



Office for  
Life Sciences

# BIOSCIENCE AND HEALTH TECHNOLOGY SECTOR STATISTICS 2018

May 2019

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# Biotechnology and Health technology Sector Statistics 2018

## Contents

Introduction .....	6
Terminology .....	7
1. Industry overview .....	8
1.1. Core sectors.....	9
1.2. Service & Supply sectors .....	10
2. Sector overviews – Key facts .....	11
2.1 Biopharma sector .....	11
2.2. Biopharma – Core businesses .....	11
2.3. Biopharma – Service & Supply chain .....	12
2.4. Med Tech sector (including digital health) .....	12
2.5. Med Tech – Core businesses.....	12
2.6. Med Tech – Service & Supply chain.....	13
3. Geographical analysis.....	14
4. Digital health and Genomics .....	19
4.1. Digital health.....	19
4.1. Genomics .....	20
5. Industry and sector trends 2009-2018.....	21
5.1. Life sciences industry trends .....	22
5.2. Core Biopharma and Med Tech sector trends .....	24
5.3. Service & Supply sector trends .....	25
5.4 Geographical trends.....	26
Annex 1 – Full data partners acknowledgement statement .....	28
Annex 2 – Methodology .....	29
Annex 3 - Company Ownership.....	35
Annex 4 - Segmentation Codes.....	36
Annex 5 - Data quality principles .....	37

## Key Messages

The UK life sciences industry employs 248,400 people in 5,870<sup>1</sup> businesses and generates a turnover of £73.8bn.

The Core Biopharma and Core Med Tech sectors contain businesses involved in the discovery, development and marketing of therapeutics, and medical devices respectively. The Core Med Tech sector is the largest by employment (97,600 or 39% of the industry) and Core Biopharma is the largest by turnover (£33.4bn or 45% of the industry).

The Core sectors are supported by two Service & Supply sectors that supply materials, equipment and specialist services. These two sectors employ 87,500 in 2,580 businesses with a turnover of £21.7bn.

The largest segment within the industry is small molecules, consisting of businesses with the majority of their activity developing and marketing therapeutics based on this technology. The segment employs 48,900 (20% of the industry) and generates a turnover of £27.8bn (38% of the industry total).

Along with small molecules, the Top 3 Core segments in the industry include digital health (the largest segment by employment in Core Med Tech with 11,100 employees) and in vitro diagnostics (9,000 employees). The Top 3 Core segments in the industry by turnover are small molecules, in vitro diagnostics, and therapeutic proteins and total account for 43% of industry turnover.

Within the two Service & Supply sectors, the two largest segments contain businesses that supply contract manufacturing and research services, and that supply reagents and equipment. In Biopharma, these two segments employ 30,100 with a turnover of £11bn; in Med Tech, these segments employ 11,600 with a turnover of £2.3bn.

80% of the businesses in the industry are SMEs; these employ 23% of the industry total and generate 10% of the turnover. The Core Biopharma sector has a higher percentage of non-SME businesses at 31% compared to 18-19% for all other sectors. The Top 25 Global Pharmaceutical companies with activity in the UK (and are non-SMEs) employ 58% of the Core Biopharma sector.

The South East of England contains the largest population of life sciences industry jobs with a total employment across all four sectors of 58,400 or 24%. The East and North West of England together with the South East are the Top 3 regions by employment.

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<sup>1</sup> The number of business counts at the industry level is lower than the count at the sector level because in the latter analysis some businesses are counted in more than one sector where they have activity in, for example, Core Biopharma and Core Med Tech, which can be the case for larger companies

Employment in the Core Biopharma sector is concentrated in the South East and East of England, and London with 66% of all sector employees, compared to 39% for Core Med Tech employment.

## **Trend Data**

Between 2009 and 2018, the industry increased employment by 17,400 an increase of 8% at a compound annual growth rate of 0.8%. Over the period, all sectors except for Core Biopharma increased employment. This is compared to employment growth in all industries<sup>2</sup> of 12% since 2009 at a CAGR of 1.3%.

The employment decreases in Core Biopharma (8,300 in total over the period) was concentrated between 2010-2014, when a number of the large pharmaceutical companies underwent re-structuring.

Total industry turnover increased by £2.0bn between 2009 to 2018. This was driven by the Service & Supply sectors (£5.9bn) offsetting decreases in Core Biopharma (£3.3bn) and Med Tech (£0.7bn).

Between 2009 and 2018, the single-use technology and orthopaedic devices segments replaced hospital hardware and ophthalmic devices in the industry's top 5 core segments by employment. By turnover, therapeutic proteins replaced vaccines in the top 5 segments over the same period.

Between 2009 and 2018, most regions in England, Wales, and Northern Ireland have seen a net increase in employment in the life sciences industry. The South East of England and West Midlands were exceptions to this, seeing large decreases in employment relating to large pharma restructuring in the South East and decreases across sectors in the West Midlands.

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<sup>2</sup> UK employment (all industries) taken from H100 Regional labour market: Headline Labour Force Survey indicators for all regions 19th March 2019 release

## Introduction

This report contains analysis of trends in the UK life science industry, covering the Biopharma and Med Tech sectors<sup>3</sup>. The three main measures of economic contribution and industry structure are:

- employment - the number of people employed by life science businesses
- turnover - the amount of money taken by businesses within scope of life science sector activities
- number of businesses – the number of life science businesses and their sites registered in the UK

It contains analyses of the industry looking at the economic activity of businesses that market therapeutic products and medical devices as well as the specialist Service & Supply chains that are key parts of the ecosystem. A segmentation approach is applied that enables a detailed analysis of the product and service categories that make up the industry<sup>4</sup>.

The analysis is based on the 2018 database of sites and businesses updated between October and December 2018<sup>5</sup> using the methodology summarised in Annex 2.

The year referred to in this report is the year of the update rather than the year of the turnover and employment figures; turnover and employment are for the latest 12 months available. For the majority of sites, these figures will have been derived from latest accounts submitted by businesses to Companies House; the figures may be submitted up to 9 months after the end of the accounting period (which itself may vary between businesses).

The data, charts, figures, and maps used in this document, plus separate infographics can be found at

<https://www.gov.uk/government/collections/bioscience-and-health-technology-database-annual-reports>

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<sup>3</sup> The data does not include industrial biotechnology, animal health, not-for-profit organisations, public funded institutions or universities

<sup>4</sup> See Annex 3 for a list of the segmentation categories

## Terminology

**Industry:** used to collectively describe all Sectors covered in the analysis

**Sector:** used to describe Core Biopharma, Core Med Tech, Biopharma Service & Supply or Med Tech Service & Supply

**Segment:** used to describe the individual product or service groups within a Sector (see Annex 3 for a detailed list of segments)

**Core Biopharma:** includes all businesses involved in developing and/or producing their own pharmaceutical products - from small, research and development (R&D) focused biotechs to multinational Big Pharma

**Biopharma Service & Supply:** comprises businesses that offer goods and services to Core Biopharma businesses including, for example, Contract Research and Manufacturing Organisations (CRMOs), and suppliers of consumables and reagents for R&D facilities

**Core Med Tech:** includes all businesses whose primary business involves developing and producing Med Tech products, ranging from single-use consumables to complex hospital equipment, including digital health products

**Med Tech Service & Supply:** comprises businesses that offer services to Core Med Tech businesses including, for example, CRMOs, and suppliers of consumables and reagents for R&D facilities

**Digital health:** includes businesses involved in making products for both hospitals and consumers including products such as hospital information systems and mobile medical devices and apps. It is a segment wholly within the Core Med Tech Sector.

**Genomics:** an interdisciplinary field focusing on the study of the human genome and the application of resulting knowledge to human health. It is a cross-cutting categorisation across all four sectors.

**Business:** used to describe an entity that is the legal owner of a group of trading addresses or sites and legal entities. A business may consist of more than one site or registered company. The term business is used in this document when discussing the whole life sciences industry and the four sectors.

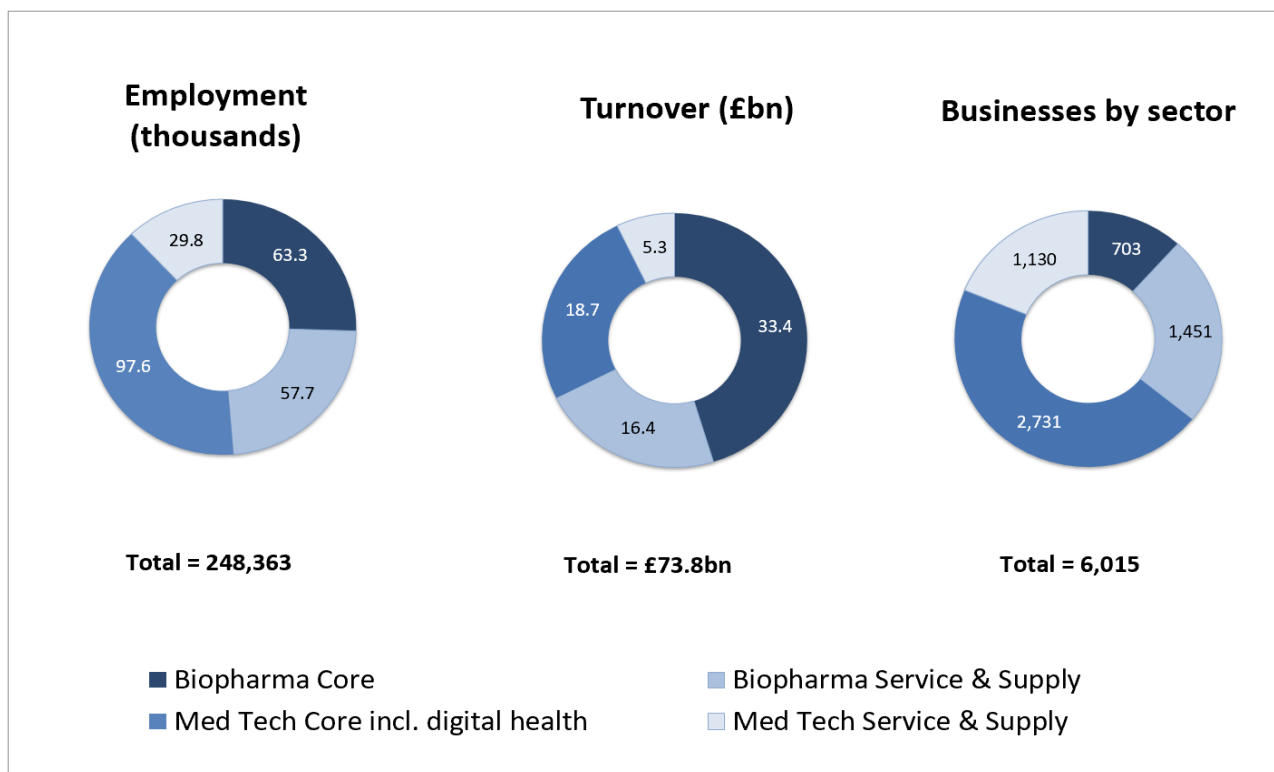
There are 49 businesses that are active in more than one sector which means there is a small difference in the count of businesses at the industry level (5,543) compared to the sector level (5,592). There is no difference in the sums of employment or turnover at the different levels of analysis. See Annex 2 for more detail.

**Sites:** used when referring to the data at the segment or geographical level. All data in the spreadsheets that accompany this document are analysed at the site level. This is the level at which all data entries (6,340 records) are held and analysed in the database. A single site is segmented and has employment and turnover assigned to it. As a business can have multiple sites and can operate in more than one segment, the total counts of sites at segment level is greater than the count of businesses referred to at sector level.

**SME status:** based on the European definition of Small and Medium-sized Enterprises (SMEs) and refers to businesses with fewer than 250 employees and which either have annual turnover up to and including €50m and/or have an annual balance sheet total up to and including €43m.

# 1. Industry overview

Figure 1: Total employment, turnover and number of businesses in the life sciences industry by sector



The life sciences industry employs approximately 248,400 people in the UK. Approximately 127,400 (51% of the industry total) are employed in the Med Tech sector comprising the Core Med Tech and the Service & Supply segments. The Core Med Tech sector is the largest in the industry by employment and number of businesses with a total employment of 97,600 (39% of the industry) and 2,730 businesses (45% of the industry).

The digital health segment is included in the Core Med Tech sector and is the largest segment in this sector with 11,100 employees (4.5% of the industry) and the second largest in the Core sector by employment.

The Core Biopharma sector contributes the largest turnover to the industry at £33.4bn (45% of the industry). This turnover is generated from 703 business (12% of the industry). Within the Core Biopharma sector, the Top 25 global pharmaceutical<sup>6</sup> companies by revenue make up 62% of this turnover (£20.6bn) and employ 58% (36,800) of the Core Biopharma employees.

<sup>6</sup> <http://www.pharmexec.com/pharm-execs-top-50-companies-2018>



The Service & Supply companies that support the Core Biopharma and Med Tech sectors have a combined employment of 87,500 compared to 160,900 for the two Core sectors, while turnover is £21.7bn compared to £52.1bn.

### 1.1. Core sectors

The two Core segments of the industry contain an estimated 3,400 businesses, with the majority in the Med Tech sector (80%). The businesses in these two sectors focus on the discovery, development and marketing of new therapies and medical devices.

- On average, a Biopharma sector business has a turnover six times of that of a Med Tech business and employs twice as many people.
- 31% of Biopharma sites have a turnover greater than £5m compared to 19% for Med Tech.
- 8% of Biopharma sites have 250 or more employees compared to 2% for Med Tech.

The global Top 30 Core Med Tech businesses by revenue<sup>7</sup> employ 19% of the total Core Med Tech sector and their revenue accounts for 27% of the sector total.

The global Top 25 Core Biopharma businesses by revenue<sup>8</sup> employ 58% of the total Core Biopharma sector and their revenue accounts for 62% of the sector total.

The largest segment in the Core Biopharma sector by employment is small molecules, employing 77% of the Core Biopharma sector. In contrast, in Core Med Tech, the largest segment is Digital Health that employs 11% of the sector total. The top 14 of 20 segments employ 90% of the Core Med Tech sector.

The five largest employment segments in the two Core sectors combined employ 85,500 or 53% of the total in the Core sectors. Of the five largest segments, all but small molecules are segments within Core Med Tech. The top five segments in the two Core sectors by turnover (small molecules, in vitro diagnostics, therapeutic proteins, single use technology, and orthopaedic devices) have a combined turnover of £34.8bn or 67% of the total Core sectors; £27.8bn of which is from the small molecules segment.

Of the businesses in Core Biopharma 69% are SMEs compared to 81% in the Core Med Tech sector.

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<sup>7</sup> The Top 30 ranking as based on [https://www.mpo-mag.com/issues/2018-07-01/view\\_features/the-2018-top-30-global-medical-device-companies](https://www.mpo-mag.com/issues/2018-07-01/view_features/the-2018-top-30-global-medical-device-companies)

<sup>8</sup> The Top 25 ranking based on <http://www.pharmexec.com/pharm-execs-top-50-companies-2018>

## 1.2. Service & Supply sectors

Both the Core Biopharma and Med Tech businesses are supported by large specialist UK based Service & Supply sectors.

The Biopharma Service & Supply sector employs 57,700 people in 1,450 businesses and generates a turnover of £16.4bn. The largest segments by employment in this sector are contract manufacturing and research, reagent & equipment suppliers, and clinical research organisation that together employ 39,300 people and account for 83% (£13.6bn) of the sector turnover.

The Med Tech Service & Supply chain sector employs 29,800 people in 1,130 businesses, with a turnover of £5.3bn. The largest segments in this sector are reagent & equipment suppliers, contract manufacturing and research, and specialist consultants (excluding regulatory) that together employ 15,300 people and account for 51% (£2.7bn) of the sector turnover.

## 2. Sector overviews – Key facts

### 2.1. Biopharma sector

- In total, the sector employs 118,000 people; 63,300 in Core Biopharma businesses and 54,700 in Service & Supply businesses. The combined turnover of the sector is £50bn.
- Employment in the sector is concentrated in the south east and North West of England, and in Scotland.
- Large non-SME businesses are the major employers in Core Biopharma (92% of all employment in the sector). In the Service & Supply sector, the majority (81%) of the businesses are SMEs and employ 22% of the sector.

### 2.2. Biopharma – Core businesses

**Overall** the Core Biopharma sector contains 703 businesses employing 63,300 people and a turnover of £33.4bn in 2018.

**The sector breakdown** shows that businesses whose main economic activity involves small molecule therapeutics form the largest segment, accounting for 67% (585) of sites, 77% of employees (48,900) and 83% (£27.8bn) of turnover. Antibodies, therapeutic proteins and vaccines are the next largest segments, together making up 19% (12,000) and 15% (£4.9bn) of employment and turnover respectively.

**Geographical analysis of employment** shows Core Biopharma businesses in all areas of the UK with the greatest concentration in the South East, East of England, London, and the North West of England which together account for 80% (50,650) of Core Biopharma employment.

**Analysing the size of the businesses** shows 31% (220) of Core Biopharma businesses are non-SMEs. These large businesses employ 58,000 people (92% of Core Biopharma employment) and account for £32.4bn of turnover (97% of Core Biopharma turnover). They represent 44% of total life sciences industry turnover and 23% of employment.

## 2.3. Biopharma – Service & Supply chain

**Overall** the Biopharma Service & Supply chain consists of 1,450 businesses employing 57,700 people with a turnover of £16.4bn in 2018.

**The sector breakdown** shows the largest employing segment is contract manufacturing and research organisations that consist of 338 sites employing 19,200 people. The largest segment in terms of turnover is reagent & equipment suppliers, which represents 46% (£7.6bn) of the total. Clinical research organisations completes the Top 3 Biopharma Service & Supply segments; in total the Top 3 account for 68% (39,300) of the employment.

**Geographical analysis of employment** shows the South East and East of England combined have the most Service & Supply businesses (590) and employees (39%), followed by Scotland (11%), and the North West of England (10%).

**Analysing the size of businesses shows** that the Biopharma Service & Supply sector is predominately composed of SMEs (1,180) that make up 81% of all businesses, yet they represent only 22% of employment (12,800 people) and 9% of turnover (£1.5bn) for the sector.

## 2.4. Med Tech sector (including digital health)

- In total, the sector employs 127,400 people; 97,600 in Core Med Tech businesses and 29,800 in Service & Supply businesses. The combined turnover of the sector is £24bn.
- Core Med Tech employment is spread across the UK. While the South East and North West of England, and the East Midlands account for 48% of the employment in the Service & Supply sector, 61% is outside of the south east of England, the normal hub for such services.
- SMEs in both Core Med Tech and Service & Supply account for a similar proportion of businesses (81% and 82% respectively) and employment (30% and 31% respectively).

## 2.5. Med Tech – Core businesses

**Overall** the Core Med Tech sector contains 2,730 businesses, employing 97,600 people with a turnover of £18.7bn in 2018.

**The sector breakdown** shows the largest segment by turnover is in vitro diagnostics followed by single use technology, orthopaedic devices, digital health, and assistive technology. These top five segments account for 42% (£7.8bn) of the Core Med Tech turnover. Digital health

technology is the largest segment by employment followed by in vitro diagnostics, single use technology, orthopaedics, and assistive technology. These top five account for 46% (44,800) of sector employment.

**Geographical analysis of employment** shows there are sites spread across the UK and employment is less concentrated in the South East, East of England, and London. Compared to the Core Biopharma sector where 34% of employment is outside these regions, the majority (61%; 59,700) of Core Med Tech employment is outside of the south east of England.

**Analysis of the size of businesses** shows that of the 2,740 businesses in Core Med Tech, 81% (2,220) are SMEs. They represent 30% (29,600) of Core Med Tech employment and 20% (£3.7bn) of Core Med Tech turnover. Core Med Tech SMEs account for 46% of the total number of life sciences SMEs.

## 2.6. Med Tech – Service & Supply chain

**Overall** the sector contains 1,130 businesses that employ 29,800 and generates a turnover of £5.3bn in 2018.

**The sector breakdown** shows the largest segment of the sector is reagent, equipment and consumables suppliers, which has the highest number of sites (325) and employs 24% (7,100) of the sector's total and 31% (£1.7bn) of its turnover. The next largest segments by employment are contract manufacturing and research followed by specialist consultants.

**Geographical analysis** shows, in contrast to Core Med Tech, the top 3 areas are the South East and North West of England, and the East Midlands. These three areas account for 48% (14,200) of the employment and 51% (£2.7bn) of the sector turnover.

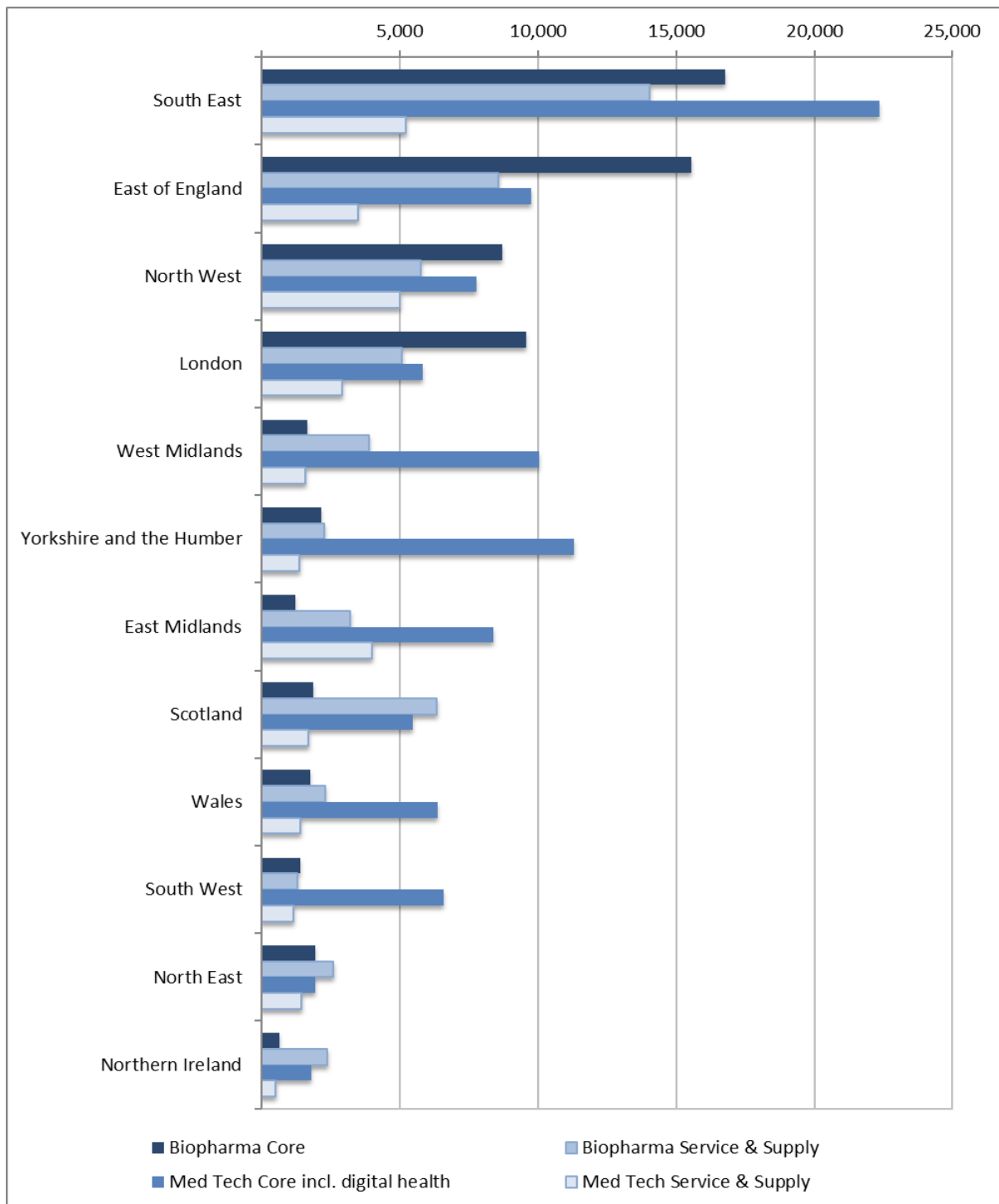
**Analysis of the size of businesses** shows that 82% (922) of businesses are SMEs, employing 9,100 people (31% of Med Tech Service & Supply) and accounting for £1.2bn (23%) of turnover.

### 3. Geographical analysis

- The South East of England contains the largest population of life sciences industry jobs with a total employment across all four sectors of 58,400 (24%). The East and North West of England together with the South East are the Top 3 regions by employment.
- The Core Biopharma sector is concentrated within the South East and East of England, particularly in an area stretching from Cambridge to Reading, and areas around Stevenage and in London. In the North West, Core Biopharma businesses are located along the corridor running from Liverpool to Manchester.
- Core Med Tech has concentrations of employment around the major cities in the Midlands and Yorkshire including Leeds, Sheffield, and Birmingham, as well as London and Reading.
- The Service & Supply sectors' employment is distributed in a similar pattern to the sector they serve but less concentrated around the major conurbations.

The distribution of employment by sector is shown in Figure 2. The South East of England contains the largest population of life sciences industry jobs with 58,400 (24% of the industry) employed across all four sectors. The Top 3 regions by employment include the South East followed by East of England, and the North West. Together these regions contain 50% (123,000) of all life sciences industry employees.

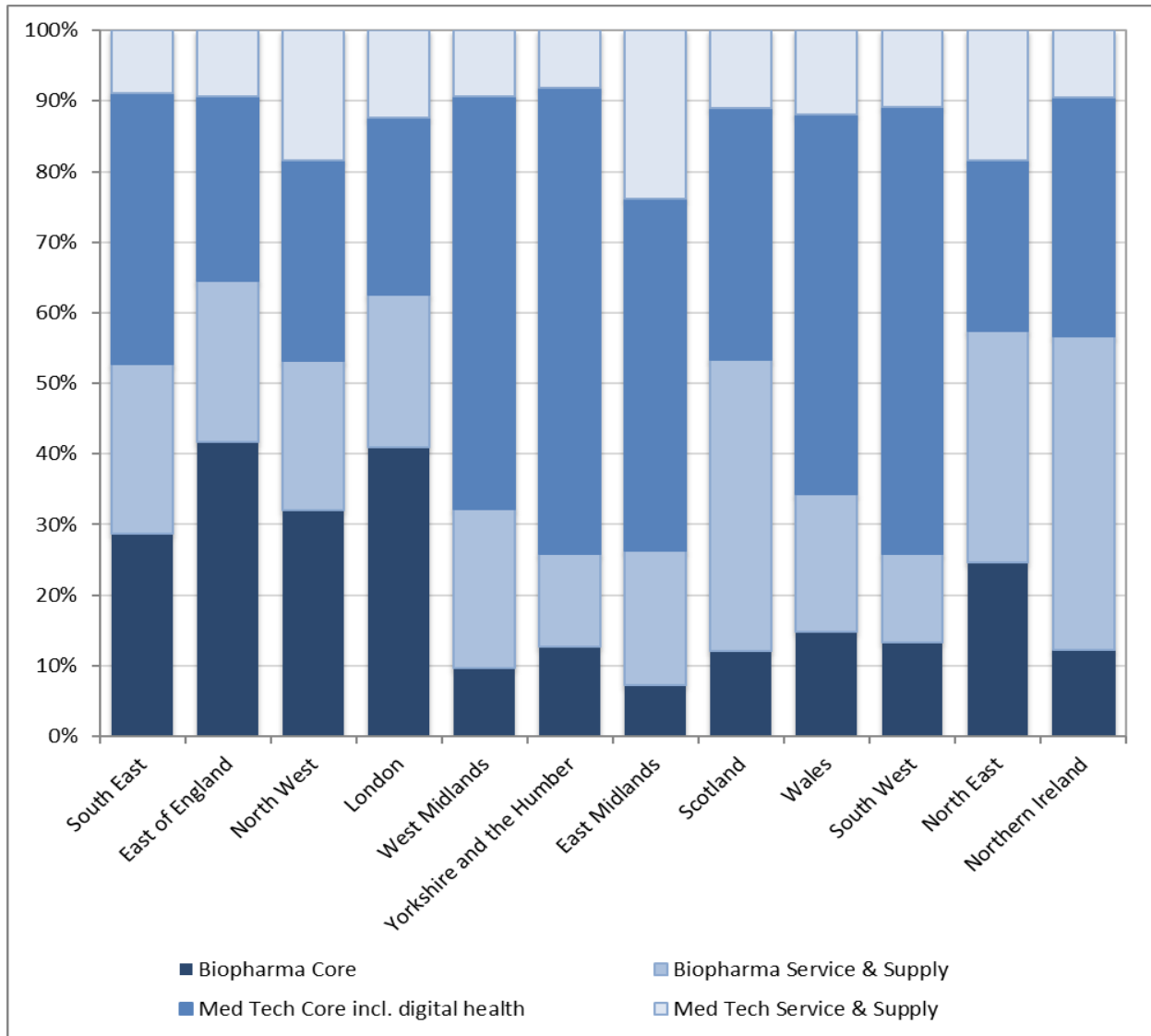
**Figure 2: The distribution of the industry employment by sector across the regions of England and in Northern Ireland, Scotland, and Wales**



The relative contribution of the four sectors to the overall life sciences employment in the regions is shown in Figure 3. In the East of England, the North West, and London the Core Biopharma sector accounts for more than 30% of life sciences employment; Biopharma Service & Supply accounts for more than 30% of employment in Scotland, the North East of England, and Northern Ireland; Core Med Tech accounts for more than half of life sciences

employment in West Midlands, Yorkshire & Humber, Wales, and the South West of England; no region has Med Tech Service & Supply employment greater than 25%.

**Figure 3: Regional employment in the life science sector displayed as a percentage of the total life sciences employment in the region**



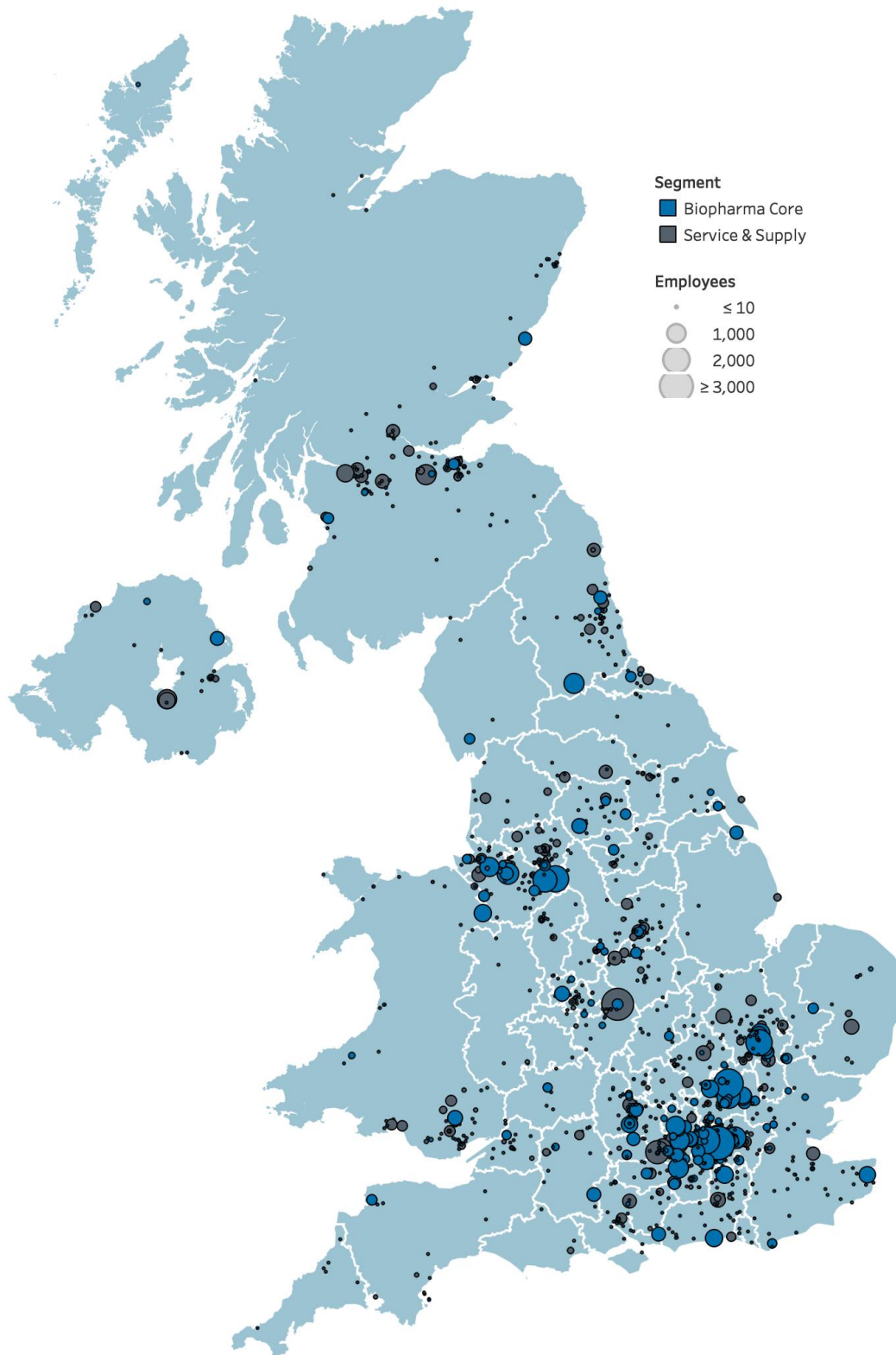
Maps of the distribution of life sciences employment across the UK gives detail on the location concentrations of employment.

The Core Biopharma sector is concentrated within the South East and East of England particularly in an area stretching from Cambridge to Reading including areas around Stevenage and in London. In the North West, Core Biopharma businesses are located along the corridor running from Liverpool to Manchester.

The Biopharma Service & Supply sector, while showing similar concentrations to Core Biopharma, is more widely distributed with 58% (compared to 80%) of the employment in the same Top 4 regions. In particular, Scotland contains the third largest concentration of employment representing 11% of the UK sector.

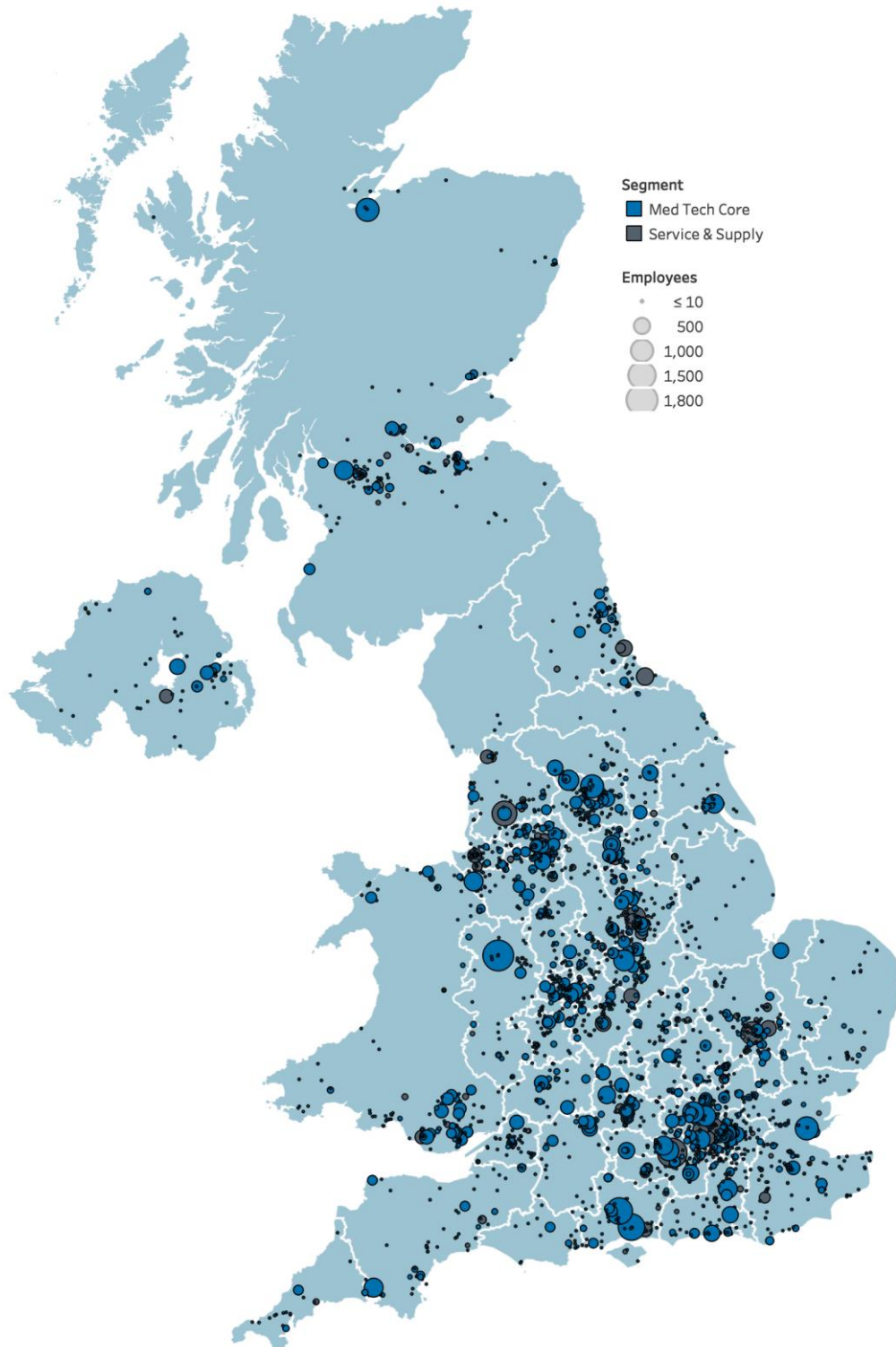


**Figure 4: Map showing the location and relative level of employment for the Core Biopharma and Service & Supply sectors**



The Core Med Tech and Service & Supply sectors employment has concentrations of employment in areas around London and in the North West of England. In contrast to the Biopharma sectors, Core Med Tech has concentrations of employment around the major cities in the Midlands and Yorkshire including Leeds, Sheffield and Birmingham.

Figure 5: Map showing the location and relative level of employment for the Core Med Tech and Service & Supply sectors



## 4. Digital health and Genomics

- The digital health segment employs 11,100 people and has a total turnover of £1.4bn.
- Between 2009 to 2018, the segment has increased employment by 2,100 and turnover by £152m.
- Of the businesses where the formation date is known, 59% (350) of digital health sites were formed in the last 10 years.
- The Top 3 regions for employment in the segment are London, Yorkshire and Humber, and the South East.
- Overall genomics related activity in the UK is located in 57 sites with 2,400 employees and a total turnover estimated at £1.9bn.
- The largest activity in the Genomics segment is in sequencing consumables and instruments businesses that employ 1,600 and generated £1.7bn in turnover

### 4.1. Digital health

**The digital health segment** is composed of 600 sites, the highest number of sites for a Core segment in the life sciences industry. Digital health employs 11,100 people and has a total turnover of £1.4bn.

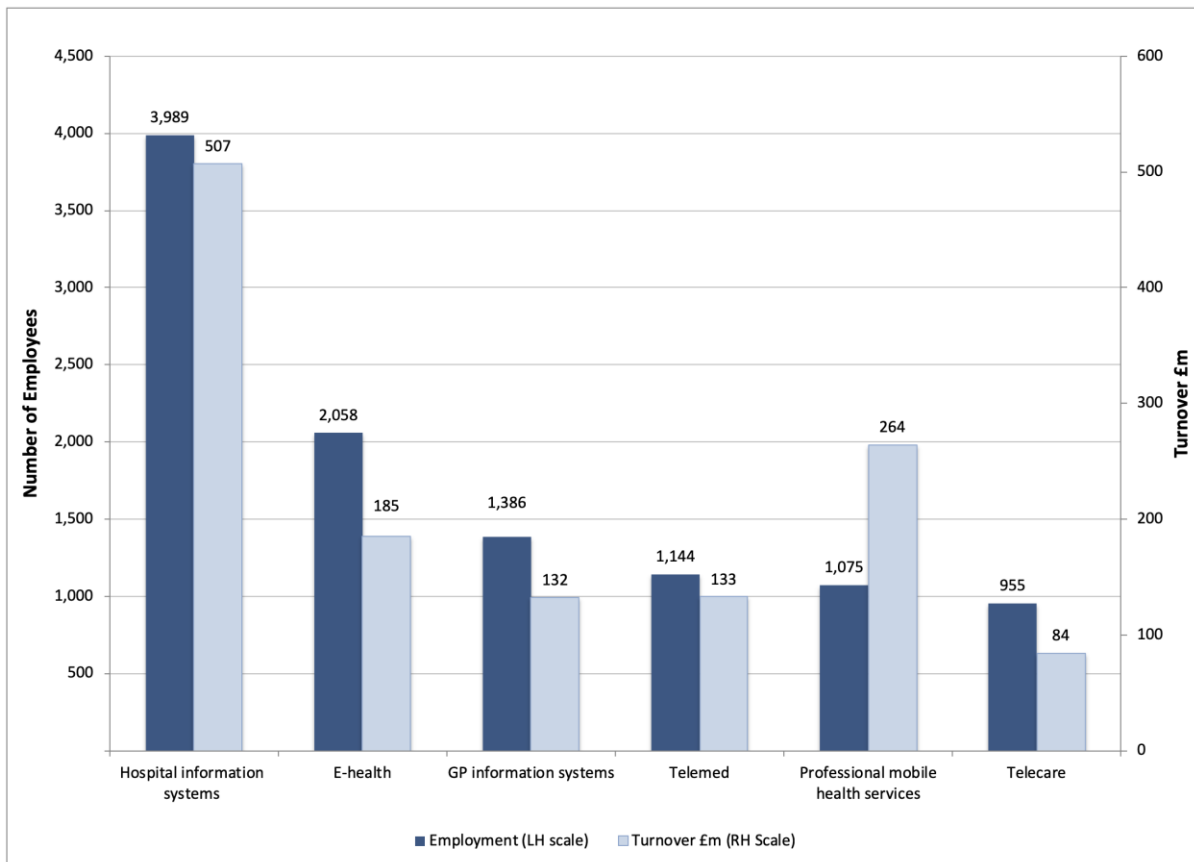
The estimated turnover and employment includes only businesses where a significant proportion (over 20%) of their economic activity is in digital health. This approach does not include all the economic activity associated with, for example, large diversified businesses where digital health is not their main activity.

**Geographically**, 28% of the sites are located in London along with 24% of the employment in the segment. The Top 3 regions for employment in the segment are London, Yorkshire and Humber, and the South East. These regions together employ 60% of the segment.

**Analysis of the sector breakdown** shows that, within digital health, hospital information systems accounts for 37% (£510m) of turnover and 36% (4,000) of employment. The e-health analytics and GP information system are the next largest segments and together the Top 3 sub-segments employ 7,400 people, or 67% of the segment.

**Analysis of the size of businesses** shows that 79% (459) of digital health businesses are SMEs and employ 34% of digital health jobs (3,800), contributing £300m in turnover (24%) of the digital health segment turnover.

**Figure 6: The distribution of employment and turnover for sub-segments of Digital Health (only segments with >900 employees shown)**



## 4.2. Genomics

Genomics is an interdisciplinary field of science and technology focused on the study of genomes. In this analysis the focus is on the study of the human genome and the application of the resulting knowledge to human health. Since the instigation of the Human Genome Project in 2001, the field and its applications have grown. The global market for equipment, reagents, and services based on genomics was estimated at over £8bn in 2015 and is forecast to grow rapidly.<sup>9</sup>

**Overall genomics related activity** in the UK is located in 57 sites with 2,400 employees and a total turnover estimated at £1.9bn<sup>10</sup>. Between 2016 and 2018 the activity has increased employment by 590 and turnover by £0.8bn.

**The largest activity in the segment** is in sequencing consumables and instruments businesses that employ 1,600 and generated £1.7bn in turnover. Within this segment, sale of instruments is the largest activity employing 513 (68% of the genomics total) and generating a turnover of £1.6bn (93% of the genomics total).

<sup>9</sup> Genomics in the UK, Deloitte study for the Office of Life Sciences, Sept 2015

<sup>10</sup> The economic activity is based primarily on businesses that have the majority of their activity in the sector either selling equipment, reagents or services. The analysis does not include in-house use or application of genomics for example for drug discovery & development

## 5. Industry and sector trends 2009-2018

In this section, the changes in employment and turnover between 2009 to 2018 are analysed using the same methodology as that from the supplemental report<sup>11</sup>, published in 2018, using a subset of the database records. These cover 97.7% of all 2018 records.

- Over the period 2009 to 2018, the life sciences industry increased employment by 17,400 an increase of 8% over 2009, at a compound annual growth rate (CAGR) of 0.8%
- Total industry turnover increased by £1.2bn between 2009 and 2018, which was driven by the Service & Supply sectors (£4.8bn) offsetting decreases in Core Biopharma (£3.1bn) and Med Tech (£0.5bn).
- Over the period, Core Med Tech and the two Service & Supply sectors showed overall increases in employment totalling 25,600, while the Core Biopharma sector reduced employment by 8,300.
- This decrease in the Core Biopharma sector was concentrated in the small molecule sector and over the period 2010-2014, during which time a number of the Top 25 pharmaceutical companies underwent re-structuring.
- The Core Med Tech employment grew by 10,400 between 2009 to 2018, a 12% increase.
- Both Service & Supply sectors employment grew from 2009 to 2018 by 15,300, with the largest increase in employment in the Biopharma Service & Supply sector (8,700).
- Over the 10 year period, the majority of regions in England, Wales, and Northern Ireland have seen a net increase in employment in the life sciences industry. The South East of England and West Midlands were the exception to this, seeing large decreases in employment.

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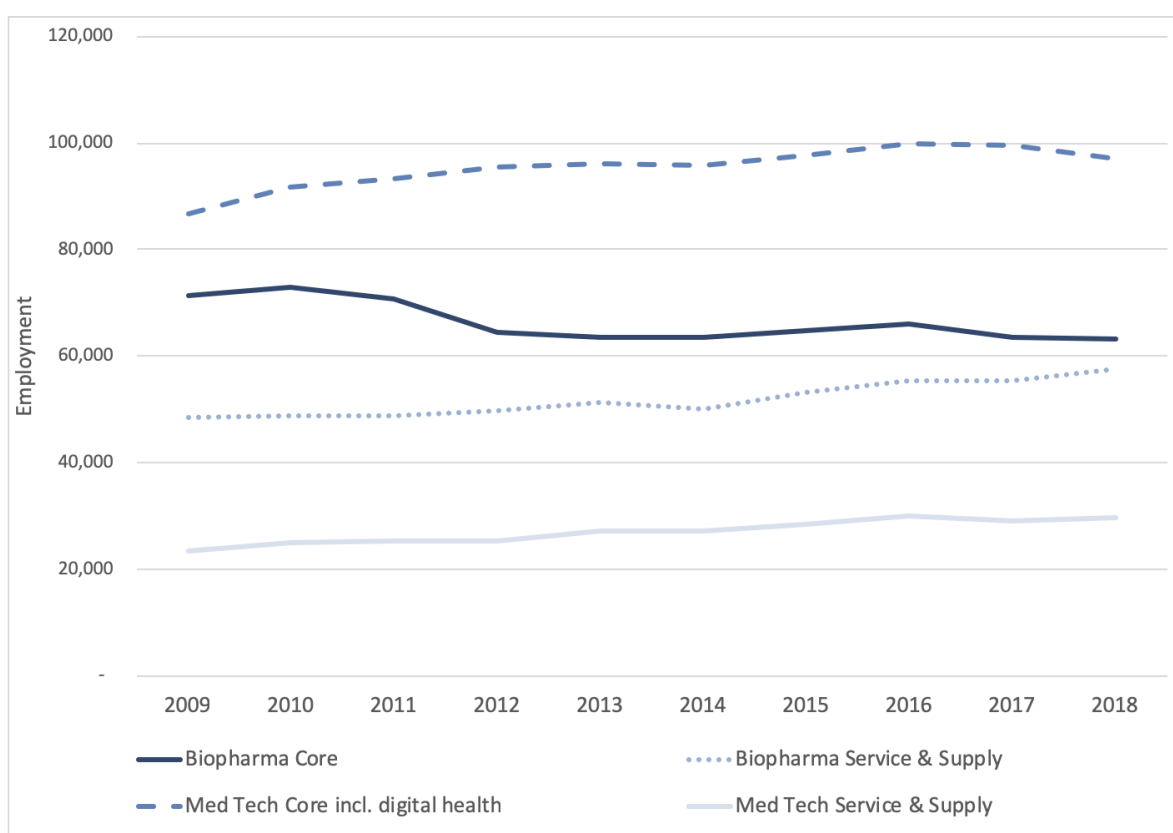
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## 5.1. Life sciences industry trends

Over the period 2009 to 2018, the life sciences industry increased employment by 17,400, an increase of 8% compared to 2009, at a compound annual growth rate (CAGR)<sup>12</sup> of 0.8%. This is compared to employment growth in all industries<sup>13</sup> of 12% since 2009 at a CAGR of 1.3%. Over the period, Core Med Tech and the two Service & Supply sectors showed overall increases in employment totalling 25,600 while the Core Biopharma sector reduced employment by 8,300. Several of the Top 25 companies, who are the majority employers in the segment, completed site closures and reorganisations during this period. Both Core sectors recorded falls in employment over the last year in contrast to the Service & Supply sectors that both recorded increases.

**Figure 7: Employment by life sciences industry 2009 to 2018**



Total industry turnover increased by £2.0bn between 2009 and 2018, which was the result of increases in the Service & Supply sectors (£5.9bn) offsetting decreases in Core Biopharma (£3.3bn) and Med Tech (£0.7bn). From 2009 to 2011, total industry turnover grew but a decline followed until 2014 after which growth resumed. This decrease was primarily driven by decreased revenue of £6.9bn in the Core Biopharma sector between 2010 and 2016 after

<sup>13</sup> UK employment (all industries) taken from H100 Regional labour market: Headline Labour Force Survey indicators for all regions 19th March 2019 release

which turnover has remained steady. Growth in the industry from 2014 was also positively impacted by increases of £4.5bn from 2014 in the Biopharma Service & Supply sector.

**Table 1: Employment, turnover, and number of sites for the life sciences industry 2009 to 2018**

	Year									
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Employment	230,130	238,660	238,450	234,790	238,250	236,810	244,000	251,040	247,580	247,480
Turnover £bn (2018 prices)	71.8	77.1	77.6	76.1	71.4	68.8	69.1	70.8	73.0	73.8
Sites	5,920	6,110	6,240	6,360	6,490	6,370	6,460	6,370	6,250	6,590

Comparing the Top 5 segments of 2018 to those of 2009:

- The Top 3 segments by employment have remained the same but fourth and fifth have changed with single use technology and orthopaedic devices replacing hospital hardware and ophthalmic devices.
- The Top 5 by turnover also changed, with vaccines being replaced by therapeutic proteins in the list.

**Figure 8: Top 5 segments in 2009 and 2018 in the Core sectors of Biopharma and Med Tech ranked by employment, turnover, and number of sites**

	2009 Top 5 for core segments (excluding service & supply chain)				2018 Top 5 for core segments (excluding service & supply chain)		
	Employment	Turnover	Sites		Employment	Turnover	Sites
1st	Small Molecules	Small Molecules	Small Molecules	1st	Small Molecules	Small Molecules	Digital Health
2nd	In vitro diagnostic technology	Vaccines	Assistive Technology	2nd	Digital Health	In vitro diagnostic technology	Small Molecules
3rd	Digital Health	Single use technology	Digital Health	3rd	In vitro diagnostic technology	Therapeutic Proteins	Assistive Technology
4th	Hospital hardware inc. ambulatory	Orthopaedic Devices	In vitro diagnostic technology	4th	Single use technology	Single use technology	In vitro diagnostic technology
5th	Ophthalmic Devices/ Equipment	In vitro diagnostic technology	Single use technology	5th	Orthopaedic Devices	Orthopaedic Devices	Single use technology

## 5.2. Core Biopharma and Med Tech sector trends

The Core Biopharma sector employment fell by 8,300 (-12%) between 2009 and 2018, at a CAGR of -1.4%. Most of this decrease happened between 2010 and 2014, when employment in the small molecules segment fell by 8,400. Since 2014, sector employment has remained approximately the same. The segments associated with biological or advanced therapy medicinal products (ATMP) therapeutics all showed employment increase totalling 4,000.

Over the 10 years, this sector's turnover fell by £3.3bn. The decrease in turnover began in 2011 then returned to growth from 2015, and has stabilised over the past three years.

**Table 2: Employment, turnover, and number of sites for the Core Biopharma sector 2009 to 2018**

	Year									
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Employment	71,440	72,920	70,760	64,420	63,600	63,530	64,670	65,960	63,460	63,160
Turnover £bn (2018 prices)	36.7	40.2	40.2	38.7	34.1	33.6	32.6	33.4	33.6	33.4
Sites	740	760	770	790	810	790	810	820	830	860

The Core Med Tech sector employment grew by 10,400 over the period 2009 to 2018, an increase of 12% on 2009. The sector employment grew at a CAGR of 1.3% with the trend of growth slowing and then falling slightly between 2016 and 2018. 14 out of 20 segments in Core Med Tech had an increase in employment totalling 14,500, and six segments accounted for 82% of this increase, led by single use technology. Over the whole period, turnover fell by £0.7bn.

In the Digital Health segment, employment increased by 2,100 and turnover by £152m, which represents 23% and 13% growth respectively. The number of sites has also increased from 310 in 2009 to 590 in 2018. Of the businesses where the formation date is known, 51% (299) of digital health businesses were formed in 2010 or later.

**Table 3: Employment, turnover, and number of sites for the Core Med Tech sector 2009 to 2018**

	Year									
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Employment	86,780	91,840	93,260	95,440	96,220	95,960	97,610	99,740	99,600	97,140
Turnover £bn (2018 prices)	19.4	20.1	20.1	20.1	20.0	18.9	18.8	18.8	18.9	18.7
Sites	2,940	3,000	3,040	3,050	3,098	2,980	3,010	2,950	2,870	3,000



### 5.3. Service & Supply sector trends

Both Service & Supply sectors increased employment and turnover between 2009 and 2018, by 15,300 and £5.9bn respectively, with the largest increase in employment in the Biopharma Service & Supply sector (8,700). The largest increases in these sectors were in the Biopharma contract manufacturing and research segment (4,400), and Med Tech training segment (1,400).

Between 2009 and 2018, the Biopharma Service & Supply sector employment and turnover increased by 18% and by 30% (£3.8bn) respectively. With the exception of between 2013 and 2014, there was growth in employment in all years and the CAGR over the period was 1.9%.

**Table 4: Employment, turnover, and number of sites for the Biopharma Service & Supply sector 2009 to 2018**

	Year									
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Employment	48,610	48,960	48,960	49,700	51,270	50,180	53,190	55,380	55,420	57,490
Turnover £bn (2018 prices)	12.6	13.1	13.4	13.2	13.1	11.9	13.0	13.7	15.5	16.4
Sites	1,250	1,310	1,380	1,440	1,500	1,500	1,530	1,520	1,500	1,570

Between 2009 and 2018, the Med Tech Service & Supply sector employment increased by 6,400 and turnover by £2.1bn over the period. The sector employment had a CAGR of 2.7%.

**Table 3: Employment, turnover, and number of sites for the Med Tech Service & Supply sector 2009 to 2018**

	Year									
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Employment	23,310	24,940	25,480	25,230	27,160	27,140	28,530	29,960	29,100	29,690
Turnover £bn (2018 prices)	3.2	3.7	3.9	4.1	4.2	4.4	4.7	5.0	5.1	5.3
Sites	1,000	1,040	1,060	1,080	1,100	1,110	1,110	1,090	1,090	1,150

## 5.4. Geographical trends

When comparing geographical employment data over the 10 year period, the majority of regions in England, Wales, and Northern Ireland have seen a net<sup>14</sup> increase in employment in the life sciences industry. Two regions in England, the West Midlands and the South East saw employment fall by over 2,000 in each region, while employment in Scotland fell slightly.

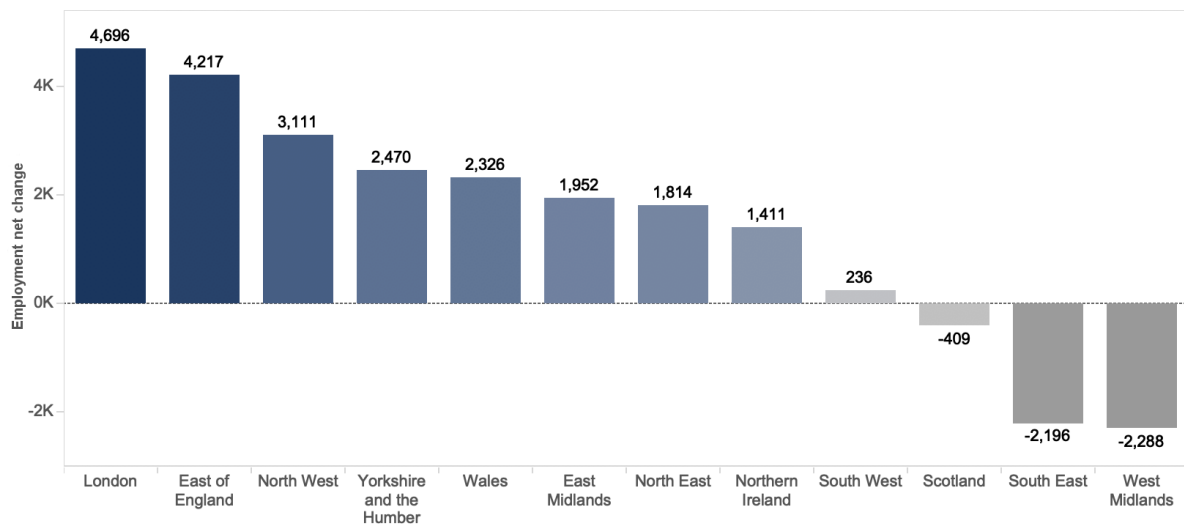
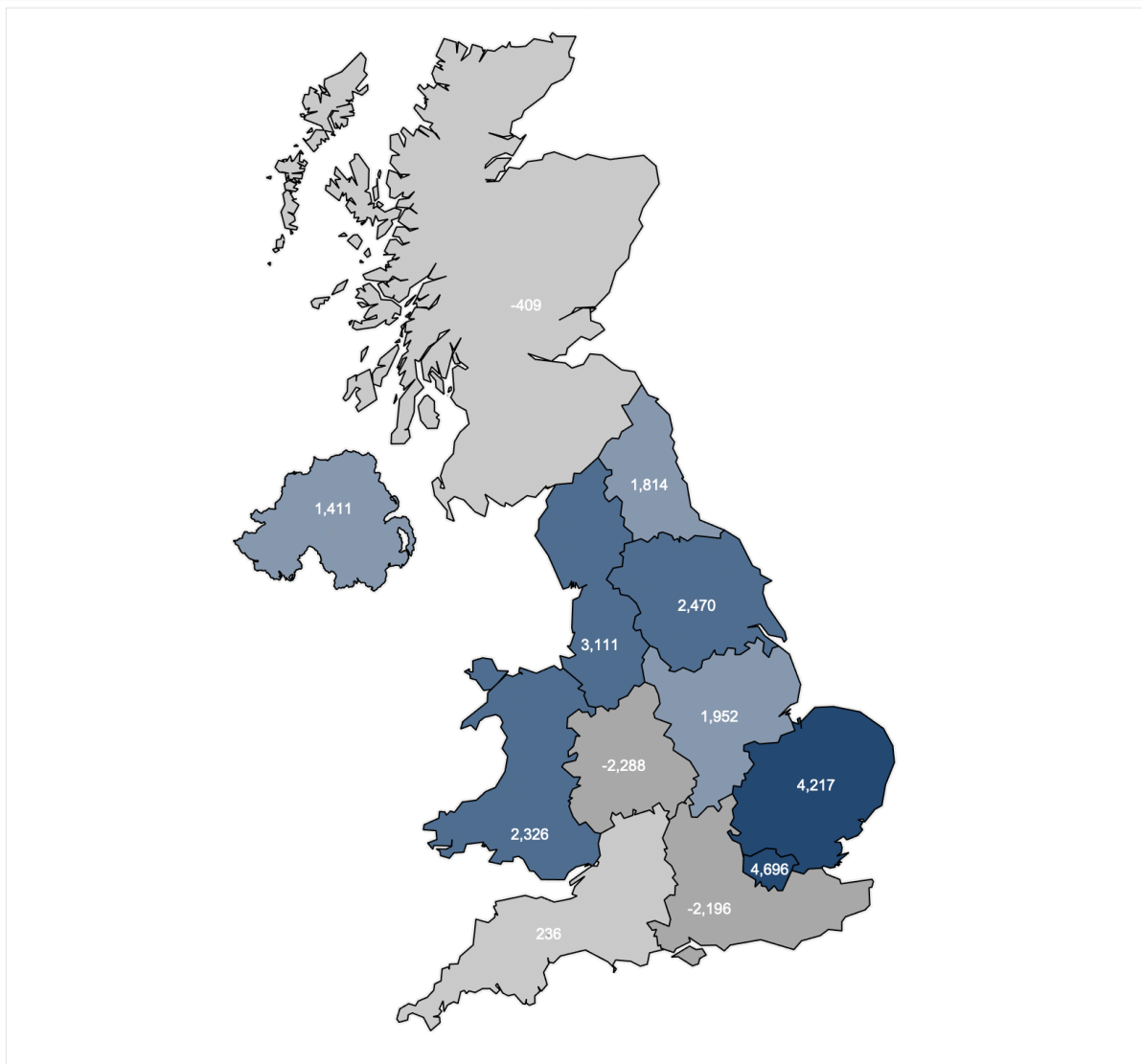
The geographical net changes in employment vary by life sciences sector. These major changes are:

1. Core Biopharma – Large decrease in employment in the South East of England and an increase in the East of England. The main cause of the fall in employment in the South East was the restructuring of three Top 25 Pharma businesses that resulted in closures of a number sites in the region.
2. Core Med Tech – Increases in all regions of England except a large decrease in the West Midlands. Increases in Northern Ireland and Wales but a large decrease in Scotland. The fall in employment in the West Midlands is due to a mixture of causes including movement of businesses to other UK regions and acquisition of businesses by overseas owners leading to restructuring. The main cause of the fall in Scotland was the closure of a manufacturing plant operated by one of the Top 30 Medical Device businesses.
3. Biopharma and Med Tech Service & Supply – Increases in the majority of regions of England and in Northern Ireland, Scotland, and Wales. Large increase in the South East of England in Med Tech Service & Supply and London, North West, and Northern Ireland in Biopharma Service & Supply. The West Midlands is the only region to see decreases in both Service & Supply sectors.

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<sup>14</sup> The net changes in employment in a region will be the result of a combination of new company formation, growth at existing companies, movement between regions, inward investment into the UK and companies reducing employment or trading.

**Figure 9: Net changes in employment between 2009 and 2018 for the life sciences industry in regions of England, Northern Ireland, Scotland, and Wales**



## Annex 1– Full data partners acknowledgement statement

The Office for Life Sciences gratefully acknowledge the contribution of the following regional and national organisations in the compilation of the life sciences database over the past ten years.

The content of the database has been derived from a variety of proprietary data sources which have been provided under license. The Office for Life Sciences would like to acknowledge the assistance given by the owners of these data sources.

Business Information was accessed under license by Dun & Bradstreet (D&B) Limited and the FAME database from Bureau van Dijk Electronic Publishing. More details on how this data is used can be found in Annex 2 below.

The database construction, data integration, data analysis and commentary preparation were completed by a consortium led by Cels Business Services (CBSL) Ltd. The consortium included Kepier & Company Ltd and Lindum Research.

### Data partners

- Association of British Healthcare Industries (ABHI)
- Association of the British Pharmaceutical Industry (ABPI)
- AXREM
- BioIndustry Association (BIA)
- BioNow
- Biopartner
- Biosciences Knowledge Transfer Network (KTN)
- British Healthcare Trade Association (BHTA)
- British In Vitro Diagnostics Association (BIVDA)
- HealthTech and Medicines Knowledge Transfer Network (KTN)
- Innovate UK
- Invest Northern Ireland
- MedCity
- Medilink East Midlands
- Medilink North of England
- Medilink South West
- Medilink West Midlands
- MediWales
- MHRA
- OBN
- One Nucleus
- Scottish Enterprise
- South East Health Technologies Alliance (SEHTA)
- TechUK
- Welsh Government
- West of England LEP

## Annex 2 – Methodology

### Summary

The annual update of the database is carried out in four main phases: compiling information on new businesses and existing businesses; classification or segmentation of new businesses; matching of business details with economic data from external databases; and validation of the data set.

Information on new businesses is sourced from the data partners and also by searches of publicly available and subscription databases. The data partners provide lists of businesses from their internal databases, which contain both potentially new businesses (those businesses that have been formed in the period after the last annual update) and existing businesses (those businesses that are already in the database). For existing businesses, this includes information the data partners have obtained on address changes, any information on employees at a location, or suggested segmentation changes.

The information from data partners and other information sources is cleansed to remove duplicates and records already in the database and is then segmented. Segmentation assigns each new business and site to a sector and segment. In some cases, allocation can be to more than one sector or segment, for example some large multi-national businesses produce both pharmaceutical and medical devices. If, based on the information available, a business cannot be assigned to a sector and segment, it is deemed to be not-in-scope (NIS). Such NIS business information is retained but is not included in the data set used to analysis the industry.

In order for a business to be classified as in-scope and their data to be included, they are assessed against the following criteria: have a legal entity in the UK; is a private limited company (this excludes universities, publicly owned institutions, NHS activities, and charities); and have 20% of their total UK turnover derived from one or more of the segments shown in Annex 3<sup>15</sup>.

Businesses proposed for inclusion or identified through a search of new incorporations, are checked for "proof of life" i.e. signs of economic activity such as employees, turnover, award of funding, or an active website with contact details. Businesses which fail this test but appear to be in scope are reviewed again in the next project cycle.

Once the cleansed data set is prepared, it is used to source data on turnover and employment from either D&B or FAME, and from examination of published company reports or data. The turnover figures will include turnover on the sale of products wholly or partially manufactured outside the UK.

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<sup>15</sup> The focus of the economic activity included in the database is from companies that either develop or produce pharmaceuticals or medical devices sold to healthcare providers (e.g. the NHS) and companies that are part of the supply chain to these Core companies. There is also included activity from some of the larger wholesale companies that historically were involved in manufacture.

The data returns from D&B and FAME are carefully checked to ensure a correct match with the business location. Further detailed validation of the data is then carried out examining significant changes in the employment and turnover data. These changes are investigated to detect any anomalies through verification against other sources. For example, large changes in employment at a business site are scrutinised to see if information is available from press releases or other information in the public domain to verify the change. In 2018, Gender Pay Gap reporting was used both to detect potential anomalies by using the compulsory employment band data, and to verify or update using more detailed information provided by businesses within their own reports. The data for individual sites under one business is examined to ensure that there is no double-counting of employment or turnover data.

Once the validation analysis is completed, the data set is “locked” for the annual update cycle, ready for analysis for this publication.

Postcodes attached to records in the database allow geographical analysis of employment and turnover at site level. Where available, we have validated employment data for the large businesses by using information such as annual reports or websites to identify the number and types of employment.

The primary allocation of turnover to location is based on the legal entity information sourced from third party databases, validated for large businesses from annual accounts. This method of turnover reporting is used throughout the document.

To bring the definition used for SME status in previous datasets in line with that used in the database from 2017 onwards, we sourced information from D&B.

We used GDP deflators<sup>16</sup> to take account of inflation across the years. We also adjusted for population demographics to represent the changing size of the potential workforce<sup>17</sup>.

## Trends Analysis

In order to create trends over the period 2009 to 2018 historical information for all businesses which have matched company registration number (CRN) was sourced. This backfilling approach creates a like-for-like snapshot for each year from 2009 from which we can observe trends. Because the dataset used for the trend analysis excludes companies and records where no CRN match was possible the 2018 employment and turnover figures in the trend analysis do not match those in the single year 2018 analysis<sup>18</sup>

To gather additional economic information (employment and turnover), third-party sources including Dun & Bradstreet (D&B), FAME, and published company-filed accounts or reports are used. These are the same sources as those used to construct the main annual dataset. Where economic data could not be sourced from company-filed accounts, an algorithm was used to populate the dataset based on growth profile averages for individual segments.

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<sup>16</sup> GDP Deflators Spring Statement 2019 update issued 13<sup>th</sup> March 2019

<sup>17</sup> Regional labour market statistics: HI00 Headline indicators for UK region and countries issued 19<sup>th</sup> March 2019

<sup>18</sup> 155 records did not have a matched CRN and are not included in the trend data set. These exclusion of these records reduces the 2018 employment and turnover in the trend dataset by 879 and £32m respectively

To source additional segmentation information, company reports and information available via Internet searches were used. This was necessary to align definitions, e.g. the merging of the 'Pharmaceutical' and 'Medical Biotechnology' sectors into 'Biopharmaceuticals' in the 2014 report.

## Segmentation

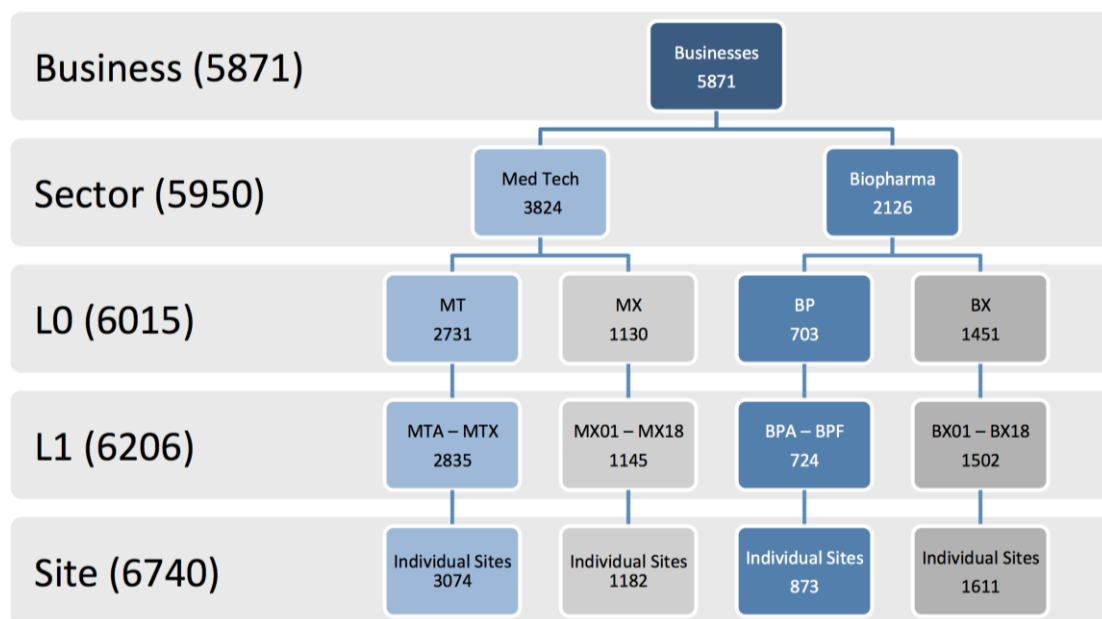
The life sciences database contains information on businesses in the UK structured at the level of trading address corresponding to the 6,740 records in the database for 2018. Using this as the lowest level of information the data is aggregated to site and company level to give the estimate of total number of life sciences businesses in the UK (5,871). Each trading address or site is examined to allocate the activity carried out to one of the segments within in a sector. As a small proportion of businesses in the database have more than one trading address or site and can operate in more than one sector (for example can have activity in medical technology and pharmaceuticals), the sum of number of businesses at the sector, segment, and geographical level will be greater than the total number of businesses in the UK.

Each business and their individual sites are segmented depending on the main type of final medicinal product or device produced. Businesses that produce products that are directly used in healthcare are designated "Core" businesses to distinguish them from businesses that are active only in the Service & Supply chain.

It should be noted that within in the Biopharma sector suppliers of over the counter (OTC) medicines are included along with generic suppliers and manufacturers.

Within the database, codes are used to allocate businesses and sites to one or more segments. Where a company has products that fall in more than one category. these are all coded, however only the code that represents the majority of the business activity is used in the analysis. Figure 10 breaks down the count of records in the database from the total number of businesses in life sciences down to the allocation of sites to business activity.

**Figure 10: The count of records in the database at each level of classification from site level through segment, sector and industry for 2018.**



Segmentation was reviewed for all businesses and sites in the 2014 update. During the 2015 update a number of the businesses that have large contributions to employment and turnover were reviewed for segmentation and their turnover in scope (TOS). The Pharmaceutical and Medical Biotechnology sectors were also combined into a new sector: Biopharma.

Additional segmentation codes are used to further classify company activities by both product type and business activity. For example, in vitro diagnostics is further segmented into in vitro diagnostic products that involve clinical chemistry, immunochemistry etc. The business activity codes are used to code businesses and sites dependent on whether they undertake R&D, manufacturing, Service & Supply (of their products), and sales/distribution (of their products).

The codes for each sector containing Core businesses are shown in Annex 3. The Service & Supply chain sectors that serve the Biopharma and Med Tech sectors are coded with the prefix BP and MT respectively followed by the appropriate number to define the type of service or supply.

### Alignment with Standard Industry Classification (SIC) codes

Standard Industry Classification (SIC) codes are used to classify businesses by industry in administrative statistics. This was last updated in 2008<sup>19</sup>. This classification system has categories for businesses whose primary activity is the manufacture of pharmaceuticals, manufacture of types of medical equipment, and those whose primary activity is biotechnology R&D.

<sup>19</sup> <https://www.gov.uk/government/publications/standard-industrial-classification-of-economic-activities-sic>



The SIC system, however, does not allow identification of the full range of life sciences businesses. A bespoke industry segmentation based on this wider range, specifically to be used in the database, was defined with the assistance of the data partners and is summarised in Annex 3. This is the classification system used in this report.

We have analysed the SIC codes of the businesses within the database and only 24% of businesses in the life sciences database fall into the standard SIC codes used to identify the life sciences industry. The remaining businesses fall into another 247 SIC codes, demonstrating the on-going need for this report and for the life sciences database to describe and analyse the full breadth of this industry.

For comparison, Table 6 shows the total employment and turnover for businesses in the database with SIC codes typically used to define the life sciences industry.

**Table 4: Turnover, employment, and number of sites based on the SIC codes that cover the main sectors in the life sciences industry**

SIC code description	SIC Code	Number of Sites	Employment	Turnover £m
Manufacture of Basic Pharmaceuticals	21100	279	43,970	20,904
Manufacture of pharmaceutical preparations	21200	113	12,184	4,312
Manufacture of Irradiation, Electromedical and Electrotherapeutic Equipment	26600	30	1,411	408
Manufacture of Medical and Dental Equipment and Supplies	32500	481	26,353	5,107
Research and Experimental Development on Biotechnology	72110	694	11,684	4,193
<b>Total life sciences based on SIC</b>		<b>1,579</b>	<b>95,602</b>	<b>34,924</b>
<b>Total life sciences in database</b>		<b>6,740</b>	<b>248,363</b>	<b>73,835</b>

The additional benefit of the segmentation approach used in the life sciences database is the ability to make a more granular assessment of the sector, including growth rates and trends. For example, this is the only source of definitive information that shows employment and growth rates in digital health or allows us to understand the growth of advanced therapy medicinal products.

## Timeline of events

The trends described in this report should be considered in context. A short timeline of political and life sciences-specific events is detailed below. This does not attempt to explain causality or justify the trends detailed above and should be viewed as contextual information only.

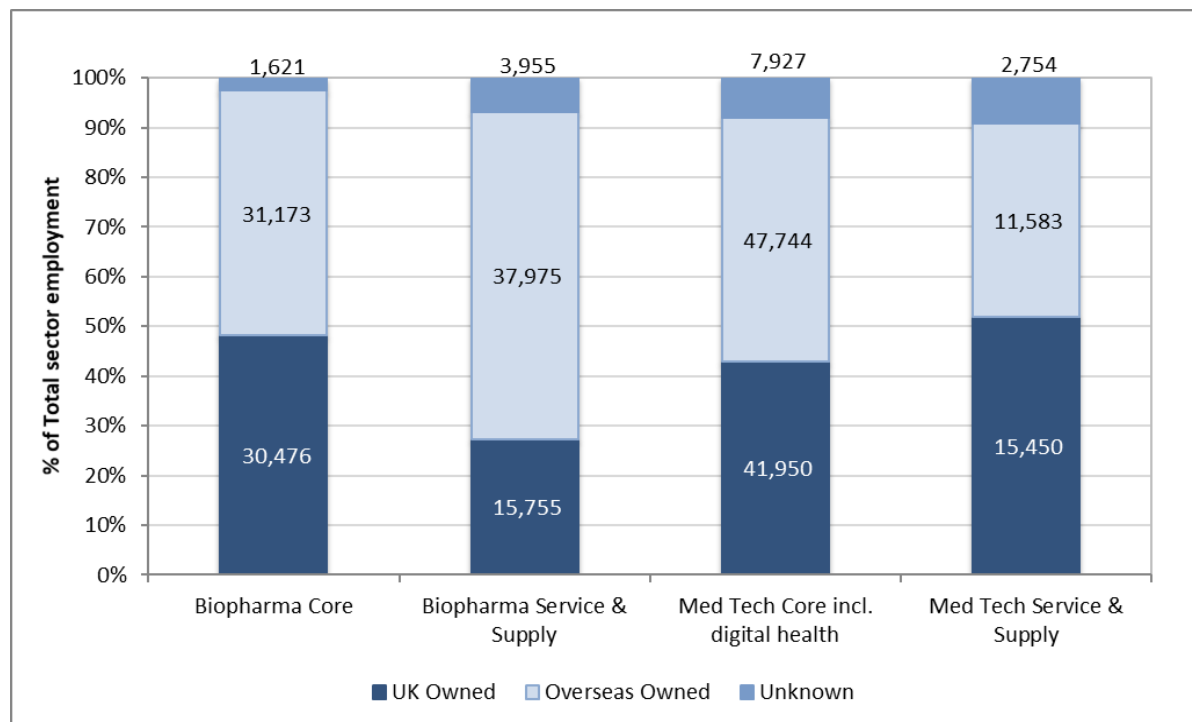
*Table 5: Timeline of political and life sciences specific events*

Date	Event
May 2010	UK General Election
Autumn 2010	Formation of Local Enterprise Partnerships (LEPs) in England
December 2011	Strategy for UK Life Sciences published
Duration of 2012	City Deals wave 1 (8 cities)
Duration of 2013	City Deals wave 2 (18 cities)
March 2014	Formation of the Office for Life Sciences
Late 2014 to early 2015	Devolution Deals (3 city regions)
May 2015	UK General Election
Duration of 2015	Growth Deals (39 LEPs)
June 2016	Referendum on UK leaving the European Union
June 2017	UK General Election
August 2017	Life Sciences Industrial Strategy published
December 2017	Life Sciences Sector Deal launched
December 2018	Life Science Sector Deal 2 launched

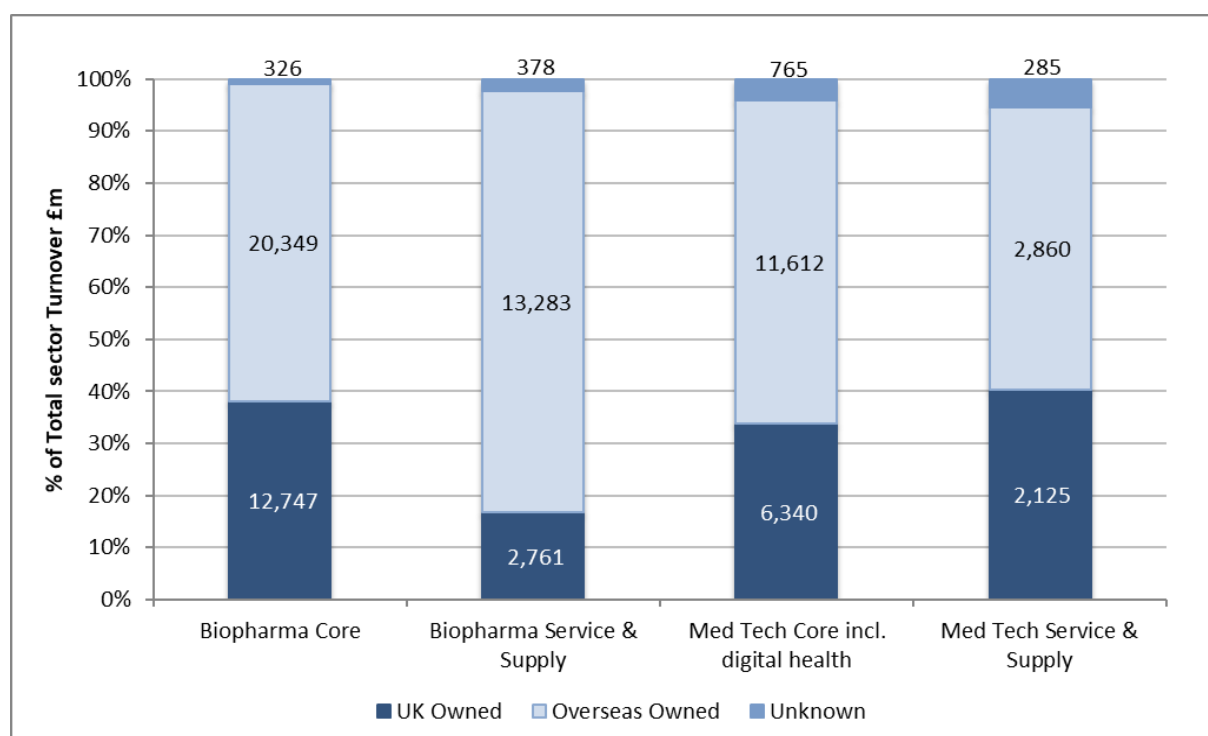
## Annex 3 – Company Ownership

The data sources contain information on the ultimate global owner of the businesses in the database. This information is available for 4,556 (69%) of the records in the database. However, the businesses where the owner origin is not known have a low economic impact as can be seen from Figures 11 and 12.

**Figure 11: Distribution of sector employment between UK and Overseas life sciences businesses 2018**



**Figure 12: Distribution of sector turnover between UK and Overseas life sciences businesses 2018**



## Annex 4 – Segmentation codes

Biopharma Core (BP)	
Code	Description
BPA	Antibodies
BPB	Therapeutic Proteins
BPC	Advanced Therapy Medicinal Products (ATMPs)
BPD	Vaccines
BPE	Small Molecules
BPF	Blood & Tissue Products

Service & Supply Chain (MX/BX)	
Code	Description
X01	Clinical Research Organisation
X02	Contract Manufacturing Organisation
X03	Contract Formulation Manufacturing
X04	Assay developer
X05	Analytical Services
X06	Formulation/Drug delivery specialist
X07	Reagent, Equipment & consumables supplier
X08	Regulatory Expertise
X09	Patent and Legal specialist
X10	Logistics & Packaging
X11	Information systems specialists
X12	Tissue and Biomass
X13	Market Analysis/Specialist consultants
X14	Contract design
X15	Training
X16	Recruitment
X17	Investment Companies
X18	Healthcare service provider

Business Activity	
Code	Description
BAA	Research & Development, including Design
BAB	Manufacture
BAC	Sales / Distribution
BAD	Service & Supply Chain

Genomics	
Code	Main Value Chain
GenA	Sampling
GenB	Sequencing
GenC	Analysis
GenD	Interpretation
GenE	Application
GenX	N.E.C

Medical Tech Core (MT)	
Code	Description
MTA	Wound Care & Management
MTB	In vitro diagnostic technology
MTC	Radiotherapy equipment
MTD	Medical Imaging/Ultrasound Equipment
MTE	Anaesthetic and respiratory technology
MTF	Orthopaedic Devices
MTG	Cardiovascular & vascular devices
MTH	Neurology
MTI	Ophthalmic Devices/Equipment
MTJ	Dental and maxillofacial technology
MTK	Drug Delivery
MTL	Infection Control
MTM	Surgical Instruments (reusable) n.e.c.
MTN	Single use technology n.e.c.
MTO	Re-usable diagnostic or analytic equipment n.e.c.
MTP	Implantable devices n.e.c.
MTQ	Assistive Technology
MTR	Mobility Access
MTS	Hospital hardware including ambulatory
MTT	Digital health

Digital Health	
Code	Description
MTT01	Hospital information systems
MTT02	GP information systems
MTT03	Social Alarms/Communications devices
MTT04	Personal medical records
MTT05	Telemed (medical monitoring) and telediag
MTT06	E-health – data analytics
MTT07	Digital Medical Electronics
MTT08	Professional Mobile health devices
MTT09	Professional Mobile health services/apps
MTT10	Consumer Mobile health devices
MTT11	Consumer Mobile health services/apps
MTT12	Training simulators and robotics

## Annex 5 - Data quality principles

As an Official Statistics publication, we aim to collect data and present this report in line with principles of the Code of Practice for Statistics<sup>20</sup> to engender trust in our data and encourage the use of this report as a reliable source of life sciences data.

This data quality statement covers the fourteen principles under the three pillars of the Code: trustworthiness, quality and value.

### Trustworthiness:

**T1: Honesty and integrity** – Data is collected, processed and quality assured by an independent contractor. The initial technical specification is set by professional statisticians with the Office for Life Sciences (OLS) who also engage regularly with the contractor, review methodological aspects, and undertake further quality assurance checks before publication.

**T2: Independent decision making and leadership** – OLS statisticians abide by the Code of Practice, keeping pre-publication access to the data strictly to those involved in the report's creation and ensuring the statistical integrity of content. The Department's Head of Profession for Statistics is engaged when necessary.

**T3: Orderly release** – Pre-publication access to the report is restricted to those involved in the report's creation and publication. The report meets Government Statistical Service (GSS) standards of statistical impartiality, separating statistical commentary from any political, press or ministerial statements. Subsequent statements by the government using data from this report quote this source and non-governmental users are encouraged to do the same. Unscheduled corrections are released as soon as is practicable, alongside an explanatory note on both the cause and impact of the error, in line with the Code of Practice.

**T4: Transparent processes and management** – Substantial financial and administrative resources are employed to enable this data collection and effective quality assurance, including a proportion for further development of the report each year in light of new user requirements or new methodology / collection possibilities. We are transparent about our methodology and approach to quality, as evidenced in Annex 2.

**T5: Professional capability** – Data is collected, processed and quality assured by a consortia contractor. Each individual has appropriate analytic capabilities, data protection awareness and industry-specific expertise, and has been involved in the production of the report for several years. The report 'owners' within OLS are professional GSS-badged statisticians.

**T6: Data governance** – All professionals involved in the creation, publication and storage of this dataset are well-versed in data protection and operate in compliance with data protection legislation. We publish the maximum amount of data available without contravening third-party licence agreements, utilising GSS best practice for statistical disclosure control (e.g. banding commercially sensitive variables).

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<sup>20</sup> <https://www.statisticsauthority.gov.uk/code-of-practice/>

## Quality:

**Q1: Suitable data sources** – Full methodology including a description of third-party administrative data sources and their suitability can be found in Annex 2. The annex also contains a comparison between the health life sciences database and ONS SIC codes, the main alternative source. Different segmentation levels and how these are aggregated into final figures are explained in Annex 2, with the glossary defining key terms to ensure users are clear at what level figures are presented (e.g. businesses vs. sites).

**Q2: Sound methods** – Full methodology can be found in Annex 2, alongside assumptions made. Terminology is consistent through the report and accompanying files, with clear descriptions in the glossary. Year-on-year trends are for real growth only based on like-for-like data against the previous year. The method used for the real growth calculations is explained in the Annex 2. To ensure long-term trends are calculated using the most robust methodology and greatest level of data available, we will be undertaking extra trend analysis which will be published in a supplemental report later in the year.

**Q3: Assured quality** – Rigorous quality assurance has been undertaken by the contractor, OLS statisticians and an external business analyst within the wider Department. Quality assurance is a significant part of the technical specification and contract tendering process and is reviewed each year. When an unscheduled revision was necessary following the post-publication identification of an error in a previous report, we immediately alerted users, engaged with the Department's Head of Profession for Statistics, and published an explanation of the cause and impact of the error alongside the revised report, all in accordance with the Code of Practice.

## Value:

**V1: Relevance to users** – We review content each year based on user needs, allowing a proportion of resource for that year's topic of interest. In previous years this has led to the inclusion of digital health and genomics as chapters in their own right, with a new cross-cutting classification designed to identify businesses operating in genomics. This year the topic of interest is a portrayal of long-term trends using an alternative methodology which will be published in a supplemental report later in the year. In response to user feedback, this year we have further extended the fields in the publicly available underlying businesses dataset to include all fields for which we are not restricted by commercial licences. In particular, we now include a unique reference number for each site.

**V2: Accessibility** – Data is free and equally available to all, published on gov.uk with no restrictions to access. Underlying data is published up to the extent our commercial licenses allow, with banded variables where we cannot provide exact figures. Commentary is objective and a range of graphical visualisations are used to aid comprehension.

**V3: Clarity and insight** – Commentary on the current size and shape of the life sciences sector is objective, focussing on impartial statistical messages. Charts and maps are used to illustrate these. Key statistical messages are highlighted up front. A comparison between the health life sciences database and ONS SIC codes, the main alternative source, is presented in Annex 2. The database itself is created through collaboration with a range of industry experts, including region-specific and sector-specific representation through trade bodies and other network organisations.

**V4: Innovation and improvement** – We review content, presentation and methodology each year based on user needs. Past development has primarily been around scope and how to identify new and emerging segments of the life sciences sector, e.g. digital health and genomics. Each new approach to scope is explored and tested with our data partners, and the statistical impact is fully considered before implementation. Other developments have included extending the scope of publicly available data fields.

**V5: Efficiency and proportionality** – Where possible, the database draws on existing information using third party sources, such as the D&B and FAME datasets and company accounts. All data partners are voluntary contributors. The need for this health life sciences database and report arises from the difficulty in identifying the life sciences sector from already-existing ONS sources since they use SIC codes, which do not encapsulate the full extent of the life sciences. In particular, as SIC codes were last refreshed in 2008, they do not allow easy identification of new and emerging segments within the medical technology sector, such as digital health. The database and report provide a valuable and robust evidence base on the size and shape of the UK life science sector.