

Article

Update on transformation of research and development statistics: May 2024

Update on the changes to the Business Enterprise Research and Development (BERD) and UK Government Expenditure on Research and Development (GovERD) statistics.

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Table of contents

1. [Overview of the transformation of research and development statistics](#)
2. [How the transformation improves the quality of the data we collect from businesses](#)
3. [Systems development](#)
4. [Future developments](#)
5. [Related links](#)
6. [Cite this article](#)

1 . Overview of the transformation of research and development statistics

- For the 2022 reference period, the Business Enterprise Research and Development (BERD) statistics had new methods (including a new sample design), processes and systems that saw an improvement in the quality of our collected data.
- For the 2023 reference period, the BERD sample design has been optimised, to further refine our methods.
- Our BERD estimates are now processed on two new systems, the statistical processing platform (SPP) and the data access platform (DAP), to allow flexibility of a changing sample and methods, and to use opensource technology.

2 . How the transformation improves the quality of the data we collect from businesses

Response rates

We published [improved Business Enterprise Research and Development \(BERD\) statistics for 2022](#) on 27 February 2024. These statistics incorporated a number of improvements, including:

- an increased sample size of 38,500
- an improved sample design, which was informed by administrative data sources and sampled directly from the inter-departmental business register
- a newly developed electronic questionnaire with improved guidance, making it easier for businesses to complete
- a new communication strategy with businesses, to improve response rate and the quality of returns

Together, these developments have allowed us to produce higher quality statistics. Two of the metrics we use to measure the quality of the statistics are response and clearance rates. Response rates reflect the number of businesses responding to the survey. Clearance rates are a measure of what proportion of those responses are suitable for use in producing the statistics, after the responses have been checked for accuracy and consistency.

Table 1: Sample, response, and clearance rates, 2022

	Sampled	Response Rate	Clearance Rate
Great Britain Total	36,900	78.10%	98.40%
England	32,900	78.40%	98.40%
Scotland	2,500	74.80%	98.60%
Wales	1,500	76.00%	98.10%

Source: Business Enterprise Research and Development (BERD) from the Office for National Statistics

We also use a measure of response and clearance rate after 12 weeks, because at this point there have normally been enough responses returned to enable us to begin analysis. The response rate and clearance rate after 12 weeks have also increased under the new methodology. This means that as we continue to collect data, we may be able to start analysing the data sooner, allowing higher quality estimates by publication. We may also be able to explore publishing estimates at an earlier date, which is something we will consider for publications from 2025 onwards.

Throughout the development of the business research and development (R&D) statistics, we have been conscious of the impact these changes may have on businesses responding to the survey, and how this may affect both the volume and quality of responses. We have taken two important steps to minimise the impact on businesses; the introduction of an electronic questionnaire and a changed sample size.

Electronic questionnaire

Last year, the collection of the BERD statistics took place through an electronic questionnaire for the first time. This allowed:

- an enhanced user experience for BERD respondents, with easy navigation and checks to help them ensure they have completed the survey
- automatic validation at the point of data entry, to help improve the quality of the data reported
- collection of data in a timelier manner, meaning that responses can be instantly sent to the Office for National Statistics (ONS) systems for processing

The use of electronic questionnaires is part of the ONS commitment to bring more flexibility to our processes and how we work, as well as reducing the time and effort it takes respondent to complete the survey.

Sample size

As part of our initial development, we increased the sample size of the BERD Survey by around 10 times, from 4,000 to almost 38,500, for the 2022 survey. This helped us to make sure the survey and statistics were more accurately recording R&D, particularly the R&D performed by smaller businesses and less intensive R&D industries.

The responses we received to the 2022 survey allowed us to review our sample approach and understand which industries, and business sizes, needed the larger samples and which ones could have the sample reduced, while maintaining the quality of the detailed data we collected.

We used this information to re-optimize our sample, which means that our 2023 BERD Survey (currently being collected) was sent out to around 20,000 businesses. This decrease in sample size will help to reduce the overall time and effort it takes businesses to complete the survey, while maintaining data quality.

3 . Systems development

Statistical processing platform for survey processing

To allow a change to our sample design and to increase the number of businesses responding to the survey, we have developed new systems in new technology. Although our previous system was fit for purpose for the previous sample design, the increase in our sample size needed to be processed on a new technology; the statistical processing platform (SPP). Using SPP to process our survey responses delivered many benefits, including:

- modern, cloud-based architecture, that provides a more robust, repeatable, and efficient processing of data
- compatibility with the new data collection tool (eQ) to allow timely processing of returns
- using more consistent processes with other surveys, where we could follow best practice
- the ability to be flexible with sample design changes, both now and in the future
- a review and implementation of our validation checks, which target quality issues in the data, allowing better understanding of response
- flexibility in the system to change and improve the processing of survey returns in the future (when identified)

Data access platform for results and analysis

We took the opportunity to move our results processing onto a new data access platform (DAP) to implement changes to our Business Enterprise Research and Development (BERD) methods, as a result of the change to our sample design. The use of DAP to produce our results and analysis has delivered many benefits, including:

- DAP-enabled improvements to methods and stability that were not possible with existing systems
- the introduction of opensource programming languages, which will help the DAP to remain flexible and sustainable in the future
- the implementation of programming best practice in how we designed and structured our system, to allow more flexibility in the future
- the use of opensource languages, which means we can increase the transparency of what we are doing
- greater flexibility in analytical tools

4 . Future developments

Time series

The statistics published in our [Business enterprise research and development, UK: 2022 \(BERD\) UK: 2022 bulletin](#) on 27 February 2024 were the first step in our suite of improvements. Although they contained significantly greater detail of product and regional breakdowns, we were only able to provide time series data at the headline level.

We understand the importance of a time series to the users of our data, who need to understand the changes in research and development (R&D) across time. To address this, we have been working to understand the changes in methodology and how these have affected the lower-level breakdowns. This will allow us to construct a time series for both product groups and industries, which we hope to publish by June 2024.

Regional breakdowns

Our new sampling methodology means that we have much more information available about where R&D is being performed around the UK. As a result, we were able to reintroduce the International Territorial Level (ITL1) regional breakdowns to our BERD statistics that were published in February.

Following the publication of these statistics, we considered whether it is possible to publish ITL2 regional breakdowns. This review has shown us that it is feasible to publish ITL2 regional breakdowns for 2022 and in the future. Each year we will aim to publish data for ITL2 subject to data quality. All microdata for researchers interested in the lower-level information are available in the Secure Research Service (SRS) as standard.

We published the ITL2 data for Business Enterprise R&D for the first time in our [UK Business Expenditure on Research and Development by region: 2022 dataset](#) on 26 April 2024.

National accounts

The BERD statistics published on 27 February 2024 will feed into the national accounts in 2025. We recognise that the impact of these new estimates on the wider economy is important for users, and our recently published [Impact of new Business Enterprise Research and Development Survey data on UK business investment: 2022 article](#) highlights the indicative impacts on business investment within the national accounts. The impact on business investment is subject to revision when it is fully integrated in 2025.

UK Government Expenditure on R&D

Our Government Expenditure on R&D (GovERD) estimates for 2022 were published in our [Research and development expenditure by the UK government bulletin](#) on 30 April 2024. We previously updated that our collection included new questions about where purchased R&D was carried out (regional data) and looked at R&D into certain information technology types. Although we carried out the data collection, we are still analysing the results, and understanding the quality of the estimates. Therefore, we have not yet published estimates relating to these new questions.

Public non-profit R&D

We collect statistics on public non-profit (PNP) R&D every two years as part of our wider suite of R&D. These statistics are a component in our gross domestic expenditure (GERD) release. This year, we have migrated the collection to electronic collection and processed the survey results on SPP to allow for greater respondent journey and more efficient processing of the returns. These survey results will be part of the GERD release we publish in 2025.

5 . Related links

[Update on transformation of research and development statistics: November 2023](#)

Article | Released 06 November 2023

Improvements to the ONS research and development (R&D) statistics. Outlines changes to both the Business Enterprise Research and Development (BERD) and UK Government Expenditure on Research and Development (GovERD) surveys and methods.

[The impact of new Business Enterprise Research and Development Survey data on UK business investment: 2022](#)

Article | Released 29 April 2024

Indicative impact on UK business investment and gross fixed capital formation in the national accounts following improvements to Business Enterprise Research and Development Survey estimates.

[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 article

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