

SDG Goal 9	Industry, innovation and infrastructure
SDG Target 9.5	Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending
SDG Indicator 9.5.2	Researchers (in full-time equivalent) per million inhabitants
Time series	Persons working in Research and development (in full-time equivalents)

1. General information on the time series

- Date of national metadata: 17 December 2021
- National data: <http://sdg-indicators.de/9-5-2/>
- Definition: The time series measures the number of researchers in full-time equivalent, expressed per 1 million inhabitants. Researchers are professionals engaged in the conception or creation of new knowledge, products, processes, methods and systems, and in the management of the projects concerned.
- Disaggregation: Not available.

2. Comparability with the UN metadata

- Date of UN metadata: July 2024
- UN metadata: <https://unstats.un.org/sdgs/metadata/files/Metadata-09-05-02.pdf>
- The time series is compliant with the UN metadata.

3. Data description

- Research and experimental development (R&D) comprise creative and systematic work undertaken in order to increase the stock of knowledge – including knowledge of humankind, culture and society – and to devise new applications of available knowledge. R&D personnel include all persons engaged directly in R&D activities within a statistical unit. Researchers are professionals engaged in the conception or creation of new knowledge. They conduct research and improve or develop concepts, theories, models, techniques, instrumentation, software or operational methods.

The data on researchers is given in full-time equivalent and is collected by the Federal Statistical Office of Germany on an annual basis for Higher education Sector, Government sector and Private non-profit Sector. Data for Business enterprise sector is collected by Wissenschaftsstatistik GmbH im Stifterverband für die Deutsche Wissenschaft on behalf of the Federal Ministry of Education and Research.

The population data comes from the intercensal population updates, the basis of which is the last census conducted in 2011. The population data is rolled forward using statistical results on natural population change (births, deaths) and migrations. For 2010, the population was calculated backwards using the 2011 census and migration, birth and death statistics.

4. Access to data source

- Total researchers – Eurostat table [tsc00004]:
<https://ec.europa.eu/eurostat/databrowser/view/tsc00004/default/table?lang=en>
- Population: reference date – GENESIS online 12411-0006:
<https://www-genesis.destatis.de/genesis//online?operation=table&code=12411-0006&bypass=true&language=en>
- Population data based on Census 2011 – 1991 to 2011 (only available in German):
https://www.destatis.de/DE/Themen/Gesellschaft-Umwelt/Bevoelkerung/Bevoelkerungsstand/_inhalt.html

5. Metadata on source data

- Quality Report – Survey on Expenses, Revenues and Personnel of the Public and Publicly Subventioned Institutions for Sciences, Research and Development (only available in German):
<https://www.destatis.de/DE/Methoden/Qualitaet/Qualitaetsberichte/Bildung/wissenschaft-forschung-entwicklung.pdf>

6. Timeliness and frequency

- Timeliness: t + 15 months
- Frequency: Annual

7. Calculation method

- Unit of measurement: Per 1 million inhabitants
- Calculation:

$$\text{Researchers per million inhabitants} = \frac{\text{Researchers[full-time equivalents]}}{\text{Population[number]}} \cdot 1,000,000$$