Article

Update on transformation of research and development statistics: November 2026

Final update on the transformation of research and development statistics.

Contact:
Research and Development team
randd@ons.gov.uk
+44 (0)1633 455718

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1 . Main points

- Initial estimates showing the region of performance of research and development (R&D) activity either purchased or funded by the government sector are published for the first time.
- Outside the Greater South East, Scotland (39.6%) and the West Midlands (26.3%) had the largest increases of where R&D either purchased or funded by government was performed in the 2024 to 2025 reference period.
- Research into the development of a data back series for the Business Enterprise Research and Development (BERD) Survey concludes there are no appropriate methods at this time that can be used to produce a comparable time series at granular levels of detail.

2 . Overview

In 2022, the Office for National Statistics (ONS) published our Comparison of ONS business enterprise research and development statistics with HMRC research and development tax credit statistics article to explain differences between the two estimates of business expenditure on research and development (R&D). An important finding was that undercoverage was identified in the Business enterprise research and development (BERD) statistics, and new sample design and survey methodology were needed to address this undercoverage.

In response, an ONS R&D transformation project was set up in 2022 with the aim of reviewing and improving the sources and methods used to measure R&D expenditure for all sectors of the UK economy.

The transformation project was completed in March 2025. It successfully delivered:

- a transformed end-to-end BERD Survey, which included moving the survey online
- new sample design and results methodologies that addressed the undercoverage identified
- improved Business enterprise research and development statistics were published in February 2024
- merged data collection of the Private Non-profit (PNP) R&D Survey with BERD
- implementation of a new administrative data source that better captured R&D expenditure for the higher education sector
- new regional questions were added to the UK Government Expenditure on Research and Development (GovERD) Survey to better understand where R&D either purchased or funded by government was performed

This article provides an update on the continuous improvement work actioned by the ONS and summarises additional analysis before incorporation into our annual publications.

3 . New insights about UK government expenditure on R&D statistics

In 2022, a white paper on Levelling Up the United Kingdom was published by the then Department for Levelling Up, Housing and Communities (DLUHC), from which a mission was outlined to increase investment in research and development (R&D) outside the Greater South East region by at least 40%; part of which would be driven by an increase in funding provided by the UK government.

At the time, there were no official statistics to measure progress against this mission, therefore the Office for National Statistics (ONS) developed new initial baseline estimates that provided a regional breakdown of where R&D either purchased or funded by government was performed. These were published in 2022 in our UK public-funded gross regional capital and non-capital expenditure on research and development bulletin.

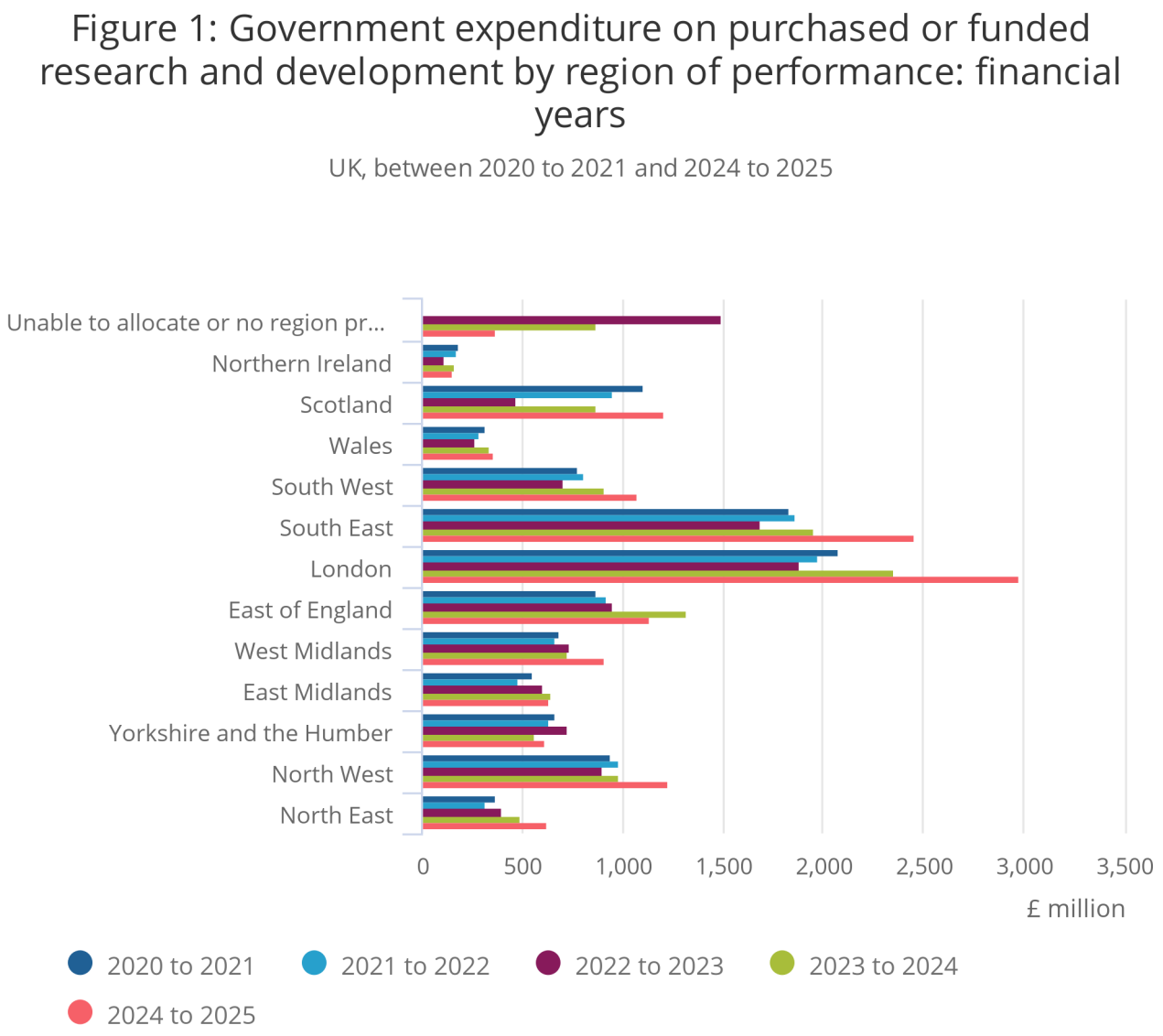
While these estimates were compiled using microdata analysis from only a small number of government departments, it was based on those departments that historically had spent the most on R&D. However, the long-term development was to add additional questions onto the Government Expenditure on Research and Development (GovERD) Survey; which is a survey of all government departments that perform, purchase or fund R&D.

The new questions split the total amount spent on either purchasing or funding R&D by the region in which the R&D activity was performed. The question was designed to only capture R&D that was performed by the higher education, business and private non-profit sectors. All references to purchased or funded R&D in this article represent these sectors only.

The new questions were added to the GovERD Survey for the 2022 to 2023 financial period and have been included as part of the questionnaire since. The estimates in Figure 1 show the results based on the interim approach up to 2021 to 2022 and those based on GovERD from 2022 to 2023. While these estimates are not directly comparable, Figure 1 does show the regional distributions are broadly consistent between both approaches.

Figure 1: Government expenditure on purchased or funded research and development by region of performance: financial years

UK, between 2020 to 2021 and 2024 to 2025



Source: Government Expenditure on Research and Development Survey from the Office for National Statistics

Limitations

While asking departments to provide the regional breakdowns of where all purchased or funded R&D was performed improves the accuracy of the data, there are limitations that should be considered when interpreting the results:

- quality assurance of data at this early stage has been limited, particularly as there are no other known sources that can be used to compare to
- with a short span of data, the ONS has no viable method of estimating a breakdown for non-responding departments
- although the "unable to allocate" category has been declining each year, it shows not all departments can provide the level of detail asked for

Data initially collected from new survey questions can be lower quality until respondents have established adequate reporting processes. This could potentially explain part of the fall seen in the "unable to allocate category", suggesting that over time, government departments are starting to capture more comprehensive information about any purchased or funded R&D activity to compile their GovERD return.

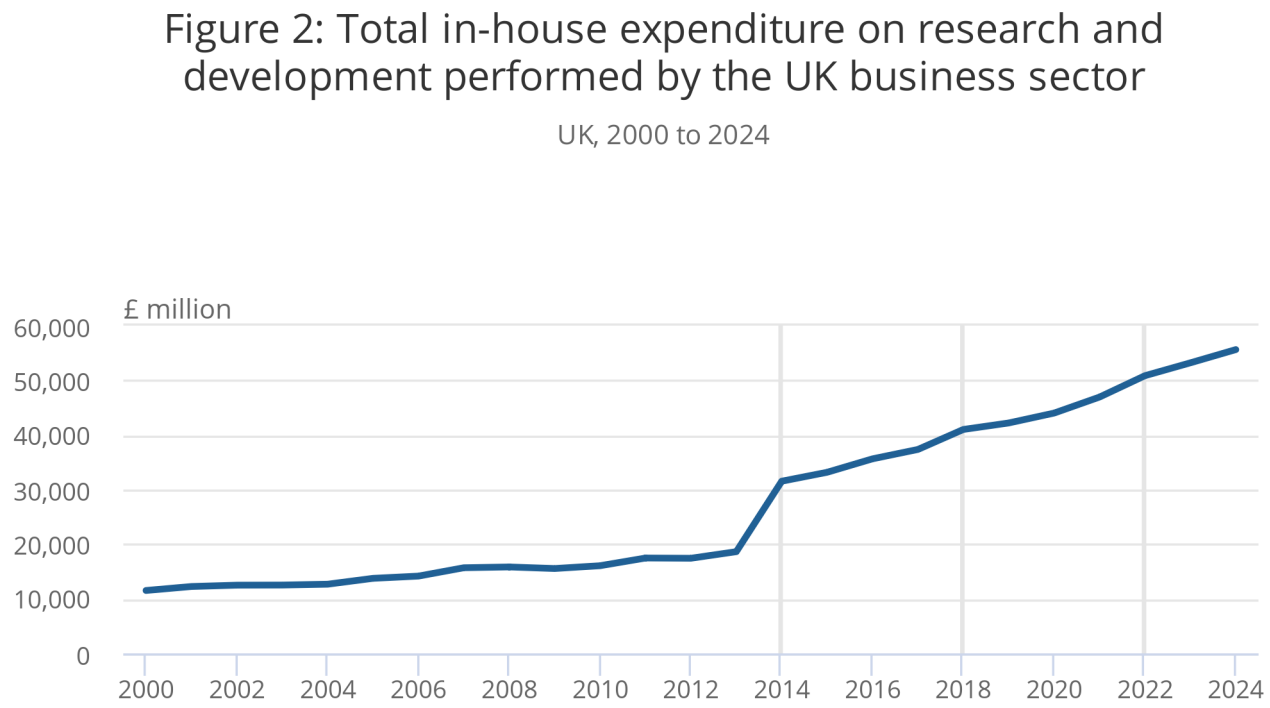
Although these estimates show increases in some regions, they cannot be compared with the Business enterprise research and development (BERD) or GovERD publications to track funding flows. This is because some respondents of the BERD survey receive a reduced set of questions to keep the reporting burden proportionate. For example, for those respondents who receive the shorter questionnaire in the business sector, their registered postcode is used to assume that all their R&D activity takes place at that location.

4 . Business enterprise research and development data back series development

The results from the transformed Business Enterprise Research and Development (BERD) Survey were published in 2024 for the 2022 reference period. To date the Office for National Statistics (ONS) has published data for the two following survey periods on this new basis, but a comparable back series for BERD before 2022 is not available.

Figure 2: Total in-house expenditure on research and development performed by the UK business sector

UK, 2000 to 2024



Source: Business Enterprise Research and Development Survey from the Office for National Statistics

Figure 2 shows total BERD expenditure from 2000 and indicates there are three breaks in the series:

- 2000 to 2013 shows total BERD expenditure based on the previously published results, which were not adjusted to take account of any undercoverage; granular breakdowns are available consistent with the totals
- 2014 to 2017 shows adjusted estimates for total BERD to take account of the undercoverage in this period; these estimates were based on the growth rates of the previously published BERD statistics only, no detailed breakdowns are available
- 2018 to 2021 shows adjusted estimates for total BERD that were calculated based on the "uplift" approach (explained in Option 1), with limited breakdowns (XLS, 148KB) and a high level of aggregation available
- 2022 onwards, based on the transformed BERD Survey; granular breakdowns are available (XLS, 150KB) consistent with the totals

The ONS has recently been considering several different methodological options that could be used to create a comparable data time series for BERD. While the approaches explored differ, the same levels of volatility and uncertainty in the results at granular levels exist in them all.

Option 1

In our Comparison of ONS business enterprise research and development statistics with HMRC research and development tax credit statistics article published in 2022, we outlined the "Interim methodological solution" (also referred to as the "uplift approach") that was developed to take account of the undercoverage identified in the BERD statistics. This was used for the 2018 to 2021 survey periods.

The method identified the number of R&D-performing businesses from both BERD and the Annual Business Survey (which has a larger sample size). The ratio between these estimates was used to "uplift" (weight) the BERD statistics. The uplifts were further refined by calculating these based on employment size band and for each product group published in the BERD statistics. This was to acknowledge that each of these factors showed different growth trajectories, and that the undercoverage was not seen in larger businesses.

To test using this same approach for the back series, the uplift factors were applied to the BERD microdata back to 2000 and the results were analysed.

The results from this approach were mixed; estimates at the most granular level of detail were volatile in some but not all areas. Some breakdowns were unexplainable and not credible in the wider economic context and in many areas, the estimates did not join well to the results from the new survey.

Option 2

A refinement of Option 1 was developed where rather than estimating for the number of businesses thought to be performing R&D, estimates were calculated based on the number of employees working in businesses believed to be performing R&D across the UK business economy.

The first step was to create homogeneous groups (cells) made up of businesses with similar characteristics, that is, Standard Industrial Classification, size based on employment, and region. Then an estimate of the total number of employees expected to be performing R&D within these cells was calculated.

Sales per head estimates of R&D expenditure were then calculated based on BERD survey responses. These sales per head estimates were used to impute for BERD non-responders in the first instance.

The sales per head estimates were applied to the number of employees in businesses thought to be performing R&D. This approach gave new totals of business enterprise R&D expenditure that were similar in magnitude to those that were calculated as part of the initial uplift (Option 1), and with the 2022 BERD Survey, although this varied across industries and some product groups. The variation was higher for industries with lower levels of R&D intensity.

Option 3

This option built on the approach outlined in Option 1. In areas that were identified to be most volatile, and where the join to the new survey results was deemed implausible, attempts were made to recalculate the uplift factors to better inform the back series.

For the first time these recalculated factors took into consideration the results produced from the Transformed BERD Survey. In a small number of areas, this slight change to the method had the desired effect by reducing volatility, but overall, this option did not make the affected series more credible.

Option 4

This option was a more simplistic approach – to calculate proportions for a limited number of breakdowns based on the previously published and unadjusted BERD statistics. The total BERD estimate produced under Option 1 was then pro-rated across the varying breakdowns we had identified as important for users. While this approach created a better join to the results from the transformed survey, there were still a number of areas where volatility existed that were unexplainable.

Summary

Having considered and tested several options, the results from Options 2 and 3 were shared with our main external stakeholders who have been helping us throughout the transformation period with quality assurance support. The feedback received agreed with our assessments that the volatility produced by all options was not in line with expectations and could not be explained.

Northern Ireland data

The Northern Ireland Statistics and Research Agency (NISRA) is responsible for running the equivalent Business Enterprise Research and Development (BERD) Survey for businesses registered in Northern Ireland (NI). Results from the NI survey are merged with Great Britain results produced by the ONS to create UK-level estimates of BERD.

When comparing the UK BERD returns to the HM Revenue and Customs R&D Tax Credit data, it was established that the same undercoverage was present in the NI BERD statistics compiled by NISRA, albeit to a lesser extent. NISRA applied the same uplift methodology as the ONS as an interim measure to address the undercoverage and, like the ONS, needed a method to create a more comparable back series.

NISRA had success in applying the interim uplift method (Option 1) to create a back series for NI, and in November 2025 published for the first time their new back series estimates. Taking this approach was straightforward for NISRA compared with the ONS as the level of undercoverage in the NI estimates was much smaller overall, and NISRA do not publish as many granular breakdowns as the ONS.

Wider use

The new BERD estimates were incorporated into the national accounts as of Blue Book 2025. To do this, a longer time series was needed, and in the absence of a BERD-specific back series, a separate approach outlined in our Improvements to estimation of research and development within gross fixed capital formation and business investment article was developed specifically and solely for national accounts purposes.

The absence of a BERD back series also creates breaks in estimates of UK R&D held by the Organisation for Economic Co-operation and Development (OECD). We are aware of separate work being undertaken by the OECD to calculate their own estimates of both business enterprise and higher education expenditure on R&D at a high level of aggregation based on their own methodology.

5 . Conclusions and next steps

Government sector

The Office for National Statistics (ONS) will continue to collect the regional breakdowns of where research and development (R&D) purchased or funded by government is performed, and over the next 12 months will look to further quality assure the data with the aim of including the results in the next Research and development expenditure by the UK government bulletin in early 2027. Some of the limitations on the compilation of the data will remain, however the ONS will clearly outline this when presenting the statistics so users are clear on how they should be interpreted.

Business sector

Having explored a number of options to produce a back series for BERD, and factoring in the feedback received from the main users of R&D statistics on the outputs, we have concluded that it is currently not possible to produce a comparable back series for BERD at the level of granularity required, and have therefore made a decision to pause development work on this.

As the length of the time series from the Transformed BERD Survey increases, the back series may be revisited in future using a method that uses the recent BERD results directly in some way and can address the volatility at the lower levels of granularity.

6 . Cite this article

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