

Statistical bulletin

Gross domestic expenditure on research and development, UK: 2022

Estimates of research and development performed and funded by businesses, higher education, government, UK Research and Innovation, and non-profit organisations.

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1 . Main points

- Expenditure on research and development (R&D) performed in the UK was £70.7 billion in 2022 (in current prices), an increase of £4.4 billion since 2021 and £12.4 billion since 2018, which is the first period available since the redevelopment of R&D statistics began.
- The largest component of R&D expenditure was the business sector, at £49.9 billion (71% of the UK total); followed by the higher education sector, at £16.3 billion (23% of the UK total).
- The government sector, including UK Research and Innovation, performed £3.6 billion of R&D (5% of the UK total); the private non-profit sector performed the least, at £0.9 billion (1% of the UK total).
- Based on our latest available measure of gross domestic product (GDP), which does not yet incorporate the new R&D methodology, total UK R&D expenditure represented 2.77% of GDP in 2022; this figure is not comparable with previously published estimates, which were last included in the 2019 release.

We have introduced a new sample design and survey methodology to improve our business sector estimates for 2022. The uplift methodology we previously applied in our BERD 2021 release remains in place for the periods 2018 to 2021. More information is available in [Section 4: Methodological developments](#).

2 . Data on Gross domestic expenditure on research and development

[UK gross domestic expenditure on research and development \(designated as official statistics\)](#)

Dataset | Released 8 August 2024

Annual estimates of research and development in the UK performed and funded by business enterprise, higher education, government, UK Research and Innovation, and private non-profit organisations.

[UK gross domestic expenditure on research and development \(designated as accredited official statistics\)](#)

Dataset | Released 8 August 2024

Annual estimates of research and development in the UK performed and funded by business enterprise, higher education, government, UK Research and Innovation, and private non-profit organisations.

3 . Data sources and quality

This bulletin provides estimates of research and development (R&D) performed in, and funded by, the following four sectors of the UK economy, as defined in the [Organisation for Economic Co-operation and Development \(OECD's\) Frascati Manual, 2015](#):

- business enterprise R&D (BERD)
- higher education R&D (HERD)
- government, including UK Research and Innovation, R&D (GovERD)
- private non-profit organisations R&D (PNPRD)

R&D data from these sectors collectively form the gross domestic expenditure on R&D (GERD) measure.

In this statistical bulletin, R&D and related concepts follow internationally agreed standards defined by the [OECD](#), as published in the Frascati Manual 2015. GERD is the OECD's preferred measure of R&D activity for use in international comparisons.

R&D can be measured by the expenditure on R&D performed by an organisation, or the funding received by an organisation for R&D work. These are often, but not always, the same. Performance is regarded as a more accurate measure than funding received, as not all funds received may be used as intended. This bulletin reports on R&D expenditure in UK organisations, irrespective of the country of residence of the ultimate owner or users of the R&D produced.

All figures quoted are in current prices, unless otherwise stated.

4 . Methodological developments

In this bulletin, the UK totals and performing sector level research and development (R&D) figures are designated as accredited official statistics, while the remaining figures have official statistics designation.

This methodological approach was introduced in our [Gross domestic expenditure on research and development \(GERD\) 2020 bulletin](#). This bulletin includes information about the reduction in the available data breakdowns and the redesignation of the lower-level estimates as official statistics because of the interim uplift factor approach used for the business enterprise R&D (BERD) 2021 results. This approach to statistics accreditation has been retained in this bulletin. While some of the detailed breakdowns have been reintroduced in this release, breakdowns by region for the periods 2018 to 2021 are not yet available and will be published in next year's GERD 2023 bulletin.

Business sector

The Office for National Statistics (ONS) identified that there was undercoverage, particularly of small businesses, in our previously published [BERD statistics](#) up to the 2020 reference period. As an interim step to adjust for this, we applied an uplift approach in our [BERD 2021 release](#) to both the new estimates for 2021 and the previously published results for 2018 to 2020. Further information about this is available in our [Options for Transformation of BERD Statistics article](#).

We have also made further methodological improvements by introducing a new sample design and results methods for the BERD 2022 survey. The new sample has increased the volume of survey data received and ensured that the BERD statistics better reflect business R&D performed in the UK. Because of the increased volume of survey data received, the estimates in the [BERD 2022 release](#) are the most robust we have produced, and the most representative of business R&D performed in the UK.

As part of our ongoing work to transform R&D statistics, we are compiling a time series for the business sector, where the 2022 estimates in this release will be comparable with the lower-level breakdowns, as well as UK totals for previous years.

Before the time series becomes available, we would advise users not to compare any of the 2022 estimates in this release below the UK level, with the lower-level values for previous years.

The total and sector breakdowns in GERD retain their accredited official statistics designation. However, the ONS asked the [Office for Statistics Regulation \(OSR\)](#) to temporarily pause the accredited official statistics status of the detailed GERD breakdowns, which include the BERD data, because of uncertainty. The suspension of accredited official statistics status will continue until the redevelopment of the BERD statistics is complete.

Higher education sector

Our [GERD 2020 bulletin](#) improved the measurement of R&D performed in the higher education sector, by introducing a new data source: the [Transparent Approach to Costing \(TRAC\)](#). This data source was developed to help cost R&D activity within the higher education sector.

The previous source that was used to measure R&D activity in the higher education sector was not able to fully capture all R&D being performed. The source was compiled based on flows of money into the higher education sector for R&D to be performed, rather than actual R&D performance. Further details of the changes made are available in our GERD 2020 bulletin.

In this release, TRAC continues to be the main data source for R&D performed in the higher education sector. However, we have estimated R&D expenditure in a small number of regions, instead of using the TRAC data. This is because a small number of universities were unable to be included in the TRAC results. No account is made for these universities in the TRAC estimates, as noted in the most recent annual [TRAC data publication](#). For the regions affected by missing institutions in the TRAC results, we have estimated expenditure based on previous growth in those regions. This will mean that estimates in this bulletin are not directly comparable with those in the TRAC publication. However, our estimated values only represent a small proportion of the overall total for the higher education sector.

R&D as a proportion of gross domestic product

Estimates of the percentage of gross domestic product (GDP) spent on R&D performed in the UK were not included in the 2020 and 2021 editions of the GERD statistical bulletin. This is because work to improve the R&D estimates for the business and higher education sectors was still in progress and we had not yet incorporated these improvements into the calculations of GDP.

We stated in our [GERD 2021 bulletin](#) that we would reinstate the estimates of the proportion of GDP spent on performing R&D when our improvements to the R&D statistics were incorporated into the National Accounts. However, we have reintroduced the estimates in this release, which is earlier than previously planned. This is so that users can see an estimate of the impact on GDP from our improved methods, now that we have implemented the new BERD sample design. The percentages of GDP should be treated as indicative only, because the R&D estimates based on our new methodology have not yet been incorporated into the calculations of GDP. They should also not be compared with the percentages of GDP last published in our 2019 release, because of our methodology changes to compiling the R&D statistics for the business and higher education sectors.

Quality

Methodological improvements to our GERD datasets from 2018 onwards mean that comparing with estimates from before 2018, for total R&D performed in the UK and in the business and higher education sectors, is not possible.

We are currently updating our UK gross domestic expenditure on research and development quality and methodology information (QMI). Our QMI details the strengths, limitations and appropriate uses of our survey estimates.

5 . Related links

[Business enterprise research and development, UK: 2022](#)

Bulletin | Released 27 February 2024

Spending and numbers employed on research and development by businesses in the UK, including data on sources of funds and regional spread.

[Research and development expenditure by the UK government: 2022](#)

Bulletin | Released 30 April 2024

Research and development and related expenditure by UK government departments and devolved administrations.

6 . Cite this statistical bulletin

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