



HM Government

The background of the cover is a vibrant, abstract composition of numerous overlapping spheres. The majority of these spheres are a bright, glowing red, creating a sense of depth and movement. Interspersed among the red spheres are several larger, more prominent spheres in shades of blue and purple, some of which have a textured, grid-like surface. The overall effect is one of dynamic energy and technological sophistication.

Strength and Opportunity 2015

The landscape of the medical technology and biopharmaceutical sectors in the UK



This is the seventh annual report that analyses the information contained in the Health Life Sciences Database.

Contents

Ministerial Foreword	1
Overview	2
Chapter 1. Cross Cutting Data	7
Chapter 2. Sector Overviews – Key Facts and Trends	10
2.1 Biopharmaceuticals – core companies	10
2.2 Biopharmaceuticals – service and supply chain	10
2.3 Medtech – core companies	11
2.4 Medtech – service and supply chain	12
2.5 Digital health	13
2.6 Genomics	14
Chapter 3. Sector Growth Trends	16
3.1 Job growth calculations	16
3.2 Revenue growth calculations	17
3.3 Sector growth – trends sub-set of companies	17
3.4 Medtech sector growth trends	18
3.5 Biopharmaceutical sector growth trends	20
Chapter 4. Cross Cutting Analysis – Top 5 Segments	21
Chapter 5. Geographical Analysis	23
Chapter 6. Company Size	32
6.1 Analysis of company size	32
6.2 Company ownership – medtech and biopharmaceuticals	35

Annex 1	Data Quality and Methodology	37
Annex 2	Data Partners Acknowledgement	39
Annex 3	Summary of Methodology	41
Annex 4	Sector Segmentation: Biopharma, Medtech, Digital Health, Genomics	43

Ministerial Foreword



I am delighted to introduce the seventh annual Strength and Opportunity report, which sets out a detailed picture of the health life sciences industries in the UK. Alongside the established biopharmaceutical and medical technology sectors, this report highlights for the first time the emerging digital health and genomics sectors – both key areas of future growth for the UK.

I am pleased to be able to say that despite facing some significant challenges, the UK health life sciences sectors are thriving: since 2011 the Government has secured £6bn of inward investment, leading to 17,000 jobs. This report shows that, today, almost 222,000 people are employed across these sectors, by 5,633 companies, which are collectively generating around £60.7bn in annual turnover. As well as our established strengths in the biopharmaceutical sector there are many smaller companies, with 78% of the sector and supply chain made up of SMEs. I think it is also significant that we are seeing the greatest employment growth in emerging sectors, with digital health showing an annual growth rate of 23 per cent over the last five years.

This report also shows that the health life sciences sectors are helping to deliver balanced growth, with economic activity spread across the country. Two thirds of employment is found outside London and the South-East, with significant concentrations in the East of England, where almost 34,000 people are employed (15 per cent of the total), and the North-West, where almost 26,000 people are employed (12 per cent of the total). This report should be read alongside the Life Science Competitiveness Indicators publication, which shows a higher level picture of the UK life sciences ecosystem and performance relative to a set of comparator countries. It shows that the UK is second only to the US in terms of life science Foreign Direct Investment projects along with the UK's relative strength in the academic base and clinical research landscape. Combined with the strength of the health life sciences supply chain, these factors are driving investment, growth and employment across the country.

I would like to thank all those who contributed to the annual update and continue to support and work with the Government to make the UK the best place in the world to invest in life sciences.

A handwritten signature in dark ink that reads "George Freeman".

George Freeman MP

Parliamentary Under Secretary of State for Life Sciences

Overview

This report identifies the strengths in the UK health life sciences industry and the opportunities for future growth. The content of the report provides an up to date snapshot of UK life sciences based on the best understanding of its structure.¹

The three main measures of economic contribution and industry structure are:

- employment – the number of people employed by life science companies;
- turnover – the amount of money taken by businesses within scope of life science sector activities;
- number of companies – the number of life science companies registered in the UK.

This report demonstrates the significant economic contribution of the life science sector in terms of company turnover and employment distributed across the UK. It shows the trends and breakdown across different segments and the significant economic contribution both of 'core' product manufacturers and the 'service and supply chain' companies that support them.

The key messages

There are significant levels of health life sciences employment. Almost 222,000 people are employed in 5,633 companies generating approximately £60.7bn turnover. This covers both core life science companies and the service and supply chain.²

This breaks down into:

- 107,000 employed in the biopharmaceutical sector and service and supply chain in 1,948 companies, generating £39.7 billion turnover;
- 115,000 employed in the medical technology sector and service and supply chain in 3,685 companies, generating £21 billion turnover.

The first definitive assessment of emerging sectors on a consistent basis shows that:

- The digital health sector has an estimated turnover of £886m and approximately 7,400 employees.
- The digital health sector is the fastest growing sector for employment with 23% annual growth rate over the last 5 years.

1 Further discussion of the methodology and how company data is collected and classified can be found in Annex 1.

2 The methodology used to collect the data for this report has changed from the previous year. Therefore the headline numbers cannot be compared like-for-like. We have provided more detailed analysis of growth later in this report.

- Genomics related activities in life science companies generate an estimated turnover of £164m and approximately 1,364 employees.
- The total number of companies, turnover and employment is not directly comparable with 2014 data (£56bn in turnover; 183,000 jobs and 4,398 companies) as methodology changes mean more companies are captured. Adjusting for these methodology changes, the overall jobs growth in the sector is estimated to be 2.9% and overall revenue growth is estimated to be 2%.

We monitor a sub-set of trend companies which have been in the health life science database since the first year of data collection. Analysis of trends for this sub-set shows the following:

- The trend sub-set for the the life science sector as a whole has shown flat annual growth in revenue and 4% annual growth in employment.
- Employment growth is driven by 4.6% annual growth in medical technology service and supply chain and 11.9% annual growth in medical technology companies.

SMEs with fewer than 250 employees make up 98% of medtech companies and 82% have less than £5m turnover.

Two thirds of employment is outside of London and the South-East with significant concentrations in the East of England (15%, almost 34,000 people) and North-West (12%, almost 26,000 people).

Terminology

Core Biopharmaceuticals (biopharma) includes all companies whose business involves developing and/or producing their own pharmaceutical products – from small, R&D-focused “biotechs” to multinational Big Pharma.

Biopharma Service & Supply (BS&S) comprises companies which offer goods and services to core biopharma companies. These include contract research and manufacturing organisations, suppliers of consumables and reagents for R&D facilities, providers of specialist analytical, IT, recruitment and logistics services as well as legal and regulatory expertise and finance companies specialising in biopharma investments.

Core Medical Technology (medtech) includes all companies whose primary business falls under developing and producing their own medical technology products (ranging from single-use consumables to complex hospital equipment, including digital health products).

Medtech Service & Supply (MTS&S) sector comprises companies which offer services to core medtech companies. This includes contract research and manufacturing organisations, suppliers of consumables and reagents for R&D facilities, providers of specialist analytical, IT, recruitment and logistics services as well as legal and regulatory expertise and finance companies specialising in medtech investments (but not counting their portfolio assets).

Digital health includes companies involved in making products for both hospitals and consumers. The biggest three segments by employment and turnover are hospital information systems, GP information systems, and E-health – data analytics. Digital health also includes companies that make more consumer facing products such as apps and health devices.

Genomics related activities are classified as sampling, sequencing, analysis, interpretation, and application using genomics technology. In many cases these are used by companies who have a broader set of business activities (e.g. they would be classified as biopharmaceuticals).

List of Figures

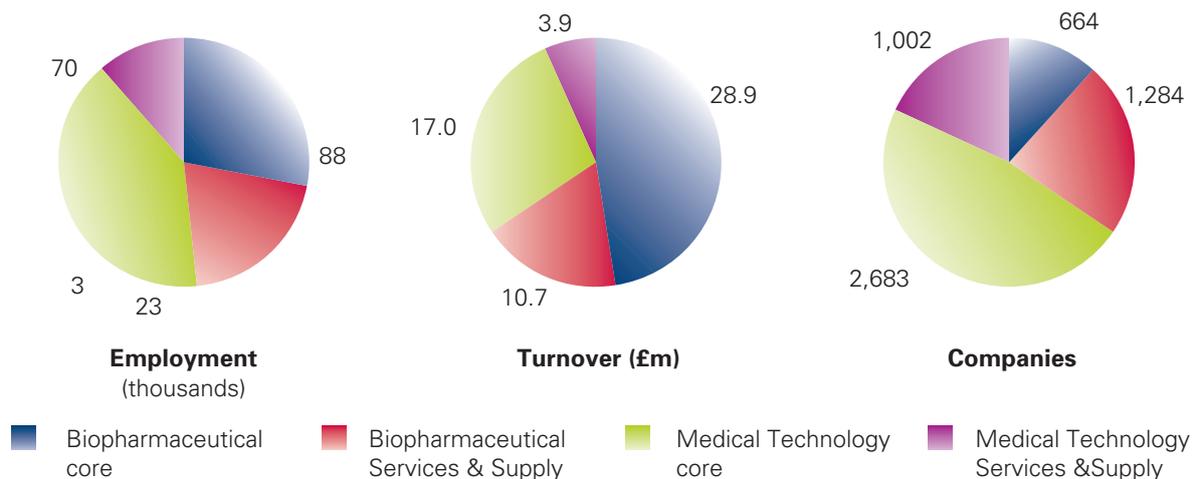
Figure 1.	Total employment, turnover and number of companies in the life sciences sector	7
Figure 2.	Summary Digital Health breakdown	8
Figure 3.	Genomics breakdown	9
Figure 4.	Tree diagram of biopharmaceutical sector	11
Figure 5.	Tree diagram of medtech employment	13
Figure 6.	Digital health geographical breakdown	14
Figure 7.	Tree diagram of life science sector employment	15
Figure 8.	Year-on-year trends in estimated turnover over 2011 to 2015	17
Figure 9.	Year-on-year trends in estimated employment over 2011 to 2015	17
Figure 10.	Comparison of life sciences employment and turnover CAGR 2011-2015	18
Figure 11.	Compound annual turnover growth in the top 5 medical technology segments 2011-2015	19
Figure 12.	Compound annual employment growth in the top 5 medical technology segments 2011-2015	19
Figure 13.	Turnover and employment growth rates 2011-2015 for the biopharmaceutical sector	20
Figure 14.	Top 5 segments: all sectors including service and supply chain	21
Figure 15.	Top 5 segments: all sectors excluding service and supply chain	22
Figure 16.	Top 5 segments in medical technology excluding service and supply chain	22
Figure 17.	Distribution of Biopharmaceutical and Medical Technology employment	23
Figure 18.	Digital health – geographic breakdown	24
Figure 19.	Overall sector map – location of all life science sector sites	25

Figure 20. Regional distribution of medtech sector	28
Figure 21. Medtech map – distribution of medtech turnover	29
Figure 22. Regional distribution of biopharmaceutical sector	30
Figure 23. Biopharma map – geographical distribution of biopharmaceutical revenue	31
Figure 24. Distribution of medtech core companies – broken down by company turnover	33
Figure 25. Distribution of medtech service and supply chain companies – broken down by company turnover	33
Figure 26. Distribution of biopharmaceutical services and supply chain companies – broken down by company turnover	34
Figure 27. Distribution of biopharmaceutical core companies – broken down by company turnover	35
Figure 28. Employment in life science sector by country of origin of company	36

Chapter 1

Cross Cutting Data

Figure 1. Total employment, turnover and number of companies in the life sciences sector



1.1 The medtech sector makes up the majority of employment and companies while the biopharmaceutical sector makes up the majority of revenue. The charts above show the life science sector composition with:

- significant employment of almost 222,000 people employed in the life science sector and service and supply chain (medtech 52%, biopharma 48%);
- 5,633 companies (medtech 59%, biopharma 41%);
- approximately £60.7bn annual turnover (medtech 35%, biopharma 65%).

1.2 This breaks down into:

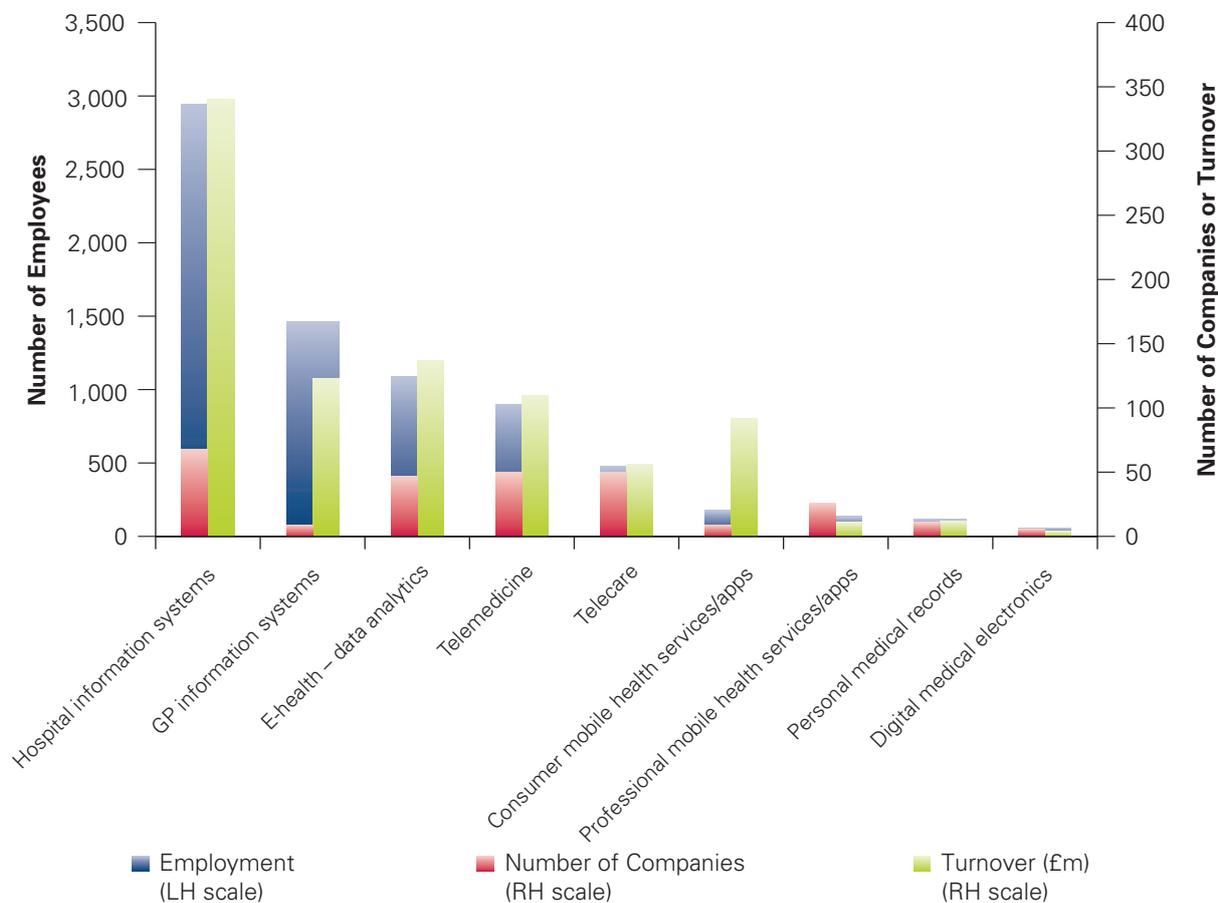
- 107,000 employed in the biopharmaceutical sector and service and supply chain in 1,948 companies, generating £39.7bn turnover;
- 115,000 employed in the medtech sector and service and supply chain in 3,685 companies, generating £21bn turnover;
- the two service and supply sectors account for 41% of companies, 24% of turnover and 31% of employment.

1.3 Digital health and genomics are two emerging life science sectors included within the total numbers above. The charts below show:

- digital health has 289 companies, with 7,405 employees generating approximately £886m turnover,

- estimates of genomics related activities in life science companies generate turnover of £164m and approximately 1,364 employees.

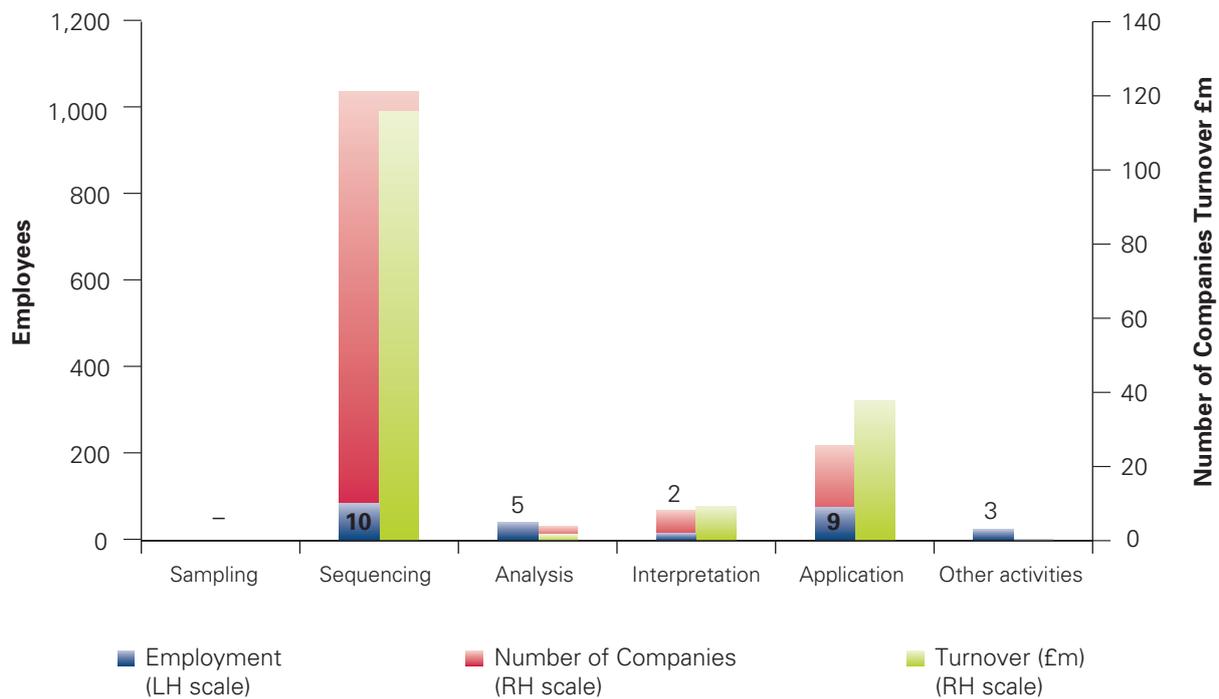
Figure 2. Summary Digital Health breakdown



1.4 These high level numbers are not directly comparable with the previous year; however in the section on growth we outline analysis of growth in the sector.

1.5 The next section shows key facts for these sectors in more detail.

Figure 3. Genomics breakdown



Chapter 2

Sector Overviews – Key Facts and Trends

2.1 Biopharmaceuticals – core companies

2.1.1 **Core Biopharmaceuticals includes** all companies whose business falls under developing and/or producing their own pharmaceutical products – from small, R&D-focused “biotechs” to multinational Big Pharma.

2.1.2 **Overall** the core biopharma sector has 664 companies employing 62,300 people and with a turnover of £28.9bn in 2015.

2.1.3 **The sector breakdown shows** that ‘small molecule drugs’ is by far the largest segment accounting for 67% of companies, 82% of employees and 82% of turnover; companies which obtain the majority of their turnover from small molecules, including most large pharmaceutical companies, make up this segment. Therapeutic proteins, antibodies and vaccines are the next three segments, together making up 16% of both turnover and employment.

2.1.4 **Geographical analysis of employment** shows core biopharma companies in all areas of the UK with the greatest concentration in the South East, East of England, and in London which together account for 65% of employment in the sector.

2.1.5 **Analysing the size of the companies shows** there is a diverse size range of core biopharma companies with a lot of micro companies: 42% have less than 5 employees and just over 10% have over 250 people.

2.1.6 **Analysis of growth** shows that the fastest growing sub-segment is advanced therapy medicinal products (e.g. cell-based therapies) – the only segment with both increasing employment (+6% CAGR over 2011-2015) and turnover growth of 35%. Therapeutic proteins also showed high turnover growth, just over 16%.

2.2 Biopharmaceuticals – service and supply chain

2.2.1 **The Biopharma Service and Supply (BS&S) sector** comprises companies which offer goods and services to core biopharma companies. This includes contract research and manufacturing organisations, suppliers of consumables and reagents for R&D facilities, providers of specialist analytical, IT, recruitment and logistics services as well as legal and

regulatory expertise and also finance companies specialising in biopharma investments (but not counting their portfolio assets).

- 2.2.2 Overall** the service and supply chain has around 1,250 companies, over 44,600 employees and a turnover of £10.7bn.
- 2.2.3 Combining with the core biopharmaceutical companies** the service and supply chain represents 66% of the companies, 42% of the employees and 27% of turnover (note: core biopharma contains many of the large pharmaceutical companies that supply the NHS).
- 2.2.4 The sector breakdown shows** the largest segments of the BS&S sector are contract manufacturing and research organisations together with clinical research organisations which together make up 29% of the sector companies (366), 48% of its employees (21,580) and 32% of turnover (£3.4bn). But the reagent, equipment and consumables suppliers account for just under 50% of the sector's turnover (£5.3bn).
- 2.2.5 Geographical analysis of employment** for BS&S companies shows the South-East and East of England have the most companies and employees followed by Scotland, then the North West and the midlands.

Figure 4. Tree diagram of biopharmaceutical sector

Small Molecules 51,048	Contract Manufacturing/Research Organisation 14,561		Reagent, Equipment and consumables supplier 10,510	
	Clinical Research Organisation 7,109	Antibodies 3,104	Vaccines 2,957	Logistics and Packaging 2,811
	Therapeutic Proteins 4,029	Analytical services 2,669	Market	
		Recruitment 1,727	Information systems specialists	
			Advanced Therapy	Patient

2.3 Medtech – core companies

- 2.3.1 Core Medical Technology** includes all companies whose primary business falls under developing and producing their own medical technology products (ranging from single-use consumables to complex hospital equipment and including digital health products).

- 2.3.2 **Overall** the core medtech sector has 2,683 companies employing 89,870 people with a turnover of £17bn.
- 2.3.3 **The sector breakdown shows** the largest segment by turnover is single-use technology (i.e. disposables) followed by in vitro diagnostics, orthopaedics and wound-care (the top four segments account for 40% of the sector's turnover). Single-use technology is also the largest segment by employment followed by orthopaedics, in vitro diagnostics and digital health (the top four account for 38% of sector turnover).
- 2.3.4 **Geographical analysis of employment** shows there are companies spread across the UK: South East England has the greatest number of companies (15% of UK total), turnover (26%) and employment (20%) followed by the East of England, West Midlands, North West England and Yorkshire and the Humber.
- 2.3.5 **Analysis of the size of companies** shows that most are small: 41% are micro-companies with less than 5 employees and only 3% have over 250 employees.
- 2.3.6 **Analysis of growth** for the sub-set of core medtech companies where there is time series data shows that there was turnover growth of just over 1% CAGR over 2011-2015 with employment growth of just under 12%. The fastest growing segment in terms of turnover is 'medical imaging/ultrasound equipment and materials' (+10% CAGR 2011-15) and digital health for employment (+28% CAGR 2011-15).
- 2.4 Medtech – service and supply chain**
- 2.4.1 **The Medtech Service and Supply (MTS&S)** sector comprises companies which offer services to core medtech companies. This includes contract research and manufacturing organisations, suppliers of consumables and reagents for R&D facilities, providers of specialist analytical, IT, recruitment and logistics services as well as legal and regulatory expertise and finance companies specialising in medtech investments (but not counting their portfolio assets).
- 2.4.2 **Overall** the medtech service and supply sector has just over 1,000 companies, over 24,600 employees and a turnover of £3.9bn. This represents 27% of the total medtech (including MTS&S) companies, 21% of the employees and 19% of the turnover.
- 2.4.3 **The sector breakdown shows** the largest segment of MTS&S sector is 'reagent, equipment and consumables suppliers' which alone makes up 25% of the sector's employment (6,100) and 34% of its turnover (£1.3bn). However, if the contract research and manufacturing segments are added together these account for 27% of employment and 20% of turnover.

2.4.4 **Geographical analysis** shows that although the East Midlands leads in terms of numbers of MTS&S companies followed by the South East and West Midlands, the North West of England has a clear lead in employment and turnover due to the location of some major MTS&S sites there.

2.4.5 The tree diagram below shows the employment in the medtech sector – core and service and supply.

Figure 5. Tree diagram of medtech employment

Single use technology 9,880	Assistive Technology 7,031	Re-usable diagnostic or analytic equipment 4,778	Contract	Wound Care and Management 4,634	Drug Delivery 4,403
Orthopaedic Devices 8,340	Hospital hardware including ambulatory 6,534	Surgical Instruments (reusable) 3,658	Market	Analytical Services 2,483	
In vitro diagnostic technology 7,943	Reagent, Equipment and consumables supplier 6,101	Medical Imaging/ Ultrasound Equipment and Materials 3,558	Dental and maxillofacial technology 2,230	Logistics and Packaging 2,811	
Digital Health 7,405	Ophthalmic Devices/ Equipment 5,390	Mobility Access 3,473	Infection Control 2,204	Education and Training 1,108	
		Anaesthetic and respiratory technology 2,784	Clinical Research Organisation 1,850	Patient and Legal Healthcare service	

2.5 Digital health

2.5.1 **Overall the digital health segment** has around 290 companies with 7,400 employees and a total turnover of £886m.³

2.5.2 There are more companies in the digital health segment than any other life science segment except small molecules (biopharma) and assistive technologies. Digital health is also the fourth ranked medical technology segment in terms of employment and eighth for turnover.

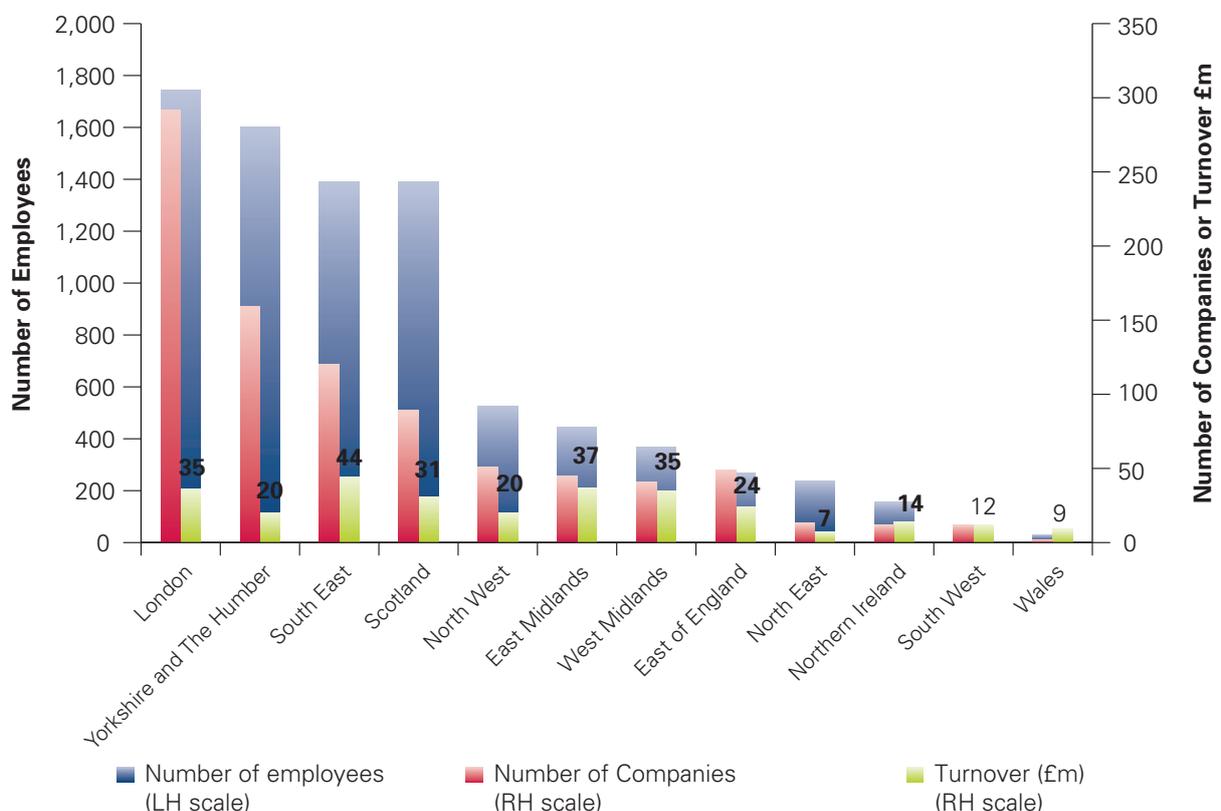
³ In 2015 Deloitte undertook a study for the Office for Life Sciences on the digital health industry. The report showed similar growth rates for the sector; however the overall estimate of turnover was higher as a different methodology for estimating turnover was used.

2.5.3 Analysis of growth shows that between 2011 and 2015, the average annual growth rate for employment in digital health was +28%, more than for any other segment where time series data is available.

2.5.4 Analysis of the breakdown of the sector shows that within digital health, 'hospital information systems' accounts for the most companies, turnover and employees with GP information systems, E-health analytics and telemedicine all featuring significantly.

2.5.5 Geographical analysis shows that the South East has the most digital health companies followed by the Midlands (East and West) and London but both employment and turnover were highest in London, followed by Yorkshire and the Humber. Only London, Yorkshire and the Humber and the South East have more than 1,000 employees in digital health.

Figure 6. Digital health geographical breakdown



2.6 Genomics

2.6.1 Overall genomics related activity has 29 companies with 1,364 employees and a total turnover of £165m approximately.

2.6.2 Of the **29 companies involved in genomics related activity** there are 10 companies involved in sequencing, 5 in analysis, 2 in interpretation, 9 in application, and 3 involved in 'other activities'.

2.6.3 The **majority of revenue, 70%**, and employment, 76%, is in sequencing companies, followed by application, 23% of revenue and 16% of employment. Sequencing can be further broken down into 'instruments and consumables', with £34m turnover, and sequencing services, £82m turnover.

2.6.4 The tree diagram below shows employment further broken down – equivalent graphs for turnover can be found in the data spreadsheet that accompanies this publication.

Figure 7. *Tree diagram of life science sector employment*

Single use technology 9,880	Digital Health 7,405	Ophthalmic	Re-usable diagnostic or analytic equipment 4,778	Wound Care and Management 4,634	Drug Delivery 4,403	Contract Manufacturing/ Research Organisation 14,561	Reagent, Equipment and consumables supplier 10,510
Orthopaedic Devices 8,340	Assistive Technology 7,031	Surgical Instruments (reusable) 3,658	Infection Control 2,204	Dental and maxillofacial technology 2,230		Clinical Research Organisation 7,109	Analytical services 2,669
In vitro diagnostic technology 7,943	Hospital hardware including ambulatory 6,534	Medical Imaging/ Ultrasound Equipment and Materials 3,558		Education and Training 1,108		Logistics and Packaging 2,811	
Digital Health 7,405	Ophthalmic Devices/ Equipment 5,390	Mobility Access 3,473				Reagent, Equipment and consumables supplier 6,101	Market
Small Molecules 51,048				Vaccines 2,957		Contract	Logistics and Packaging 2,811

Chapter 3

Sector Growth Trends

The section above shows that the life science sector and supply chain:

- employs almost 222,000 people;
- includes 5,633 companies; and
- generates approximately £60.7bn annual turnover.

This is not directly comparable with 2014 data (£56bn in turnover; 183,000 jobs and 4,398 companies) due to methodology changes (detailed further in Annex 1 below).

Adjusting for these methodology changes overall jobs growth in the sector is estimated to be 2.9% and overall revenue growth is estimated to be 0.8%.

3.1 Job growth calculations

3.1.1 Jobs growth of 2.9% has been calculated on the following basis:

- The total number of jobs has increased from 180,328 to 221,919, a total change in employees of approximately 41,591.
- Some of this is due to methodology change and some is due to genuine employment growth in the sector.
- We estimate that 10,350 of this increase was due to companies added in 2015 (methodology change).
- We estimate that 25,368 was due to methodology change for companies that were in the database in 2014, but a new methodology has been used to calculate employment.
- We estimate that 657 jobs were lost due to company deaths.
- We estimate that 5,216 ($41,591 - 10,350 - 25,368 - 657$) of this increase was due to net real growth in employment, an estimated growth rate of 2.9% ($5,216 / 180,328$).

3.2 Revenue growth calculations

3.2.1 Revenue growth of 2% has been calculated on the following basis:

- The total amount of revenue has increased from £55.3bn to £60.7bn a total a change of £5.4bn approximately.
- Some of this is due to methodology change and some is due to genuine turnover growth in the sector.
- We estimate that £3.2bn was due to methodology change for companies that were in the database in 2014, but a new methodology has been used to calculate their turnover.
- We estimate an increase of £1.1bn of net real growth after accounting for methodology change, giving a net real growth rate in turnover for the sector of 2%.

3.3 Sector growth – trends sub-set of companies

Figure 8. Year-on-year trends in estimated turnover over 2011 to 2015

Segment	Trend in Turnover between years			
	2011/2012	2012/2013	2013/2014	2014/2015
Biopharmaceutical core	↓	↓	↑	↑
Biopharmaceutical service & supply	↑	↓	↓	↑
Medical Technology core	↑	↑	↓	↑
Medical Technology service & supply	↑	↑	↑	↑
Total life sciences	↓	↓	↑	↑

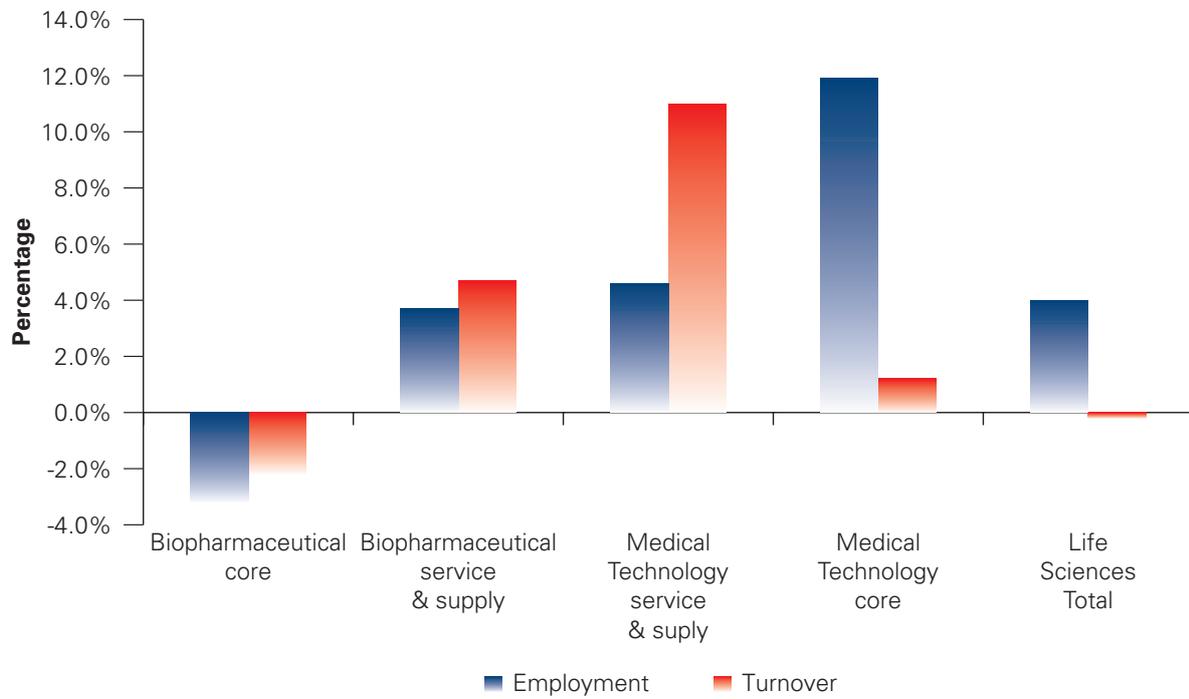
3.3.1 This trend summary is based on a sub-set of companies for which annual data is available for this period. Turnover rose for all sectors in 2014/15 after falling in the two medtech sectors and in biopharma service and supply in 2013/14.

Figure 9. Year-on-year trends in estimated employment over 2011 to 2015

Segment	Trend in Employment between years			
	2011/2012	2012/2013	2013/2014	2014/2015
Biopharmaceutical core	↓	↓	↑	↓
Biopharmaceutical service & supply	↑	↑	↓	↑
Medical Technology core	↓	↑	↑	↑
Medical Technology service & supply	↓	↓	↑	↑
Total life sciences	↓	↑	↑	↑

3.3.2 Whilst employment fell for core biopharma in 2014/15, it rose in all the other life science sectors as a whole. Employment in both core medtech and the service and supply chain was up in both of the last two years.

Figure 10. Comparison of life sciences employment and turnover CAGR 2011-2015



3.3.3 This shows Compound Annual Growth Rate (CAGR) for turnover and employment over 2011-2015 with medtech core companies growing fastest for employment and medtech service and supply growing fastest for turnover. The negative growth for core biopharma and positive growth for biopharma service and supply chain may reflect the impact on the UK of the global pharmaceutical restructuring undertaken as the industry reduces its in-house operations and contracts out more activity.

3.4 Medtech sector growth trends

3.4.1 For this analysis digital health and medtech are grouped and show that digital health companies have had the fastest compound annual growth rate (CAGR) between 2009 and 2015 for employment, 23%, and in vitro diagnostic technology for turnover, 7.4%. Single-use technology is notable for both employment CAGR, 23%, and turnover CAGR, 3.5%.

Figure 11. Compound annual turnover growth in the top 5 medical technology segments 2011-2015

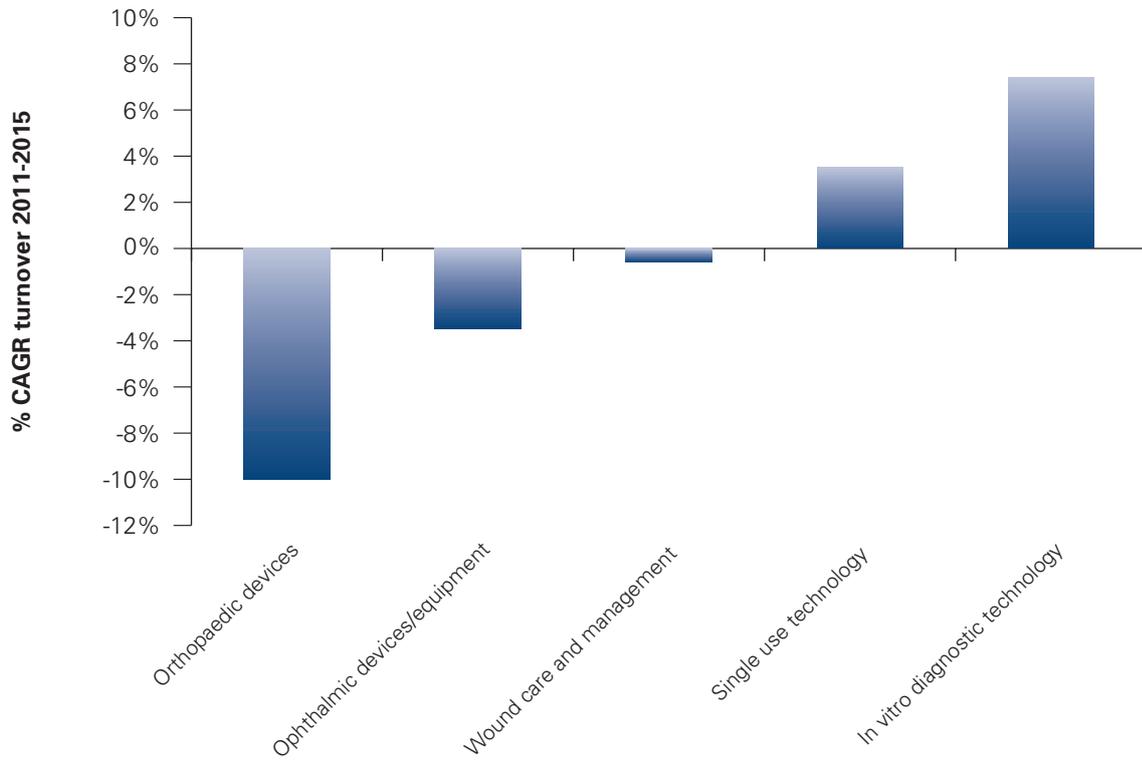
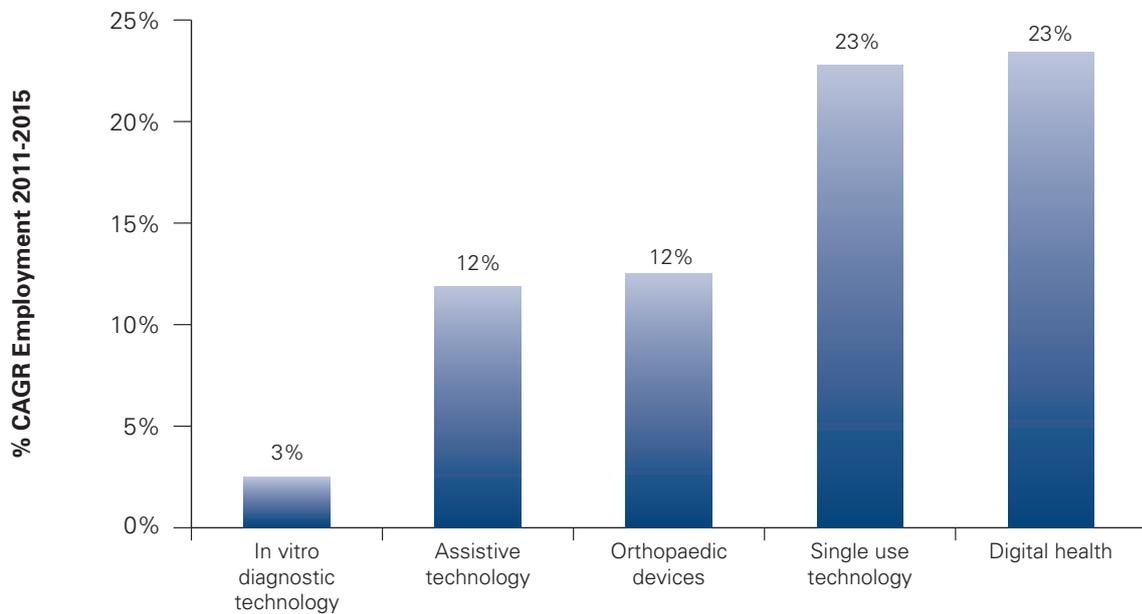


Figure 12. Compound annual employment growth in the top 5 medical technology segments 2011-2015

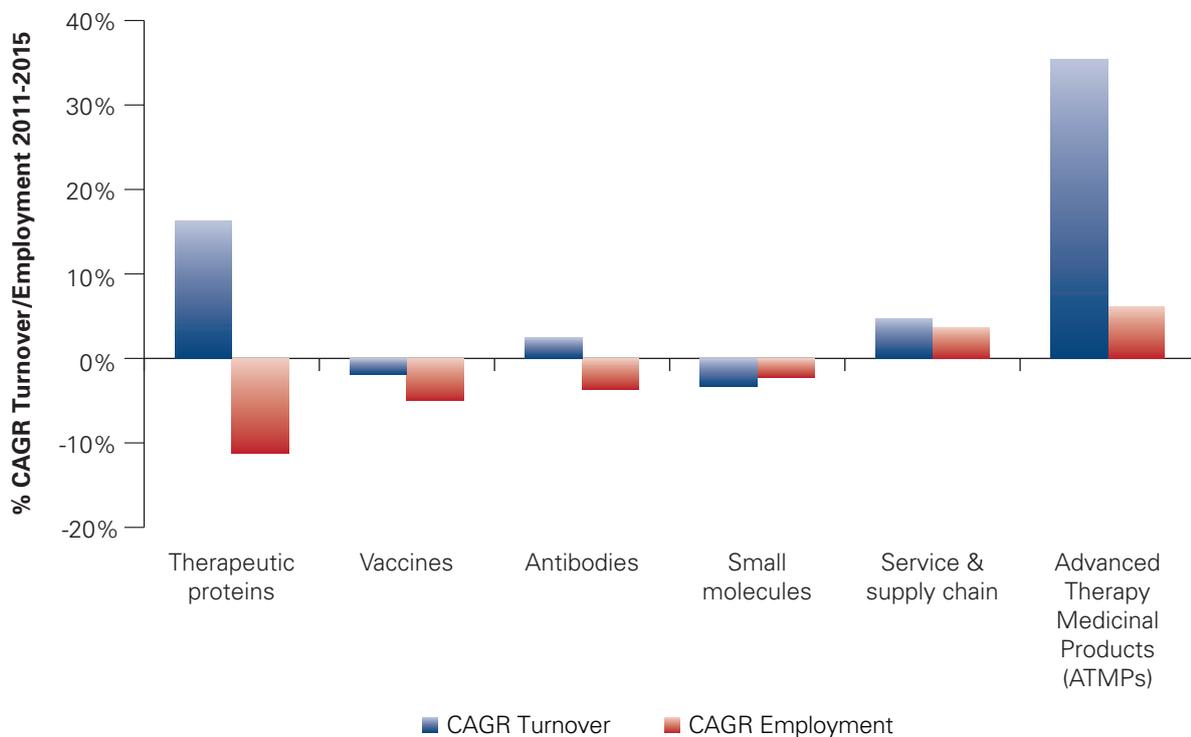


3.5 Biopharmaceutical sector growth trends

3.5.1 The chart below shows the breakdown of the trends in turnover and employment. 'Advanced therapy medicinal products' is notable for large turnover growth, approximately 35%, and positive employment growth; the service and supply chain is also showing positive trends for employment and turnover.

3.5.2 As the small molecule segment is the largest segment across all of life sciences, this small proportional reduction in turnover and employment has a big effect on overall turnover and jobs in the life science industry.

Figure 13. Turnover and employment growth rates 2011-2015 for the biopharmaceutical sector



Chapter 4

Cross Cutting Analysis – Top 5 Segments

4.1.1 The top segment across all sectors, including the service and supply chain for employment, turnover and number of companies is small molecules, part of the biopharmaceutical core. Notably, digital health shows the third highest number of companies and when the supply chain is excluded has the fifth highest employment.

Figure 14. *Top 5 segments: all sectors including service and supply chain*

	Employment	Turnover	Number of Companies
1st	Small molecules	Small molecules	Small molecules
2nd	Biopharm Contract Manufacturing/Research Organisation	Biopharm Reagent, Equipment and consumables supplier	Assertive Technology
3rd	Biopharm Reagent, Equipment and consumables supplier	Biopharm Contract Manufacturing/Research Organisation	Digital Health
4th	Single Use Technology	Single Use Technology	Specialist Consultants
5th	Orthopaedic Devices	In vitro diagnostic technology	Medical Technology Reagent, Equipment and consumables supplier

Figure 15. *Top 5 segments: all sectors excluding service and supply chain*

	Employment	Turnover	Number of Companies
1st	Small molecules	Small molecules	Small molecules
2nd	Single Use Technology	Single Use Technology	Assertive Technology
3rd	Orthopaedic Devices	In vitro diagnostic technology	Digital Health
4th	In vitro diagnostic technology	Vaccines	In vitro diagnostic technology
5th	Digital Health	Orthopaedic Devices	Single Use Technology

Figure 16. *Top 5 segments in medical technology excluding service and supply chain*

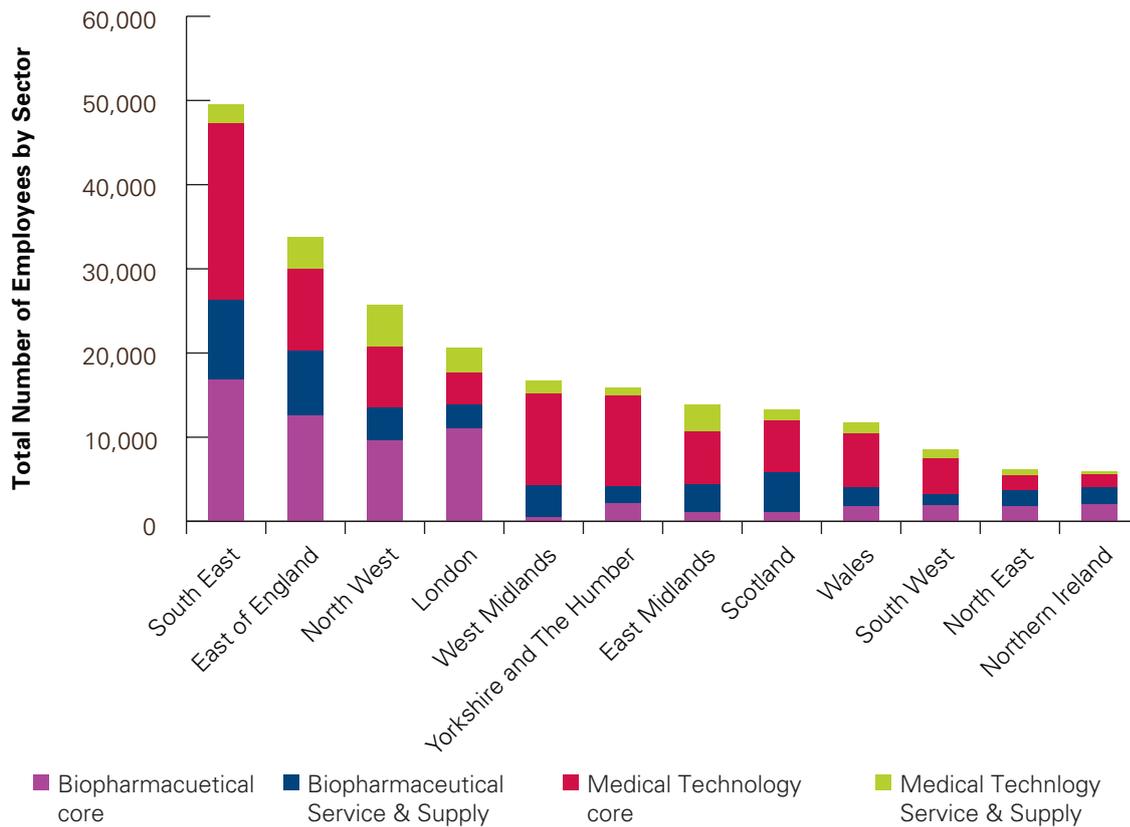
	Employment	Turnover	Number of Companies
1st	Single Use Technology	Single Use Technology	Assertive Technology
2nd	Orthopaedic Devices	In vitro diagnostic technology	Digital Health
3rd	In vitro diagnostic technology	Orthopaedic Devices	In vitro diagnostic technology
4th	Digital Health	Wound Care and Management	Single Use Technology
5th	Assertive Technology	Orthopaedic Devices/ Equipment	Re-usable diagnostic or analytic equipment

4.1.2 Whilst core medtech is still dominated by long established sectors such as single-use and assistive technologies, in vitro diagnostics and orthopaedic devices, digital health is coming through strongly in terms of number of companies and employment.

Chapter 5

Geographical Analysis

Figure 17. *Distribution of Biopharmaceutical and Medical Technology employment*



- 5.1.1 Whilst the biopharmaceutical core is focused in the south and east of England and the North West, the medical technology sectors are more evenly spread through the UK.
- 5.1.2 The service sectors tend to follow their client 'core' sectors but the North West has relatively high medtech service and supply chain employment and Scotland has a high level of biopharma service and supply chain employment.

Figure 18. Digital health – geographic breakdown

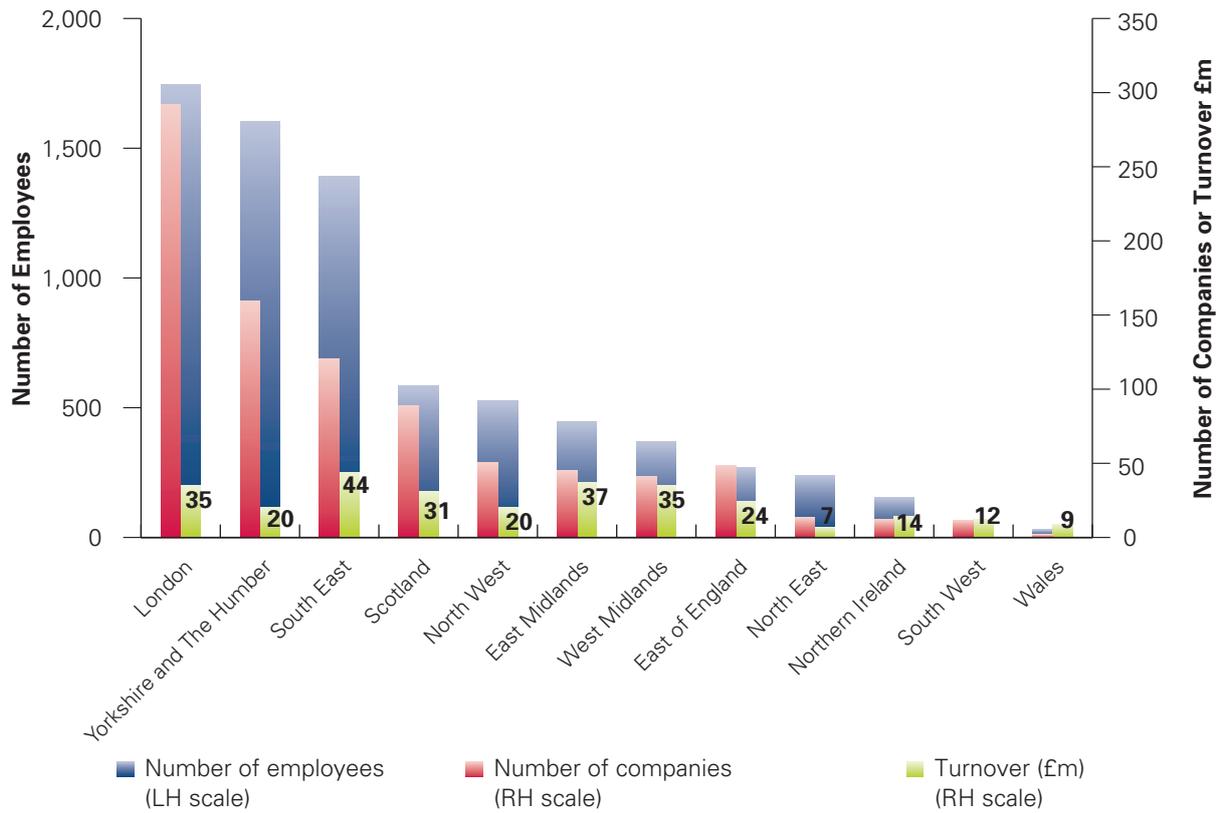
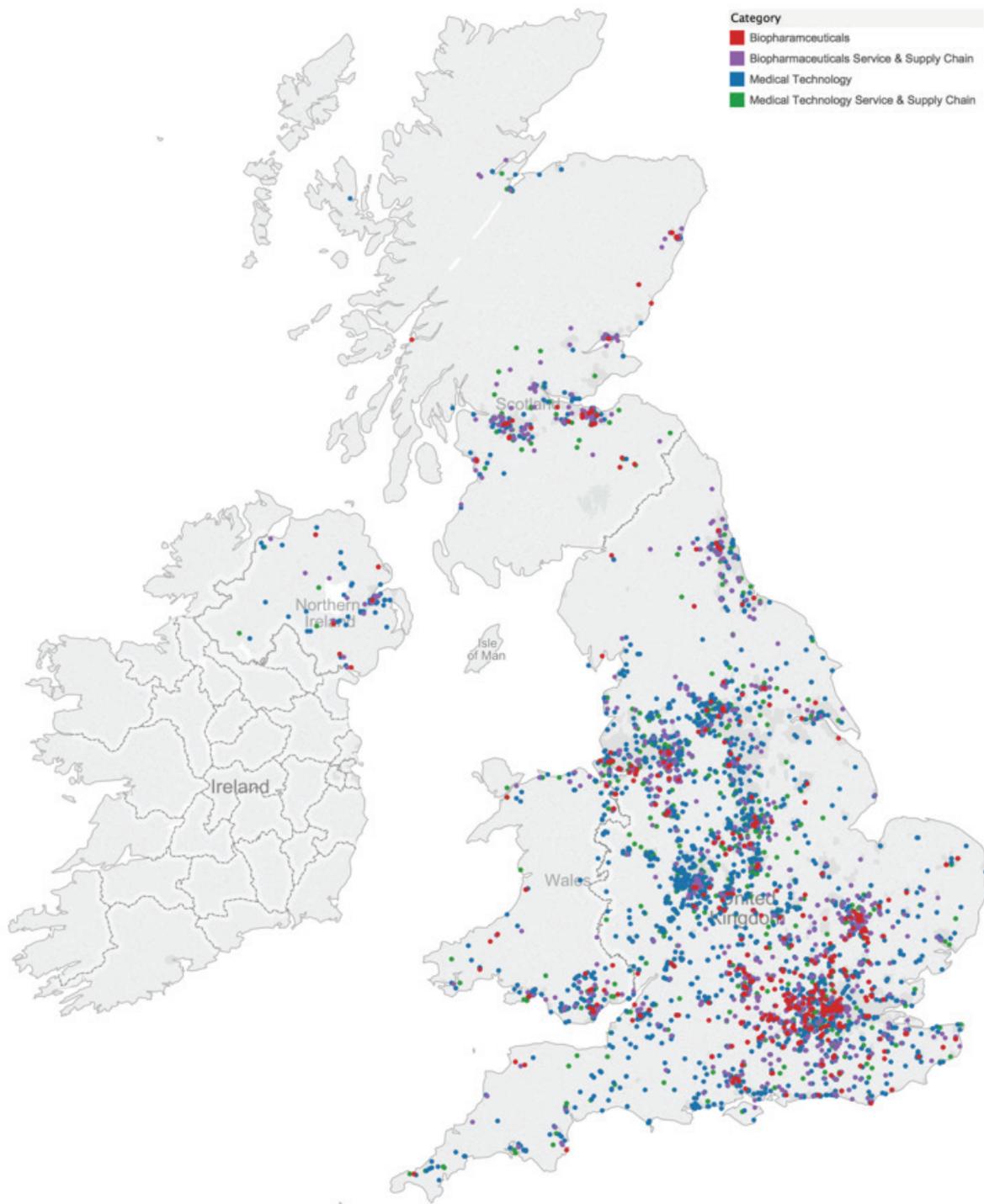


Figure 19. Overall sector map – location of all life science sector sites



Regional breakdown by sector

Table 1. Number of jobs by geographical area and sub-sector of life sciences

Region	Biopharmaceutical core	Biopharmaceutical Service & Supply	Medical Technology core	Medical Technology Service & Supply	Total
South East	16,784	9,552	20,958	2,254	49,548
East of England	12,526	7,709	9,765	3,797	33,797
North West	9,556	3,924	7,252	4,980	25,712
London	11,046	2,759	3,824	3,021	20,650
West Midlands	550	3,760	10,819	1,554	16,683
Yorkshire and The Humber	2,111	2,058	10,745	1,044	15,958
East Midlands	1,062	3,388	6,170	3,262	13,882
South West	1,952	1,205	4,330	1,090	8,577
North East	1,781	1,954	1,762	709	6,206
England total	57,368	36,309	75,625	21,711	191,013
Scotland	1,123	4,665	6,238	1,236	13,262
Wales	1,779	2,225	6,430	1,262	11,696
Northern Ireland	2,041	1,923	1,572	396	5,932
UK total	62,311	45,122	89,865	24,605	221,903

Table 2. Proportion of total UK employment by geographical area and sub-sector of life sciences

% of UK total	Biopharmaceutical core	Biopharmaceutical Service & Supply	Medical Technology core	Medical Technology Service & Supply	Total
Region					
South East	27%	21%	23%	9%	22%
East of England	20%	17%	11%	15%	15%
North West	15%	9%	8%	20%	12%
London	18%	6%	4%	12%	9%
West Midlands	1%	8%	12%	6%	8%
Yorkshire and The Humber	3%	5%	12%	4%	7%
East Midlands	2%	8%	7%	13%	6%
South West	3%	3%	5%	4%	4%
North East	3%	4%	2%	3%	3%
England total	92%	81%	84%	88%	86%
Scotland	2%	10%	7%	5%	6%
Wales	3%	5%	7%	5%	5%
Northern Ireland	3%	4%	2%	2%	3%

Medtech geographical analysis

5.1.3 For core medtech companies and medtech service and supply chain the biggest regions by employment are the South East, 23,312 employees, East of England, 13,526 employees, and West Midlands, 12,373 employees. Approximately 74% of employment, 79% of companies and 67% of turnover is generated outside of London and the South East. A further breakdown of the core companies and the service and supply chain by geography, can be found in the published data.

Figure 20. Regional distribution of medtech sector

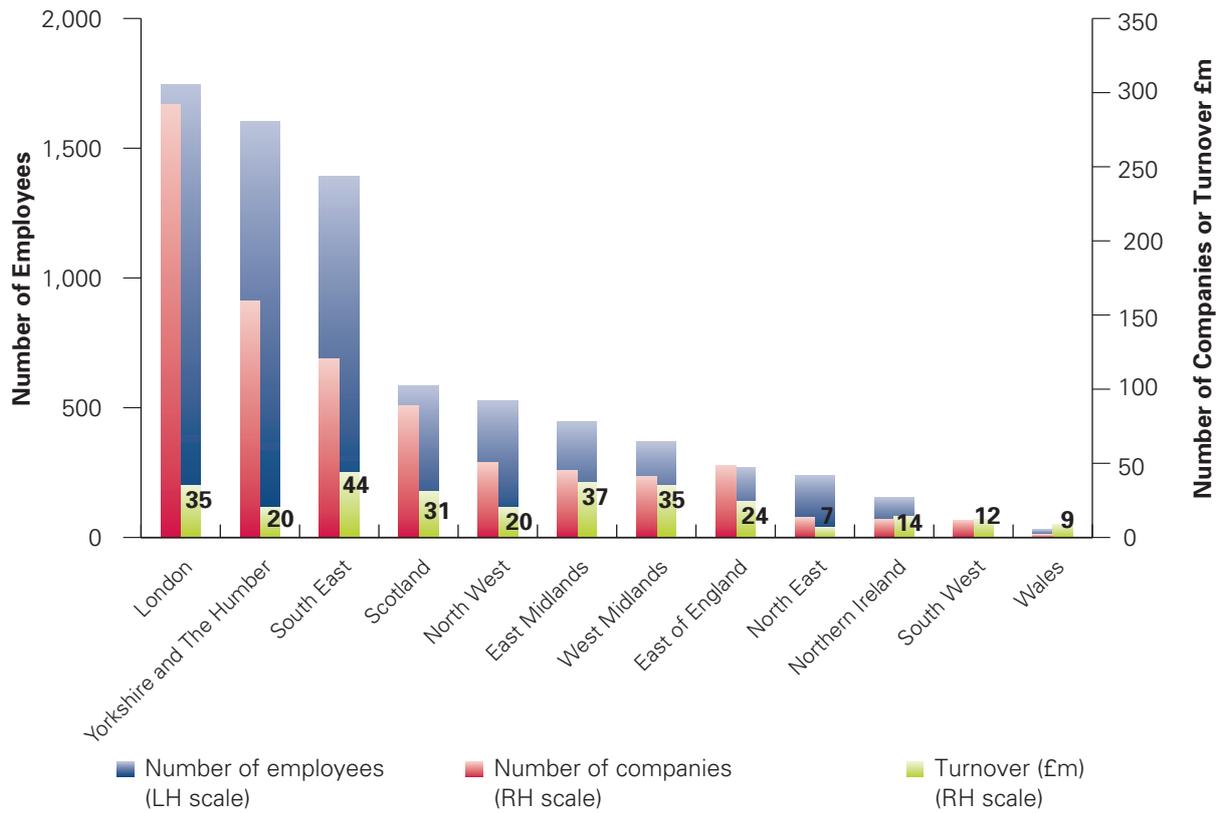
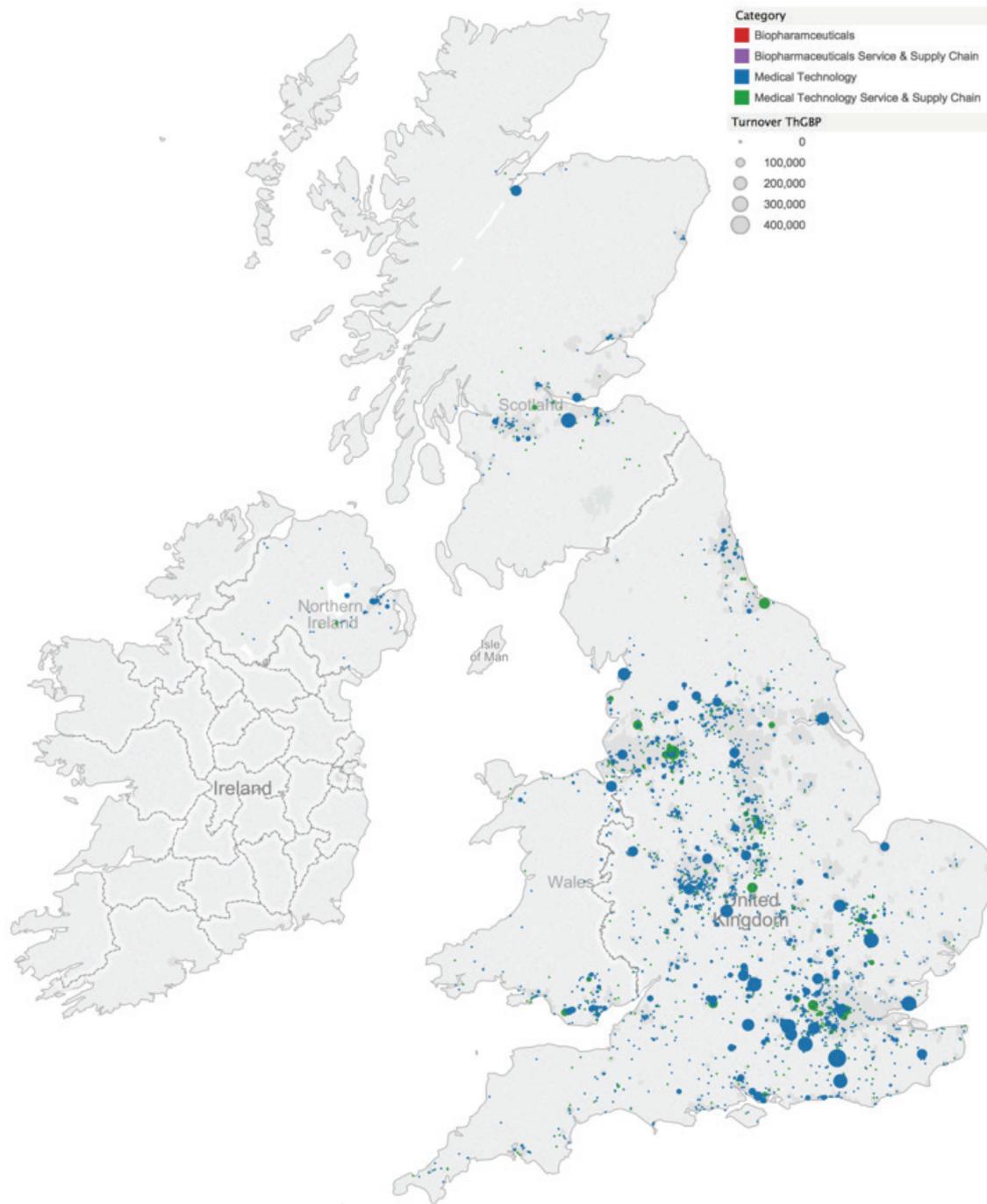


Figure 21. Medtech map – distribution of medtech turnover

Biopharmaceutical geographical analysis

5.1.4 For the core biopharmaceutical and service and supply chain companies the biggest regions by employment are the South East, 26,336, East of England, 20,235, and London, 13,805. Around 63% of employees and 63% of companies, generating 48% of turnover, are outside London and the South East.

Figure 22. Regional distribution of biopharmaceutical sector

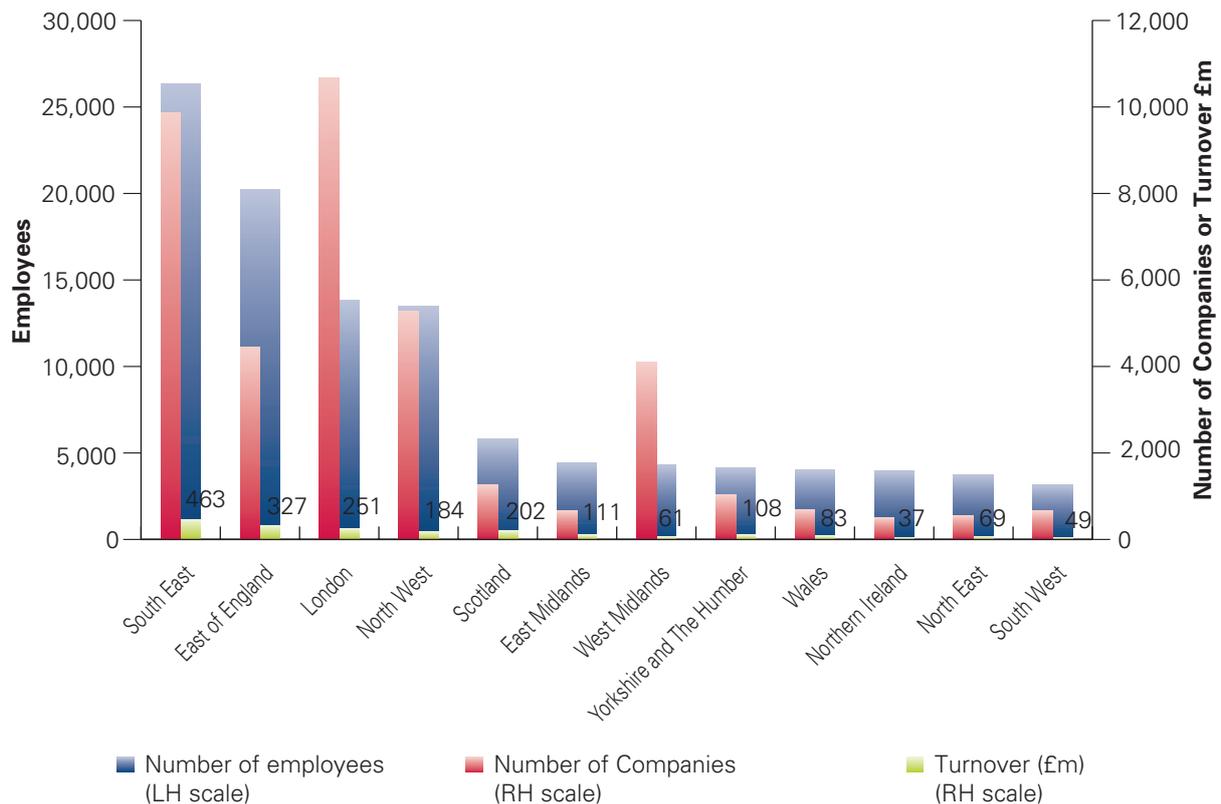
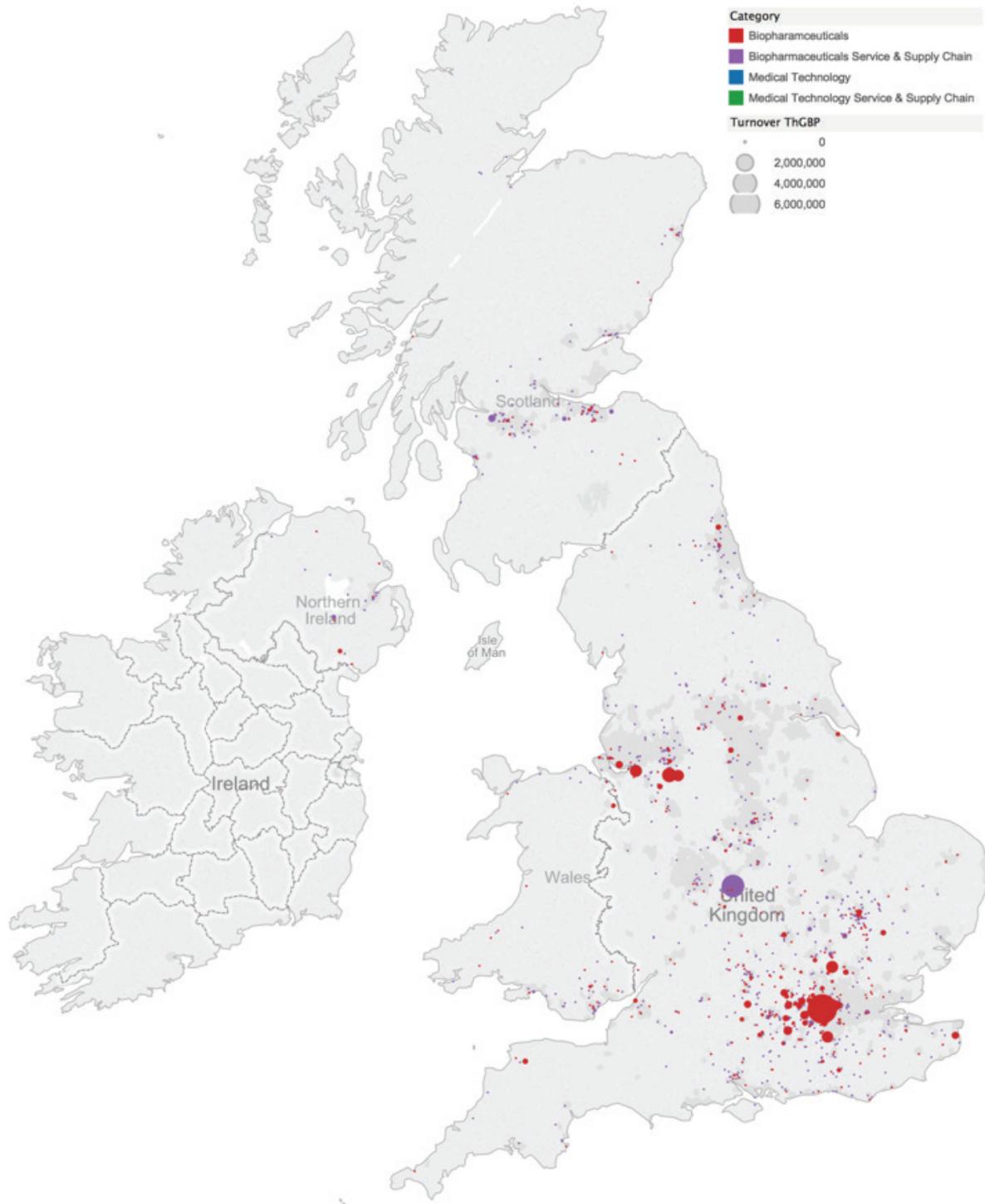


Figure 23. Biopharma map – geographical distribution of biopharmaceutical revenue

Chapter 6

Company Size

6.1 Analysis of company size

6.1.1 SMEs with fewer than 250 employees make up 98% of medtech companies (including the service and supply chain) and 82% have less than £5m turnover. SMEs with fewer than 250 employees make up 78% of biopharmaceutical companies (including the service and supply chain) and 94% have less than £5m turnover.

Analysis of company size – medtech

Table 3. *Medtech core and service and supply chain – proportion of companies by revenue band*

Turnover size band value in 000s	% of companies
£0-49,000	14%
£50-99,000	8%
£0.1-0.249m	16%
£0.25-0.499m	14%
£0.5-0.999m	11%
£1-4.9m	19%
£5m+	18%

Table 4. *Medtech core and service and supply chain – proportion of companies by employment band*

Employee size band	% of companies
0-4	44%
5-9	17%
10-19	12%
20-49	13%
50-99	7%
100-249	4%
250+	2%

6.1.2 The breakdown for core medtech and service and supply chain companies is shown below. The equivalent charts for employment can be found in the published data.

Figure 24. *Distribution of medtech core companies – broken down by company turnover*

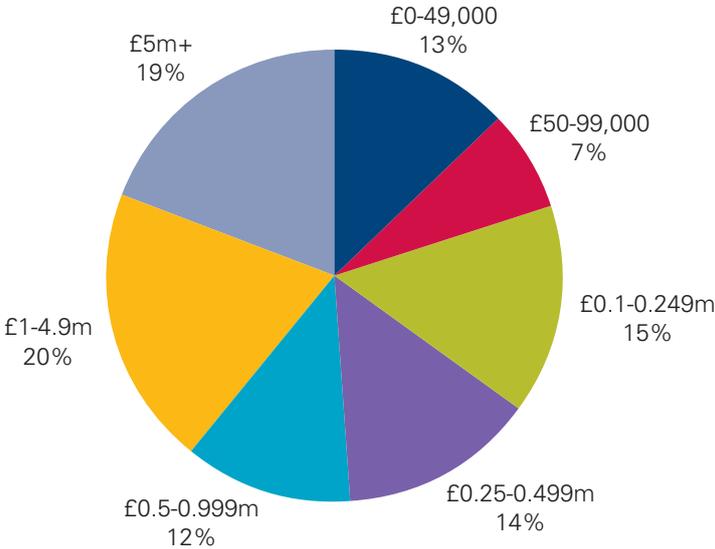
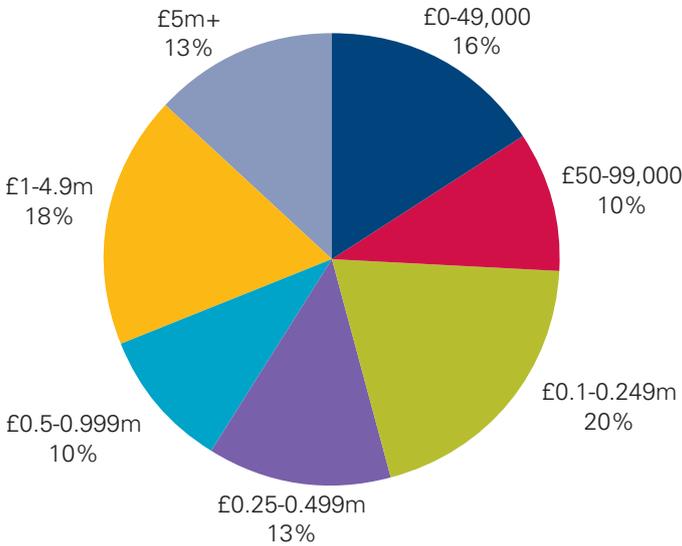


Figure 25. *Distribution of medtech service and supply chain companies – broken down by company turnover*



Analysis of company size – biopharmaceuticals

Table 5. *Biopharma core and service and supply chain – proportion of companies by turnover band*

Turnover size band value in 000s	% of companies
£0-49,000	13%
£50-99,000	11%
£0.1-0.249m	18%
£0.25-0.499m	13%
£0.5-0.999m	8%
£1-4.9m	15%
£5m+	22%

Table 6. *Biopharma core and service and supply chain – proportion of companies by employment band*

Employee size band	% of companies
0-4	51%
5-9	13%
10-19	8%
20-49	10%
50-99	6%
100-249	6%
250+	6%

Figure 26. *Distribution of biopharmaceutical services and supply chain companies – broken down by company turnover*

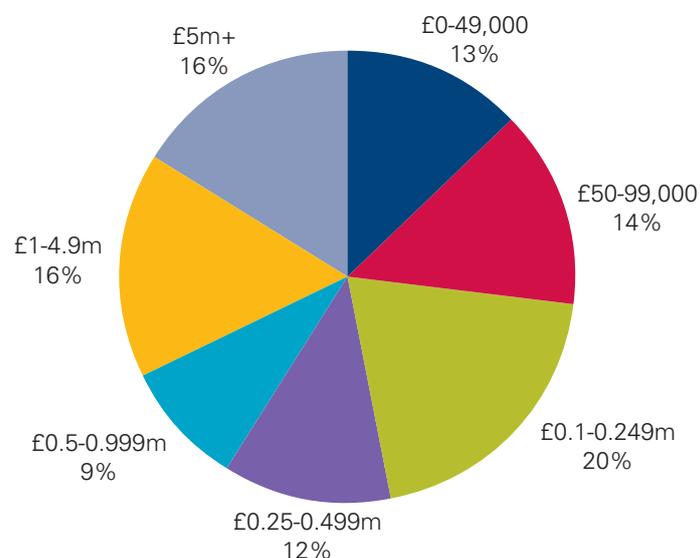
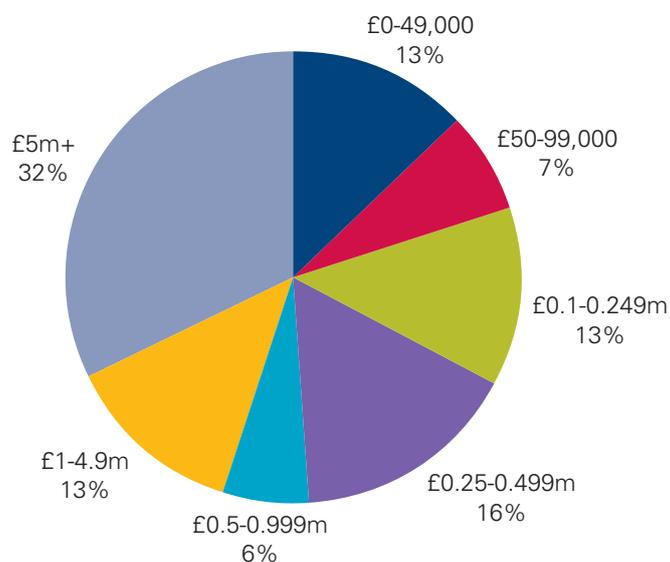


Figure 27. Distribution of biopharmaceutical core companies – broken down by company turnover



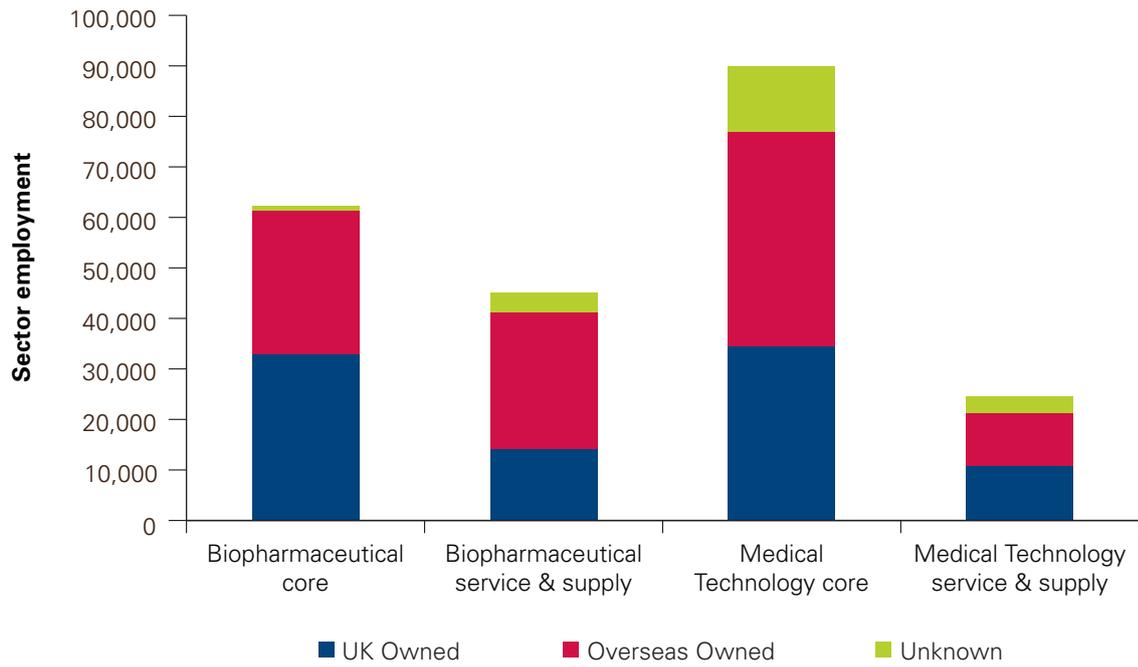
6.2 Company ownership – medtech and biopharmaceuticals

6.2.1 The life science industry is global and the data below shows that around 42% of employment is at UK owned companies and 49% of employment is at overseas-owned companies and 10% where the ownership location is unknown.

Table 7. Life Science company ownership – country of origin

	UK Owned	Overseas Owned	Unknown
Biopharmaceutical core	53%	46%	2%
Biopharmaceutical service & supply	31%	60%	9%
Medical Technology core	38%	47%	14%
Medical Technology service & supply	44%	43%	14%

Figure 28. *Employment in life science sector by country of origin of company*



Annex 1

Data Quality and Methodology

- A1.1 Data quality statement: we aim to collect data and present this report in line with principles of the Government Statistical Code⁴ as well as build the reliability of data in the sector.
- A1.2 **Principle 1: Meeting user needs** – Since the previous publication we undertook a significant methodology review engaging with users to ensure the data collection remains relevant and useful. We publish data at Local Enterprise Partnership level, a key user.
- A1.3 **Principle 2: Impartiality and objectivity** – Data is collected, processed and quality assured by an independent contractor. The next section looks at the impacts of recent methodology changes, transparently presenting their impact.
- A1.4 **Principle 3: Integrity** – In this report we present data in a transparent way, commenting objectively on life science industry sector trends.
- A1.5 **Principle 4: Sound methods and assured quality** – Significant quality assurance is carried out by the contractor, BIS analysts and OLS. Issues of methodology are identified and explored in this report.
- A1.6 **Principle 5: Confidentiality** – We publish the maximum amount of data possible without revealing any data provided to us under licence.
- A1.7 **Principle 6: Proportionate burden** – The data collection is based on analysis and collation of secondary data sources (e.g. company accounts) to ensure we do not impose a burden on businesses in the life science sector.
- A1.8 **Principle 7: Resources** – Significant financial and administrative resources are employed to enable this data collection and development of this report.
- A1.9 **Principle 8: Frankness and accessibility** – The aim is to provide objective commentary on life science sector trends, presenting the data in an accessible way using a range of graphical presentations.

4 https://www.statisticsauthority.gov.uk/wp-content/uploads/2015/12/images-codeofpracticeforofficialstatisticsjanuary2009_tcm97-25306.pdf

Impact of methodology changes

A1.10 To keep the database up to date and relevant the Office for Life Sciences undertook a methodology review in 2015 engaging with users. The following key changes to the methodology were made:

- **Removal of Industrial Biotechnology (IB) sector** – IB was no longer considered within the scope of the health life sciences data that OLS aims to collect. This led to a small number of records being removed and a small number of records were reclassified as within scope of the biopharmaceutical service and supply chain.
- Companies are regularly reviewed to ensure their business activities are still within scope of the definition of life sciences. This leads to the removal of some companies from the database which supports this publication.
- **Employment Methodology** – A change was made to the algorithm that calculates employment which allowed allocation of employees to individual sites of a multi-site company so that the total for all sites matched the total employees stated on the top level group accounts. Previously, we sourced employment data at a site level and in instances where this sum did not equal the total given for a group we had no mechanism to add the “missing” employees.
- **Turnover Methodology** – In 2015 82 companies and sites which had always been classed as branches with no turnover by Dun & Bradstreet Limited have been matched to the FAME database and had turnover associated with them for the first time (see next section for detail on the Dun & Bradstreet and Fame databases).

Annex 2

Data Partners Acknowledgement

- A2.1 The Office for Life Sciences gratefully acknowledge the contribution of a number of regional and national organisations in the compilation of the Health Life Sciences Database (see list below).
- A2.2 The content of the database has been derived from a variety of proprietary data sources which have been provided under license. The Department for Business, Innovation and Skills and UK Trade & Investment would like to acknowledge the assistance given by the owners of these data sources.
- A2.3 Business information was accessed under license from Dun & Bradstreet Limited and the FAME database from Bureau van Dijk Electronic Publishing.
- A2.4 The database construction, data integration, data analysis and commentary preparation was completed by a consortium led by Cels Business Services (CBSL) Ltd. The consortium included Kepier Ltd and Lindum Ltd (data integration and analysis).

Data Partners

- One Nucleus
- Medilink East Midlands
- Bionow
- Invest Northern Ireland
- Scottish Enterprise
- South East Health Technologies Alliance
- MediWales
- Welsh Assembly Government
- Medilink West Midlands
- Association of British Healthcare Industries (ABHI)
- Association of the British Pharmaceutical Industry (ABPI)
- British Healthcare Trade Association (BHTA)
- BioIndustry Association (BIA)

- Biosciences Knowledge Transfer Network (KTN)
- HealthTech and Medicines Knowledge Transfer Network (KTN)
- British In Vitro Diagnostics Association (BIVDA)

Annex 3

Summary of Methodology

- A3.1 Each company and their individual sites are segmented depending on the main type of final medicinal product or device produced. The latter companies are designated 'core' companies to distinguish them from companies that are active only in the service and supply chain.
- A3.2 Within the database codes are used to allocate companies and sites to one or more segments. Where a company has products that fall in more than one category these are all coded, however in the analysis of the data only the code that represents the majority of a company's activity is used.
- A3.3 Segmentation was reviewed for all companies and sites in the 2014 update and during the 2015 update a number of the companies that have large contributions to employment and turnover were reviewed for segmentation and their turnover in scope (TOS).
- A3.4 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 companies and sites dependent on whether they under take R&D, manufacturing, service and supply (of their products) and sales/distribution (of their products).
- A3.5 The codes for each sector containing core companies are shown in the following tables (Annex 4). In the 2015 annual update, in contrast to all previous years, the pharmaceutical and medical biotechnology sectors have been combined into one sector, 'biopharmaceuticals'.
- A3.6 The service and supply chain sectors that serve the biopharmaceutical and medical technology sectors are coded with the prefix BP and MT respectively followed by the appropriate number to define the type of service or supply.
- A3.7 Standard Industry Classification (SIC) codes are used to classify companies by industry in administrative statistics. This was last update in 2008.⁵ This classification system does not capture the full span of life science companies based on the information we receive from industry and trade associations. This is described by the classification system used in this report. The additional benefit of the approach of the health life science database is the

5 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/455263/SIC_codes_V2.pdf

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 which shows employment and growth rates in digital health or allows us to understand the growth of advanced therapy medicinal products. We have analysed the SIC codes of the companies within the database and this shows a wide span, reflecting the ongoing need for this report and for the Health Life Science database.

Annex 4

Sector Segmentation: Biopharma, Medtech, Digital Health, Genomics

Biopharmaceutical	
Code	Description
PBA	Antibodies
PBB	Therapeutic Proteins
PBC	Advanced Therapy Medicinal Products (ATMPs)
PBD	Vaccines
PBE	Small Molecules
PBF	Blood and Tissue Products
PBX	Supply Chain

Service & Supply Chain	
Code	Description
X1	Clinical Research Organisation
X2	Contract Manufacturing/Research Organisation
X3	Contract Formulation Manufacturing
X4	Assay developer
X5	Analytical Services
X6	Formulation/Drug delivery specialist
X7	Reagent, Equipment and consumables supplier
X8	Regulatory Expertise
X9	Patent and Legal specialist
X10	Logistics and Packaging
X11	Information systems specialists
X12	Tissue and Biomass
X13	Specialist consultants
X14	Contract design
X15	Training
X16	Recruitment
X17	Investment Companies
X18	Healthcare services

Medical Technology	
Code	Description
MTA	Wound care and Management
MTB	In vitro diagnostic technology
MTC	Radiotherapy equipment
MTD	Medical Imaging/Ultrasound/and Materials
MTE	Anaesthetic and respiratory technology
MTF	Orthopaedic Devices
MTG	Cardiovascular and vascular devices
MTH	Neurology
MTI	Ophthalmic Devices/Equipment
MTJ	Dental and maxillofacial technology
MTK	Drug Delivery
MTL	Infection Control
MTM	Surgical Instruments (reusable)
MTN	Single use technology nec
MTO	Re-usable diagnostic or analytic equipment
MTP	Implantable devices nec
MTQ	Assistive Technology
MTR	Mobility Access
MTS	Hospital hardware including ambulatory
MTT	ICT+ E-health
MTV	Education and Training
MTX	Supply Chain

Digital Health		
Sub-segment code	Description	Detailed Description
MTT2	GP Information Systems	Primary health system-held medical record systems are electronic versions of traditional paper records – often abbreviated to EHR. Includes provider-provider communication systems, e-prescribing.
MTT3	Social Alarms / Communications devices / bed-nurse call	Telecare – support and assistance provided at a distance using ICT, such as fall alarms and medicine management delivered over hardline or mobile platforms.
MTT4	Personal Medical Records	Systems for patients to hold their own medical information.
MTT5	Teled (medical monitoring) and telediag	Telehealth – the remote exchange of clinical data between a patient and their clinician delivered over hardline or mobile platforms. Includes video consultation and remote monitoring of health parameters such as blood pressure.
MTT6	E-health – data analytics	<ul style="list-style-type: none"> • Software and infrastructure to enable analysis of health and medical Big data. Applications included: • To support clinical decision-making: enabling clinicians to make evidence-based clinical decisions about patient care. • Pathway design: using population level analysis to help redesign clinical pathways. • Commissioning: developing standard frameworks and models for innovative commissioning/funding using patient outcomes and resource utilisation data for new and existing treatments. • Drug assessment: the long term use of real world evidence to support drug development and approval. • Performance management: prioritising resource allocation and measuring key performance metrics to better manage finances within the healthcare system. • Evidence based learning: using analytics to more effectively share best practice.
MTT7	Digital Medical Electronics	Devices that conduct monitoring of body activity internally or externally, are wireless and incorporate sophisticated software that enables a high degree of operation independent of human intervention.
MTT8	Professional Mobile health devices	Mobile devices that are applied in a clinically setting (can include embedded software or interface with independent software).
MTT9	Professional Mobile health services/apps	Clinically-led apps that manage medium to high confidentiality data (health data and personal medical records); these are used by clinicians, patients or hospital system reporting to aid prevention, diagnosis, and/or monitoring of disease.
MTT10	Consumer Mobile health devices	Consumer-led fitness and wellbeing devices that monitor basic body functions such as activity levels, heart rate and blood pressure.
MTT11	Consumer Mobile health services/apps	Consumer-led fitness and wellbeing apps that handle low-confidentiality data (personal wellness and activity data) and are usually a consumer-driven purchase, includes services to store consumer data in the cloud and provide health advice based on the data.

Genomics				
Main	Main Value chain	Description	Sub-tag code	Sub-tag chain activity
Tagging code	Activity			
GenA	Sampling	The process of collecting and packaging samples (e.g. saliva, blood). The kits used to collect DNA samples are fairly simple.	GenA1	Consumables
GenB	Sequencing	Decoding the order of the nucleotides in a genome. DNA sequencing on a large scale is done by high-tech machines.	GenB1	Consumables
			GenB2	Instruments
			GenB3	Services
GenC	Analysis	The process to identify disease-causing variants, often run by bioinformatics software.	GenC1	Data cleansing
			GenC2	Variant Analysis
			GenC3	Database services
GenD	Interpretation	Taking analysed information and providing clinically useful interpretations and results.	GenD1	Reporting
			GenD2	Link with EHRs
			GenD3	Tailoring results
GenE	Application	The process of directly using genomic information to improve targeting of clinical services.	GenE1	Drug development
			GenE2	Clinical Services
			GenE3	Diagnostics
GenX	Activities not elsewhere classified	A segment where companies that are not clearly assigned to GenA-E should be placed. When this group becomes large it will be examined to see if new segments are required.		
			NA	NA

Contact BIS Email: enquiries@bis.gsi.gov.uk
Phone: 020 7215 5000 Web: www.bis.gov.uk



Crown copyright 2016

You may re-use this information (not including logos) free of charge in any format or medium, under the terms of the Open Government License. To view this license, visit <http://www.nationalarchives.gov.uk/doc/open-government-licence/> or write to the Information Policy Team, The National Archives, Kew, London TW9 4DU, or e-mail: psi@nationalarchives.gsi.gov.uk

This publication is also available on our website at <http://www.bis.gov.uk>

Any enquiries regarding this publication should be sent to:

Department for Business, Innovation and Skills
1 Victoria Street
London SW1H 0ET
Tel: 020 7215 5000

If you require this publication in an alternative format, email: enquiries@bis.gsi.gov.uk, or call 020 7215 5000.

URN BIS/16/237

Cover photo is from the UKTI Life Sciences Marketing toolkit.