Research and development expenditure by the UK government QMI

Quality and Methodology Information for statistics on research and development (R&D) expenditure by the UK government, detailing how the data are compiled, methods used, and data uses and users.

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To be announced

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1 . Output information

- Statistical designation: official statistics.
- Survey name: UK government expenditure on research and development (GovERD).
- Data collection: census survey of UK government departments, agencies, arm's-length bodies, the devolved governments, and other government organisations, which perform and fund research and development (R&D).
- Frequency: annual.
- How compiled: census survey of all government organisations that perform or fund R&D.
- Geographic coverage: UK.

Related publications

Gross domestic expenditure on research and development (GERD) statistical bulletin

2 . About this quality and methodology Information report

This quality and methodology information report contains information on the quality characteristics of the data (including the European Statistical System's five dimensions of quality) as well as the methods used to create it.

The information in this report will help you to:

- learn about existing uses and users of the data
- understand the methods used to create the data
- help you to decide suitable uses for the data
- reduce the risk of misusing the data

3 . Important points

- The UK government expenditure on research and development (GovERD) survey measures UK government expenditure on performing and purchasing or funding research and development (R&D).

- Until the 2017 release, the GovERD estimates were published in our UK government expenditure on science, engineering and technology (SET) statistical bulletin; the 2018 release was renamed as the Research and development expenditure by the UK government statistical bulletin, to reflect that the statistics predominantly related to R&D.

- The R&D statistics are compiled according to internationally agreed standards defined by the Organisation for Economic Co-operation and Development (OECD) in its Frascati Manual 2015.

- The Frascati Manual defines R&D as "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 must contain an appreciable amount of novelty.

- Additional information on knowledge transfer activities related to R&D is also included in our 2024 GovERD statistical bulletin.

- Data are available dating back to 1986, when they were published as Science, engineering and technology (SET) statistics.

Estimates are shown in both current and constant prices; current prices (also known as nominal or cash) are expressed in terms of the prices of the reference period, while constant prices (also known as real terms) are adjusted using the R&D deflator. This is to remove the effects of inflation by fixing the prices of goods and services in one period (the base year), so that only the volumes change, allowing changes in government expenditure on R&D to be examined on a more comparable basis over time.

The gross domestic product (GDP) expenditure deflator was historically used to create the constant price series in the GovERD release. Although this deflator was not specifically intended to be used for R&D estimates, it was the best deflator available to use until the development of the R&D deflator. In the 2024 GovERD statistical bulletin we replaced the GDP deflator with the R&D deflator to calculate the constant price estimates. More information on the deflator used in the 2024 GovERD statistical bulletin is available in our article Deflator improvements to the UK National Accounts.

4 . Quality summary

Overview

The statistics on research and development (R&D) expenditure by the UK government consist of:

- expenditure on in-house R&D performed by government organisations (intramural R&D)
- expenditure on purchased R&D and funding provided for R&D to external organisations (extramural R&D)
- funding received for R&D
- contributions to international programmes covering indicative UK contributions to the European Union (EU)'s R&D expenditure and the Horizon Europe and Copernicus programmes
- expenditure on knowledge transfer activities (including technology transfers) associated with R&D, and which contribute to the dissemination and application of scientific and technical knowledge

Net R&D expenditure is defined as: "In-house R&D plus purchased R&D or funding provided for R&D less funding received for R&D."

This concept is the basis for many of the data tables associated with the Research and development expenditure by the UK government (GovERD) statistical bulletin.

Estimates of indicative UK contributions to EU R&D expenditure are provided by HM Treasury. Although the UK is no longer an EU member state, the UK contributions to the EU budget are paid as a result of the financial settlement relating to the UK's withdrawal from the EU.

Contributions are not made to individual expenditure programmes, but to the EU budget as a whole. They are therefore referred to as indicative estimates. It is unknown where and how UK contributions to EU R&D expenditure are spent, so these estimates are not regarded as in-house R&D performed in the UK.

Knowledge transfer activities (including technology transfers) are designed to help the conveyance of ideas, research, results, and skills between researchers, businesses, and wider communities. These actions contribute to the dissemination and application of scientific and technical knowledge, including consultancy services, demonstration projects, and sharing information. For example, developing partnerships, establishing forums for knowledge exchange, specialist training, and licensing.

The UK government has seven publicly funded research councils responsible for supporting, coordinating, and promoting R&D in seven distinct fields. From 2018, the research councils became part of UK Research and Innovation (UKRI). Research England and Innovate UK also became part of UKRI.

The research councils cover the full spectrum of academic disciplines from the medical and biological sciences to the arts and humanities.

The UK government also manages research institutes and laboratories via several government departments, most notably the Department of Health and Social Care (DHSC), and the Department for Science, Innovation and Technology (DSIT).

Uses and users

Estimates of government research and development (R&D) expenditure are used by a wide range of government policy-makers and other users in the UK and internationally as R&D expenditure is perceived as an important determinant of economic growth.

There is a wide range of users of the GovERD statistics:

- The Department for Science, Innovation and Technology which is responsible for R&D funding as well as for supporting innovations, scientific and technological advancement.

- The Welsh Government (WG), Scottish Government (SG), and the Northern Ireland Executive use government R&D estimates as an important indicator for measuring the performance of their respective economies within the UK, as well as to monitor and develop R&D policies that seek to increase R&D investment.

- HM Treasury uses the statistics to monitor R&D spending.

- The Organisation for Economic Co-operation and Development (OECD) use R&D estimates for constructing internationally comparable data tables and producing regular statistical publications such as the Main Science and Technology Indicators (MSTI); these data are also used for analytical studies, which underpin economic analyses and policy reviews.

- The Research and Development Society is a UK-based organisation formed to promote the better understanding of R&D in all its forms; its members include representatives from industry, government departments and agencies, universities, and consultants.

- There is a also wide range of academic users of the GovERD data.

5 . Quality characteristics of the data

Accuracy and reliability

(The degree of closeness between an estimate and the true value.)

Sampling error

The Government Expenditure on Research and Development (GovERD) Survey, which collects the data, is an annual census survey and is therefore not subject to sampling errors. All government departments and organisations that have been identified as performing or funding research and development (R&D) are included in the survey.

Non-sampling error

Non-sampling errors are not easy to quantify and include errors of coverage, measurement, processing and non-response. There can be difficulty in identifying the population of actual or likely R&D performers and in ensuring that government departments adhere to the Frascati Manual R&D definitions. However, response rates are high, and the survey coverage is reviewed annually to ensure that all appropriate government organisations are included.

Coherence and comparability

(Coherence is the degree to which data that are derived from different sources or methods, but refer to the same topic, are similar. Comparability is the degree to which data can be compared over time and domain, for example, geographic level.)

Research and development expenditure by the UK government (GovERD) is one of our three publications that relate to R&D expenditure, which we publish annually. The others are:

- Business enterprise research and development (BERD), which measures UK business expenditure on R&D performed in the UK

- UK gross domestic expenditure on research and development (GERD), which measures UK gross expenditure on R&D performed in all sectors of the UK economy

In addition to the ONS R&D publications, Statistics at Ministry of Defence provides professional analytical, economic, and statistical services and advice to the Ministry of Defence (MoD), and defence-related statistics to Parliament, other government departments, and the public.

The main effect on the comparability of the Research and development expenditure by the UK government data over time arises from the change of responsibilities within government departments. These can occur as a result of machinery of government (MoG) changes, which are reorganisations that create or abolish government departments, or move functions between them.

Responsibility for R&D expenditure on specific projects can transfer between different departments, which can impact historical comparisons. Detailed notes on these changes are included in the notes tab within the published datasets.

Caution should therefore be taken when examining departmental time series especially where there have been MoG changes.

Accessibility and clarity

(Accessibility is the ease with which users can access the data, also reflecting the format in which the data are available and the availability of supporting information. Clarity refers to the quality and sufficiency of the release details, illustrations, and accompanying advice.)

Our recommended format for accessible content is a combination of HTML web pages for narrative, charts, and graphs, with data being provided in usable formats such as CSV and Excel. We also offer users the option to download the narrative in PDF format. In some instances, other software may be used, or may be available on request.

Available formats for content published on our website but not produced by us, or referenced on our website but stored elsewhere, may vary. For further information, please refer to the contact details at the beginning of this report.

For information regarding conditions of access to data, please refer to these links:

- Terms and conditions (for data on the website)

- Accessibility

Timeliness and punctuality

(Timeliness refers to the lapse of time between publication and the period to which the data refer. Punctuality refers to the gap between planned and actual publication dates.)

The time between the end of the reference period and the GovERD statistics publication date is approximately 12 months, as the results are usually published in April each year, relating to the financial year that ended in April of the previous year.

For more details on related releases, the GOV.UK release calendar is available online and provides 12 months' advance notice of release dates. If there are any changes to the pre-announced release schedule, public attention will be drawn to the change and the reasons for the change will be explained fully at the same time, as set out in the Code of Practice for Statistics.

Concepts and definitions

(Concepts and definitions describe the legislation governing the output and a description of the classifications used in the output.)

The updated Frascati manual introduced in 2015 included five important criteria to help determine whether an activity should be regarded as R&D. These criteria are that R&D work should be all of the following:

- novel - new findings that support new concepts, products, and processes
- creative - original and not obvious
- uncertain - the final outcome cannot be predicted
- systematic - to be planned, budgeted and outcomes documented
- transferable or reproducible - to lead to results that could be reproduced

R&D activity is distinguished by the presence of an appreciable element of novelty. If the activity follows an established pattern, it is excluded; if it departs from routine and breaks new ground, it is included. For example, activities such as routine testing, market research, patent applications, trial production runs, and artistic work are excluded. Overheads of R&D projects are included. Value Added Tax (VAT) is excluded.

Organisation for Economic Co-operation and Development (OECD) terminology is used throughout the GovERD statistical bulletin.

The term "Government" corresponds to the "general government" sector of the national accounts and includes local as well as central government.

Why you can trust our data

The Office for National Statistics (ONS) is the UK's largest independent producer of statistics and is its national statistical institute. The Data policies section of our website details the policies that underpin our data principles detailing how data are collected, secured, and used in the publication of statistics. We treat the data that we hold with respect, keeping it secure and confidential, and we use statistical methods that are professional, ethical, and transparent.

6 . Methods used to produce the data

How we collect the data

The data are collected using an Excel-based questionnaire. This is sent to responders via Secure Electronic File Transfer (SEFT). The questionnaire includes detailed notes to help responders to adhere to the Frascati Manual definitions of research and development (R&D). The completed questionnaires are returned via SEFT.

Sample size

Government expenditure on research and development (GovERD) samples approximately 33 government departments and other bodies. Within that there are approximately 140 individual units that respond to the survey, as the returns for some departments consist of several returns for individual agencies and arm's-length bodies (ALBs).

Individual reporting units are aggregated to form department totals, and these are the values which are published in the data tables associated with the release.

The 140 individual responding organisations include:

- arm's-length bodies (ALBs)
- agencies
- research councils (reported by UK Research and Innovation (UKRI))
- higher education funding bodies
- civil departments
- Ministry of Defence

Sample frame

The sample is manually reviewed each year, to update the list of government departments and agencies, devolved governments, and higher education funding bodies that perform or fund R&D and therefore need to be included in the survey.

Sources that are used to keep the frame up to date include government websites like the UK Parliament website, the main UK government website, and the Cabinet Office.

Each organisation is contacted approximately four months before the survey dispatch date to check its structure and to confirm contact details. Any government organisations that are newly identified as performing or funding R&D are added to the forthcoming survey.

How we process and quality assure the data

Detailed validation checks are carried out on the returned survey data to compare figures with those previously reported and to investigate data changes. Respondents are contacted to discuss and resolve anomalies with the returned data. Where possible, comparisons are also made against published departmental accounts.

As GovERD is a census survey, there is no weighting or estimation involved in the calculation of the results. This means that each unit in the survey only represents itself, unlike surveys where samples are randomly drawn and responses are weighted up to represent other non-sampled units in the population. In GovERD, where possible, non-responders are manually constructed based on information previously reported.

How we review the data

GovERD estimates are revised in accordance with our revision policy, which is to revise data for the previous two periods. Most revisions are because of misreporting and late returns. Estimates can be revised for longer periods if there is statistically significant misreporting.

How we disseminate the data

The main release of the data takes place in the Research and development expenditure by the UK government (GovERD) statistical bulletin. In addition, estimates for the government sector are also included in the Gross domestic expenditure on research and development (GERD) statistical bulletin. This measures R&D performed in the UK by all sectors of the economy and how this is funded.

Some elements of government R&D spending are supplied to the Organisation for Economic Co-operation and Development (OECD) and they publish results for the UK on an internationally comparable basis in regular statistical publications such as the Main Science and Technology Indicators (MSTI).

7 . Other information

Differences between the GovERD and GERD statistical bulletins

There are important differences between estimates in the Research and development expenditure by the UK government (GovERD) and the Gross domestic expenditure on research and development (GERD) statistical bulletins.

Estimates in the GovERD statistical bulletin include in-house R&D, purchased R&D, and other funding provided to external organisations for R&D (both within the UK and overseas); as well as taking account of funding received for R&D, to provide estimates of net expenditure. The GERD statistical bulletin only includes estimates of expenditure on R&D performed "in-house", that is, by organisations themselves.

UK government net expenditure on R&D has been significantly larger than the value of R&D performed in-house by the government sector itself. For example, the 2023 estimate of UK government net expenditure on R&D in the GovERD 2024 bulletin was more than four times larger than the value of in-house R&D performed by the government sector in the GERD 2023 bulletin.

The GovERD statistical bulletin also contains other components that are not included in GERD. These are the UK's indicative contributions to EU R&D expenditure budget and knowledge transfer. In addition, the GovERD 2024 statistical bulletin for the first time included UK contributions to the Horizon Europe and Copernicus programmes, which are also not included in GERD, as they are not regarded as in-house R&D.

UK Research and Innovation (UKRI) and research councils

In 2018, UK Research and Innovation (UKRI) was created to bring together the UK's seven research councils, Innovate UK, and Research England into one unified body. When UKRI was formed, Research England, one of the bodies that make up UKRI, took over some functions of the former Higher Education Funding Council for England (HEFCE). Research England, therefore, is included with the higher education funding bodies for Scotland, Wales, and Northern Ireland, rather than as part of UKRI.

In previous publications of government R&D expenditure (published in the UK government expenditure on science, engineering and technology (SET) statistical bulletin), estimates were available for research councils individually and collectively as a sector. In the 2018 GovERD release, separate estimates for the individual research councils were no longer available as these formed part of UKRI. The category for "research councils" was therefore replaced by "UKRI" in the data tables from the 2018 period onwards.

The category "UKRI" for 2018 is not directly comparable with the research councils' category in previously published SET datasets. This is because UKRI also includes Innovate UK, which, until the 2017 SET bulletin, was part of the Department for Business, Energy, and Industrial Strategy (BEIS) and therefore part of the civil departmental total.

8 . Cite this methodology

Office for National Statistics (ONS), updated 17 April 2026, ONS website, statistical bulletin, methodology, Research and development expenditure by the UK government quality and methodology information (QMI)