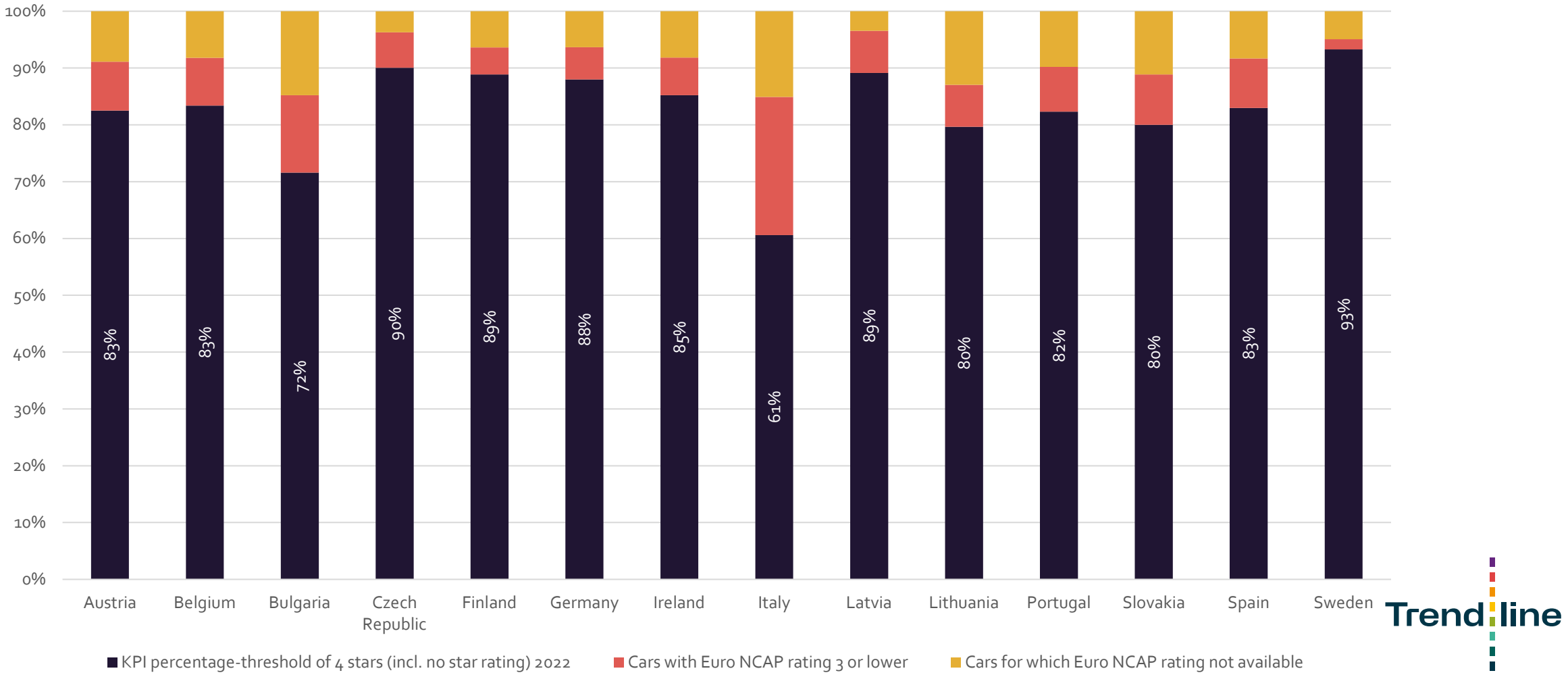
Trendline

Standard KPI (new registered passenger cars), 2022 (including no star rating cars)



Trendline

Standard KPI (new registered passenger cars), 2022 (including no star rating cars)

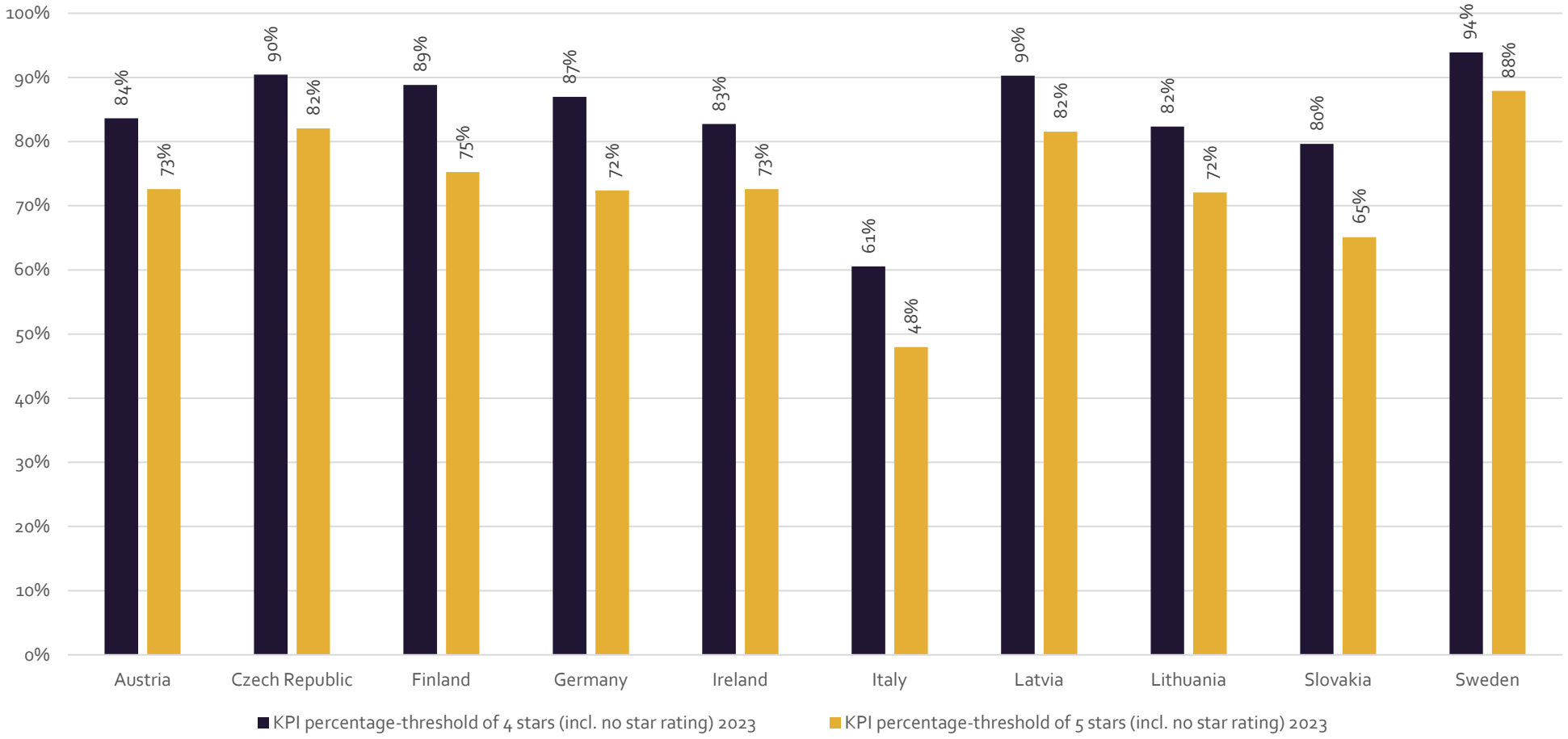


Standard KPI (new registered passenger cars), 2022 (including no star rating cars)

- The percentage of new passenger cars in 2022 with Euro NCAP rating 4 stars or higher ranges from 61% in Italy to 93% in Sweden
- The percentage of new passenger cars in 2022 with Euro NCAP rating 5 stars ranges from 47% in Italy to 86% in Sweden
- Although the countries with the lowest and highest KPI are the same for both thresholds, the ranking of countries is not the same
- Regarding the proportion of cars in each country that do not have 4 Euro NCAP stars, the ratio between cars with Euro NCAP rating 0-3 stars and cars for which no rating is available differs between countries

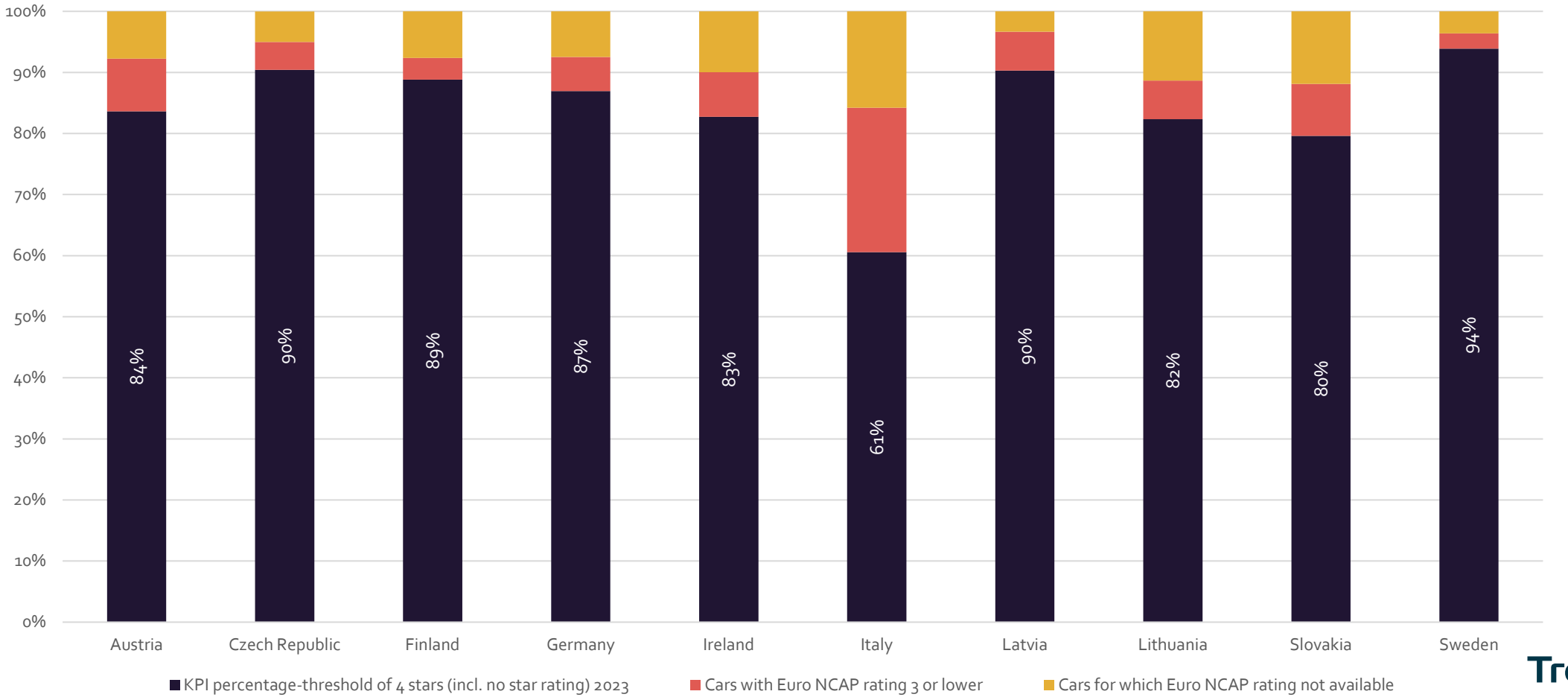
Trendline

Standard KPI (new registered passenger cars), 2023 (including no star rating cars)



Trendline

Standard KPI (new registered passenger cars), 2023 (including no star rating cars)



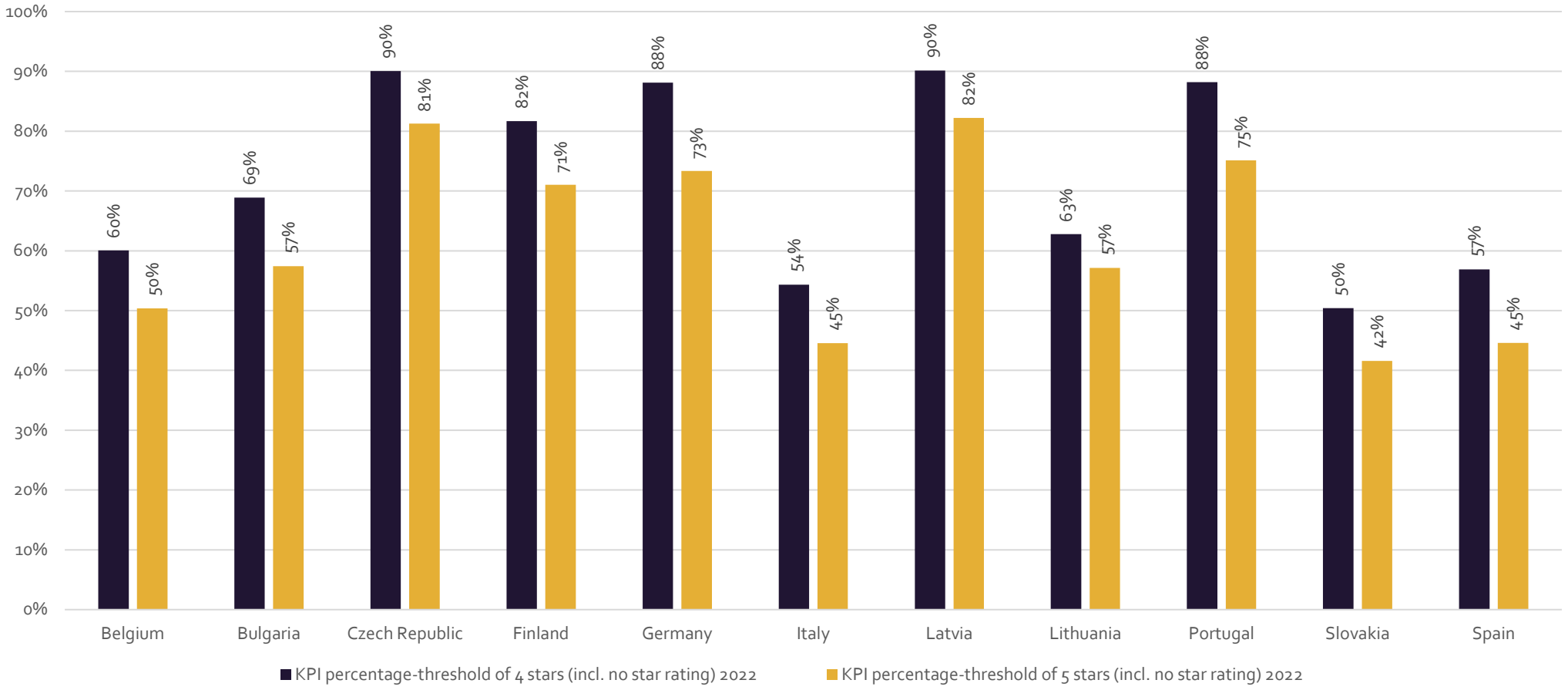
Trendline

Standard KPI (new registered passenger cars), 2023 (including no star rating cars)

- As this KPI is not mandatory but only recommended, not all countries calculated this KPI. 10 countries calculated this KPI.
- The percentage of new passenger cars in 2023 with Euro NCAP rating 4 stars or higher ranges from 61% in Italy to 94% in Sweden
- The percentage of new passenger cars in 2023 with Euro NCAP rating 5 stars ranges from 48% in Italy to 88% in Sweden

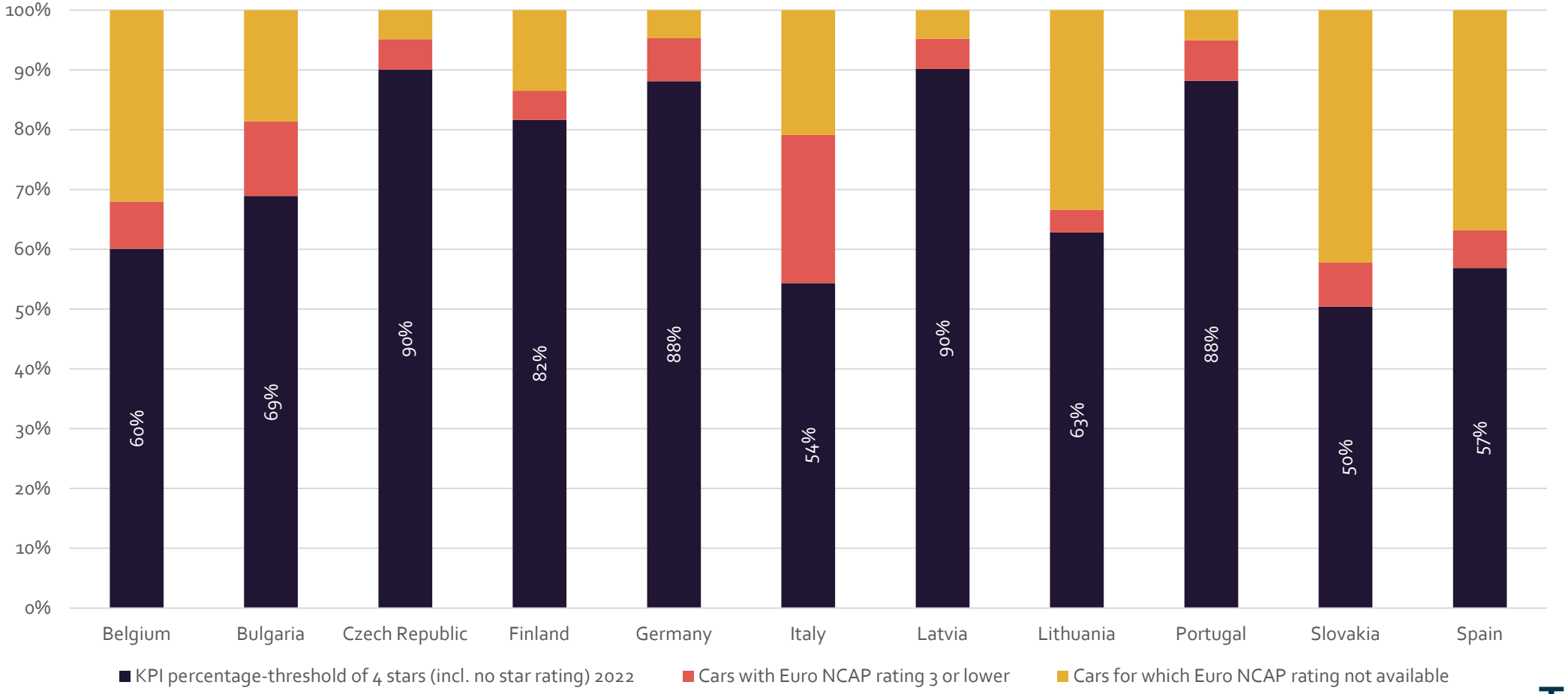
Trendline

2nd indicator, KPI for passenger cars age 0-5y, 2022 (including no star rating cars)



When this indicator for passenger cars with age 0-5y is compared to the standard KPI for new passenger cars in 2022 (slide 16 and 17), it can be observed that for some countries the KPI is more or less the same for the two indicators (examples are Germany, Czech Republic, Latvia) while in other countries the KPI is (much) lower for the indicator 0-5y (examples are Belgium, Slovakia and Spain). In theory it is expected that the KPI for passenger cars age 0-5y is lower, as the proportion of cars for which no Euro NCAP rating is available is larger than for the indicator on new passenger cars, since for a larger proportion of passenger cars the Euro NCAP rating is already expired (Euro NCAP ratings have a validity of 6 years).

2nd indicator, KPI for passenger cars age 0-5y, 2022 (including no star rating cars)



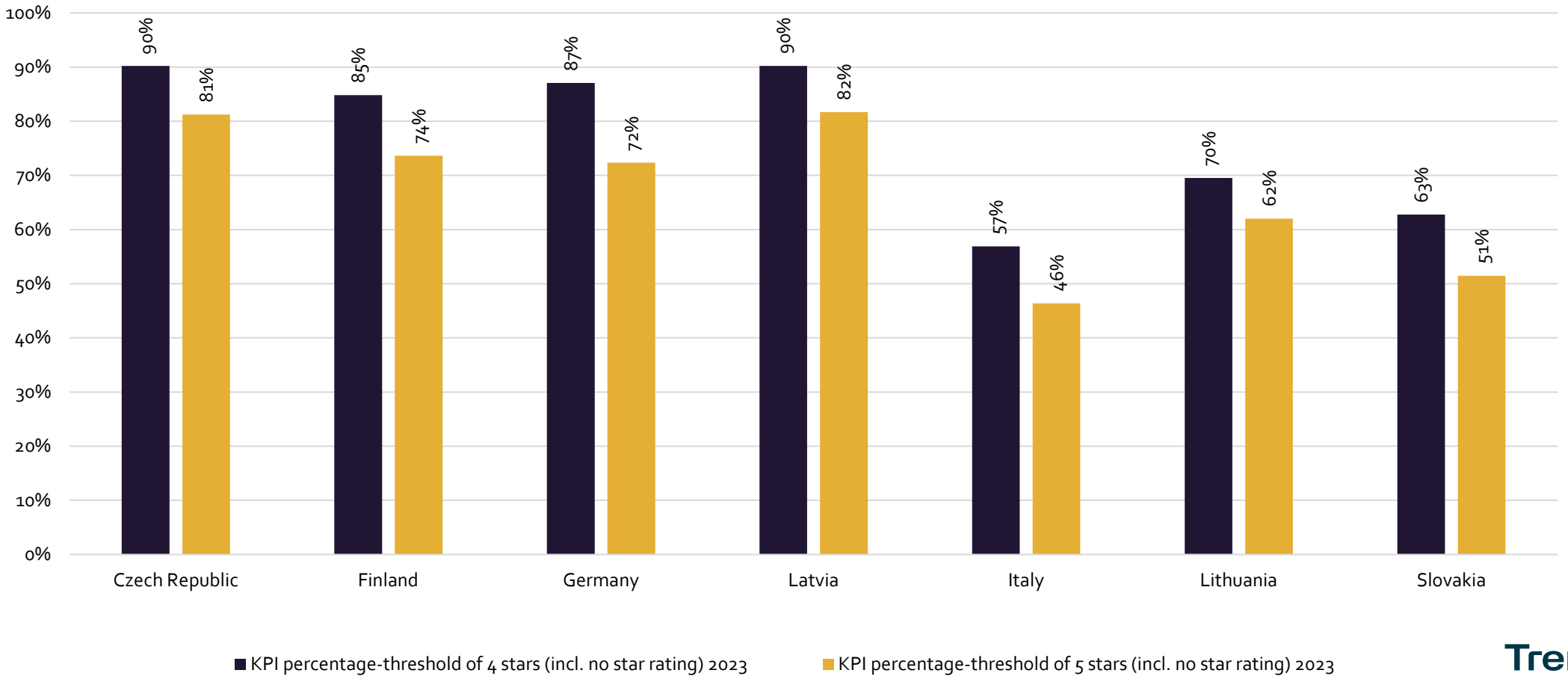
When this indicator for passenger cars with age 0-5y is compared to the standard KPI for new passenger cars in 2022 (slide 16 and 17), it can be observed that for some countries the KPI is more or less the same for the two indicators (examples are Germany, Czech Republic, Latvia) while in other countries the KPI is (much) lower for the indicator 0-5y (examples are Belgium, Slovakia and Spain). In theory it is expected that the KPI for passenger cars age 0-5y is lower, as the proportion of cars for which no Euro NCAP rating is available is larger than for the indicator on new passenger cars, since for a larger proportion of passenger cars the Euro NCAP rating is already expired (Euro NCAP ratings have a validity of 6 years).

2nd indicator, KPI for passenger cars age 0-5y, 2022 (including no star rating cars)

- As this KPI is not mandatory but only recommended, not all countries calculated this KPI. 11 countries calculated this KPI.
- The percentage of passenger cars with age 0-5y in 2022 with Euro NCAP rating 4 stars or higher ranges from 50% in Slovakia to 90% in Czech Republic and Latvia
- The percentage of passenger cars with age 0-5y in 2022 with Euro NCAP rating 5 stars ranges from 42% in Slovakia to 82% in Latvia
- The ranking of countries is the same for both thesholds
- Regarding the cars in each country that do not have 4 Euro NCAP stars, the ratio between cars with Euro NCAP rating 0-3 stars and cars for which no rating is available differs between countries
  - The proportion of cars without rating is in most countries larger than for the standard KPI, as for a larger proportion of cars the rating is already expired (Euro NCAP ratings have a validity of 6 years)

When this indicator for passenger cars with age 0-5y is compared to the standard KPI for new passenger cars in 2022 (slide 16 and 17), it can be observed that for some countries the KPI is more or less the same for the two indicators (examples are Germany, Czech Republic, Latvia) while in other countries the KPI is (much) lower for the indicator 0-5y (examples are Belgium, Slovakia and Spain). In theory it is expected that the KPI for passenger cars age 0-5y is lower, as the proportion of cars for which no Euro NCAP rating is available is larger than for the indicator on new passenger cars, since for a larger proportion of passenger cars the Euro NCAP rating is already expired (Euro NCAP ratings have a validity of 6 years).

2nd indicator, KPI for passenger cars age 0-5y, 2023 (including no star rating cars)



Trendline

2nd indicator, KPI for passenger cars age 0-5y, 2023 (including no star rating cars)

- As this KPI is not mandatory but only recommended, not all countries calculated this KPI. 7 countries calculated this KPI.
- The percentage of passenger cars with age 0-5y in 2023 with Euro NCAP rating 4 stars or higher ranges from 57% in Italy to 90% in Latvia
- The percentage of passenger cars with age 0-5y in 2023 with Euro NCAP rating 5 stars ranges from 46% in Italy to 82% in Latvia
- The ranking of countries is almost the same for both thesholds, except that Germany and Finland switch places

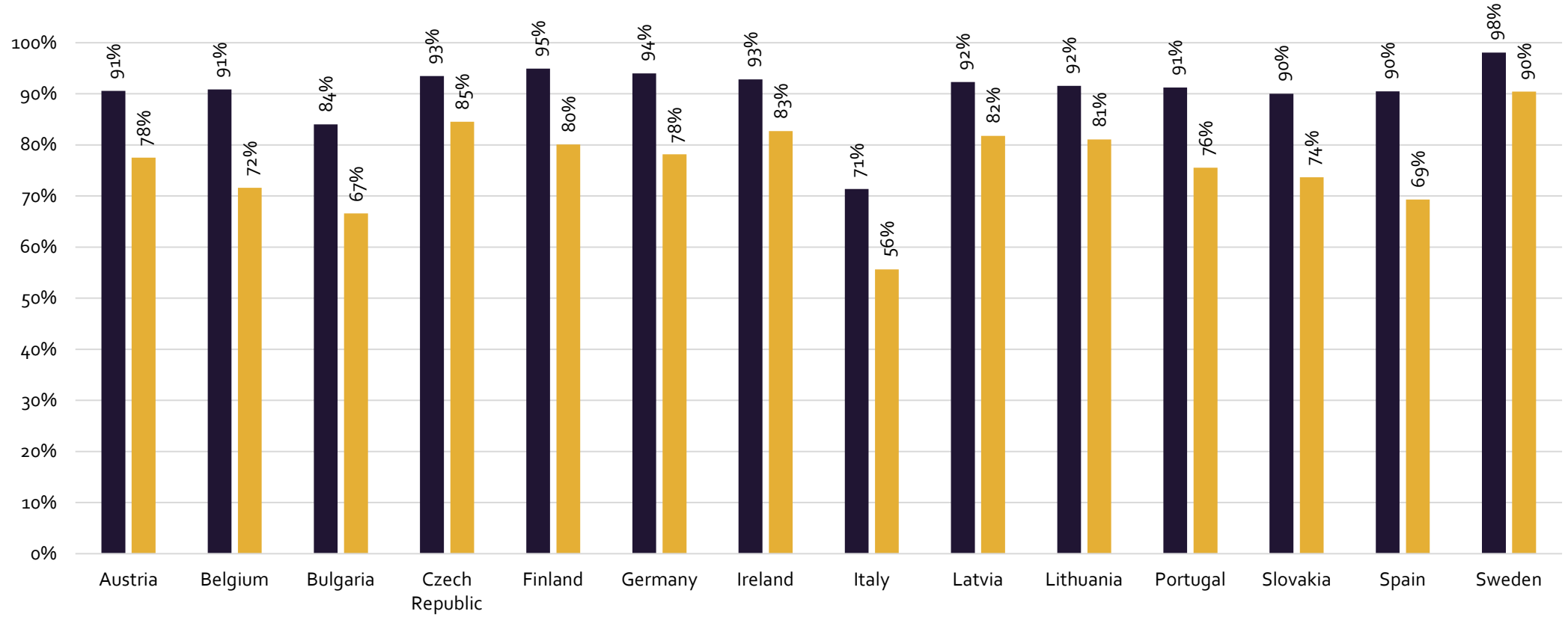
Trendline

Comparability of results across countries

- Only a small number of countries were able to exclude (part of) the cars adapted for drivers with disabilities. However, the expected effect on comparability is small (as it concerns a small number of cars).

Additional results

Standard KPI (new registered passenger cars), 2022 (excluding no star rating cars)

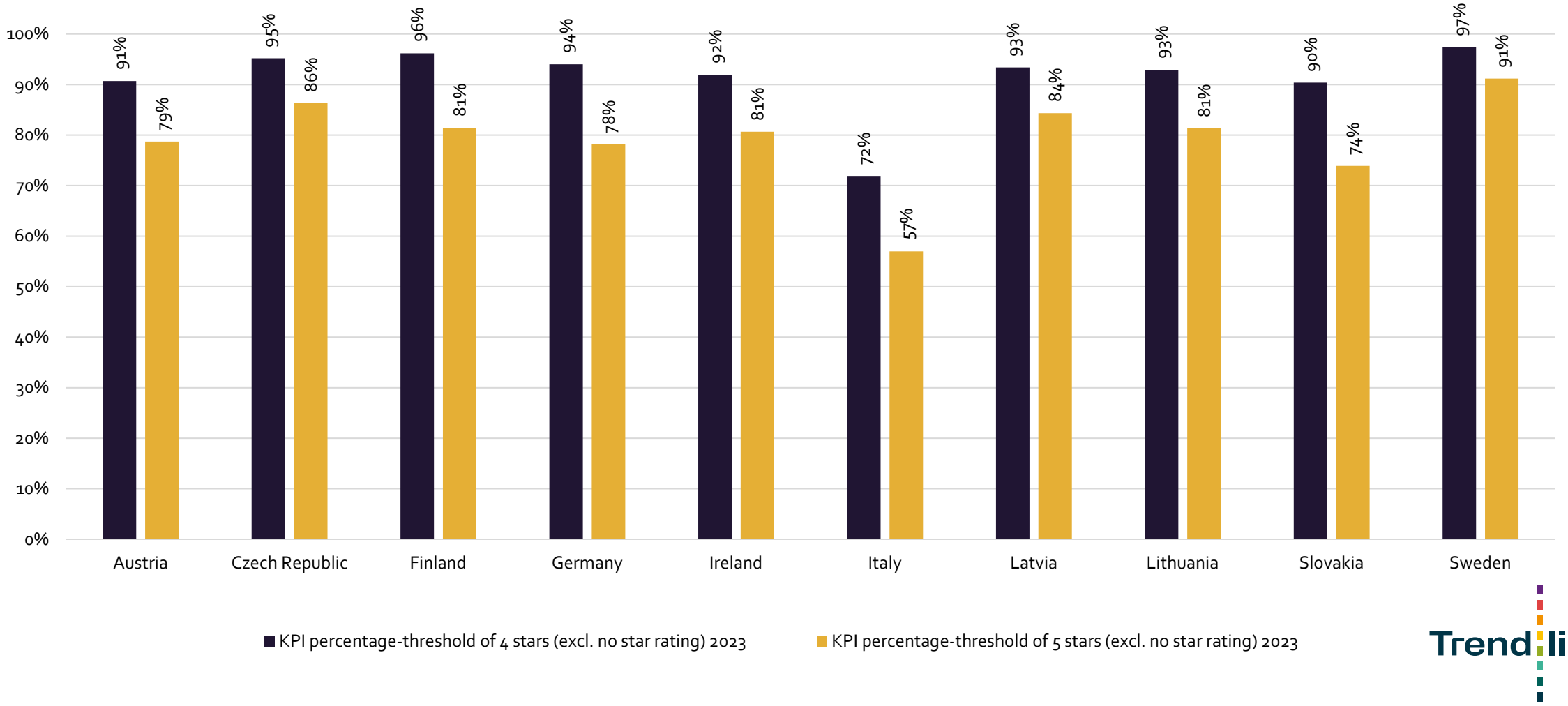


Trendline

Standard KPI (new registered passenger cars), 2022 (excluding no star rating cars)

- Cars for which no Euro NCAP rating is available, are excluded
- The percentage of new passenger cars in 2022 with Euro NCAP rating 4 stars or higher (excluding no star rating cars) ranges from 71% in Italy to 98% in Sweden
- The percentage of new passenger cars in 2022 with Euro NCAP rating 5 stars (excluding no star rating cars) ranges from 56% in Italy to 90% in Sweden

Standard KPI (new registered passenger cars), 2023 (excluding no star rating cars)



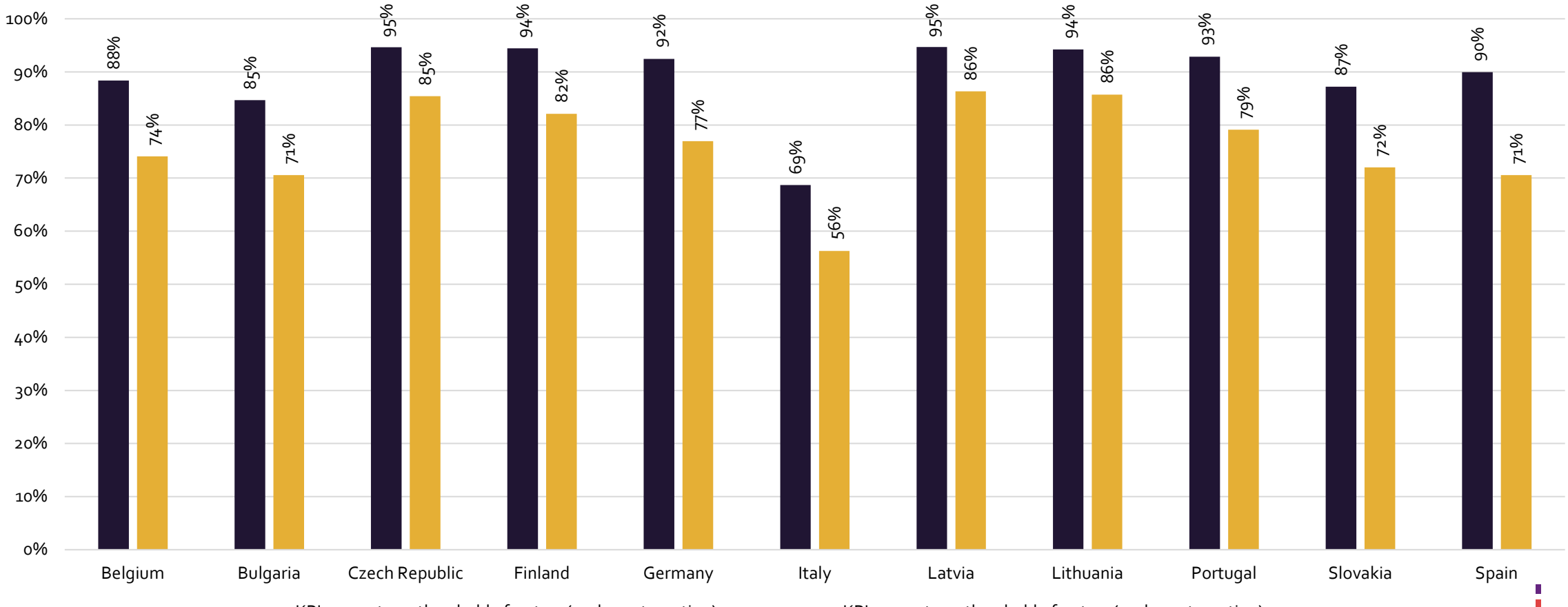
Trendline

Standard KPI (new registered passenger cars), 2023 (excluding no star rating cars)

- Cars for which no Euro NCAP rating is available, are excluded
- The percentage of new passenger cars in 2023 with Euro NCAP rating 4 stars or higher (excluding no star rating cars) ranges from 72% in Italy to 97% in Sweden
- The percentage of new passenger cars in 2023 with Euro NCAP rating 5 stars (excluding no star rating cars) ranges from 57% in Italy to 91% in Sweden

Trendline

2nd indicator, KPI for passenger cars age 0-5y, 2022 (excluding no star rating cars)



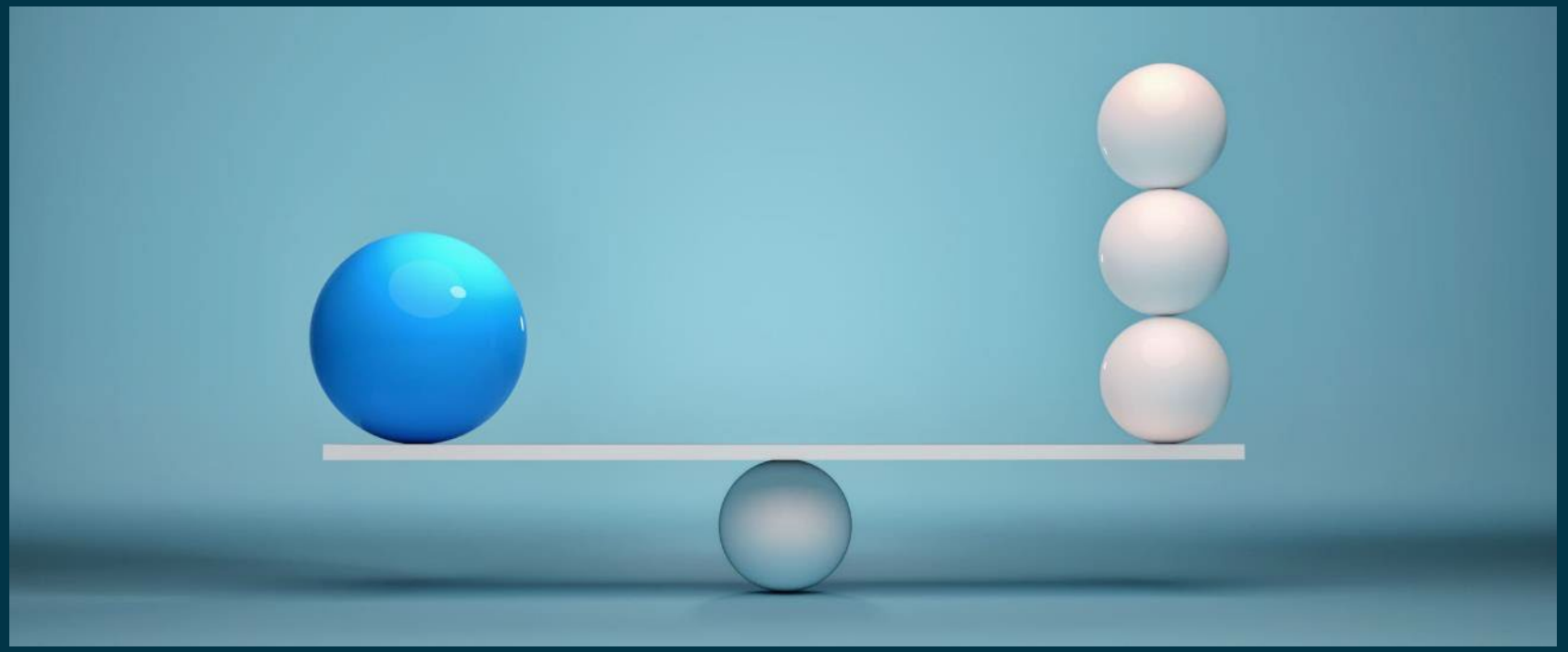
Trendline

2nd indicator, KPI for passenger cars age 0-5y, 2022 (excluding no star rating cars)

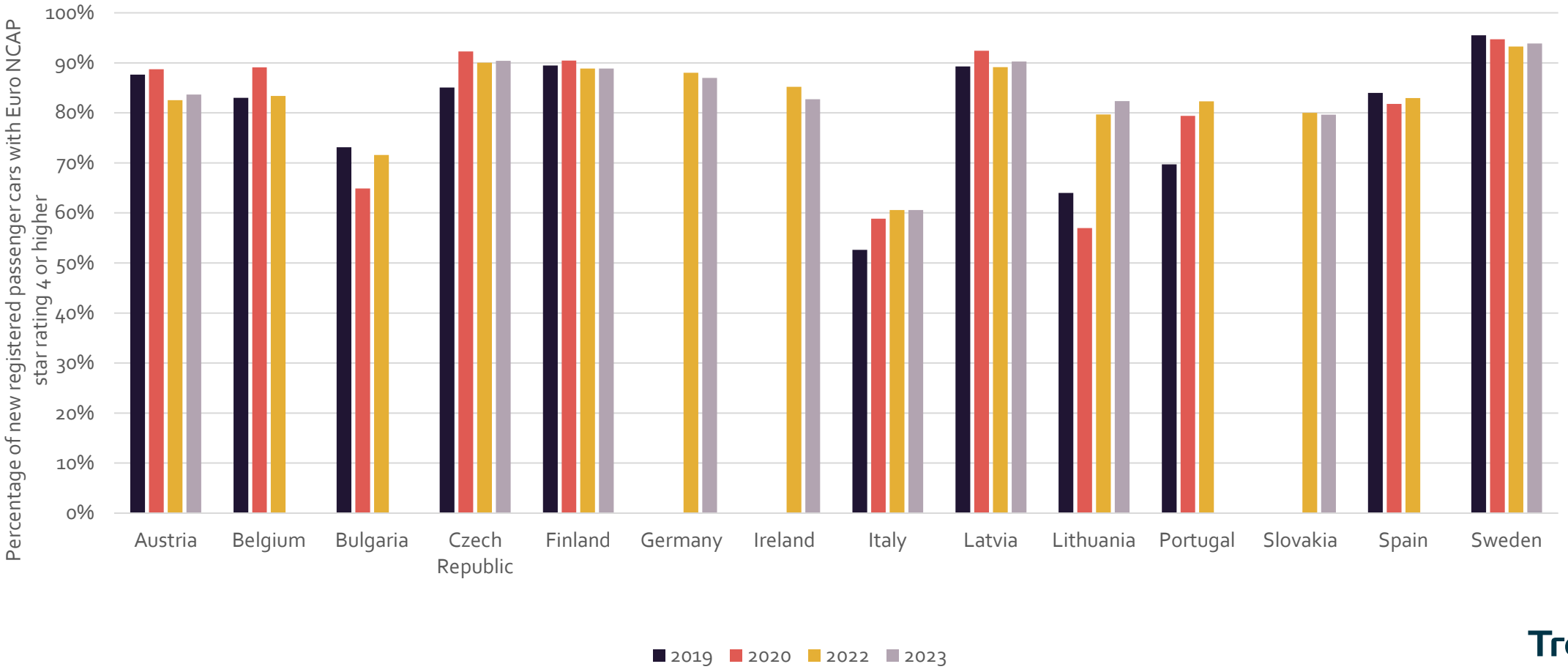
- Cars for which no Euro NCAP rating is available, are excluded
- The percentage of passenger cars with age 0-5y in 2022 with Euro NCAP rating 4 stars or higher (excluding no star rating cars) ranges from 69% in Italy to 95% in Czech Republic and Latvia
- The percentage of passenger cars with age 0-5y in 2022 with Euro NCAP rating 5 stars (excluding no star rating cars) ranges from 56% in Italy to 86% in Latvia

Trendline

Comparison with Baseline

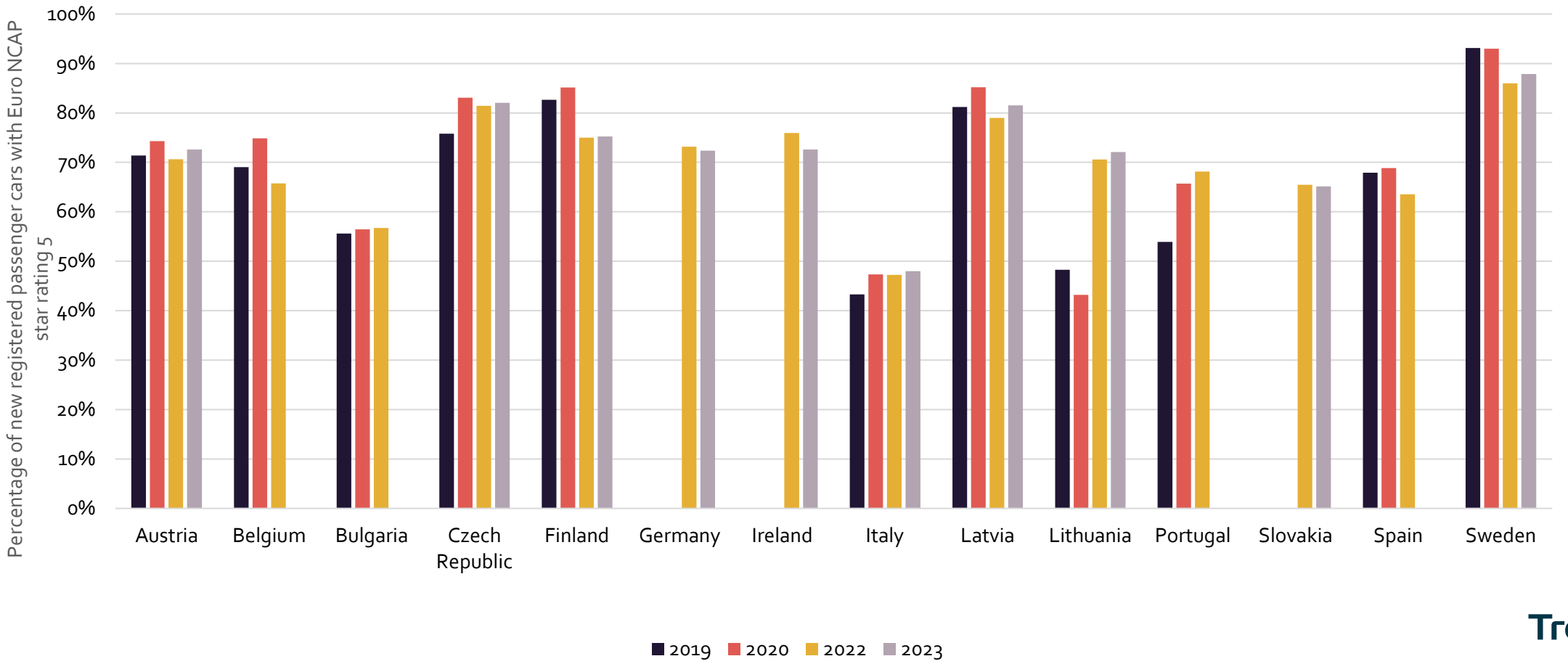


Standard KPI: new registered passenger cars with threshold 4 Euro NCAP stars (incl. no star rating cars)**, 2019-2023**



Trendline

Standard KPI: new registered passenger cars with threshold 5 Euro NCAP stars (incl. no star rating cars)**, 2019-2023**



Trendline

Comparison Trendline - Baseline

- An increase of the KPI with the years is not observed in all countries
  - In most countries KPI stays at at same level
  - Increase of KPI in some countries (Lithuania and Portugal)
  - Light decrease of KPI in some countries for one of the two thresholds
- Increases or decreases can also be related to stricter Euro NCAP classifications

Recommendations

Recommendations on methodology

- In Trendline decided by KEG to exclude cars adapted for drivers with disabilities
  - Only two countries able to do this
  - Most countries do not have information to distinguish them
  - → Change again in next edition?
- Other change in Trendline: exclude cars derived from commercial vehicles/vans
  - Most countries were able to exclude these
  - → Keep in next edition

Recommendations on methodology

- Shortcoming that surfaced in Baseline: car manufacturers registering cars in one country and exporting immediately to another country for tax reasons
  - → Unclear if this is still an issue and/or if this has effect on validity of standard KPI
  - → Only for standard KPI, issue becomes much smaller for indicator on passenger cars with age 0-5y

Recommendations on future scope

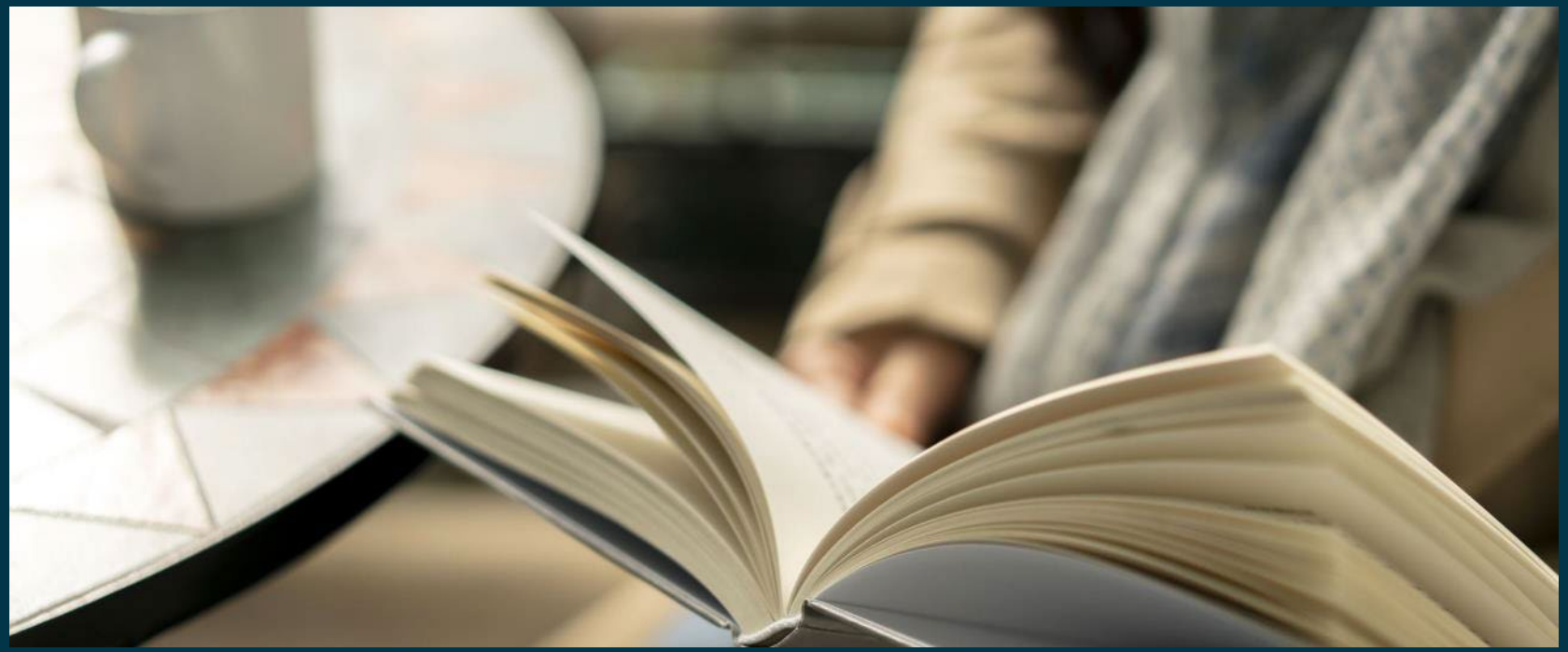
- Keep the KPI on passenger cars with age 0-5y:
  - Larger part of vehicle fleet than new registered passenger cars
  - Less subject to issue where car manufacturers register cars in one country and export immediately to another for tax reasons
  - Feasible for countries to calculate indicator
  - Over time: make time series with this indicator
- General recommendation: KPI vehicle safety for whole vehicle fleet
  - → Stays very challenging
  - → If this indicator is developed, correct registration of the vehicle fleet is also important (e.g. in some countries it is the case that many cars are still registered while no longer in circulation as they are not being unregistered or were not being unregistered in the past)

Recommendations on policy integration

- Authorities should take measures to increase the proportion of passenger cars with a Euro NCAP rating of 4 or 5 stars and their share in traffic volume. Examples are:
  - Awareness raising
  - Financial incentives
  - Promoting safety culture in enterprises
- Authorities should monitor the use of active safety features.
- Harmonization of registration of cars in Europe to facilitate the calculation of a KPI on vehicle safety (for example regarding registration of type approval numbers)

Trendline

References and further reading



Key documents and links

- Wardenier, N., Van den Berghe, W., Schram, R., Gaillet, J.-F., Thomas, P., Folla, K., Cleij, D., Rizzi, M., & Silverans, P. (2024). KPI Vehicle Safety. Methodological Guidelines. Report produced as part the of Trendline project, supported by the European Union. https://trendlineproject.eu/publications/methodological-guidelines-kpi-vehicle-safety.pdf
- Wardenier, N. & Silverans, P. (2023). Baseline report on the KPI Vehicle Safety. Baseline project, Brussels: Vias institute. https://www.baseline.vias.be/storage/minisites/baseline-kpi-vehicle-safety2.pdf
- Final report on Trendline (+link)
- European Commission (2021) Road safety thematic report – Advanced driver assistance systems. European Road Safety Observatory. Brussels, European Commission, Directorate General for Transport.
- Trendline Dashboard (+ link)
- Datafiles of the KPI vehicle safety (includes meta data)

Trendline

Trendline

For more information:

www.trendlineproject.eu

trendline@swov.nl

Co-funded by the
European Union