

Statistical bulletin

Gross domestic expenditure on research and development, UK: 2019

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



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1 . Main points

- Expenditure on research and development (R&D) that was performed in the UK rose by £1.3 billion (3.4%) to £38.5 billion in 2019; but this was the lowest percentage growth since 2013.
- The largest components of R&D expenditure were the business sector at £25.9 billion (67% of the UK total), followed by the higher education sector at £9.1 billion (24%).
- Total R&D expenditure represented 1.74% of gross domestic product (GDP) in 2019; the long-term trend has been for very small growth over time with the value up from 1.59% in 2008 and 1.72% in 2018.
- Funding of UK R&D from overseas increased by 4.1% to £5.6 billion in 2019 compared with 2018; this was 0.8% higher than the peak in 2014 of £5.5 billion.
- The UK spent £577 per head of population on R&D in 2019; this is up from £561 in 2018.

2 . Flow of funds for UK R&D in 2019

Figure 1 has been created to help demonstrate the complex nature of how research and development (R&D) performed in the UK is funded. Within the chart, the flows from left to right show the value of funds that organisations within each of the sectors of the UK economy provided to other sectors and to organisations within their own sector. Funding from overseas is also included. Values of each sector on the right of the chart are the amounts that each sector spends on performing R&D, which comprises funds received from all other sectors.

The total government sector is subdivided into two elements: government departments and UK Research and Innovation (UKRI); and higher education funding councils (HEFCs) including Research England. In the government sector, HEFCs primarily provide funds to higher education institutes (HEIs) for them to perform R&D. This contrasts with government departments and UKRI, which receive funds from other sectors as well as partly fund themselves to perform R&D, yet they also provide substantial funds to other sectors.

HEIs are regarded as an R&D-performing sector. However, as this analysis is focusing on funding, and the data shown relate to the flow of funds provided between sectors, in this context HEFCs are regarded as part of the government funding sector. This is because the money they allocate to HEIs comes from the government.

Figure 1: Flows of research and development funding in the UK in 2019

Notes:

1. Higher Education Funding Councils (HEFCs), including Research England are funded by government and primarily provide funds for higher education institutes to perform R&D. For the purposes of reporting R&D funding they are classified separately from the rest of government.
2. All figures quoted are in current prices.
3. Differences may occur between data presented in this chart and elsewhere in the release due to rounding.

Download this chart

[.XLSX](#)

3 . Gross domestic expenditure on research and development data

[Gross domestic expenditure on research and development time series](#)

Dataset DIOP | Released 4 August 2021

Annual estimates of research and development (R&D) spending in the UK from the public and private sectors: business enterprise, government, higher education and private non-profit organisations.

[Gross domestic expenditure on research and development, by region, UK](#)

Dataset | Released 4 August 2021

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

[Gross domestic expenditure on research and development, UK](#)

Dataset | Released 4 August 2021

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.

4 . Measuring the data

This release 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 [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)

These sectors' R&D data are known collectively as gross domestic expenditure on R&D (GERD).

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

This release reports on expenditure on R&D performed in the UK irrespective of the country of residence of the ultimate owner or users of the R&D produced.

R&D is 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 by an organisation, as not all funds received may be used on R&D as intended.

Industrial strategy

The UK Government's [UK Research and Development Roadmap](#) includes a target to "raise investment on R&D to 2.4% of gross domestic product (GDP) by 2027". UK R&D statistics are used to assess how sectors of the economy are contributing towards reaching this policy goal.

Coronavirus (COVID-19)

The effect the coronavirus (COVID-19) pandemic has had on the collection of the data contained in this statistical bulletin has varied between sectors. The business and private non-profit sectors have been subject to lower response as a result, with the higher education sector witnessing more of a delay in reporting rather than a lower response rate overall. The government sector has been unaffected.

The Office for National Statistics (ONS) has released a public statement on [COVID-19 and the production of statistics](#). Specific queries must be directed to the [Media Relations Office](#).

Future developments

As part of ongoing development work to improve our R&D statistics, we are reviewing how we measure R&D performed in the UK. We hope to be able to implement improved methods, in the Gross domestic expenditure on research and development 2020 release scheduled for publication in 2022.

Our work to date indicates that the possible changes in methods could result in an increase in the estimate of the value of expenditure on R&D performed in the UK, and this in turn could affect the estimate of the percentage of gross domestic product (GDP) that was spent on R&D. We estimate that for 2019, the percentage of GDP spent on R&D could be approximately 0.1 to 0.3 percentage points higher than the value of 1.7% published in this release. However, it should be noted that this estimated impact range is intended to be indicative of what the final impact could be. There is still significant uncertainty around the precise size of the increase because further work is needed to develop the new methods for our R&D statistics.

When we are further forward in our development work, we will consult with experts and users to seek views and input on our proposals. We hope to be in a position to do so later this year.

Quality

More quality and methodology information on strengths, limitations, appropriate uses, and how the data were created is available in the [UK gross domestic expenditure on research and development QMI](#).

5 . Related links

[Business enterprise research and development, UK: 2019](#)

Bulletin | Released 20 November 2020

Annual spending and numbers employed on research and development in the UK broken down by product sector, and civil and defence type of research.

[Research and development expenditure by the UK government: 2019](#)

Bulletin | Released 15 April 2021

Research and development and related expenditure by UK government departments, UK Research and Innovation (UKRI) and higher education funding bodies. Formerly released as UK government expenditure on science, engineering and technology (SET).

[Qualified scientists and engineers in the labour force: Great Britain](#)

Dataset | Released 2 April 2020

These estimates are from our Labour Force Survey (LFS) and are categorised by gender, type of qualification and occupation from the population of Great Britain aged 16 to 64 years. Occupation is based on the [Standard Occupational Classification 2010 \(SOC 2010\)](#).