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 9.5.1	**Research and development expenditure as a proportion of GDP**
Time series	**Proportion of R&D expenditures to GDP**

1. General information on the time series

• Date of national metadata: 13 August 2021

• National data: http://sdg-indikatoren.de/en/9-5-1/

• Definition: Research and development (R&D) expenditure as a proportion of Gross Domestic Product (GDP) is the amount of R&D expenditure divided by the total output of the economy.

• Disaggregation: region

2. Comparison with global metadata

• Date of global metadata: July 2017

• Global metadata: https://unstats.un.org/sdgs/metadata/files/Metadata-09-05-01.pdf

• The time series is compliant with the global 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. Expenditures on intramural R&D represent the amount of money spent on R&D that is performed within a reporting unit. The data on GDP is calculated by the Federal Statistical Office's National Accounts as a secondary statistic. GDP is adjusted based on a price base changing every year (previous year's price base). After several revisions due to new data input, final results are available four years after the first preliminary release.

4. Accessibility of source data

• Expenditure, revenue, and human resources of public and publically funded institutions for science, research and development (only available in German):"Ausgaben, Einnahmen und Personal der öffentlichen und öffentlich geförderten Einrichtungen für Wissen

https://www.destatis.de/DE/Themen/Gesellschaft-Umwelt/Bildung-Forschung-Kultur/Forschung-Entwicklung/_inhalt.html - sprg233698

• GDP calculation – detailed annual results (only available in German):"Inlandsproduktsberechnung - Detaillierte Jahresergebnisse" – Fachserie 18, Reihe 1.4, table 2.1.1:

https://www.destatis.de/DE/Themen/Wirtschaft/Volkswirtschaftliche-Gesamtrechnungen-Inlandsprodukt/_inhalt.html - sprg233858

5. Metadata on source data

• Quality report of survey on expenses, revenues and personnel of the public and publicly subventioned institutions for sciences, research and development (only available in German): "Erhebung der Ausgaben, Einnahmen und des Personals der öffentlichen und öffentlich geförderten Einrichtungen für Wissenschaft, Forschung und EntwicklungWissenschaft, Forschung und Entwicklung":

https://www.destatis.de/DE/Methoden/Qualitaet/Qualitaetsberichte/Bildung/einfuehrung.htm

• Quality report of national accounting, GDP (only available in German):"Volkswirtschaftliche Gesamtrechnungen, Inlandsprodukt":

https://www.destatis.de/DE/Methoden/Qualitaet/Qualitaetsberichte/Volkswirtschaftliche-Gesamtrechnungen/einfuehrung.html

6. Timeliness and frequency

• Timeliness: t + 15 months

• Frequency: Annual

7. Calculation method

• Unit of measurement: %

• Calculation method:

$$\text{Proportion of R \& D expenditures to GDP} = \frac{\text{R\&D expenditure [Mn EUR]}}{\text{GDP [Mn EUR]}} \cdot 100 \, [\%]$$