

Statistical bulletin:

UK Gross domestic expenditure on research and development: 2014

Estimates of R&D in Business Enterprise, Higher Education, Government, which includes Research Councils, and Private Non-Profit organisations.



Contact:
Cecil Prescott

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1. Main points

In 2014, the gross domestic expenditure on research and development (R&D) performed in the UK, in current prices, increased by 5% to £30.6 billion compared with £29.3 billion in 2013.

In 2014, total gross domestic expenditure on R&D performed in the UK, in constant prices, increased by 3% compared with £29.7 billion in 2013.

In constant prices, R&D expenditure increased by 45% from the 1990 estimate of £21.1 billion. Expenditure reached an all time high of £30.6 billion in 2014.

The business sector accounted for £19.9 billion of expenditure in 2014, representing 65% of total expenditure on R&D performed in the UK. This is an increase of 6% in current prices from £18.8 billion in 2013.

Total R&D expenditure in the UK in 2014 represented 1.67% of Gross Domestic Product (GDP), unchanged from 2013. This was below the European Union (EU-28) provisional estimate of 2.03% of GDP, but the 11th highest of all member countries.

2. Overview

This release provides estimates of R&D performed in and funded by the following 4 sectors of the UK economy, as defined in the Frascati Manual (2002) (<http://www.oecd.org/innovation/innovationinsciencetechnologyandindustry/frascati-manual-proposed-standard-practice-for-surveys-on-research-and-experimental-development-6th-edition.htm>):

- Business Enterprise (BERD)
- Higher Education (HERD)
- Government, which includes Research Councils (GovERD)
- Private Non-Profit organisations (PNP)

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

GERD is unique in providing this information and is the preferred measure of R&D activity for use in international comparisons. This release reports on R&D expenditure in the UK irrespective of the country of residence of the ultimate owner or users of the R&D produced. The main purpose of collecting R&D data from all sectors of the economy is to supply data for policy and monitoring purposes on science and technology, of which R&D is an important part.

R&D is defined as “creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society and the use of this stock of knowledge to devise new applications”. The statistics are produced according to internationally agreed standards defined by the Organisation for Economic Cooperation and Development (OECD), as published in the Frascati Manual (2002)

(<http://www.oecd.org/innovation/innovationinsciencetechnologyandindustry/frascati-manual-proposed-standard-practice-for-surveys-on-research-and-experimental-development-6th-edition.htm>).

In this release, 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. R&D performed 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. Our surveys therefore measure expenditure on R&D performed by 4 sectors of the economy and how this expenditure is funded.

The business sector is the largest component of GERD; its estimates in this release are derived from the Business Enterprise Research and Development (BERD) survey, published on 20 November 2015 in the Business Enterprise Research and Development 2014 statistical bulletin

(<http://www.ons.gov.uk/economy/governmentpublicsectorandtaxes/researchanddevelopmentexpenditure/bulletins/businessenterpriseresearchanddevelopment/2014>).

Approximately 5,500 UK businesses were selected for this survey from a continually updated register of R&D performers.

Notes for overview

1. The National Accounts provide the framework that is used to define and measure the UK's economic performance, such as the value of the UK's GDP. Changes to the European System of Accounts (ESA) meant that from September 2014 onwards, expenditure on R&D contributed to the formation of assets and therefore the value of the UK economy. Further information about this important change can be found at ONS ESA 2010 (<http://www.ons.gov.uk/ons/guide-method/development-programmes/esa2010/index.html>).

2. Please note an updated Frascati Manual (2015) (<http://www.oecd.org/publications/frascati-manual-2015-9789264239012-en.htm>) was introduced in October 2015 which improved the definitions and explanations of R&D.
3. The GDP measure used is non-seasonally adjusted money GDP (BKTL) from 1955-56 to 2014-15 (1955 to 2014) consistent with United Kingdom Economic Accounts Q3 2015 published on 23rd December 2015.

3. Your views matter

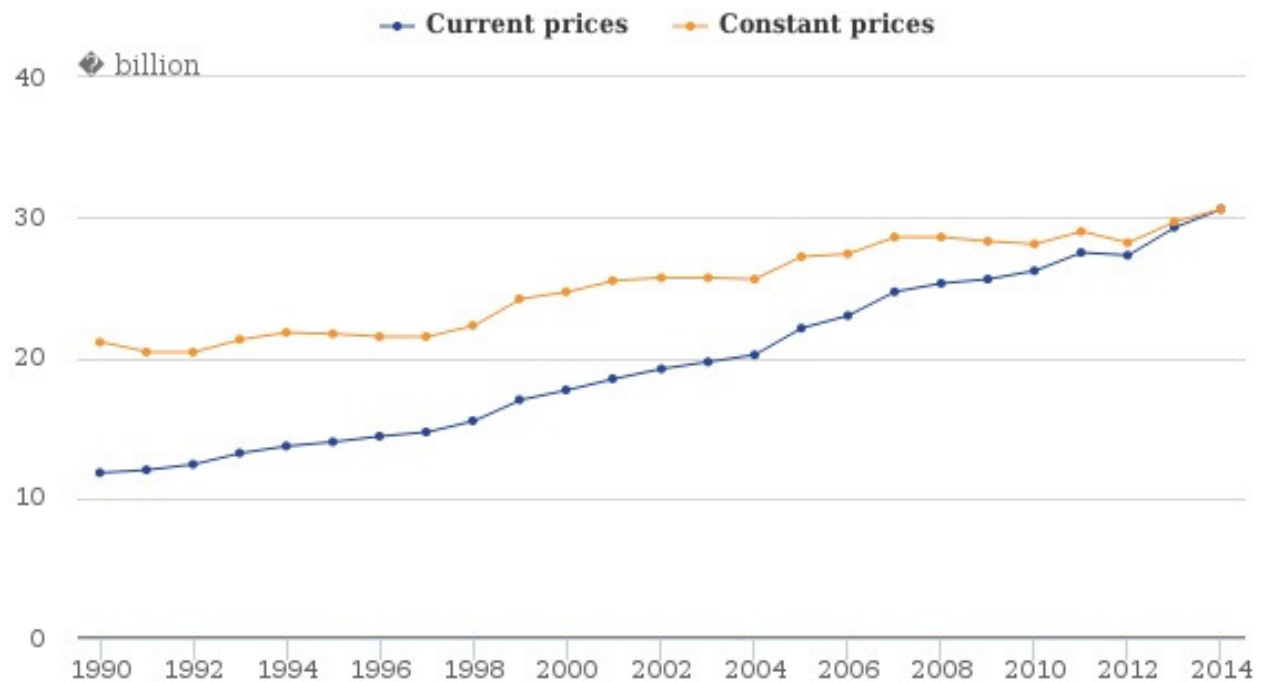
We are constantly aiming to improve this release and its associated commentary. We would welcome any feedback you might have, and would be particularly interested in knowing how you make use of these data to inform your work. Please contact us via email: RandD@ons.gsi.gov.uk or telephone Cecil Prescott on +44 (0)1633 456767.

4. UK Gross domestic expenditure on R&D performed in the UK, 2014

Expenditure on R&D performed in the UK reached £30.6 billion in 2014 in current prices, up from £29.3 billion in 2013 and £11.8 billion in 1990. R&D expenditure increased by 5% since 2013, while the average annual growth rate since 1990 was 4.1%.

In constant prices, which have been adjusted to remove the effects of inflation, the value of R&D expenditure in 2014 (£30.6 billion) reached its highest level on record, surpassing 2013's high by £0.9 billion, which represented an increase of 3%. With an average annual growth rate of 1.6% since the 1990 level (£21.1 billion), a long-term upward trend, in constant prices, is still evident (Figure 1).

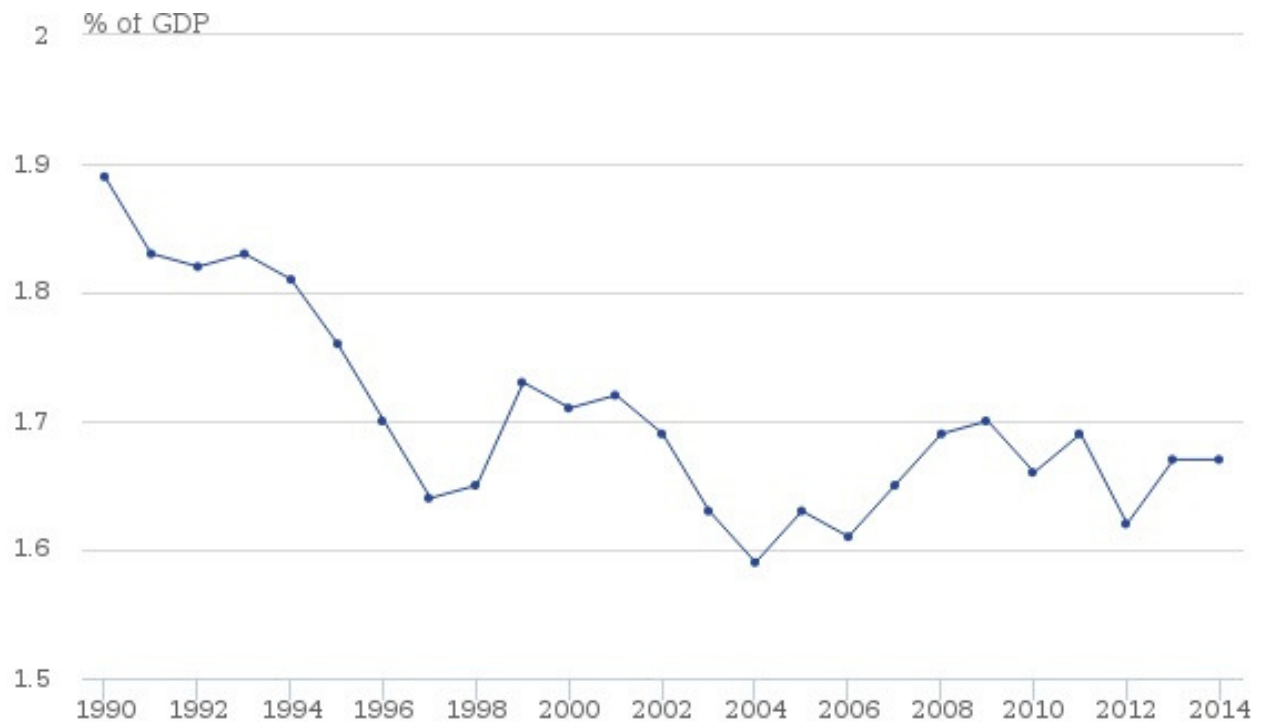
Figure 1: UK gross domestic expenditure on R&D, 1990 to 2014



Source: Office for National Statistics

Figure 2 shows UK gross domestic expenditure on R&D performed in the UK, as a percentage of GDP. Total R&D expenditure in 2014 represented 1.67% of GDP, unchanged from the 2013 estimate. UK gross domestic R&D expenditure, as a percentage of GDP, declined steadily between 1990 and 1997. Since 1998, the level has fluctuated between 1.59% and 1.73% with an average estimate of 1.67% for the period 1998 to 2014.

Figure 2: UK gross expenditure on R&D as a percentage of GDP, 1990 to 2014

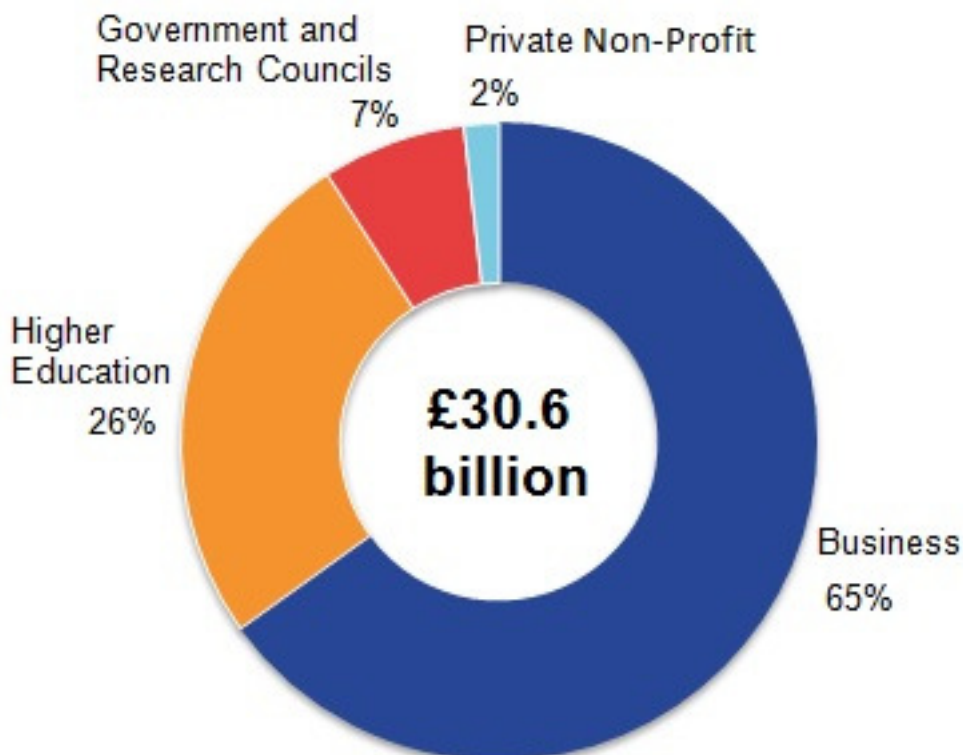


Source: Office for National Statistics

5. Expenditure on R&D performed in the UK

UK estimates of R&D cover the 4 sectors of the economy, namely Business, Higher Education, Government (including Research Councils) and Private Non-Profit organisations. Figure 3 shows the contribution each sector made to the total UK R&D expenditure estimate in 2014.

Figure 3: Composition of UK GERD by performing sector, 2014



Source: Office for National Statistics

Business

The business sector performs the most R&D of any sector in the UK. In 2014 it accounted for £19.9 billion of expenditure, representing 65% of total expenditure on R&D performed in the UK. This is an increase of 6% in current prices from £18.8 billion in 2013.

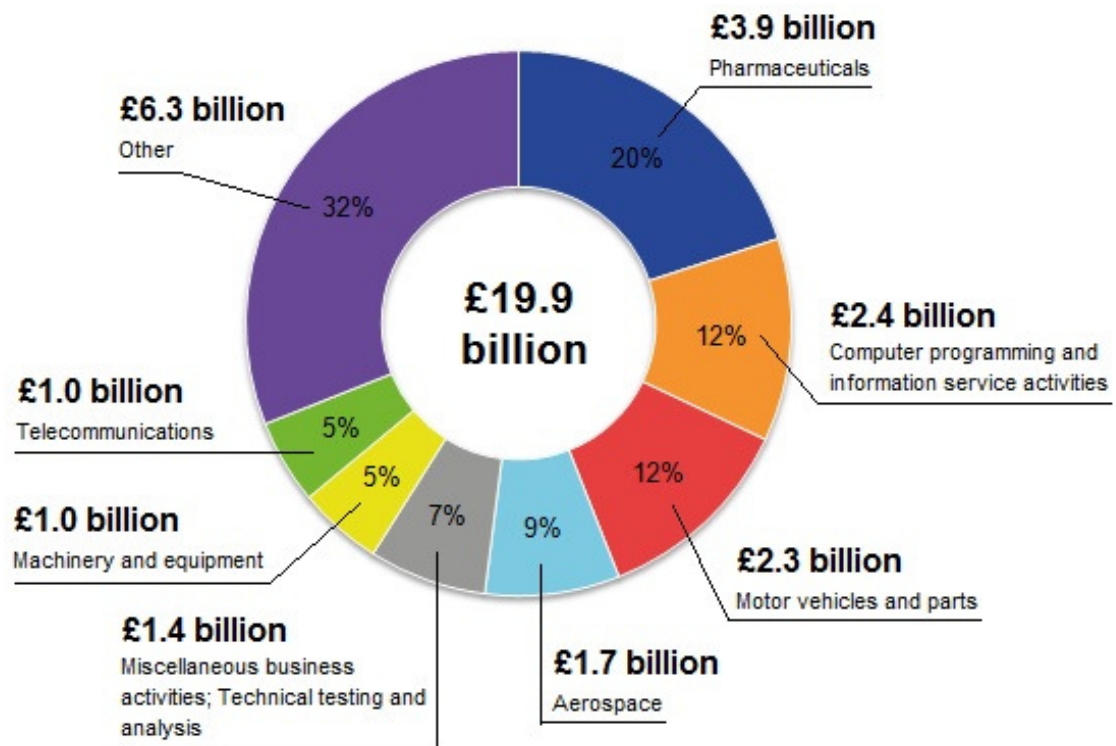
On an annual basis, the 400 largest business R&D performers are asked to select the industry product groups that best describe the type of R&D they undertake. For the smaller R&D performers, no product group data were collected, however, these businesses' dominant Standard Industrial Classification (SIC) is used as a proxy to determine product group (background note 4). The product groups with the largest R&D expenditure in 2014 (Figure 4) were:

- Pharmaceuticals (£3.9 billion)

- Computer programming and information service activities (£2.4 billion)
- Motor vehicles and parts (£2.3 billion)
- Aerospace (£1.7 billion)
- Miscellaneous business activities (£1.4 billion)
- Machinery and equipment (£1.0 billion)
- Telecommunications (£1.0 billion)

The UK government has continued to promote growth in R&D, particularly in the business sector, through tax relief and Catapult (<https://www.catapult.org.uk/>) centres. A Catapult is a “technology and innovation centre where UK businesses, scientists and engineers can work together on research and development, transforming ideas into new products and services”.

Figure 4: Expenditure by the UK business sector on performing R&D, by product group, 2014



Source: Office for National Statistics

Notes:

1. Percentages sum to 102 due to rounding

More detailed information on business R&D expenditure can be found in the [Business Enterprise Research and Development 2014 statistical bulletin](http://www.ons.gov.uk/economy/governmentpublicsectorandtaxes/researchanddevelopmentexpenditure/bulletins/businessenterpriseresearchanddevelopment/2014) (<http://www.ons.gov.uk/economy/governmentpublicsectorandtaxes/researchanddevelopmentexpenditure/bulletins/businessenterpriseresearchanddevelopment/2014>) published on 20 November 2015.

Higher education

The higher education sector, which includes universities and higher education institutes, represented 26% of total UK R&D expenditure in 2014 at £7.9 billion. This is an increase of 3% in current prices from £7.6 billion in 2013. The funding for this sector is mainly provided by the Higher Education Funding Councils for England (<http://www.hefce.ac.uk/>), Scotland (<http://www.sfc.ac.uk/>) and Wales (<http://www.hefcw.ac.uk/>), the Department for Employment and Learning in Northern Ireland (<https://www.delni.gov.uk/>) and the 7 UK research councils.

Government and research councils

The UK government owns many research institutes and laboratories that carry out R&D. These are managed by different government departments, including the Department for Business, Innovation and Skills, the Department for Environment, Food and Rural Affairs and the Department of Health.

In 2014, R&D expenditure in the UK performed by the government and research councils sector decreased by 5% in current prices, from £2.3 billion in 2013 to £2.2 billion in 2014. This sector accounted for 7% of total expenditure on R&D performed in the UK in 2014.

Research Councils UK (RCUK) (<http://www.rcuk.ac.uk/>) is the strategic partnership of the UK's 7 research councils. Each year the councils perform research covering the full spectrum of academic disciplines from the medical and biological sciences to the arts and humanities.

Research councils' R&D expenditure increased by 1% in current prices, from £814 million in 2013 to £821 million in 2014.

Private non-profit organisations

The private non-profit (PNP) sector includes registered charities and trusts. Those performing R&D specialise in mainly health and medical research. Some of the largest of these are based in the UK. This sector includes, for example, a number of cancer charities that carry out extensive research into types of cancer prevention, from drug development to clinical trials.

The private non-profit sector is the smallest R&D performing sector in the UK. In 2014, it is estimated that expenditure on R&D performed by these organisations was £0.6 billion, which contributed 2% to total UK R&D expenditure. However, this sector did see the largest overall increase in percentage terms, up 7% in current prices from 2013. This is mainly attributable to reclassification of an organisation to the private non-profit sector in 2014. It should also be noted that the PNP survey is biennial and therefore the 2014 results are estimated.

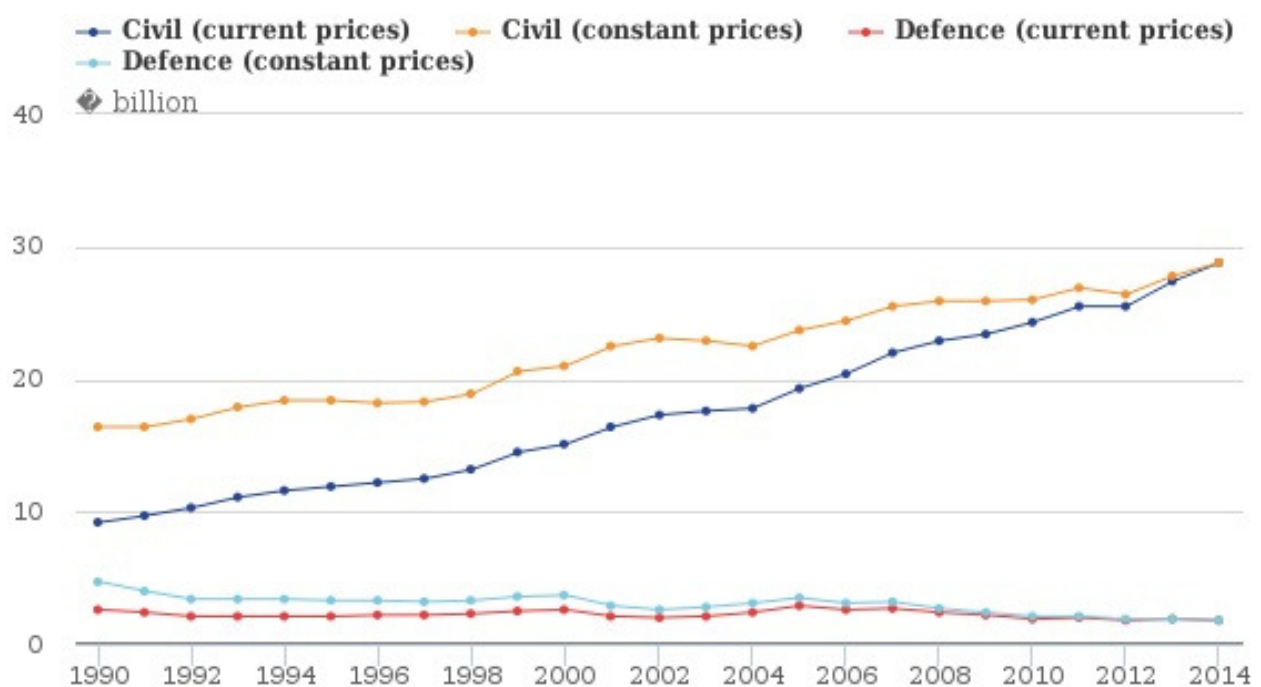
6. Civil and defence expenditure, by performing sector

Expenditure on R&D, performed for civil purposes in 2014 (£28.8 billion) accounted for 94% of total UK R&D expenditure (Figure 5).

In current prices, civil R&D expenditure increased by 5%, from £27.4 billion in 2013 to £28.8 billion in 2014. However, defence R&D expenditure decreased by 6%, from £1.9 billion in 2013 to £1.8 billion in 2014.

In constant prices, civil R&D expenditure has increased by 76% (£12.4 billion) since the 1990 estimate of £16.4 billion. In contrast, defence R&D expenditure decreased by 63% over the same period, from £4.7 billion in 1990.

Figure 5: Expenditure on civil and defence R&D performed in the UK, 1990 to 2014



Source: Office for National Statistics

Civil and defence R&D expenditure can be further split between the 4 performing sectors. The business sector was by far the largest R&D performer in both civil and defence R&D in 2014, at £18.4 billion and £1.6 billion respectively.

Of particular note, business R&D expenditure in the civil sector has increased by 63% in constant prices since 1990, but business expenditure on R&D in the defence sector has decreased by 50% over the same period.

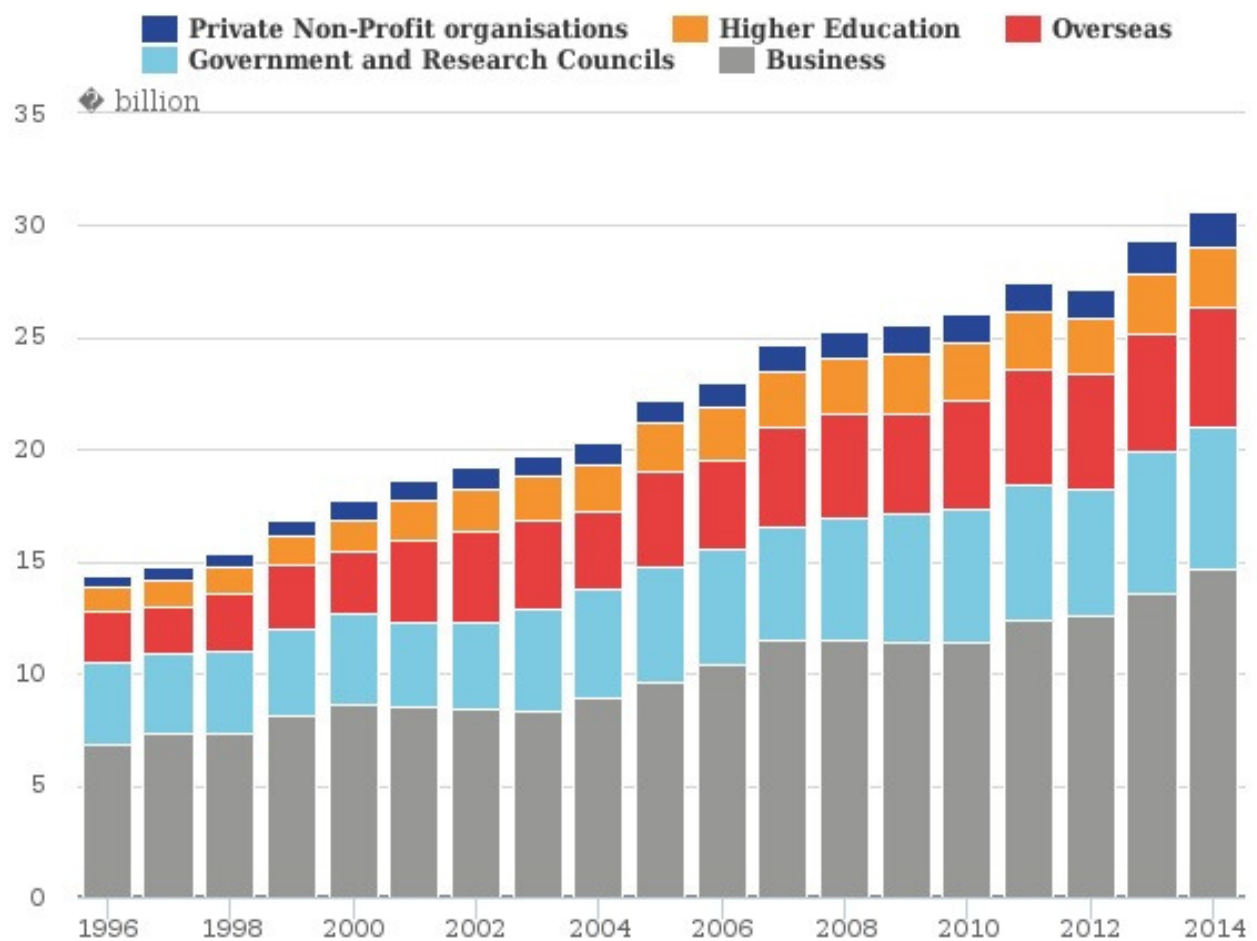
7. R&D expenditure by funding sector

In 2014, the largest funder of R&D performed in the UK was the business sector which funded £14.7 billion; 48% of total UK performed R&D. This was an increase of 8%, in current prices, from £13.6 billion in 2013 (Figure 6).

Whilst the government and research councils sector spent £2.2 billion performing R&D within their UK public research institutes, they actually funded £6.3 billion of UK R&D performance, 21% of total funding. Research Councils UK (RCUK) (<http://www.rcuk.ac.uk/>) offers individuals and businesses overseas, access to the UK's research facilities and infrastructure.

In just over 2 decades, there has been a change in the profile of how UK R&D expenditure has been funded. In 1990, £1.4 billion (12%) in current prices of R&D funding came from overseas. Since then, there has been a steady increase in the value of funding for UK R&D expenditure from overseas, from £2.3 billion (16%) in 1996 to £5.4 billion (18%) in 2014. Funding of R&D from overseas increased by 2% since 2013, while the average annual growth rate since 1990 was 5.8%.

Figure 6: Composition of UK GERD by funding sector, 1996 to 2014

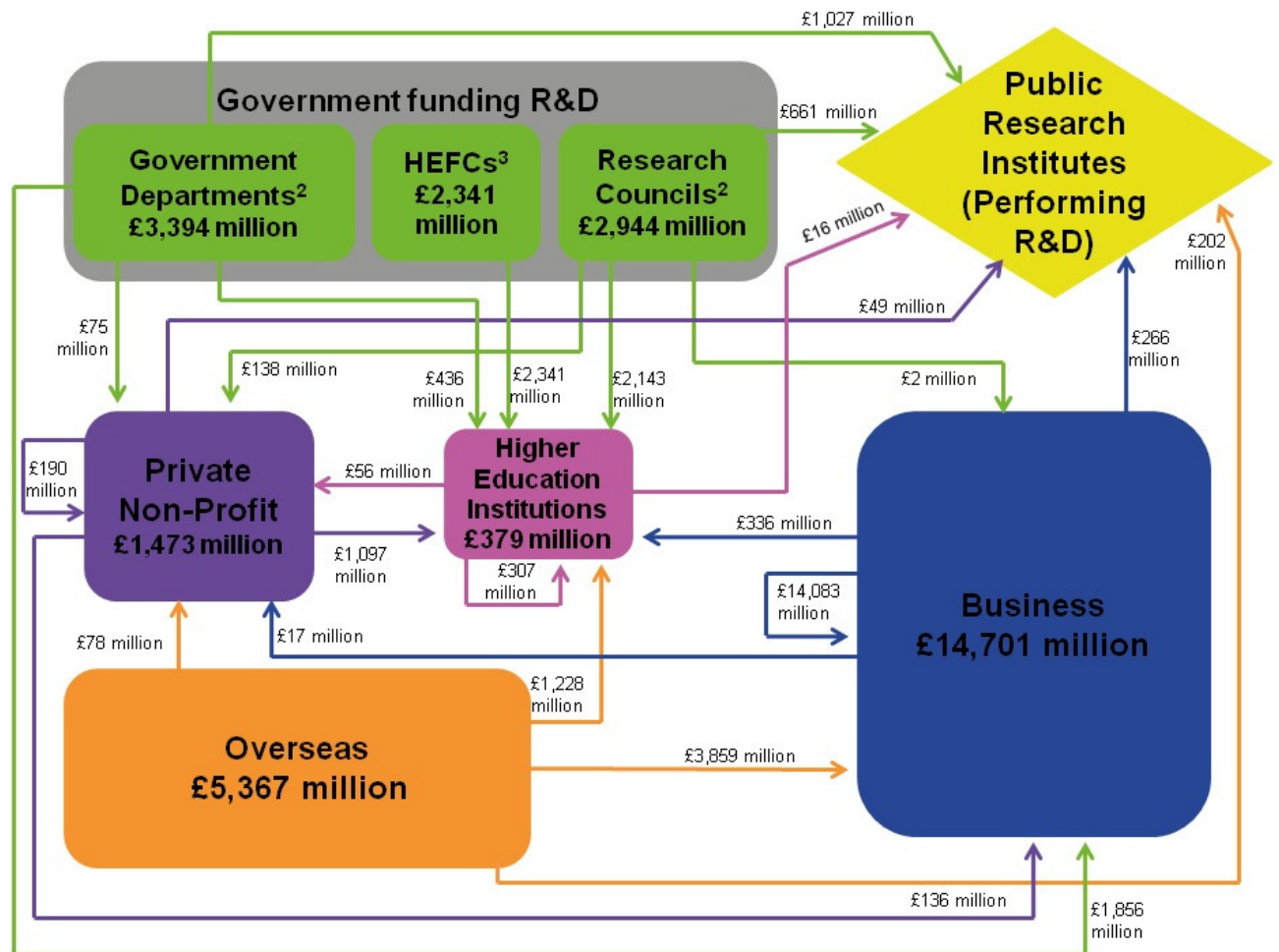


Source: Office for National Statistics

Figure 7 is a representation of the flows of R&D funding from the 4 UK sectors and overseas. The values in the boxes are the amounts of funding that each sector provided to the other sectors in the UK during 2014. The arrows indicate the values provided to the recipient performing sector.

It is important to note that sectors can fund themselves. For example, in 2014 the business sector performed £19.9 billion, of which £14.1 billion was funded by the sector itself. The remaining £5.9 billion of R&D expenditure performed by businesses was funded by other sectors and overseas.

Figure 7: Flows of R&D funding in the UK, 2014¹



Source: Office for National Statistics

Notes:

1. Values in the boxes are the amounts of funding that each sector provided to the other sectors. For full information see table 1 from the data section of this publication
2. Government departments and research councils carry out their R&D in public research institutes, their flow of funds into these institutes (£1,027 million and £661 million respectively) need to be combined
3. HEFCs – Higher Education Funding Councils

8. Civil and defence R&D expenditure by funding sector

The largest funder of civil R&D performed in the UK was the business sector (£14.3 billion), 50% of total civil funding.

Of the £5.4 billion funding received from overseas in 2014, 97% was performed on civil R&D (£5.2 billion).

R&D expenditure in the UK for defence purposes accounted for 6% of total R&D expenditure (£1.8 billion) in 2014. The UK government's funding of defence R&D in 2014 was £1.2 billion (69% of total defence funding). This remained unchanged in current prices from £1.2 billion in 2013, although the proportion of total defence funding from the government sector increased from 66% in 2013. This includes government contracts awarded to UK businesses for the development of aircraft, naval ships, submarines and their systems and equipment. The business sector provided £0.4 billion (22%) of funding and £0.2 billion (9%) came from overseas.

9. Country and regional breakdown of UK R&D expenditure

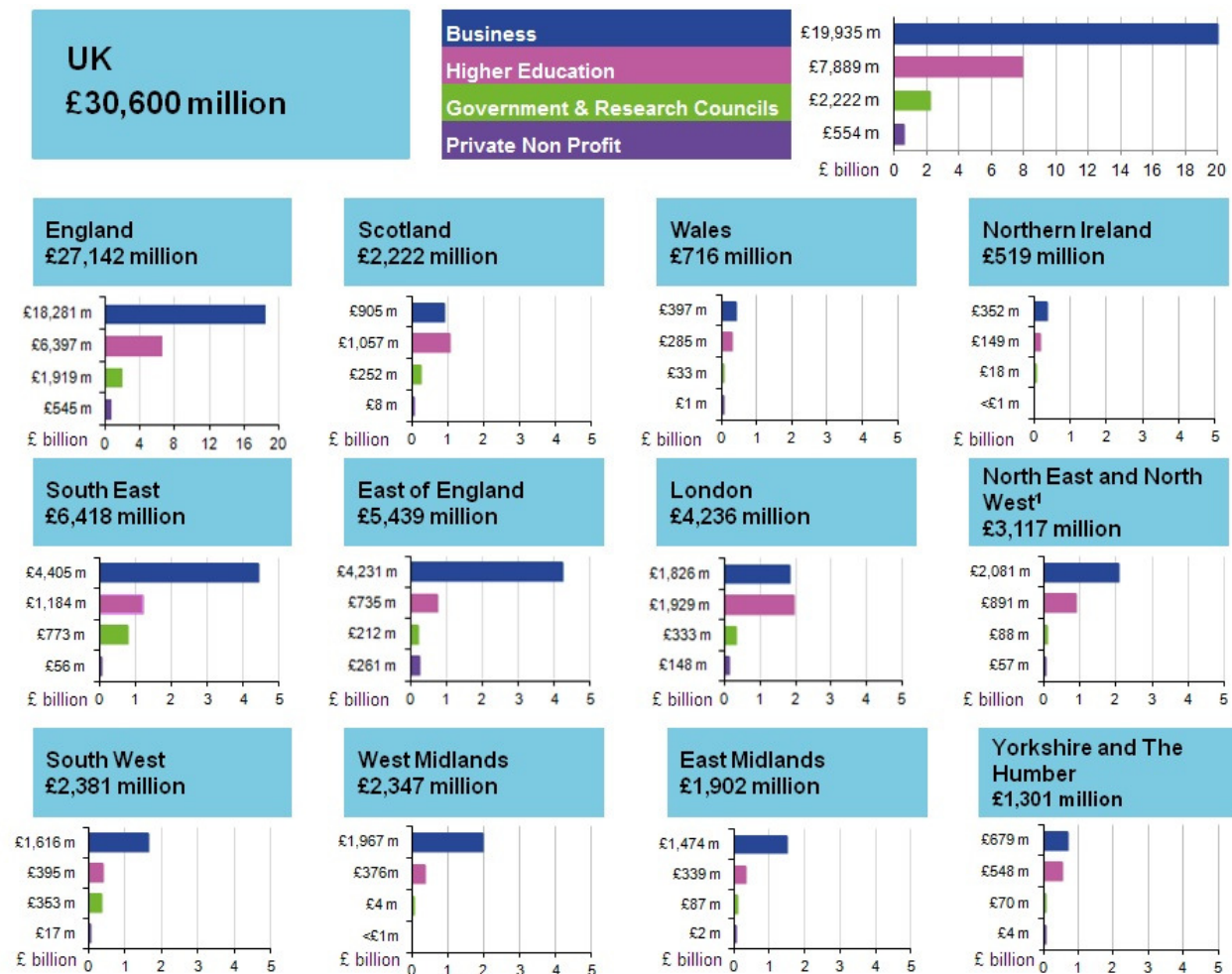
R&D expenditure can be analysed by UK country and region (Figure 8). In this context, the country and region refers to the location where the R&D is performed, not the location of the funder.

In 2014, the South East and East of England continued to dominate R&D activity in the UK. These regions together accounted for 39% of total UK R&D expenditure (£11.9 billion).

The majority of UK R&D expenditure was carried out in England (£27.1 billion) in 2014, an increase of 5% in current prices from £25.8 billion in 2013. Wales and Scotland showed increases of 4% and 1% respectively in 2014. Northern Ireland however, showed a decrease of 14% from the 2013 estimate of £0.6 billion to £0.5 billion in 2014. This is attributable to a decrease in R&D performed in the business sector within Northern Ireland.

It is interesting to note that while business is the dominant sector throughout the majority of the UK, there are 2 areas where the higher education sector was the highest. In London and Scotland the higher education sector had the largest expenditure on performing R&D, with spends of £1.9 billion and £1.1 billion respectively. This pattern has been evident for some time, but now in 2014 the gap between higher education and business has reduced to its lowest level in recent years.

Figure 8: UK GERD by sector, country and region, 2014



Source: Office for National Statistics

Notes:

1. North East and North West regions by sector have been combined due to confidentiality

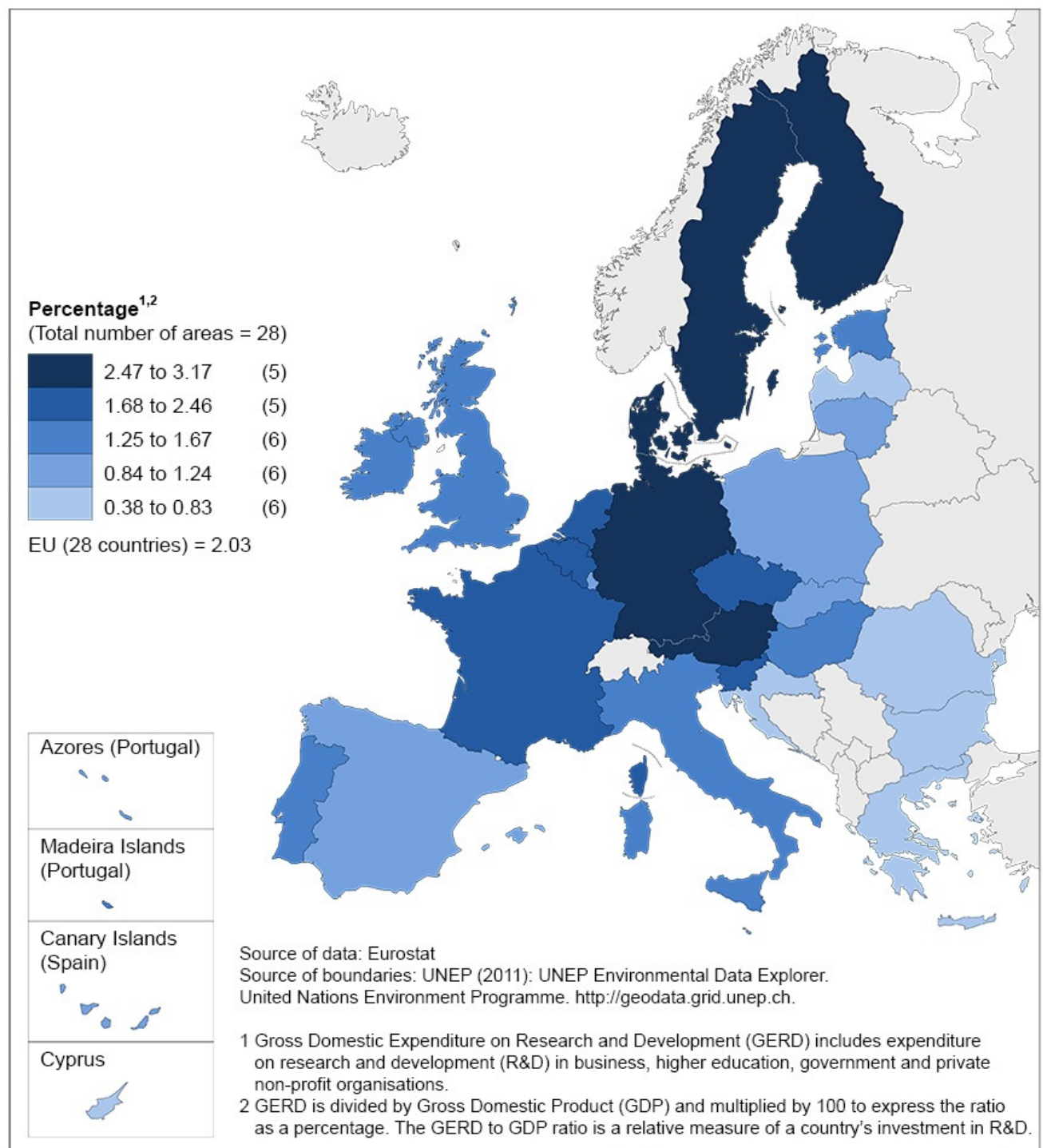
10. International comparisons of GERD as a percentage of GDP (R&D intensity)

Europe 2020 targets (http://ec.europa.eu/europe2020/europe-2020-in-a-nutshell/targets/index_en.htm) specify 5 targets for the European Union (EU) to achieve by 2020, including a target of 3% of the EU's GDP to be invested in R&D. Therefore, the estimates in this release are essential in monitoring progress towards this target.

The percentage of R&D to GDP increased marginally in the EU-28 up to 2002, reaching a high of 1.81%, before declining slightly through to 2005 (1.76%), and then climbing again to an estimated 2.03% in 2014 (Figure 9). Please note that the 2014 results for the EU-28 and OECD countries are early estimates and are provisional at the time of this release.



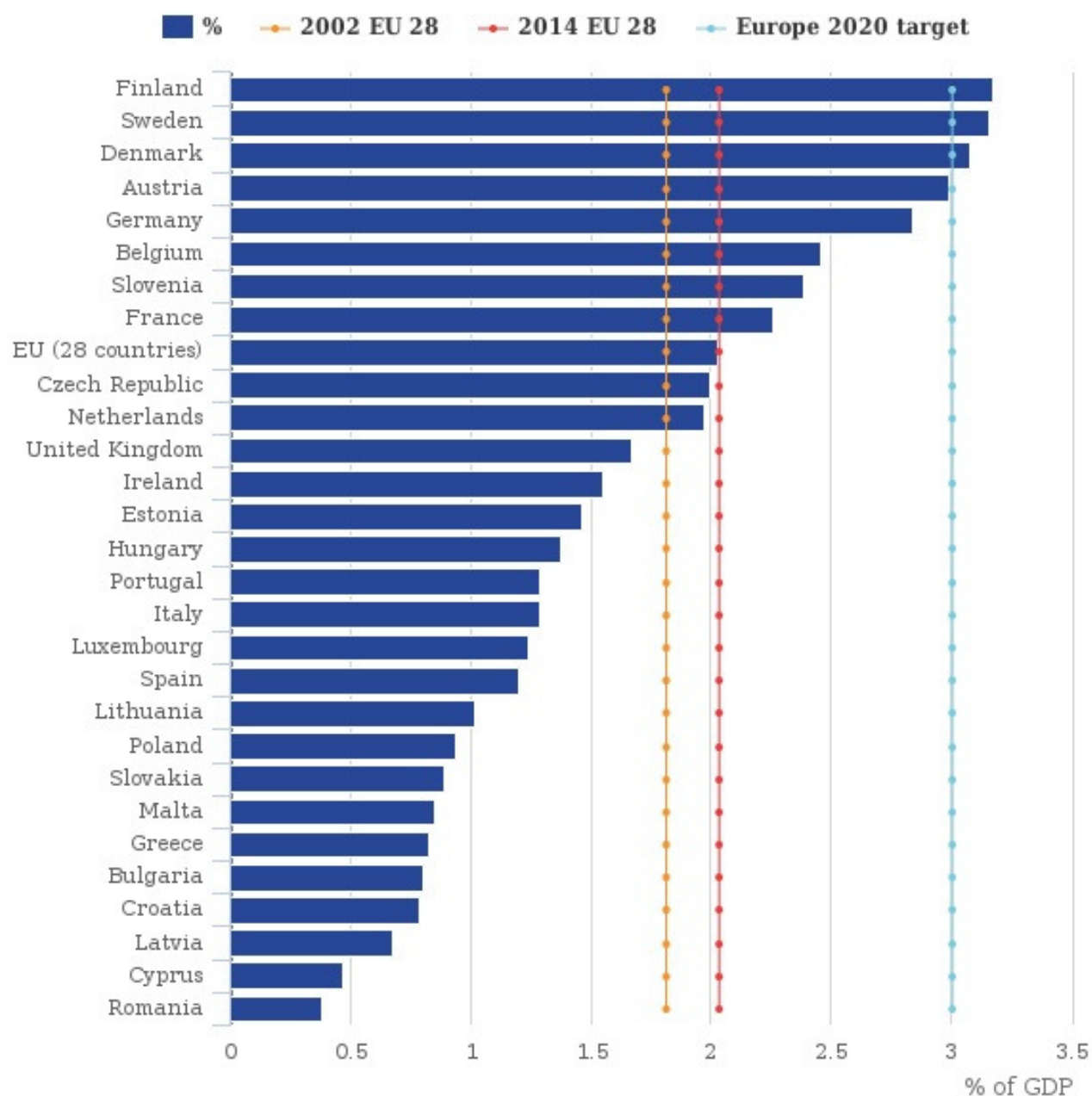
Figure 9: GERD to GDP ratio as a percentage (R&D intensity) by country, European Union (EU-28), 2014



Source: Eurostat

Figure 10 shows the latest available 2014 estimates as a means of placing the UK into an international context with regards to GERD as a percentage of GDP. It shows the individual EU-28 countries' GERD as a percentage of GDP, as well as the average for the EU-28, compared with the Europe 2020 target of 3%. The UK's GERD represented 1.67% of GDP in 2014, unchanged from 2013. The UK however, has moved up a place to 11th highest GERD as a percentage of GDP of all EU-28 countries, where the average was 2.03% of GDP.

Figure 10: EU countries' GERD as a percentage of GDP (R&D intensity), 2014



Source: Eurostat

Notes:

1. Some EU countries' 2014 estimates taken from the Eurostat website are provisional

The latest Eurostat estimates of GERD indicate that the increase in the EU GERD as a percentage of GDP that began in 2011 continued into 2014. Preliminary estimates produced by Eurostat (http://ec.europa.eu/eurostat/tgm/table.do?tab=table&plugin=1&language=en&pcode=t2020_20) indicate an overall increase in the EU-28 value of GERD as a percentage of GDP, from 1.97% in 2011 to 2.03% in 2014.

When comparing total business R&D intensity across countries, it is important to take into account differences in individual countries' industrial structures. OECD has produced a Science, Technology and Industry Scoreboard (http://www.oecd-ilibrary.org/science-and-technology/oecd-science-technology-and-industry-scoreboard_20725345;jsessionid=lkufd1802ah6.x-oecd-live-01) to facilitate these comparisons.

11. Background notes

1. Main issues specific to this bulletin

This is the latest annual release of estimates of gross domestic expenditure on research and development (R&D) performed in the UK by businesses, government departments, research councils, higher education institutes and private non-profit organisations. The results in this release are in respect of 2014. We began publishing annual data on R&D expenditure in 1993. The source of the information comes from the Business Enterprise Research and Development (BERD) survey, the Government Research and Development (including research councils) survey (GovERD), and the Private Non-Profit Research and Development (PNP) survey. Higher Education R&D (HERD) data are collected from a census of higher education institutes and provided to us by the Higher Education Funding Councils (HEFCs).

All these sectors' (Business, Government, Higher Education and Private Non-Profit) R&D data are known collectively as GERD, which represents the gross domestic expenditure on R&D performed in the UK. A quality and methodology information report (<http://www.ons.gov.uk/businessindustryandtrade/business/businessinnovation/qmis/ukgrossdomesticexpenditureonresearchanddevelopmentqmi>) for the GERD output is available on our website.

2. National Statistics

The [UK Statistics Authority \(http://www.statisticsauthority.gov.uk/\)](http://www.statisticsauthority.gov.uk/) has reviewed this publication in its report: [“Assessment of compliance with the Code of Practice for Official Statistics: Statistics on Research and Development \(http://www.statisticsauthority.gov.uk/assessment/assessment/assessment-reports/assessment-report-218---statistics-on-research-and-development.pdf\)”](http://www.statisticsauthority.gov.uk/assessment/assessment/assessment-reports/assessment-report-218---statistics-on-research-and-development.pdf) which was published on 28 June 2012. This review recommended that the UK GERD estimates be designated as [National Statistics \(https://www.statisticsauthority.gov.uk/national-statistician/types-of-official-statistics/\)](https://www.statisticsauthority.gov.uk/national-statistician/types-of-official-statistics/), subject to us carrying out certain requirements. We completed the necessary work to meet these requirements and on 3 June 2013, the Authority confirmed that this release, and its associated data, has retained National Statistics status.

3. Timeliness and punctuality

An internal investigation was conducted to identify if it is feasible to publish these R&D statistics earlier than at present. Unfortunately, this investigation concluded that it is not possible for us to bring forward the publication of these estimates in the short-term.

The main reason for this is that the higher education estimates are collected and provided by HEFCs with respect to academic years. HEFCs are not able to provide us with these estimates before the middle of February each year. Affording time to quality assure and check these data, the earliest that these estimates can therefore be published is March.

4. Completeness of coverage

GERD is the measure used by the majority of commentators on R&D for international comparisons. It covers all R&D performed in the UK, irrespective of who pays for it, including funding from overseas. However, it excludes R&D performed overseas even if it is funded from the UK.

The components of GERD relate to R&D performed in all sectors of the economy. BERD is a survey conducted annually covering the business sector of the economy which in 2014 performed 65% of total UK R&D expenditure. As part of the 2014 survey, approximately 5,500 (4,000 Great Britain and 1,500 Northern Ireland) questionnaires were sent to businesses known to perform R&D; this included around 400 of the largest R&D performers, accounting for approximately 79% of the 2014 total business R&D estimate. The 400 largest R&D performers are asked to select the industry product groups that best describe the type of R&D activities they undertake. For smaller R&D performers, no product group data were collected. However, an assumption is made that for these smaller R&D performers, expenditure is in the detailed product group that corresponds to the individual businesses' dominant Standard Industrial Classification (SIC). This approach must be regarded as an approximation since, in practice, an individual business can perform R&D for a range of product groups.

Smaller R&D performers, and others believed to be performing R&D, were selected using various sampling fractions. Industry product group and business employment size were used as the stratification variables. Completed questionnaires were returned by 5,065 businesses representing a response rate of 92%. Estimates from this survey were published on our website on 20 November 2015 in the Business Enterprise Research and Development statistical bulletin, 2014 (<http://www.ons.gov.uk/economy/governmentpublicsectorandtaxes/researchanddevelopmentexpenditure/bulletins/businessenterpriseresearchanddevelopment/2014>).

For more information about comparisons of UK BERD with the rest of Europe please visit our short story Business Research and Development (R&D) across the European Union (EU) (<http://webarchive.nationalarchives.gov.uk/20160105160709/http://www.ons.gov.uk/ons/rel/rdit1/gross-domestic-expenditure-on-research-and-development/2013/sty-gerd-2013.html>).

As part of the assessment of “Statistics on Research and Development” by the Authority, a requirement was placed on us to review the methodology for producing business R&D statistics to identify potential gaps in coverage and meet the coverage requirements of European System of Accounts (ESA) 2010. To meet this requirement and to assist users in their understanding of this complex issue, an information note entitled Coverage of the Business Enterprise Research and Development Survey (<http://webarchive.nationalarchives.gov.uk/20150904113534/http://ons.gov.uk/ons/guide-method/method-quality/specific/business-and-energy/research---development-surveys/index.html>) was published on 20 November 2012 to address this issue.

HERD data are provided by the Higher Education Funding Councils for England (<http://www.hefce.ac.uk/>), Scotland (<http://www.sfc.ac.uk/>) and Wales (<http://www.hefcw.ac.uk/>), the Department for Employment and Learning in Northern Ireland (<https://www.delni.gov.uk/>) and the 7 research councils. Additional data on external research funding from overseas, non-profit organisations and businesses is supplied by the Higher Education Statistics Agency (HESA) (<https://www.hesa.ac.uk/>). Data are provided to us during February of a given year, approximately 1 month before the GERD release is published. These data are the main reason for the timing of the GERD publication.

It is important to note that R&D funding provided to the higher education sector from government departments, research councils and HEFCs are collected as part of the GovERD survey.

GovERD is an annual census of approximately 140 government departments, including 7 research councils. Government departments are asked to include the expenditure on R&D they perform, as part of their total estimated expenditure on R&D. This includes estimates of R&D performed by local authorities and NHS trusts.

PNP data are collected in a biennial survey which was introduced in 2011 with approximately 200 organisations being selected. Estimates from this survey were used in the compilation of the 2011 GERD publication, the first time since the 2003 reference year. Previously, estimates had been based on a number of different sources.

To identify an initial universe of organisations that carry out R&D in this sector, a letter was despatched in 2010 to 344 organisations which were classified as private non-profit bodies, asking if they undertake R&D activities. Following this proving exercise a more in-depth analysis indicated that only a few industries were identified as performing R&D in this sector. These included library and archive activities, botanical and zoological gardens and nature reserve activities, engineering and design activities, and technical testing and analysis. In 2011, all organisations in these industries were sent a letter to further identify R&D performers. Those identified R&D performers together with known performers from earlier surveys, were sent a questionnaire to collect their totals for 2011.

The most recent survey was run in 2014 to collect 2013 data from an updated list of R&D performers in this sector. Results for the PNP organisations performing R&D in 2014 have therefore been estimated.

5. Revisions

As part of this release, business, government, higher education and private non-profit estimates of R&D performance and funding for 2012 and 2013 have been revised to take account of misreporting and late returns.

One indication of the reliability of the main indicators in this release can be obtained by monitoring the size of revisions. Table 1 records the size and pattern of revisions that have occurred over the last 5 years. Please note that these indicators only report summary measures for revisions. The revised data may itself be subject to sampling or other sources of error.

Table 1: Revisions between first publication and estimates 3 years later

		£ million	
	Value in latest period	Average revision	Average revision without regard to sign
Gross expenditure on R&D performed in the UK	30,600	-196	225

Source: Office for National Statistics

A spreadsheet is available giving the revisions of estimates from 2007 and the calculations behind the averages in the table.

The revisions table covers estimates of the UK's GERD first published from March 2009 (for 2007) to March 2013 (for 2011). A statistical test has been applied to the average revision to find out if there is bias in the estimates. This identified some significant downward revisions to the estimates first published, for 2007 to 2011. However, the scale of the revisions is small.

6. Sampling variability

Estimates from the BERD survey are based on a stratified sample drawn from the population of businesses known to actually perform R&D or that are likely to be R&D performers. As with any sample survey, the BERD survey is subject to 2 types of possible errors:

- sampling errors - due to only a sample of the population being surveyed; the methodology for estimation of the standard errors used to measure these is currently under review and therefore the standard errors have not been included as part of the last BERD publication
(<http://www.ons.gov.uk/economy/governmentpublicsectorandtaxes/researchanddevelopmentexpenditure/bulletins/businessenterpriseresearchanddevelopment/2014>)
- non-sampling errors - these include factors such as population coverage, misreporting and non-response bias; these errors are generally hard to quantify because of the difficulty in identifying the population of actual or likely R&D performers and because of the problems ensuring that businesses adhere to Frascati R&D definitions; the information note
(<http://webarchive.nationalarchives.gov.uk/20150904113534/http://ons.gov.uk/ons/guide-method/method-quality/specific/business-and-energy/research---development-surveys/index.html>) referred to in background note 4 provides an overview of the survey design and looks at the methods and sources used to update the sampling frame

7. Discontinuities in data

The BERD, GovERD and PNP questionnaires were redesigned after the 2010 survey to better reflect user needs to address concerns about data quality, difficulty in completion and to include new National Accounts and EU requirements. These followed large revisions to both the BERD and GovERD surveys for the 2007 data collections.

While all these changes are viewed as being an improvement, they may have an impact on the comparability of data over time. Unfortunately, it is not possible to measure this impact.

8. General information

These points should be noted when examining the dataset tables:

- there may be differences between totals and the sum of their independently rounded totals
- in addition to being analysed by sector of performance, GERD may be analysed by sector of funding; the R&D performed by any 1 sector of the economy can be funded by any of the other sectors, or by the performing sector itself
- the recommended practice of the Organisation for Economic Cooperation and Development (OECD) is to use information from those performing R&D, where this is available; these estimates are considered more reliable than those from surveys of R&D funders
- it is sometimes necessary to suppress figures for certain items in order to avoid disclosing data from individual institutions and therefore tables which contain data which are disclosive will contain a relevant footnote
- note that £1.0 billion = £1,000 million in this release

9. Regional data

Regional estimates are produced for the 4 sectors as follows.

Business – businesses receiving the long questionnaire (the 400 largest R&D performers) accounted for approximately 79% of total business expenditure on performing R&D in 2014. Each business is asked to provide the workplace postcodes for all the sites at which the business performed R&D and to allocate the total expenditure figures of the business to the sites on a percentage basis. Regional data for the remaining 21% of total expenditure were estimated by using county region codes from the business register of R&D performers. Aggregation is undertaken at broad product group and county level.

Higher Education – these estimates are co-ordinated and provided by [HEFC England \(http://www.hefce.ac.uk/\)](http://www.hefce.ac.uk/) and are based on the geographic region of all Higher Education Institutes (HEIs).

Government – the annual census of the government sector collects regional full-time equivalent (FTE) data. Ratio estimation is then applied to the corresponding estimates of expenditure on performed (in-house) R&D to provide estimates per FTE per region. These are then aggregated to provide regional expenditure values for this sector.

Private Non-Profit – each organisation is asked to provide the workplace postcodes for all the sites at which the organisation performed R&D and to allocate the total expenditure figures of the organisation to the sites on a percentage basis. As this survey is a census, any non-responder's expenditure estimates are allocated regionally using the county region codes from the business register.

10. Users and uses of data

GERD is the UK's most reliable estimate of national expenditure on R&D performed in the UK that draws together information on R&D spending in the public and private sectors for both civil and defence applications.

Changes introduced as part of the amendments to the System of National Accounts (SNA) in 2008, and in ESA 2010, specify that R&D from September 2014 onwards, should be considered as an ancillary activity. Expenditure on R&D should constitute investment in R&D assets, which as a consequence needed to be capitalised in the UK National Accounts. Therefore, since September 2014, R&D expenditure has contributed to the compilation of the value of the UK economy and is included as part of Gross Domestic Product (GDP) estimates. Please see the ONS ESA 2010

(<http://www.ons.gov.uk/ons/guide-method/development-programmes/esa2010/index.html>) page for more information.

There are numerous users within and outside government who use these data to produce various analyses and to inform policy decisions. These include the following.

European Union's Statistical Office (Eurostat) (<http://ec.europa.eu/eurostat/>) - the UK provides statistics measuring R&D activity in accordance with European Commission Regulation No. 995/2012 of the European Parliament and the council. The estimates in this release are used to provide information that is consistent with other EU member states and to enable benchmarking to be achieved. Europe 2020 targets (http://ec.europa.eu/europe2020/europe-2020-in-a-nutshell/targets/index_en.htm) for economic growth include a target of 3% of the EU's GDP (both private and publicly funded) to be invested in R&D by 2020. This means that the estimates in this release are useful in monitoring progress towards this target. It should be noted that at the time of this publication, Eurostat have already published provisional estimates for EU member states' gross expenditure on R&D in 2014. The provisional estimates for the UK were based on projections and therefore when making comparisons with other countries, users are advised to use estimates from this release for UK R&D expenditure, rather than Eurostat's provisional estimates for the UK.

OECD (http://www.oecd.org/home/0,2987,en_2649_201185_1_1_1_1_1,00.html) – uses GERD data for constructing internationally comparable databases and producing regular statistical publications such as the Main Science and Technology indicators (MSTI) (<http://www.oecd.org/sti/msti.htm>) and The Annual Business Enterprise Research and Development statistics (ANBERD) (<http://www.oecd.org/innovation/innovationinsciencetechnologyandindustry/anb>)

erdanalyticalbusinessenterpriseanddevelopmentdatabase.htm). The data are also used for analytical studies, which underpin economic analyses and policy reviews.

The [European Commission's Research and Innovation Directorate](http://ec.europa.eu/research/index.cfm?pg=dg) (<http://ec.europa.eu/research/index.cfm?pg=dg>) published the [Innovation Union Competitiveness report, 2011](http://ec.europa.eu/research/innovation-union/index_en.cfm?section=competitiveness-report&year=2011) (http://ec.europa.eu/research/innovation-union/index_en.cfm?section=competitiveness-report&year=2011). One of the main findings is that the EU is slowly moving towards its target of 3% of GDP but there is a widening gap between the EU and its world competitors notably due to weaker business R&D investment.

The [Department for Business, Innovation and Skills \(BIS\)](https://www.gov.uk/government/organisations/department-for-business-innovation-skills) (<https://www.gov.uk/government/organisations/department-for-business-innovation-skills>) use GERD data to assess policy impact and inform debate. R&D data underpin their assessments of UK innovation performance as well as international work in the field.

The [Welsh Government \(WG\)](http://wales.gov.uk/splash.jsessionid=4jfhjxLRghBh6VL6ssyPP2nyWPLpgvMZ178plZLxfbDjGhIDn1QN!-1868201774?orig=/) (<http://wales.gov.uk/splash.jsessionid=4jfhjxLRghBh6VL6ssyPP2nyWPLpgvMZ178plZLxfbDjGhIDn1QN!-1868201774?orig=/>), [Scottish Government \(SG\)](http://home.scotland.gov.uk/home) (<http://home.scotland.gov.uk/home>) and the [Northern Ireland Department of Finance and Personnel \(DFPNI\)](http://www.detini.gov.uk/) (<http://www.detini.gov.uk/>) use GERD data as a main indicator for measuring the performance of their respective economies within the UK, as well as to monitor and develop R&D policies which seek to increase R&D investment. Regional GERD information is also published in the [Scottish GERD tables](http://www.scotland.gov.uk/Topics/Statistics/Browse/Business/RD/GERDPublicTables) (<http://www.scotland.gov.uk/Topics/Statistics/Browse/Business/RD/GERDPublicTables>).

The [Research and Development Society](http://www.rdsoc.org/) (<http://www.rdsoc.org/>) 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. The Research and Development Society make use of GERD data, as a main source of information, for understanding how much is being invested in R&D in the UK on an annual basis and to inform wider debates about R&D.

Do you make use of our annual estimates of UK GERD? If yes, we would like to hear from you (RandD@ons.gsi.gov.uk) and understand how you make use of these statistics. This will enable us, in the future, to better meet your needs.

Science, Engineering and Technology (SET) statistics

We publish annual estimates of government departmental spending on Science, Engineering and Technology, known as "[SET Statistics](http://www.ons.gov.uk/economy/governmentpublicsectorandtaxes/researchanddevelopmentexpenditure/bulletins/ukgovernmentexpenditureonscienceengineeringandtechnology/previousReleases)" (<http://www.ons.gov.uk/economy/governmentpublicsectorandtaxes/researchanddevelopmentexpenditure/bulletins/ukgovernmentexpenditureonscienceengineeringandtechnology/previousReleases>"). These are a summary of main science, engineering and technology indicators and are collated by us using data collected as part of the GovERD survey.

SET statistics are broader than just R&D, as they comprise government R&D expenditure on performing (in-house) R&D, purchased R&D and funding provided to external organisations for R&D, the indicative UK contributions to EU R&D expenditure, knowledge transfer activities and personnel associated with scientific and technical postgraduate education and training. Therefore, the estimates from the GovERD survey of expenditure on R&D performed in the UK by government and research councils, that are included in this GERD release, will form part of the broader estimates of SET that will be published later this year.

We have provisionally scheduled the publication of the UK's SET statistics for 2014, for 15 July 2016.

11. Coherence and international comparisons

An information note

(<http://webarchive.nationalarchives.gov.uk/20150904113534/http://ons.gov.uk/ons/guide-method/method-quality/specific/business-and-energy/research---development-surveys/index.html>) providing an assessment of the coherence of R&D statistics with other official statistics was published in 2012 on our website.

12. ONS business statistics

There is a Business and Trade Statistics community

(<http://www.statsusernet.org.uk/StatsUserNet/Communities/ViewCommunities/CommunityDetails/?CommunityKey=36dd28ed-e10a-440e-b7fb-86650b746c43>) on the StatsUserNet (<http://www.statsusernet.org.uk/home/>) website. StatsUserNet is the Royal Statistical Society's interactive site for users of official statistics. The community objectives are to promote dialogue and share information between users and producers of official business and trade statistics about the structure, content and performance of businesses within the UK. Anyone can join the discussions by registering via either of the links provided.

13. Special events

We have recently published commentary, analysis and policy on 'Special Events' which may affect statistical outputs. For full details go to the Special Events (<http://www.ons.gov.uk/ons/guide-method/method-quality/general-methodology/special-events-group/index.html>) page on our website.

14. Release policy

Details of the policy governing the release of new data are available from our [media relations \(http://www.ons.gov.uk/news/contactmediarelationsoffice\)](http://www.ons.gov.uk/news/contactmediarelationsoffice) office. Also available is a list of those given [pre-publication access \(http://www.ons.gov.uk/releases/grossdomesticexpenditureonresearchanddevelopment2014\)](http://www.ons.gov.uk/releases/grossdomesticexpenditureonresearchanddevelopment2014) to the contents of this release. All data in this release can be downloaded free of charge from our website.

Additional standard extracts containing more detail are available on request. Bespoke analyses are also available but there will be a charge for these, please see the [R&D charging policy \(http://www.ons.gov.uk/ons/about-ons/business-transparency/freedom-of-information/what-can-i-request/index.html\)](http://www.ons.gov.uk/ons/about-ons/business-transparency/freedom-of-information/what-can-i-request/index.html). For more information about either of these services please email RandD@ons.gsi.gov.uk, or telephone +44 (0)1633 456767.

Any bespoke analysis carried out for R&D customers will be available free of charge on the [User requested and analysis \(http://www.ons.gov.uk/economy/governmentpublicsectorandtaxes/researchanddevelopmentexpenditure/datalist?q=&sortBy=release_date&query=&filter=user_requested_data&fromDate=&toDate=\)](http://www.ons.gov.uk/economy/governmentpublicsectorandtaxes/researchanddevelopmentexpenditure/datalist?q=&sortBy=release_date&query=&filter=user_requested_data&fromDate=&toDate=) web pages.

These [National Statistics \(https://www.statisticsauthority.gov.uk/national-statistician/types-of-official-statistics/\)](https://www.statisticsauthority.gov.uk/national-statistician/types-of-official-statistics/) are produced to high professional standards and released according to the arrangements approved by the [UK Statistics Authority \(https://www.statisticsauthority.gov.uk/\)](https://www.statisticsauthority.gov.uk/).

12 . Methodology

[UK gross domestic expenditure on research and development QMI \(https://www.ons.gov.uk/businessindustryandtrade/business/businessinnovation/qmis/ukgrossdomesticexpenditureonresearchanddevelopmentqmi\)](https://www.ons.gov.uk/businessindustryandtrade/business/businessinnovation/qmis/ukgrossdomesticexpenditureonresearchanddevelopmentqmi)

Contact details for this statistical bulletin

Cecil Prescott

RandD@ons.gsi.gov.uk

Telephone: +44 (0)1633 456767



UK Gross Domestic Expenditure on Research and Development (R&D), 2014

Published on 18 March 2016

Please click on the links below to access the datasets:

[Table 1](#) Expenditure on R&D in the UK by performing and funding sectors, 2014

[Table 2](#) Expenditure on R&D in the UK by sector of performance: 2003 to 2014

[Table 3](#) Expenditure on Civil and Defence R&D in the UK by sector of performance: 2003 to 2014

[Table 4](#) Expenditure on R&D in the UK by sector of funding: 2003 to 2014

[Table 5](#) Expenditure on Civil and Defence R&D in the UK by sector of funding: 2003 to 2014

[Table 6](#) Country and Regional breakdown of expenditure on R&D in the UK by sector of performance, 2014

[Table R1](#) Expenditure on R&D in the UK: Revisions to series previously published

Statistical contact: Cecil Prescott, Office for National Statistics
Telephone number: +44 (0)1633 456767
Email: RandD@ons.gsi.gov.uk

Next publication: March 2017

1 EXPENDITURE ON R&D IN THE UK BY PERFORMING AND FUNDING SECTORS, 2014

Current prices		Sector performing the R&D					£ million
	Government	Research Councils	Higher Education	Business Enterprise	Private Non-Profit ¹	Total	Overseas
Sector providing the funds							
Government	944	83	436	1,856	75	3,394	617
Research Councils	62	599	2,143	2	138	2,944	208
Higher Education Funding Councils	-	-	2,341	-	-	2,341	-
Higher Education	4	12	307	-	56	379	-
Business Enterprise	237	29	336	14,083	17	14,701	5,632
Private Non-Profit	10	39	1,097	136	190	1,473	-
Overseas	144	58	1,228	3,859	78	5,367	-
TOTAL	1,401	821	7,889	19,935	554	30,600	-
of which:							
Civil	1,244	821	7,849	18,381	552	28,846	-
Defence	158	-	40	1,554	2	1,754	-

Source: Office for National Statistics

1 Private Non-Profit totals have been estimated using the 2013 data, as no survey data available for 2014.

- denotes nil, figures unavailable or too small to display.

Please note:

Differences may occur between totals and the sum of their independently rounded components.

2 EXPENDITURE ON R&D IN THE UK BY SECTOR OF PERFORMANCE: 2003 to 2014

£ million

		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Sector performing the R&D													
Current prices													
TOTAL	GLBA	19,727	20,242	22,106	22,993	24,696	25,345	25,632	26,173	27,452	27,257[†]	29,269	30,600
Government	GLBK	1,243	1,240	1,238	1,252	1,320	1,348	1,406	1,372	1,321	1,391 [†]	1,513	1,401
Research Councils	DMRS	825	930	1,051	1,061	1,034	1,041	1,097	1,141	1,035	804	814 [†]	821
Business Enterprise	GLBL	12,505	12,662	13,734	14,144	15,676	15,814	15,532	16,045	17,452	17,409 [†]	18,799	19,935
Higher Education	GLBM	4,785	5,004	5,580	6,022	6,119	6,545	6,931	6,963	7,117	7,133 [†]	7,625	7,889
Private Non-Profit ²	GLBN	369	406	502	513	546	595	666	652	526	520 [†]	518	554
As % of GDP		1.63 [†]	1.59	1.63	1.61	1.65	1.69	1.70	1.66	1.69	1.62	1.67	1.67
		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014

Sector performing the R&D													
Constant prices (2014) ¹													
TOTAL	GLBD	25,716[†]	25,589	27,152	27,430	28,645	28,639	28,295	28,050	28,971	28,247	29,712	30,600
Government	GLBW	1,620 [†]	1,568	1,521	1,494	1,531	1,523	1,552	1,470	1,394	1,442	1,536	1,401
Research Councils	DMSU	1,075 [†]	1,176	1,291	1,266	1,199	1,176	1,211	1,223	1,092	833	826	821
Business Enterprise	GLBX	16,301 [†]	16,007	16,869	16,874	18,183	17,870	17,146	17,196	18,418	18,042	19,083	19,935
Higher Education	GLBY	6,238 [†]	6,326	6,854	7,184	7,098	7,396	7,651	7,462	7,511	7,392	7,740	7,889
Private Non-Profit ²	GLBZ	481 [†]	513	617	612	633	672	735	699	555	539	526	554

Source: Office for National Statistics

1 Please note that the latest deflators have been applied to the business research and development estimates in this bulletin which has resulted in small differences being observed between the BERD and GERD publications.

2 Private Non-Profit totals have been estimated using the 2013 data, as no survey data available for 2014.

[†] crosses denote earliest data revision.

Please Note:

Differences may occur between totals and the sum of their independently rounded components.

3 EXPENDITURE ON CIVIL AND DEFENCE R&D IN THE UK BY SECTOR OF PERFORMANCE: 2003 to 2014

£ million

		Civil											
		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Sector performing the R&D													
Current prices													
TOTAL	GLBB	17,603	17,802	19,255	20,416	21,963	22,945	23,424	24,255	25,471	25,470[†]	27,412	28,846
Government	GLBO	869	889	882	895	1,042	1,087	1,119	1,146	1,164	1,241 [†]	1,349	1,244
Research Councils	DMSC	819	923	1,046	1,057	1,034	1,041	1,097	1,141	1,035	804	814 [†]	821
Business Enterprise	GLBP	10,800	10,623	11,288	11,975	13,269	13,718	13,648	14,392	15,667	15,808 [†]	17,145	18,381
Higher Education	GLBQ	4,746	4,960	5,538	5,976	6,080	6,505	6,894	6,925	7,082	7,099 [†]	7,589	7,849
Private Non-Profit ²	GLBR	369	406	502	513	539	595	666	651	524	518 [†]	516	552
As % of GDP		1.46 [†]	1.40	1.42	1.43	1.46	1.53	1.56	1.54	1.56	1.52	1.56	1.58
		Civil											
		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Sector performing the R&D													
Constant prices (2014) ¹													
TOTAL	C3V7	22,947[†]	22,505	23,650	24,356	25,475	25,927	25,857	25,994	26,880	26,395	27,827	28,846
Government	C3V9	1,133 [†]	1,124	1,083	1,068	1,209	1,228	1,235	1,228	1,228	1,286	1,369	1,244
Research Councils	C3V2	1,068 [†]	1,167	1,285	1,261	1,199	1,176	1,211	1,223	1,092	833	826	821
Business Enterprise	C3VA	14,079 [†]	13,429	13,864	14,286	15,391	15,501	15,066	15,424	16,534	16,382	17,404	18,381
Higher Education	C3VB	6,187 [†]	6,270	6,802	7,129	7,052	7,351	7,610	7,422	7,474	7,357	7,704	7,849
Private Non-Profit ²	C3VC	481 [†]	513	617	612	625	672	735	698	553	537	524	552
		Defence											
		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Sector performing the R&D													
Current prices													
TOTAL	GLBC	2,124	2,440	2,851	2,577	2,732	2,399	2,208	1,918	1,980	1,787[†]	1,857	1,754
Government	GLBS	374	351	357	357	279	262	288	226	158	150	164	158
Research Councils	DMSM	6	7	4	4	-	-	-	-	-	-	-	-
Business Enterprise	GLBT	1,706	2,039	2,446	2,169	2,407	2,097	1,884	1,653	1,785	1,601 [†]	1,654	1,554
Higher Education	GLBU	38	44	43	46	39	40	36	38	35	34	37	40
Private Non-Profit ²	GLBV	-	-	-	-	8	1	-	1	2	2	2	2
As % of GDP		0.18 [†]	0.19	0.21	0.18	0.18	0.16	0.15	0.12	0.12	0.11	0.11	0.10
		Defence											
		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Sector performing the R&D													
Constant prices (2014) ¹													
TOTAL	C3V8	2,769[†]	3,085	3,502	3,074	3,169	2,711	2,437	2,056	2,090	1,852	1,885	1,754
Government	C3VD	488 [†]	444	438	426	324	296	318	242	167	155	166	158
Research Councils	C3V3	8 [†]	9	5	5	-	-	-	-	-	-	-	-
Business Enterprise	C3VE	2,224 [†]	2,578	3,004	2,588	2,792	2,370	2,080	1,772	1,884	1,659	1,679	1,554
Higher Education	C3VF	50 [†]	56	53	55	45	45	40	41	37	35	38	40
Private Non-Profit ²	C3VG	- [†]	-	-	-	9	1	-	1	2	2	2	2

Source: Office for National Statistics

- 1 Please note that the latest deflators have been applied to the business research and development estimates in this bulletin which has resulted in small differences being observed between the BERD and GERD publications.
2 Private Non-Profit totals have been estimated using the 2013 data, as no survey data available for 2014.

- denotes nil, figures unavailable or too small to display.

[†] crosses denote earliest data revision.

Please Note:

Differences may occur between totals and the sum of their independently rounded components.

4

EXPENDITURE ON R&D IN THE UK BY SECTOR OF FUNDING:
2003 to 2014

													£ million
		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Sector funding R&D in the UK													
Current prices													
TOTAL	GLBA	19,727	20,242	22,106	22,993	24,696	25,345	25,632	26,173	27,452	27,257 [†]	29,269	30,600
Government	GLCA	2,650	2,778	2,584	2,531	2,581	2,703	2,939	3,044	3,022	2,933 [†]	3,413	3,394
Research Councils	DMSR	1,947	2,084	2,574	2,709	2,543	2,765	2,908	2,958	2,942	2,666 [†]	2,894	2,944
Higher Education Funding Councils	DMSS	1,665	1,804	1,928	2,085	2,234	2,227	2,395	2,303	2,257	2,185	2,297	2,341
Business Enterprise	GLCB	8,287	8,914	9,580	10,377	11,519	11,511	11,362	11,443	12,413	12,624 [†]	13,631	14,701
Higher Education	GLCC	218	229	266	288	284	303	314	315	353	345 [†]	368	379
Private Non-Profit ²	GLCD	931	961	1,022	1,076	1,153	1,247	1,279	1,267	1,293	1,316 [†]	1,388	1,473
Overseas	GLCE	4,029	3,472	4,152	3,927	4,382	4,589	4,436	4,842	5,172	5,188 [†]	5,277	5,367
		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Sector funding R&D in the UK													
Constant prices (2014) ¹													
TOTAL	GLBD	25,716 [†]	25,589	27,152	27,430	28,645	28,639	28,295	28,050	28,971	28,247	29,712	30,600
Government	GLCP	3,455 [†]	3,512	3,174	3,019	2,994	3,054	3,244	3,262	3,189	3,040	3,465	3,394
Research Councils	DMSV	2,538 [†]	2,635	3,162	3,232	2,950	3,124	3,210	3,170	3,105	2,763	2,938	2,944
Higher Education Funding Councils	DMSW	2,170 [†]	2,281	2,368	2,487	2,591	2,516	2,644	2,468	2,382	2,264	2,332	2,341
Business Enterprise	GLCQ	10,803 [†]	11,269	11,767	12,380	13,361	13,007	12,542	12,264	13,100	13,083	13,837	14,701
Higher Education	GLCR	284 [†]	289	327	344	329	342	347	338	373	358	374	379
Private Non-Profit ²	GLCS	1,214 [†]	1,215	1,255	1,284	1,337	1,409	1,412	1,358	1,365	1,364	1,409	1,473
Overseas	GLCT	5,252 [†]	4,389	5,100	4,685	5,083	5,185	4,897	5,189	5,458	5,376	5,357	5,367

Source: Office for National Statistics

1 Please note that the latest deflators have been applied to the business research and development estimates in this bulletin which has resulted in small differences being observed between the BERD and GERD publications.

2 Private Non-Profit totals have been estimated using the 2013 data, as no survey data available for 2014.

[†] crosses denote earliest data revision.

Please Note:

Differences may occur between totals and the sum of their independently rounded components.

5 EXPENDITURE ON CIVIL AND DEFENCE R&D IN THE UK BY SECTOR OF FUNDING: 2003 to 2014

£ million

		Civil											
		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Sector funding R&D in the UK													
Current prices													
TOTAL	GLBB	17,603	17,802	19,255	20,416	21,963	22,945	23,424	24,255	25,471	25,470[†]	27,412	28,846
Government	GLCF	1,507	1,301	1,299	1,281	1,421	1,577	1,690	1,838	1,758	1,736 [†]	2,181	2,187
Research Councils	DMSX	1,947	2,084	2,574	2,709	2,543	2,765	2,908	2,958	2,941	2,666 [†]	2,894	2,944
Higher Education Funding Councils	DMSY	1,665	1,804	1,928	2,085	2,234	2,227	2,395	2,303	2,257	2,185	2,297	2,341
Business Enterprise	GLCG	7,879	8,476	8,963	9,646	10,603	10,775	10,659	10,945	11,900	12,206 [†]	13,178	14,316
Higher Education	GLCH	218	229	266	288	284	303	314	315	353	345 [†]	368	379
Private Non-Profit ²	GLCI	931	961	1,022	1,076	1,153	1,247	1,279	1,267	1,267	1,311 [†]	1,382	1,464
Overseas	GLCJ	3,456	2,948	3,203	3,331	3,726	4,054	4,180	4,628	4,995	5,023 [†]	5,112	5,214
		Civil											
		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Sector funding R&D in the UK													
Constant prices (2014) ¹													
TOTAL	C3V7	22,947[†]	22,505	23,650	24,356	25,475	25,927	25,857	25,994	26,880	26,395	27,827	28,846
Government	C3VH	1,965 [†]	1,645	1,595	1,528	1,648	1,782	1,866	1,970	1,855	1,799	2,214	2,187
Research Councils	C3V4	2,538 [†]	2,635	3,162	3,232	2,950	3,124	3,210	3,170	3,104	2,763	2,938	2,944
Higher Education Funding Councils	C3V5	2,170 [†]	2,281	2,368	2,487	2,591	2,516	2,644	2,468	2,382	2,264	2,332	2,341
Business Enterprise	C3V6	10,271 [†]	10,715	11,009	11,508	12,299	12,176	11,766	11,730	12,558	12,649	13,377	14,316
Higher Education	C3VJ	284 [†]	289	327	344	329	342	347	338	373	358	374	379
Private Non-Profit ²	C3VK	1,214 [†]	1,215	1,255	1,284	1,337	1,409	1,412	1,358	1,337	1,359	1,403	1,464
Overseas	C3VL	4,505 [†]	3,727	3,934	3,974	4,322	4,581	4,614	4,960	5,271	5,206	5,189	5,214
		Defence											
		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Sector funding R&D in the UK													
Current prices													
TOTAL	GLBC	2,124	2,440	2,851	2,577	2,732	2,399	2,208	1,918	1,980	1,787[†]	1,857	1,754
Government	GLCK	1,143	1,477	1,285	1,250	1,160	1,126	1,249	1,206	1,263	1,198 [†]	1,233	1,206
Research Councils	GLCM	-	-	-	-	-	-	-	-	-	-	-	..
Higher Education Funding Councils	DMSZ	-	-	-	-	-	-	-	-	-	-	-	-
Business Enterprise	GLCL	407	439	616	730	916	737	703	498	513	419 [†]	453	385
Higher Education	GLCM	-	-	-	-	-	-	-	-	-	-	-	-
Private Non-Profit ²	GLCN	-	-	-	-	-	-	-	-	26	5	6	10
Overseas	GLCO	574	524	949	597	657	536	256	214	177	165 [†]	165	153
		Defence											
		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Sector funding R&D in the UK													
Constant prices (2014) ¹													
TOTAL	C3V8	2,769[†]	3,085	3,502	3,074	3,169	2,711	2,437	2,056	2,090	1,852	1,885	1,754
Government	C3VM	1,490 [†]	1,867	1,578	1,491	1,346	1,272	1,379	1,292	1,333	1,242	1,252	1,206
Research Councils	C3ZO	-	-	-	-	-	-	-	-	-	-	-	..
Higher Education Funding Councils	C3V6	-	-	-	-	-	-	-	-	-	-	-	-
Business Enterprise	C3VN	531 [†]	555	757	871	1,062	833	776	534	541	434	460	385
Higher Education	C3VO	-	-	-	-	-	-	-	-	-	-	-	-
Private Non-Profit ²	C3VP	-	-	-	-	-	-	-	-	27	5	6	10
Overseas	C3VQ	748 [†]	662	1,166	712	762	606	283	229	187	171	167	153

Source: Office for National Statistics

1 Please note that the latest deflators have been applied to the business research and development estimates in this bulletin which has resulted in small differences being observed between the BERD and GERD publications.

2 Private Non-Profit totals have been estimated using the 2013 data, as no survey data available for 2014.

- denotes nil, figures unavailable or too small to display.

[†] crosses denote earliest data revision.

Please Note:

Differences may occur between totals and the sum of their independently rounded components.

6

COUNTRY AND REGIONAL BREAKDOWN OF EXPENDITURE ON R&D IN THE UK BY SECTOR OF PERFORMANCE, 2014

Current prices	Sector performing the R&D				£ million
	Government ^{1, 5}	Higher Education ²	Business ³	Private Non-Profit ^{4, 5}	Total
United Kingdom	2,222	7,889	19,935	554	30,600
North East ⁵	..	260	283	..	560
North West ⁵	..	631	1,798	..	2,557
North East and North West⁵	88	891	2,081	57	3,117
Yorkshire and the Humber	70	548	679	4	1,301
East Midlands	87	339	1,474	2	1,902
West Midlands	4	376	1,967	-	2,347
East of England	212	735	4,231	261	5,439
London	333	1,929	1,826	148	4,236
South East	773	1,184	4,405	56	6,418
South West	353	395	1,616	17	2,381
England	1,919	6,397	18,281	545	27,142
Wales	33	285	397	1	716
Scotland	252	1,057	905	8	2,222
Northern Ireland	18	149	352	-	519

Source: Office for National Statistics

1 Government figures include Research Councils and estimates for those areas of Central Government not available from the Government Survey or from local authorities.

2 Higher Education regional data estimates provided by HEFCE.

3 Business regional estimates first published in the BERD publication on 20 November 2015.

4 Private Non-Profit breakdowns estimated using the 2013 data, as no survey data available for 2014.

5 North East and North West regions data have been combined due to confidentiality.

- denotes nil, figures unavailable or too small to display.

.. denotes disclosive figures.

Please note:

Regional expenditure data by funding sector are unavailable.

Differences may occur between totals and the sum of their independently rounded components.

R1

EXPENDITURE ON R&D IN THE UK:
REVISIONS TO SERIES PREVIOUSLY PUBLISHED
 Current prices

£ million

		2012	2013
TOTAL	GLBA	269	394
Sector performing the R&D			
Government	GLBK	59	46
Research Councils	DMRS	-	1
Business Enterprise	GLBL	265	351
Higher Education	GLBM	-30	-3
Private Non-Profit	GLBN	-25	-
Sector funding R&D in the UK			
Government	GLCA	91	199
Research Councils	DMSR	1	-5
Higher Education Funding Councils	DMSS	-	-
Business Enterprise	GLCB	294	288
Higher Education	GLCC	3	-
Private Non-Profit	GLCD	20	26
Overseas	GLCE	-139	-116
		2012	2013
CIVIL	GLBB	273	453
Sector performing the R&D			
Government	GLBO	59	46
Research Councils	DMSC	-	1
Business Enterprise	GLBP	269	411
Higher Education	GLBQ	-30	-3
Private Non-Profit	GLBR	-25	-
Sector funding R&D in the UK			
Government	GLCF	92	248
Research Councils	DMSX	1	-5
Higher Education Funding Councils	DMSY	-	-
Business Enterprise	GLCG	298	299
Higher Education	GLCH	3	-
Private Non-Profit	GLCI	20	26
Overseas	GLCJ	-140	-116
		2012	2013
DEFENCE	GLBC	-3	-59
Sector performing the R&D			
Government	GLBS	-	-
Research Councils	DMSM	-	-
Business Enterprise	GLBT	-3	-59
Higher Education	GLBU	-	-
Private Non-Profit	GLBV	-	-
Sector funding R&D in the UK			
Government	GLCK	-1	-48
Research Councils	GLCM	-	-
Higher Education Funding Councils	DMSZ	-	-
Business Enterprise	GLCL	-3	-11
Higher Education	GLCM	-	-
Private Non-Profit	GLCN	-	-
Overseas	GLCO	2	-

Source: Office for National Statistics

- denotes nil, figures unavailable or too small to display.