

Midlands MedTech Sector Analysis

Midlands Health Innovation

This report, commissioned by Midlands Health Innovation and supported by the Midlands Engine, was produced by the independent consultancy Hatch Regeneris Ltd.

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Midlands Health Innovation¹ (MHI) commissioned Hatch Regeneris to undertake an assessment of the nature and scale of the medical technologies (MedTech) sector in the Midlands, its contribution to the regional economy, what MedTech businesses in the Midlands need to achieve growth and increased productivity, and the barriers they face in achieving this. This work was supported by the Midlands Engine through the Strategic Programme Development Fund.

The findings from this assessment will support the development of the Medical Technologies Innovation Accelerator² (MTIA) and help MHI and its regional partners to better understand how they can support the sector in the future.



¹ Midlands Health Innovation is a research and innovation partnership that coordinates and combines the collective excellence of 7 Midlands universities to deliver improved health and regional growth. Driving disruptive translational interventions and influencing nationally, MHI draws together a critical mass of innovative regional stakeholders to impact national and global health challenges using local training strengths, expertise, networks, best practice and facilities. MHI also links the Midlands-based universities within a joint academic-NHS-industry innovation environment, to push forward research, collaboration and skills in the Midlands medical sector.

MHI partners are Aston University, the University of Birmingham, Keele University, the University of Leicester, Loughborough University, the University of Nottingham and the University of Warwick.

MHI also acts as the Health branch of Midlands Innovation, a world-class multi-disciplinary collaboration that unites the power of university research with the unique strengths of Midlands industry to drive cutting-edge research, innovation and skills development. Midlands Innovation also includes Cranfield University in addition to the MHI consortium.



² The Medical Technologies Innovation Accelerator programme will catalyse and facilitate a step change in Midlands' productivity by creating the UK's leading cluster for the development, manufacture, evaluation and adoption of medical technologies. This industry-led innovation pipeline will support regional business, solve patient need challenges and develop new innovative products and services at a regional scale never seen before in the UK.

The MTIA Initiator Cluster will act as Phase 1 delivery of the overall MTIA programme and will prepare the supporting infrastructure necessary to deliver the full Midlands MTIA innovation pipeline.

Key Findings

MedTech's Contribution to the Midlands Economy

- MedTech contributes an estimated £1.6bn in GVA for the region annually. It is a driver of high productivity, with GVA per worker standing 40% higher than the Midlands average.

Businesses and Employment Data

- There are close to 1,000 MedTech businesses operating in the Midlands – the largest number of MedTech companies in any region in the UK.
- Midlands MedTech employs 23,600 people – the second highest UK region for employment.
- Businesses and employment are split almost equally between East and West.
- The region contains a large number of well-established businesses, with 85% setup >10 years ago and only 5% being ≤5 years old. This compares to 80% and 7% across the UK respectively.
- The East Midlands has seen a 15% rise in MedTech employment between 2009 and 2017. This contrasts with a 12% fall in the West Midlands, likely due to a mixture of causes including successful promotion of investment options leading to overseas acquisition and restructuring.
- Most businesses view future prospects positively and appear confident in their ability to cope with future economic shocks.

Specialisms and Clusters

- Alongside major employers, the Midlands is home to a wide range of MedTech-related facilities, research and expertise, including those unique to the UK market.
- There are two major clusters of businesses located around Nottingham and Birmingham, with further clusters located in Loughborough, Leicester, Derby, Coventry and Stoke-on-Trent.
- There are key regional specialisms in assistive technology, hospital hardware, single use technologies and infection control, alongside a range of specialisms within local clusters.
- Evidence from businesses on supply-chain links and the geographical dispersal of MedTech supply and service businesses points to a fragmented supply-chain hindering productivity.

R&D and Innovation Activity

- MedTech businesses in the Midlands are already engaged in a range of innovation activity, in particular early & later stage R&D. On average, 28% of staff time is taken up by R&D.
- Around 75% of businesses are engaged in some form of collaboration. The same proportion are integrating new technology into their businesses. The majority of businesses wish to engage more in R&D and innovation activities. Research on markets, innovation focussed staff training and university collaboration are in highest demand.
- Primary barriers to innovation highlighted by businesses are access to finance, time constraints, regulatory barriers and a lack of skills. Barriers to working with universities relate to businesses' understanding of university and academic strengths, internal expertise and time constraints.

Barriers to Growth and Supporting a Stronger, More Dynamic Sector

- The barriers to growth most frequently highlighted by businesses are in access to finance and investment, clinical partnerships, skills and the means to better connect a fragmented sector.
- The priorities for support highlighted by businesses include access to finance, clinical partnerships and trials, skills, facilities for product development and research expertise, facilitating business and university collaboration and help to understand and open new markets.

Introduction

- i. Major advances are being made in medical technology, introducing innovative solutions to the way we are diagnosed, treated and cared for. These advances are helping to improve our quality of life, allowing us to live longer and are vital in the challenges that our society will face from a growing and ageing population.
- ii. MedTech employment in the UK has grown by 17.5% between 2009 and 2017, compared to between 9 and 10% for UK-wide employment¹. As the national and global market for medical technologies continues to innovate and grow, there will be a wealth of opportunity for existing and emerging MedTech business within the Midlands to capture a share of that growth.
- iii. The Midlands is home to a wide range of industry and academic-led medical facilities, research and expertise, which puts the region in a position to lead the development of new MedTech products, services and businesses and to capture some of the growing national and global MedTech market.
- iv. There are 27 universities in the Midlands, many of which are playing a leading role in the advancement of medical technology. There are seven medical schools, 50 NHS Trusts, 50 major hospitals and 25 science parks. The region is home to a range of established high growth businesses active in MedTech, including Salts Healthcare, Kimal, the Binding Site Group and Pennine Healthcare. Centres and institutes working in specialist areas related to MedTech include the Centre for Healthcare Equipment and Technology Adoption and BioCity in Nottingham, the Institute of Translational Medicine and Royal Centre for Defence Medicine in Birmingham and the Defence and National Rehabilitation Centre and National Centre for Sports and Exercise Medicine in Loughborough.
- v. Medilink Midlands and the East and West Academic Health Science Networks (AHSNs) are key partners, working to boost innovation, collaboration and growth in MedTech and the wider medical and life science sector in the region:
 - Medilink Midlands is the regional industry association for life sciences, working with a network of more than 1,700 organisations and alongside the NHS, Midlands universities and public sector partners. Medilink provides specialist support to businesses to establish, develop and generate economic growth.
 - The AHSNs works in partnership with academics and the NHS as well as public bodies and industry. They provide a vital link between medical research and medical practice, to maximise the potential for collaboration, innovation and the deployment of research to produce enhanced patient outcomes.

¹ MedTech employment growth based on OLS Strengths & Opportunities Trends Data, 2017. UK employment growth based on ONS Business Register & Employment Survey, 2017 and Annual Population Survey, 2018.

Our Approach

Defining MedTech

- vi. The MedTech sector reaches into a number of areas of the economy. Alongside manufacturers, whose core purpose is to serve the medical sector, other traditional and advanced manufacturers operating primarily in areas such as aerospace, automotive, textiles and electronics serve the market and are delivering the product innovation that is helping to transform the sector.
- vii. The digital sector is also playing a fundamental role in the development of new medical and healthcare solutions. Next generation broadband and 5G technology is a key facilitator for these solutions. Researchers and businesses developing AI, virtual reality and autonomous systems and machines are also driving the wave of new solutions in healthcare and medicine. Service innovation is also crucial in delivering these flexible and enhanced solutions.
- viii. As such, it is inherently difficult to define the full range of MedTech activity happening in the UK economy. Any effort to capture it risks excluding some of this activity.
- ix. Our analysis is defined by the segments of MedTech activity captured in the Strengths & Opportunities (S&O) data produced annually by the Office for Life Sciences (OLS)². S&O splits the MedTech sector into 'Core MedTech Companies' and 'Service and Supply-Chain Companies':
 - **Core MedTech** covers all companies whose primary business is in developing and producing MedTech products, ranging from single-use consumables to complex hospital equipment and including digital health products.
 - **Service and supply** businesses provide products and services to core MedTech businesses. This includes contract research and manufacturing, consumables and reagents, finance businesses specialising in MedTech investments and providers of specialist analytical, IT, recruitment and logistics services, legal and regulatory expertise. This group makes up 26% of all MedTech businesses nationally (and 30% in the Midlands), compared with 46% for bio-pharmaceuticals. This is largely accounted for by the greater scale of contract manufacturing and research activity undertaken in bio-pharma³.
- x. Table 1 provides a list of all MedTech segments included in the S&O data, ordered by the scale of employment in the Midlands. We explore clusters and concentrations of activity in these sectors in Section 3.

² gov.uk/government/publications/bioscience-and-health-technology-database-annual-report-2017

³ Strength & Opportunities Annual Report, 2017.

Table 1 MedTech Segments	
Core MedTech	Service & Supply
Assistive technology	Reagent, Equipment & consumables
Hospital hardware including ambulatory	Contract Manufacturing/Research
Single use technology n.e.c.	Logistics & Packaging
Wound care & management	Healthcare service provider
Digital health	Analytical Services
Infection control	Market/Analysis/Comms/Consultants
Re-usable diagnostic or analytic equip n.e.c.	Clinical Research
Anaesthetic & respiratory technology	Assay developer
Orthopaedic devices	Contract design
Dental & maxillofacial technology	Information systems specialists
Drug Delivery	Regulatory Expertise
Ophthalmic devices/equipment	Patent & Legal specialist
Surgical instruments (reusable) n.e.c.	Tissue & Biomass
In vitro diagnostic technology	Training
Mobility access	Recruitment
Cardiovascular & vascular devices	Formulation/Drug delivery specialist
Imaging/ultrasound equipment/materials	Contract Formulation Manufacturing
Education & training	Investment Companies
Implantable devices n.e.c.	
Radiotherapy equipment	
Neurology	

Source: Strengths & Opportunities Data, 2017.

Data Analysis for the MedTech Sector

- xi. We use business data to explore the nature of the MedTech industry in the Midlands, its scale, geographic spread and the concentration of employment in key industry segments.
- xii. S&O is our primary source of data, which is the largest available source of data on the MedTech sector. It provides detailed information on MedTech businesses operating at almost 4,000 sites across the UK and delivering combined revenues of over £22 billion.
- xiii. We have also drawn on wider business data using the FAME database, produced by Bureau Van Dijk, and provided to us by the University of Birmingham. This has allowed us to draw more accurate data on employment into our analysis. FAME also suggests there are around 40 MedTech businesses in the Midlands that are not included in the S&O data, expanding our understanding of the overall scale and nature of MedTech activity across the Midlands.

Surveying MedTech Businesses

- xiv. We also draw on findings from an online survey, undertaken for this assessment, of more than 100 MedTech business (full and partial responses, with the statistics based upon the full responses only⁴) operating in the Midlands, representing around 10% of the region's MedTech companies. We explore the research and innovation activity being undertaken by MedTech businesses, the prospects for, and barriers to, increased business productivity and growth and

⁴ Providing a maximum 95% confidence interval of +/- 13.8% depending on responses to individual questions.

the range of areas in which support is needed to encourage the development of a larger, stronger and more dynamic sector.

- xv. The survey questionnaire has been disseminated through networks of MedTech businesses engaged with Midlands Health Innovation, Medilink Midlands and regional research/commercialisation/support programmes.

Consultation with Business Leaders

- xvi. Input to the assessment has been provided by a number of individuals at the top of some of the larger MedTech businesses operating in the Midlands. These individuals have long standing experience of working in sector. They have provided insight into the recent and historic growth of the sector, the challenges it currently faces and the opportunities on offer to support growth development of MedTech in the Midlands.
- xvii. Business contacts have been provided by Midlands Health Innovation and Midlands Medilink.

Drawing on Wider Research & Evidence

- xviii. We also draw on some of the most recent evidence and research undertaken on MedTech, at a Midlands and UK level. This has provided additional context to our findings in terms of the wider growth and trends affecting the sector.

Report Structure

- xix. We explore the MedTech sector from a number of angles, across six Sections:
 - 1) MedTech's Contribution to the Midlands & UK Economy: providing the headline figures on employment, business numbers and economic output produced by the sector
 - 2) A Regional Overview: highlighting the distribution of MedTech activity across the Midlands, concentrations of employment relative to the UK and sub-sector specialisms
 - 3) Identifying Clusters of Activity: across the Midlands Local Enterprise Partnership (LEP) areas and towns and cities, including key specialisms, academic and industry facilities and examples of major key MedTech employers
 - 4) R&D, Innovation and Collaboration: exploring the extent and nature of MedTech businesses engagement in a range of R&D and innovation, the desire to engage more in these areas and the barriers to doing so
 - 5) Sector Health & Resilience: looking at recent growth trends, and prospects for growth among Midlands MedTech businesses
 - 6) Barriers to Growth and Supporting a Stronger, More Dynamic Sector: focussing on the barriers to productivity and business growth and the means to support the sector to achieve that growth.

1. MedTech's Contribution to the Midlands & UK Economy

- 1.1 There are close to 1,000 MedTech businesses operating in the Midlands, split almost equally between East (48%) and West (52%), making it the leading region in the UK.
- 1.2 MedTech employment in the region stands at over 23,600⁵. When the East and West Midlands are combined, only the South East has a larger number of people employed in the sector within the UK.
- 1.3 The sector is a great source of productivity, with an estimated average GVA per worker of £66,000, 40% and 22% higher than in the wider Midlands and UK economy respectively. Approximately £1.6 billion in GVA is generated through MedTech annually in the Midlands⁶.



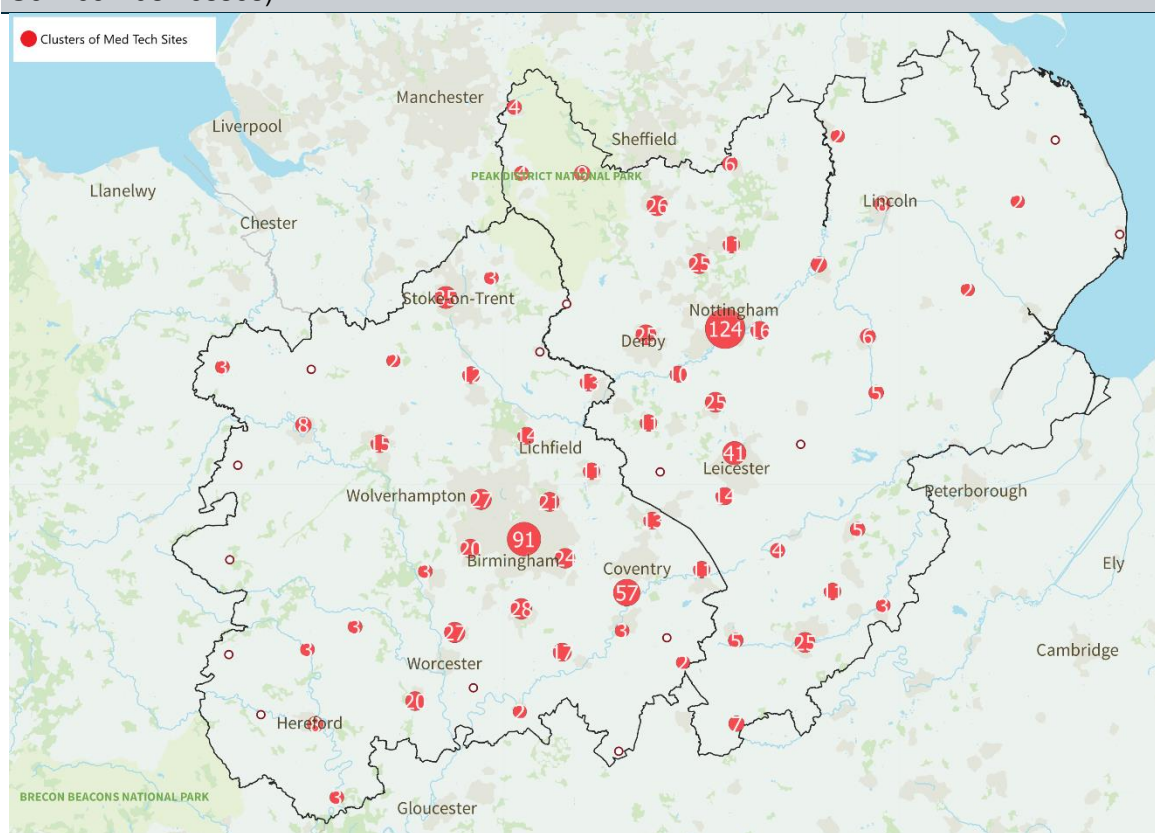
⁵ Based on OLS Strength & Opportunities data, 2017 supplemented with employment data from Bureau Van Dijk's FAME database.

⁶ Headline GVA and GVA per worker are high level estimates and exclude indirect and induced multiplier effects associated with knock-on supply-chain and worker spend. They are based on 1) turnover brackets for individual businesses from the Strength & Opportunities data 2) the relationship between turnover and GVA in the Standard Industrial Classification sectors individual businesses are operating in, from the latest Annual Business Survey.

2. A Regional Overview

- 2.1 Within the UK, the Midlands is home to the largest volume of MedTech employment outside of the South East. As is the case for businesses, employment in the sector is split equally between the East and West Midlands.
- 2.2 There are two major clusters of businesses located in and around Nottingham and Birmingham, with further clusters located in Loughborough, Leicester, Derby, Coventry and Stoke-on-Trent. There are also notable clusters of activity located in wider metropolitan areas and smaller towns. Otherwise the sector is geographically fragmented. We take a more detailed geographical look at the key clusters in Section 3.

Figure 2.1 MedTech Business Across the Midlands (Core MedTech and Supply & Service Businesses)

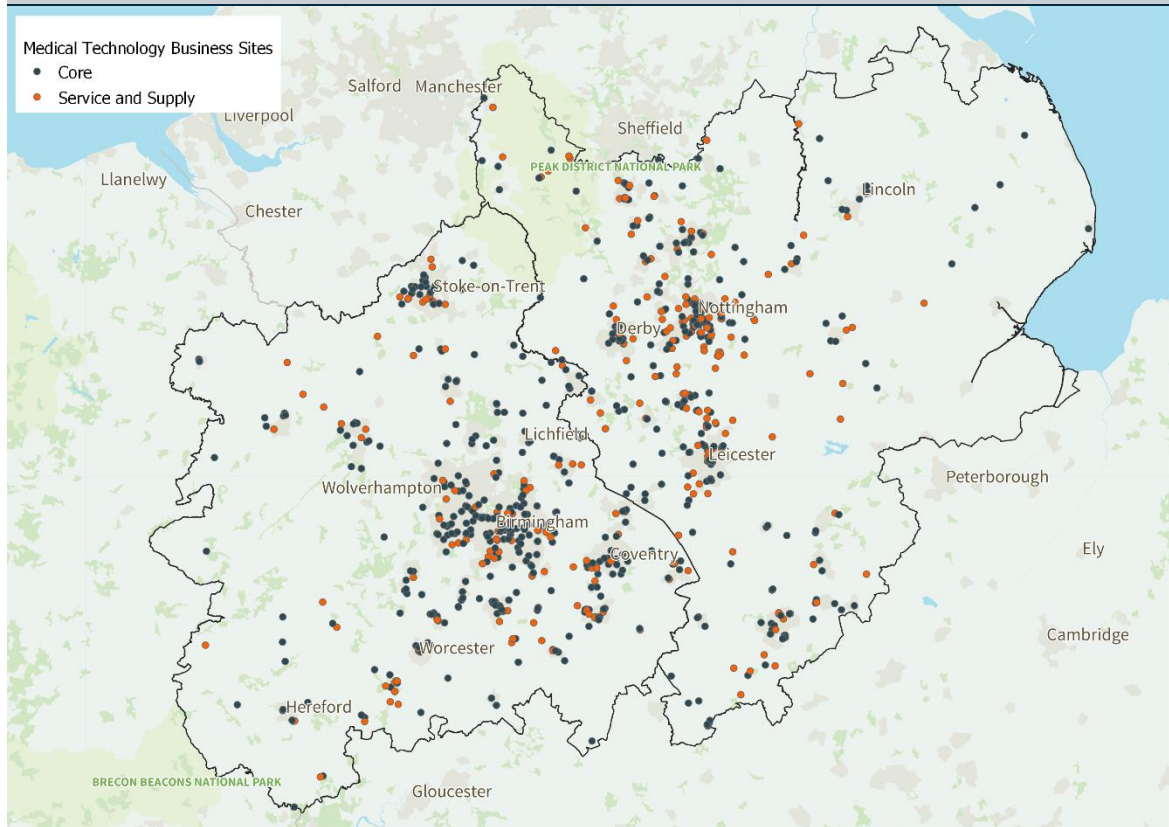


Source: Hatch Regeneris; Strength & Opportunities Data, 2017. Contains OS data © Crown copyright & database right, 2019.

- 2.3 Figure 2.2 shows the location of core MedTech businesses and businesses supplying products and services to the MedTech sector. The latter are scattered around the region, pointing to a fragmented supply-chain, with no identifiable pattern of proximity to the clusters' core of MedTech businesses.
- 2.4 On average, respondents to the survey suggested that 25% of their supply chain is located within the Midlands. The larger number of supply-chain businesses serving our respondents lies within the rest of the UK – 44% on average. The remainder of the supply-chain is split equally between Europe and the rest of the world (17% each).

- 2.5 This provides further evidence of supply-chain fragmentation, and that linkages between the MedTech sector and what is a growing supply chain in the Midlands could be strengthened. We explore the growth in core versus supply chain MedTech businesses in Section 5.

Figure 2.2 MedTech Business across the Midlands: Core and Supply & Service Sectors



Source: Hatch Regeneris; Strength & Opportunities Data, 2017. Contains OS data © Crown copyright & database right, 2019.

- 2.6 Alongside total employment, Figure 2.2 shows Location Quotients (LQs) for the regions. An LQ greater than one shows the area has a greater concentration of employment in MedTech when compared to the UK as a whole, indicating a degree of specialism in that location.
- 2.7 An overall LQ for the Midlands of 1.2 suggests MedTech employment is around 20% higher than across the UK when taken as a percentage of total employment. This rises to nearly 40% in the East Midlands; although MedTech employment is roughly the same as in the West, it represents a larger proportion of total employment in that region.

**Table 2.1 MedTech Employment & Location Quotients
Ordered by the Location Quotient**

	Total employment	Location Quotient
Wales	8,400	1.62
South East	24,200	1.46
East Midlands	11,700	1.39
Yorkshire & Humber	12,800	1.32
East of England	14,100	1.26
West Midlands	11,800	1.13
North West	12,300	0.93
Scotland	7,600	0.75
South West	7,400	0.74
North East	3,100	0.73
Northern Ireland	2,100	0.72
London	7,400	0.36
UK Total	122,900	1.00

Source: Strength & Opportunities Data, 2017; MINT Data, 2019; Hatch Regeneris.

- 2.8 The nearly 1,000 sites that are home to MedTech businesses in the Midlands are, when the East and West are combined, 42% larger in number than within any other UK region, and represent 24% of the UK total.
- 2.9 As highlighted in Section 1, productivity per employee is higher in the Midlands MedTech sector when compared with the wider regional economy (c. £66,000 vs £47,000). Yet there is clearly scope in the Midlands for the sector to secure further growth and increased productivity. GVA per worker is 16% lower than the UK sector average. It is almost 50% lower than in London; although this is likely to result, in part, from some employment being registered at larger company headquarters situated within the capital, despite being located elsewhere⁷.

⁷ GVA per worker figures are a high level estimates that should be viewed with some caution. They are based on 1) turnover brackets for individual businesses from Strength & Opportunities data 2) the relationship between turnover and GVA in the Standard Industrial Classification sectors individual businesses are operating in, from the latest Annual Business Survey. The data for the North East, for example, may be skewed by a relatively small number of high turnover businesses.

**Table 2.2 Business Sites, Turnover & GVA Per Worker
Ordered by the Number of Business Sites**

Region	Number of Business Sites	Turnover	Estimated GVA Per Worker
South East	675	£6.2bn	£90,100
West Midlands	497	£1.5bn	£65,000
East Midlands	459	£1.9bn	£66,400
East of England	423	£2.6bn	£71,000
Yorkshire & Humber	390	£1.7bn	£65,400
North West	365	£2.4bn	£86,500
London	350	£1.6bn	£97,600
Scotland	219	£1.3bn	£65,300
Wales	206	£1.4bn	£74,300
South West	206	£1.0bn	£59,500
North East	91	£0.6bn	£96,200
Northern Ireland	73	£0.2bn	£59,700
UK Total	3,954	£22.2bn	£75,900

Source: Strength & Opportunities Data, 2017; MINT Data, 2019; Hatch Regeneris. GVA per worker is rounded to the nearest £1,000.

Analysis of Business Size and Age

Business Size

- 2.10 In the Midlands, 619 (65%) of MedTech businesses⁸ are Micro (0-9 employees), 323 (34%) are Small-Medium Enterprises (10-249 employees), with the remaining 14 (1.5%) being Large (250+ employees).
- 2.11 This reveals a greater presence of micro enterprises and a smaller presence of large businesses in the Midlands relative to the rest of the UK, where 60% of MedTech businesses employ fewer than 10 people (followed by 39.2% SME and 2.3% large).

Business Age

- 2.12 The MedTech sector contains a large number of well-established businesses. Out of 950 Midlands businesses whose incorporation year was known, a large majority (85%) were established more than 10 years ago. Only 5% businesses are 5 years old or less. This compares to 80% and 7% across the UK respectively.
- 2.13 The difference in the age of micro MedTech businesses in the Midlands vs the UK is even greater; almost 80% (78%) of MedTech businesses employing between 0 and 9 employees are aged 10 years or older in the region, compared to 69% across the UK.
- 2.14 The combination of a relatively smaller sized and older business base suggests a need to work with businesses to identify barriers and opportunities to grow, and to encourage larger scale and high growth businesses to locate in the Midlands. We look at challenges and potential options to deliver growth in Section 6.

⁸ Assessed by the number of business sites.

Sector Specialisms

- 2.15 The largest volume of MedTech employment in the Midlands is in Assistive Technology⁹. Although a large employer UK wide, employment in this segment is disproportionately large in the Midlands (with an LQ of 2.57). There are also clear specialisms in hospital hardware, infection control and anaesthetic & respiratory control.
- 2.16 Some of the largest sub-sectors by employment also deliver high levels of GVA per worker. Employment in Single Use Technologies for example, produces GVA per employee estimated to be more than £90,000. Employment in that segment is almost 50% greater in the Midlands than in the UK when taken as a proportion of total employment. In other sectors there are gains that could be made in supporting increased productivity. Employment in Wound Care and Management, for instance, is estimated to be around 35% lower in the Midlands than in the UK.

Table 2.3 Key Midlands Sub-Sectors: Employment, Location Quotients & GVA Per Worker

	Total employment	Location Quotient	GVA Per Worker	GVA Per Worker Vs the UK Sector Av.
Assistive Technology	2,550	2.57	£44,900	98%
Hospital hardware inc. ambulatory	1,594	2.29	£77,100	114%
Single use technology n.e.c.	1,473	1.47	£93,100	115%
Reagent, Equipment & consumables supplier	1,108	1.43	£57,100	76%
Wound Care & Management	1,090	1.92	£62,900	64%
Digital health	1,006	0.94	£64,400	82%
Infection Control	861	2.75	£56,900	102%
Anaesthetic and respiratory technology	855	2.13	£98,200	131%
Orthopaedic Devices	805	0.92	£73,300	121%
Re-usable diagnostic or analytic equipment n.e.c.	609	1.05	£46,800	67%

Source: Strength & Opportunities Data, 2017; Hatch Regeneris. GVA Per worker rounded to the nearest £1,000.

- 2.17 In the next section we explore concentrations and clusters of MedTech employment and businesses in these sub-sectors within the Midlands Local Enterprise Partnership (LEP) areas and in the key towns and cities.

⁹ The primary purpose of assistive devices and technologies is to maintain or improve an individual's functioning and independence. They can also help prevent impairments and secondary health conditions. Examples include wheelchairs, prostheses, hearing aids, visual aids, and specialised software and hardware that increase mobility, hearing, vision, or communication capacities. World Health Organisation: who.int/disabilities/technology/en/

3. Identifying Clusters of Activity

- 3.1 Table 3.1 breaks Midlands MedTech business sites and employment down by LEP area (and for the counties of Northamptonshire and Worcestershire, which make-up wider LEP areas reaching outside of the region). The D2N2 LEP area is home to by far the greatest volume of MedTech Employment, followed by Greater Birmingham and Solihull, and Leicester and Leicestershire. There are also concentrations of employment in Coventry and Warwickshire and The Marches that stand above the concentration nationally (as indicated by an LQ of >1). Overall MedTech employment accounts for 5 people employed for every 1,000 of employment (5% of all employment).

Table 3.1 MedTech Businesses & Employment in the Midlands Local Enterprise Partnership Areas

	Business Sites	Employment	Per 1,000 of Total Employment	Location Quotient
Derby, Derbyshire, Nottingham & Nottinghamshire	272	6,700	6.9	1.75
G. Birmingham & Solihull	181	3,700	3.8	0.96
Leicester & Leicestershire	102	3,600	7.4	1.88
Coventry & Warwickshire	107	2,500	5.3	1.38
Stoke & Staffordshire	54	1,700	3.5	0.88
The Marches	51	1,600	5.1	1.31
Black Country	60	1,400	3	0.75
Northamptonshire*	59	1,200	3.3	0.86
Worcestershire	44	900	3.3	0.88
Lincolnshire*	25	200	0.6	0.17
Midlands Total	956	23,600	4.9	1.25

Source: Strength & Opportunities Data, 2017; Hatch Regeneris. Employment rounded to the nearest 100. *covering data at the county level only.

- 3.2 In the remainder of this section we look to identify concentrations of MedTech activity (businesses and employment) in each of the 11 Midlands LEP areas¹⁰. As in the previous sections, we use location quotients (LQ) to highlight concentrations of employment that are above the national average.
- 3.3 We also provide a series of maps showing the key clusters of MedTech activity located in the major towns and cities and the proximity of these clusters to university, medical and wider industry facilities relevant to the sector.

Black Country & Greater Birmingham

MedTech Activity Across the LEP Areas

- 3.4 The GBS and Black Country LEP areas are home to more than 230 MedTech businesses sites (25% of the Midlands total) employing more than 5,000 people.

¹⁰ NOTE: we have principally used Strength & Opportunities data, which provides firm-level employment data as brackets (0-4 employees, 5-9, 10-49 etc.). Our LEP level employment estimates presented below for specific MedTech segments, are based on the mid-point in that range. These estimates are intended as an indication of clustering and sub-sector strengths. Caution should be taken interpreting the figures in fine detail.

- 3.5 Greater Birmingham & Solihull has disproportionality high employment in Dental Technology and Infection Control, and large concentrations of employment in Single Use and Assistive Technology.

Figure 3.1 MedTech Segment Concentration in Greater Birmingham & Solihull

	Single use technology n.e.c.	Assistive Technology	Dental and maxillofacial technology	Infection Control	Anaesthetic and respiratory technology	Digital health	Hospital hardware including ambulatory	Ophthalmic Devices/Equip ment
Employment	633	568	327	314	286	228	223	179
Businesses	12	21	16	9	3	21	7	10
LQ	2.2	2.1	3.6	3.7	2.5	0.7	1.2	1.3

Source: S&O, 2017; MINT Data, 2019; Hatch Regeneris. Employment data rounded to the nearest 10.

- 3.6 There is an Assistive Technology cluster in the Black Country, with around 600 employees spanning 12 businesses and more than four times the employment in this segment compared to the UK average. There is also a significant concentration of activity in Mobility Access and Dental Technology.

Figure 3.2 MedTech Segment Concentration in the Black Country

	Assistive Technology	Mobility Access	Dental maxillofacial technology	Hospital and hardware including ambulatory	Infection Control	Imaging Ultra-sound Equipment Materials	Reagent, / Equipment and consumables supplier	Wound and Management	Care
Employment	603	169	114	93	80	72	70	54	
Businesses	12	7	7	3	3	3	6	3	
LQ	4.5	3.2	2.6	1.0	1.9	1.3	0.6	0.7	

Source: S&O, 2017; MINT Data, 2019; Hatch Regeneris. Employment data rounded to the nearest 10.

The Birmingham MedTech Cluster

- 3.7 The areas around Birmingham, shown below, are home to 103 MedTech business sites, 15 hospitals and four universities.

Businesses

- 3.8 The Binding Site Group and Salts Healthcare are two of the largest employers in the Birmingham area, both employing around 600 employees¹¹:
- Salts Healthcare supply stoma care and ostomy products. They are one of five employers operating in the Single Use Tech segment in the Birmingham area.
 - The Binding Site provide specialist diagnostic products to clinicians and laboratory professionals worldwide.
- 3.9 Kimal employ between 100 and 249 people, according to S&O data, near Bromsgrove to the South West of Birmingham (with an additional 55 to 99 people employed at a site in Worcester). Kimal develop and supply a wide range of single-use medical devices to the global market.
- 3.10 Birmingham Optical Group Ltd (70 employees), Evac+chair International Ltd (90 employees) and Otto Bock Heartlands (50-99) are among the medium-sized employers in the Birmingham area. Birmingham Optical Group Ltd operates in the Ophthalmic Devices and Equipment

¹¹ 2017 company accounts.

segment, Evac+chair International Ltd in Assistive Technology and Otto Bock Heartlands (Fabrication Services) in Orthopaedic Devices.

Assets

- 3.11 The combination and density of university, industry and hospital facilities and research assets position Birmingham strongly to deliver innovation, collaboration and growth in MedTech.
- 3.12 Of the 15 hospitals in the Greater Birmingham area, particularly significant is the Queen Elizabeth Hospital. With over 1,000 beds, it is one of the largest single-site hospitals in the UK. It has outstanding strengths in organ transplantation, particularly liver, heart, lung and kidney¹².
- 3.13 The University of Birmingham (UoB), also located in the area, produces internationally significant medical research. 25% of its publications appear in the top 10% cited papers globally.¹³ It is home to:
 - the Birmingham University Imaging Centre: specialising in magnetic resonance imaging (MRI), with a strong focus on combining MRI with other techniques such as electroencephalography (EEG) and transcranial magnetic and direct current stimulation (TMS/TDCS)
 - the Institute for Translational Medicine (ITM): a hub for clinical trials acceleration and clinical informatics, bringing together scientists, academic clinicians, clinical informatics, biostatisticians and experts in biomarker development to turn medical science into innovative patient and healthcare system applications
 - the Medical Technologies Testing and Evaluation Centre (MD-TEC): located within the ITM, providing simulation and laboratory facilities, expertise and support to MedTech and life science SMEs to overcome regulatory barriers and accelerate the translation of novel medical innovations from the lab through to commercial exploitation.
- 3.14 The UoB Birmingham Life Sciences Park will be located at the Battery Park site in Selly Oak, to the South West of the University. Set to open in 2022, the Park will bolster the areas major strengths in MedTech and life sciences by providing additional research facilities where university researchers can work alongside industry and clinical partners to advance a wide range of translational medicine and treatment. The vision for the park is to establish new SMEs and investment from large pharma and biotechnology firms to further enhance the region's status as an internationally recognised hub for clinical academia.
- 3.15 The University of Aston brings another set of major research and innovation assets related to the MedTech sector, including:
 - the Aston Medical School: delivering education and research in translational medicine in preeclampsia, cardiovascular disease, mental health and regenerative medicine
 - the Aston Biomedical Engineering Research Unit: an interdisciplinary team (containing expertise ranging from mechanical engineering and materials science to biology and biomedical engineering), which works alongside clinical partners in areas such as mechanical testing, computer modelling, sensing, the design of medical devices and interactions with the human body.
 - the Aston Brain Centre: providing an integrated research environment for the study of neurodevelopment. The Centre's mission is to develop translational applications of

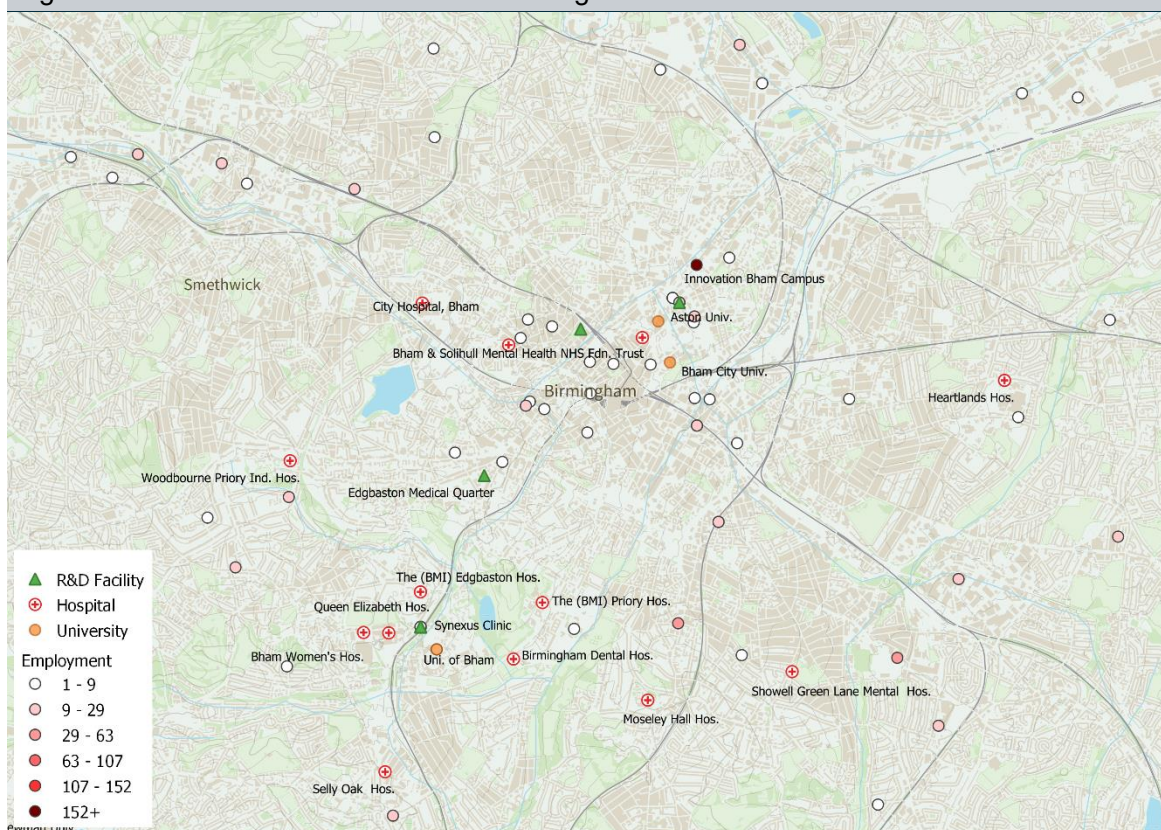
¹² uhb.nhs.uk/about-us.htm

¹³ birmingham.ac.uk/schools/medical-school/research.aspx

fundamental neurophysiological research into clinical service provision (diagnosis, therapy and treatment).

- 3.16 The Synexus Clinic, a private research centre located in southern Birmingham, is also engaged in significant research. Currently, the centre is engaged in a broad variety of studies, ranging from clinical study of mild cognitive impairment, to arthritis, to cardiovascular disease¹⁴.
- 3.17 The Edgbaston Medical Quarter in south-central Birmingham is home to a cluster of medical companies, 180 wider medical organisations, 80 hospitals and specialist care centres, 44 GP clinics and routine care facilities and 23 training facilities. Specialist facilities and care centres include oncology, trauma, mental health, diabetes, and addiction disorders¹⁵.

Figure 3.3 MedTech Across Greater Birmingham: Business Sites and Other Assets



Source: Hatch Regeneris; Strength & Opportunities Data, 2017. Contains OS data © Crown copyright & database right, 2019.

Nottinghamshire & Derbyshire

MedTech Activity Across the LEP Area

- 3.18 There are 272 MedTech business sites and 6,700 people employed in the industry in the D2N2 LEP area – 28% of the Midlands total.

¹⁴ synexusclinic.co.uk/our-clinics/the-midlands-clinic/

¹⁵ calthorpe.co.uk/developments/edgbaston-medical-quarter/

- 3.19 Across the D2N2 LEP area there are five segments, each employing more than 500 people, including Assistive Technology and Digital Health, which contain a significant number of smaller scale employers (24 and 30 business sites respectively). There are two segments with LQs greater than 20: Clinical Research Organisations and Logistics and Packaging. This concentration is driven by two particularly large clinical trials organisations and several large packaging companies.

Figure 3.4 MedTech Segment Concentration in the D2N2 LEP Area

	Assistive Technology	Digital health	Wound Care and Management	Single use technology n.e.c.	Logistics and Packaging	Hospital hardware including ambulatory	Clinical Research Organisation	Reagent, Equipment and consumables supplier
Employment	755	744	595	584	568	479	330	307
Businesses	24	30	8	15	4	13	1	25
LQ	3.8	8.0	11.2	6.6	30.0	7.5	29.4	4.3

Source: S&O, 2017; MINT Data, 2019; Hatch Regeneris. Employment data rounded to the nearest 10.

The Nottingham-Derby MedTech Cluster

- 3.20 Nottingham and Derby, as shown below, are home to 184 distinct MedTech business sites, mainly concentrated around Nottingham, in addition to 4 significant hospitals and 3 universities and research parks.

Businesses

- 3.21 Pennine Healthcare Ltd and Chesapeake Plc (both with over 250 employees according to the S&O data) and Medstrom Limited (170 employees¹⁶) are among the larger employers in the Derby-Nottingham area. Pennine Healthcare is a leading manufacturer of single use, sterile medical devices and custom procedure packs and operates in the Single Use Tech segment. Chesapeake Plc operates in the Logistics and Packaging segment and specialises in packaging solutions for the branded and healthcare markets. Medstrom operates in the Hospital hardware segment and is a specialist provider of NHS bed management services.
- 3.22 The composition of the MedTech sector in the area is diverse. Of the 16 sites in the area that employ over 50 people, 12 distinct segments are represented.

Assets

- 3.23 As in the Birmingham area, Nottingham has a wealth of knowledge and industry assets that are likely to have played a key role in the growth of the MedTech sector in and around the city.
- 3.24 A number of the area's hospitals are engaged in innovative and high quality research. The university hospitals of Derby and Burton have been named in a list of the top 10 Trusts for undertaking clinical research nationwide¹⁷. Nottingham University Hospitals (NUH) are also engaged in a significant amount of research, hosting hundreds of clinical research studies every year, with more than 300 doctors, nurses and health professionals involved in clinical research¹⁸. NUH NHS Trust includes the Nottingham Clinical Research Facility (2,000 m. sq. of NIHR accredited facilities) and the Nottingham Biomedical Research Centre, which has internationally recognised strength in Magnetic Resonance Imaging.

¹⁶ 2017 company accounts.

¹⁷ <https://www.uhdb.nhs.uk/research-news/trust-ranked-in-top-10-nationally-for-innovative-clinical-research--1641>

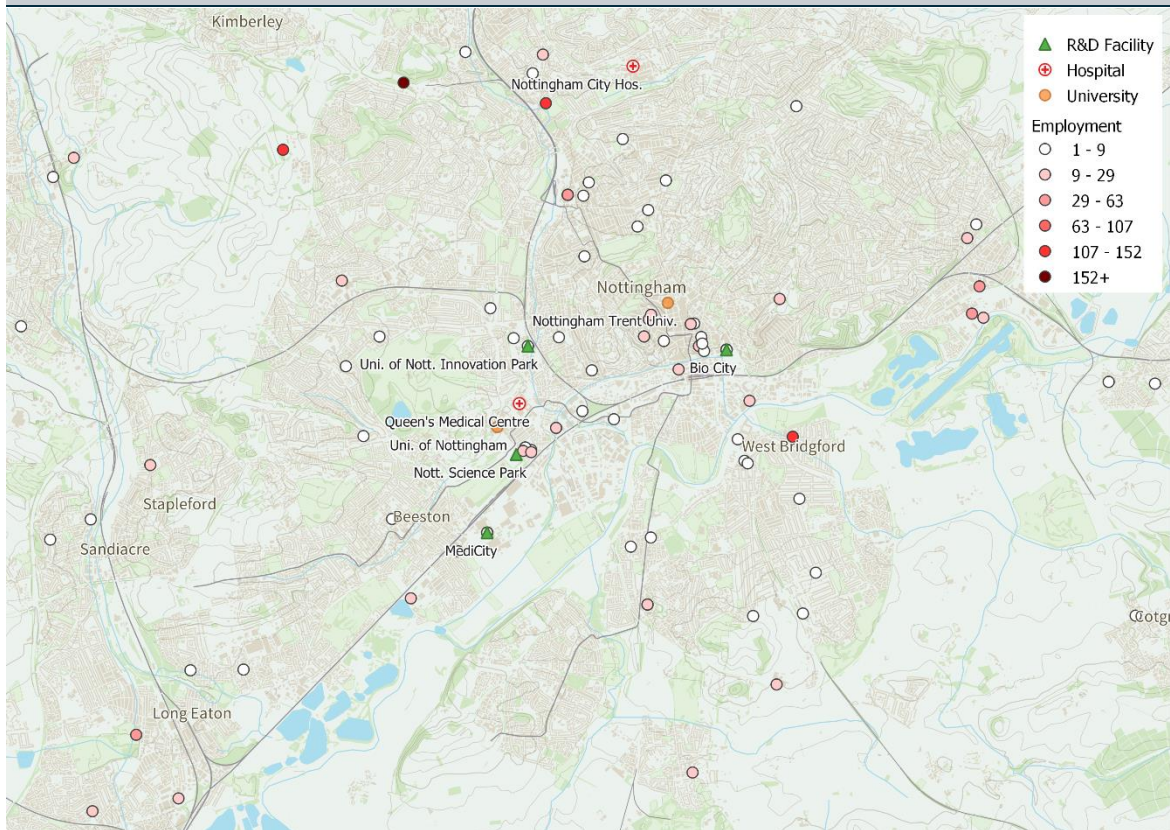
¹⁸ <https://www.nuh.nhs.uk/research>

- 3.25 The School of Medicine at the University of Nottingham also contributes to the area's excellence in medical research, particularly in the areas of translational research (bridging the gap between invention, evaluation and adoption); patient engagement; and commercial collaboration in drug and treatment development¹⁹. According to the Research Excellence Framework (REF) 2014, over 80% of the School of Medicine's research was judged to be 'world leading' or 'internationally excellent'.
- 3.26 The Medical Technologies Innovation Facility (MTIF), scheduled to open in 2020 at Nottingham Trent University's Clifton Campus, is a £23 million multi-disciplinary research and development facility that will integrate work by scientists, engineers, clinicians and entrepreneurs to speed up medical product development. The NTU site will focus on fundamental R&D for platform technologies. A second MTIF site, to be located at the Boots Enterprise Zone, will be dedicated to product prototype production and commercialisation.
- 3.27 BioCity in Nottingham is a business incubator for life science businesses founded by the University of Nottingham and Nottingham Trent University. As well as accommodating and facilitating life science start-ups, BioCity companies have access to the UK-wide BioCity Expert Network, a talent pool of specialist professionals for BioCity based companies including: senior pharma mentors and collaborators, healthcare experts, investors, serial entrepreneurs, and scientific and business specialists²⁰.
- 3.28 Complementing these assets are the research parks in the area. As part of the BioCity Group, MediCity provides a core focus on growing MedTech start-ups, and houses modular labs and write-up spaces available on short term leases. MediCity is based within Boots UK's headquarters, allowing occupants to showcase their products and services to leaders and decision makers within Boots. The companies at the MedTech incubator benefit from being based within the Enterprise Zone, enjoying (in most instances) full exemption on business rates.

¹⁹ <https://www.nottingham.ac.uk/medicine/research/index.aspx>

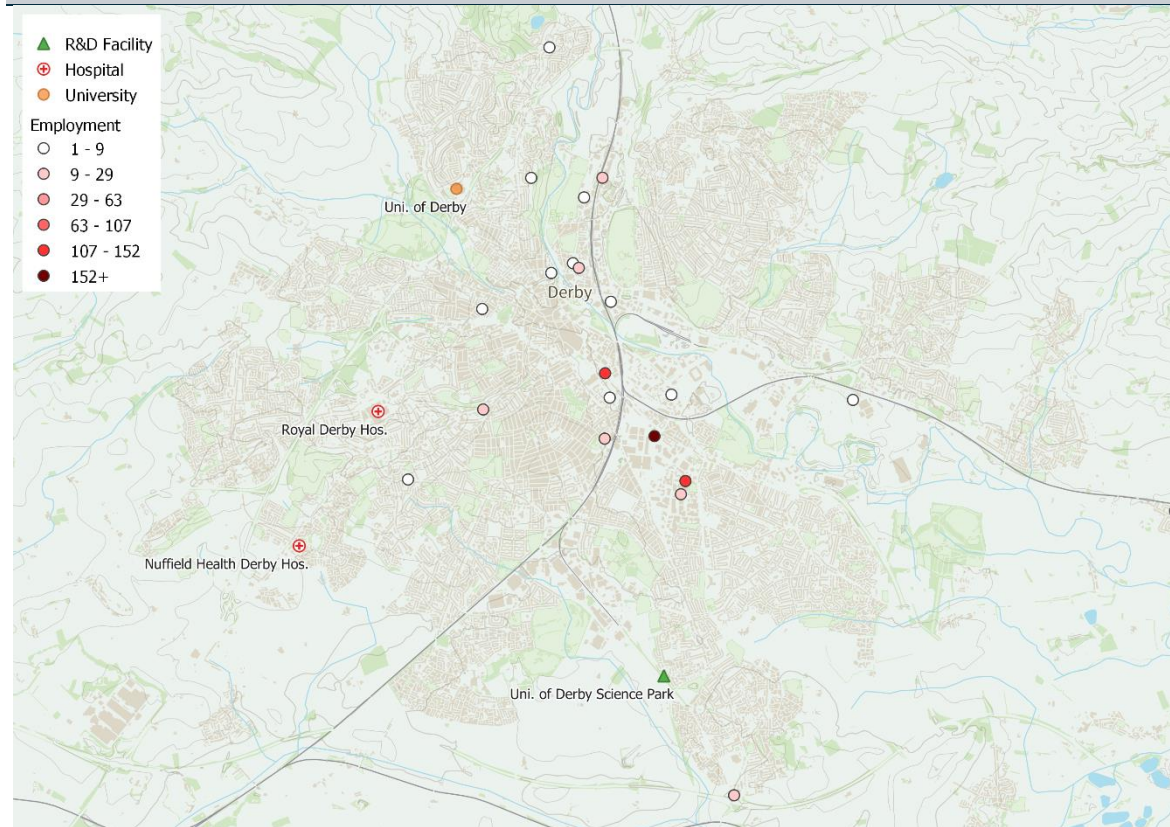
²⁰ <https://biocity.co.uk/about/>

Figure 3.5 MedTech Across Nottingham: Business Sites and Other Assets



Source: Hatch Regeneris; S&O Data, 2017. Contains OS data © Crown copyright & database right, 2019.

Figure 3.6 MedTech Across Derby: Business Sites and Other Assets



Source: Hatch Regeneris; S&O Data, 2017. Contains OS data @ Crown copyright & database right, 2019.

Coventry & Warwickshire

MedTech Activity Across the LEP Area

- 3.29 There are 107 MedTech businesses employing 2,500 people in the Coventry and Warwickshire LEP area, 11% of the Midlands total.
- 3.30 The majority of MedTech employment in Coventry & Warwickshire is located within a relatively small number of medium and larger businesses. Alliance Medical employs a large number of people in the Healthcare Provider segment at Warwickshire Technology Park. Similarly, Smith & Nephew Ltd in Warwick and Morgan Advanced Ceramics in Rugby both employ up to 250 people in Orthopaedic Devices.

Figure 3.7 MedTech Segment Concentration in the D2N2 LEP Area

	Orthopaedic Devices	Healthcare service provider	Infection Control	Cardiovas cular and vascular devices	Ophthalmic Devices/Equipment	Anaesthetic and respiratory technology	Reagent, Equipment and consumable s supplier	Single use technology n.e.c.
Employment	387	276	239	227	157	154	152	143
Businesses	2	1	5	3	2	4	6	6
LQ	5.1	27.0	8.0	10.0	3.9	4.2	2.1	1.6

Source: S&O, 2017; MINT Data, 2019; Hatch Regeneris. Employment data rounded to the nearest 10.

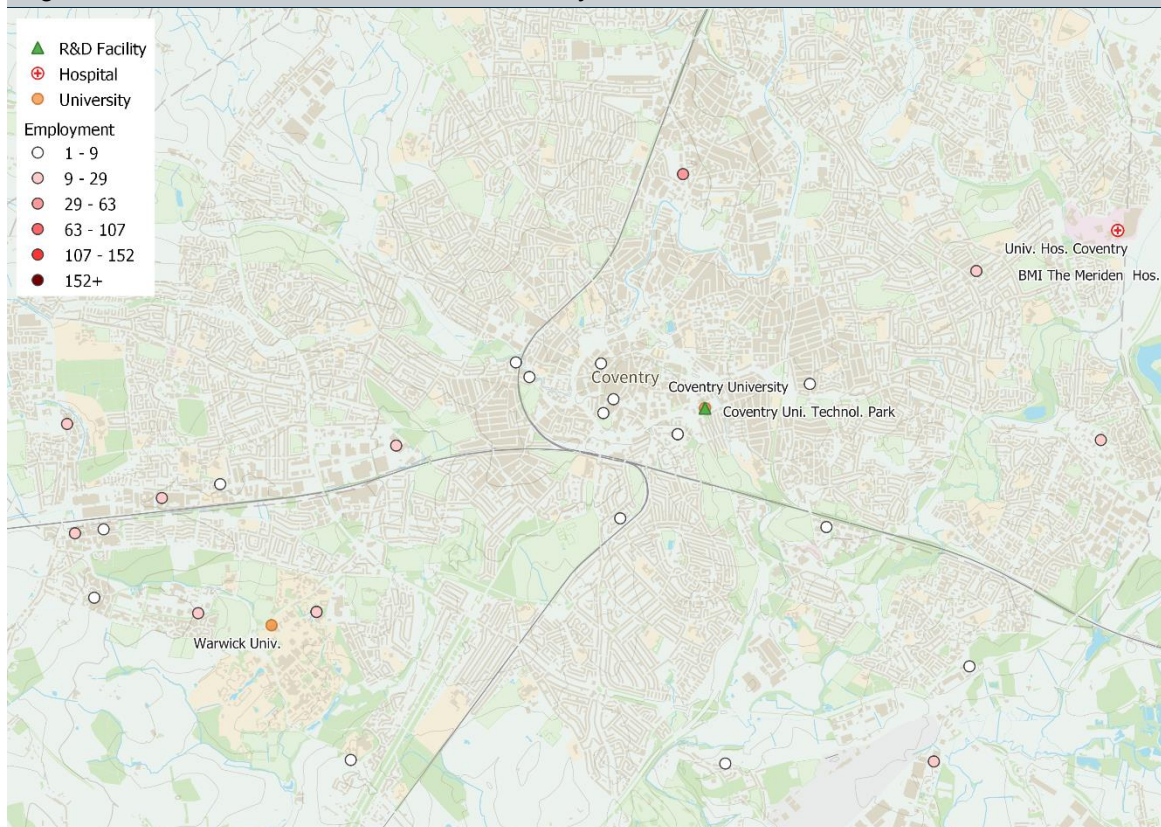
The Coventry MedTech Cluster

Businesses

- 3.31 In the map covering the city of Coventry below, there are 35 MedTech business sites, with many located in proximity to the University of Warwick and Coventry University.
- 3.32 Speciality Fibres and Materials Ltd employs 70 people in the Wound Care Management segment. It is a specialist in the development and manufacture of fibres and fabrics used in healthcare and wound-care.
- 3.33 Abena, WSP CEL, and Ecotech all employ more than 20 people according to S&O data and operate in the Single Use Tech, Contract Design and Infection Control segments respectively.

Assets

- 3.34 Coventry University's Science and Health Building, opened in January 2018 and is a £59m facility providing state of the art simulation technology. It allows the Faculty of Health and Life Science to replicate real-life scenarios and environments, within a mock hospital ward, assisted living community houses and model crimes scenes. This facilitates innovative research and clinical skills training. The building also provides super labs for research into biomechanics, bio-analysis, DNA analysis, genomics and forensic science.

Figure 3.1 MedTech Businesses in Coventry: Business Sites and Other Assets

Source: Hatch Regeneris; S&O Data, 2017. Contains OS data © Crown copyright & database right, 2019.

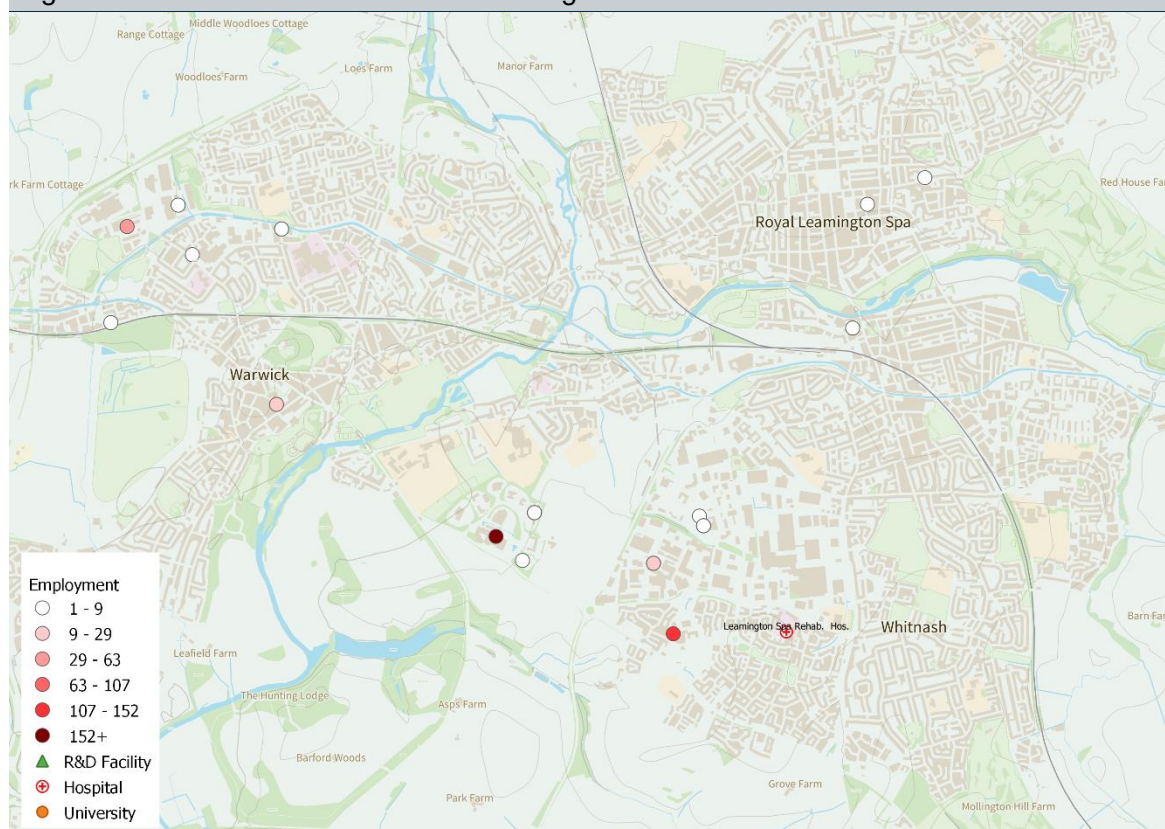
The Warwick-Leamington MedTech Cluster

Businesses

- 3.35 In the Warwick and Leamington Spa area there are 23 distinct MedTech business sites, concentrated mostly to the West of Leamington Spa Rehabilitation Hospital, but also with some sites in Leamington Spa town centre and Warwick.
- 3.36 Alliance Medical Ltd is one of largest employer in the area, with over 250 people working in the Healthcare Service segment according to S&O data. Alliance provides a range of services, including diagnostic and molecular imaging, radiopharmaceuticals, and medico-legal services.
- 3.37 Smith & Nephew Ltd Orthopaedics, employs over 100 people in the Orthopaedic Devices segment according to S&O data. S&N Orthopaedics focusses on products in orthopaedics, sports medicine and ear, nose and throat (ENT) treatment and advanced wound management.

Assets

- 3.38 The University of Warwick has specialisms in multidisciplinary health research including translational biomedicine, digital technologies for healthcare and big data analytics. It has focussed strengths in maternal health, digital pathology, mental health, microbiology and infection, and global health with a significant clinical trials portfolio which includes emergency care and rehabilitation.

Figure 3.2 MedTech in Warwick & Leamington: Business Sites and Other Assets

Source: Hatch Regeneris; S&O Data, 2017. Contains OS data © Crown copyright & database right, 2019.

Leicester & Leicestershire

MedTech Activity across the LEP Area

- 3.39 There are just over 100 sites that are home to MedTech businesses in Leicester and Leicestershire, representing 11% of the regional total. MedTech employment of 3,600 accounts for 15% of the Midlands total, suggesting a disproportionate number of larger firms operating in the area.
- 3.40 The largest cluster of businesses in Leicester & Leicestershire is in Reagent Equipment & Consumables (containing around 600 employees across 14 sites).
- 3.41 There are also large levels of employment in Hospital Hardware, Wound Care & Management, Assistive Technology and Drug Delivery.

Figure 3.3 MedTech Segment Concentration in Leicester & Leicestershire

	Re-usable diagnostic or analytic equipment n.e.c.	Reagent, Equipment and consumables supplier	Hospital hardware including ambulatory	Wound Care and Management	Assistive Technology	Drug Delivery	Infection Control	Dental and maxillofacial technology
Employment	742	611	531	511	336	234	124	122
Businesses	7	14	9	4	9	2	3	2
LQ	8.0	5.2	5.5	6.2	2.4	4.8	2.9	2.6

Source: S&O, 2017; MINT Data, 2019; Hatch Regeneris. Employment data rounded to the nearest 10.

The Leicester MedTech Cluster

- 3.42 Our map for Leicester covers 35 distinct MedTech business sites, distributed unevenly, with some concentration in the centre, and to the southern and northern edges of the city. The area is also home to two universities and three hospitals.

Businesses

- 3.43 The vast majority (over 600) of those employed in Re-usable Diagnostic/Analytic Equipment work at Baker Hughes, a subsidiary of General Electric (BHGE)²¹. BHGE specialises in digital, measuring and sensing devices for application in healthcare but also in a range of wider applications, including automotive, aerospace and oil & gas.
- 3.44 Ge Sensing employ over 250 people in Re-usable Diagnostic or Analytic Equipment according to S&O data. Nova Laboratories, employing around 220 people, produce specialist drug-related products²².
- 3.45 Spirit Healthcare employs 50 people to the South East of the city centre²³. Spirit supports businesses to access the NHS, supports Clinical Commissioning Groups to improve patient care and offers a range of GP and clinical services and digital healthcare monitoring devices.

Assets

- 3.46 Leicester and Leicestershire is uniquely covered by one NHS Trust - the University Hospitals of Leicester Trust (UHL), which is one of the largest and most research active in the UK. UHL hosts several National Institute for Health Research (NIHR) bodies with academic partners, the Universities of Leicester and Loughborough: the Leicester Biomedical Research Centre, Leicester Clinical Research Facility, the Leicester Clinical Trials Unit, the Clinical Research Network East Midlands and the Collaboration in Leadership for Applied Health Research and Care (CLAHRC) East Midlands.
- 3.47 The University of Leicester is home to:
- the Leicester Precision Medicine Institute, which works collaboratively with industry to develop precision medical devices from early stage development through to deployment and commercialisation²⁴
 - the NIHR-funded Leicester Biomedical Research Centre, which is world-leading in cardiovascular, respiratory and lifestyle-related metabolic disease and is dedicated to developing solutions to these chronic conditions
 - the Leicester Institute for Space and Earth Observation and Space Park Leicester where strengths in engineering capability, data analysis, artificial intelligence, data exploitation and leading technology can be applied both within Space Research and outside in other areas such as medical devices and diagnosis.
- 3.48 Leicester is also the only UK member of the Novo Nordisk Cities Changing Diabetes. The Novo Nordisk Cities Changing Diabetes Programme is a partnership of global cities working to identify the social and economic causes of diabetes, to set goals and design interventions to lower the number of people suffering Type 2 diabetes²⁵. The Leicester Diabetes Centre is

²¹ Bureau Van Dijk FAME data, 2019.

²² 2018 company accounts.

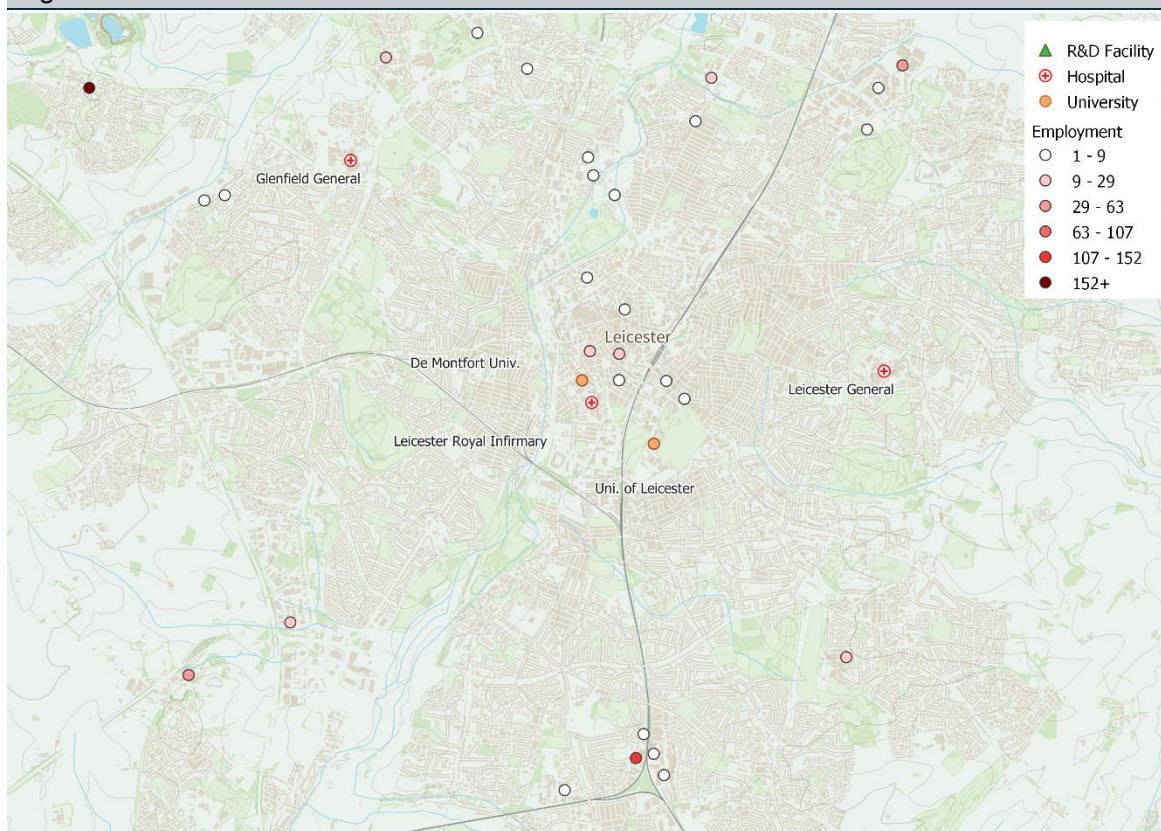
²³ *ibid*.

²⁴ <https://www2.le.ac.uk/institutes/lpmi/client-services>

²⁵ citieschangingdiabetes.com/

at the forefront of the programme and provides 4,000m² of research clinic space, specialist lab facilities and seminar rooms for healthcare professionals and patient education.

Figure 3.4 MedTech in Leicester: Business Sites and Other Assets



Source: Hatch Regeneris; S&O Data, 2017. Contains OS data © Crown copyright & database right, 2019.

The Loughborough MedTech Cluster

Businesses

- 3.49 There is a significant cluster of MedTech businesses located to the North of Loughborough town centre, within and close to the Charnwood Campus.
- 3.50 Almac employs 150 people in drug development at Charnwood Campus according to S&O data. The national centre for 3M Healthcare is located at the Charnwood Campus. 3M Drug Delivery Systems brought all of its teams together within the DDS R&D Inhalation Centre of Excellence at the campus, employing 120 R&D employees at the site²⁶.

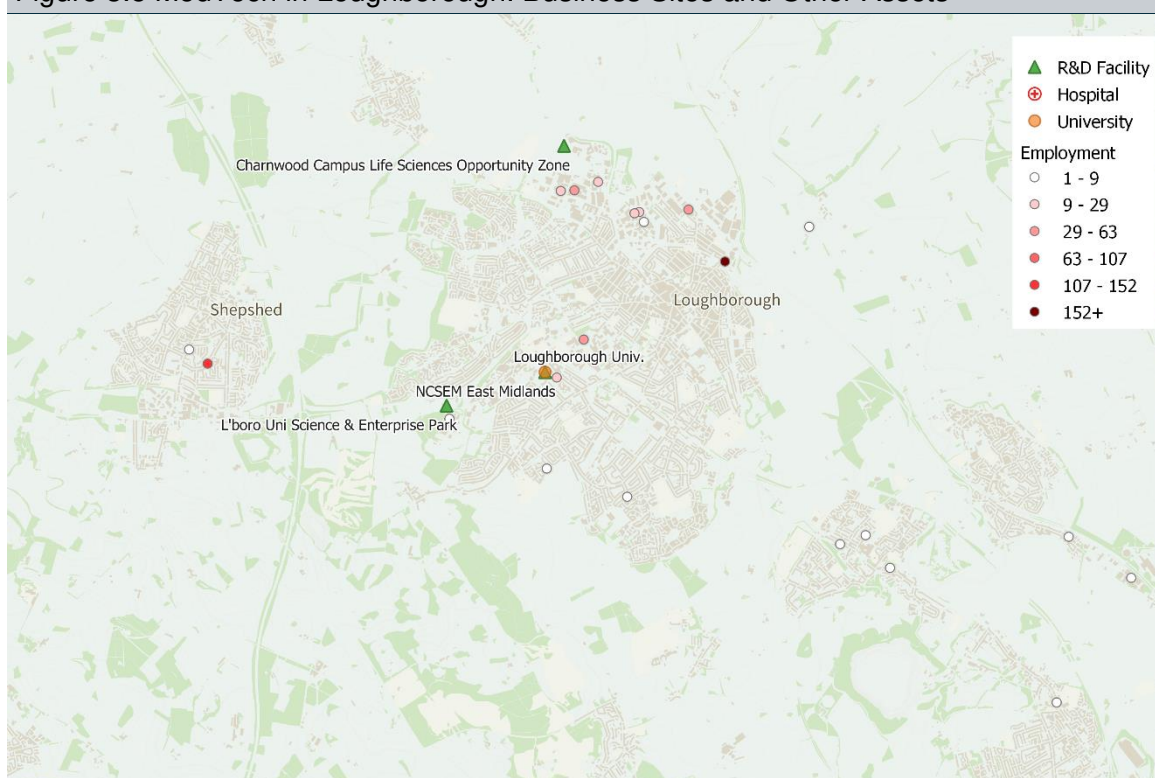
Assets

- 3.51 The Charnwood Campus, located to the north of the city centre, is a 70-acre science, technology and enterprise park. As an Enterprise Zone and the UK's first and only Life Sciences Opportunity Zone, Charnwood is able to provide businesses with favourable terms and access to laboratories, clinical resources and specialist manufacturing facilities, aimed at increasing productivity among high value life science and advanced engineering and manufacturing occupiers.

²⁶ charnwoodcampus.com/3m-drug-delivery-systems-relocates-u-k-rd-to-new-state-of-the-art-facility/

- 3.52 The Loughborough University Science and Enterprise Park (LUSEP), home to over 75 organisations and a workforce over 2,200 people, gives businesses direct access to research capacity and collaboration. LUSEP is home to eight (mostly micro) MedTech businesses.
- 3.53 Recently opened, to the North of Loughborough is the Defence and National Rehabilitation Centre (DNRC). This facility provides a 21st century replacement to the old national rehabilitation centre at Headley Court in Surrey. It aims to provide clinical rehabilitation to 'repair our seriously wounded'. Up to 800 patients a year in the East Midlands stand to benefit from this new facility.
- 3.54 The National Centre for Sport & Exercise Medicine (NCSEM) at Loughborough University is an Olympic legacy project and one of three NCSEM hubs alongside London and Sheffield. NCSEM East Midlands, a partnership between the universities and NHS Trusts of Leicester, Loughborough and Nottingham, delivers research, education and clinical services in four areas: 1) Physical activity in disease prevention 2) Exercise in chronic disease 3) Sports injuries and musculoskeletal health 4) Mental health and wellbeing and 5) Performance health.

Figure 3.5 MedTech in Loughborough: Business Sites and Other Assets



Source: Hatch Regeneris; S&O Data, 2017. Contains OS data © Crown copyright & database right, 2019.

Stoke & Staffordshire

MedTech Activity Across the LEP Area

- 3.55 There are 54 MedTech business sites in the Stoke and Staffordshire LEP area, 6% of the regional total and around 1,700 people employed in the sector.
- 3.56 Stoke-on-Trent and Staffordshire has notable specialisms in Anaesthetic & Respiratory Technology, Hospital Hardware, Orthopaedic Devices and Re-usable diagnostic/Analytic

Equipment, albeit across a relatively small number of firms (close to 1,000 employees at 10 sites across these three segments).

- 3.57 Medigas are among the larger employers (c. 250 employees according to S&O data), manufacturing gas for use in anaesthetic & respiratory control. There are a number of other businesses employing more than 100 people, two of which are located in Stone, south of Stoke-on-Trent. Bibby Scientific manufacture a large range of laboratory equipment and supplies. Instem PLC provide research services including clinical study management, big data analytics.

Figure 3.6 MedTech Segment Concentration in Stoke & Staffordshire

	Anaesthetic and respiratory technology	Hospital hardware including ambulatory	Orthopaedic Devices	Re-usable diagnostic or analytic equipment n.e.c.	Analytical Services	Wound Care and Management	Digital health	Infection Control
Employment	325	281	196	196	160	83	82	53
Businesses	4	4	5	2	1	1	4	5
LQ	5.8	2.9	1.5	2.1	6.6	1.0	0.5	1.2

Source: S&O, 2017; MINT Data, 2019; Hatch Regeneris. Employment data rounded to the nearest 10.

The Stoke-Newcastle MedTech Cluster

- 3.58 The map for Stoke-on-Trent and Newcastle-under-Lyme covers 33 distinct MedTech business sites and two universities. At least seven of the sites (21%) employ more than 20 people.

Businesses

- 3.59 Cobra Biologics, located at Keele University Science and Innovation Park, employ 90 people²⁷. The company works in DNA, virus, protein and microbiological data research bringing products from pre-clinical development to clinical and commercial manufacture within GMP approved facilities. Thea Pharmaceuticals, also based at Keele Science and Innovation Park, employs 50 people²⁸ developing and supplying a breadth of ophthalmic and eye care products. Donald Wardle And Son Limited, Biocomposites Ltd at Keele Science and Innovation Park and Accutronics, all employ over 50 people respectively in the Wound Care, Orthopaedic Services and Hospital Hardware segments, according to S&O data.
- 3.60 Keele University Science and Innovation Park, situated on a 70-acre campus, offers workshop and laboratory space with close proximity to Keele University's expertise.²⁹

Assets

- 3.61 Keele University is home to leading research, centres and facilities that represent a cluster of major life science and MedTech R&D assets in north Staffordshire:
- The Keele University School of Medicine supports research into a range of Medical Science, including neurobiology, parasitology, regenerative medicine, proteomics, orthopaedics, cardiovascular, and cellular and molecular medicine³⁰.

²⁷ 2017 company accounts.

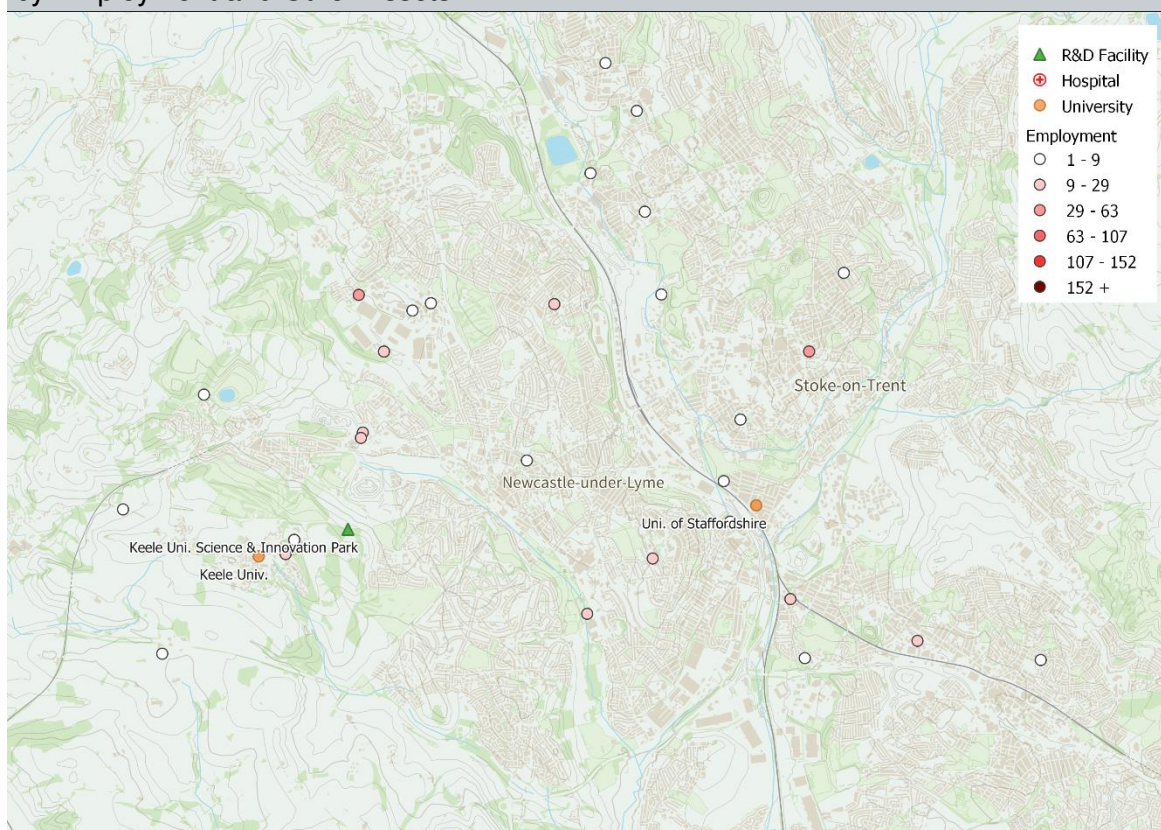
²⁸ *Ibid.*

²⁹ <https://www.keele.ac.uk/business/scienceandinnovationpark/>

³⁰ <https://www.keele.ac.uk/medicine/research/medicalsciences/>

- The School of Pharmacy first opened as a post-graduate school for pharmacists and other healthcare professionals but now also delivers undergraduate provision along with digital enterprise and Medicines Optimisation units. The school is home to the Centre for Medicines Optimisation, a not-for-profit organisation providing tailored, cost-effective, prescribing support solutions to the NHS. Working with GPs, commissioners and local medicines management teams to provide support services including on healthcare data analysis, clinical appraisal and evaluation and wider consultancy, and outreach activities.
 - The Institute for Science & Technology in Medicine (ISTM) brings together clinicians and academics from three hospitals and the four medical schools to deploy research and development into practice. Key areas of research focus at the ISTM include:
 - bioengineering and the therapeutic use of stem cells
 - genetics and epigenetics, structural biology, cell biology and apoptosis
 - novel imaging and diagnostics, e.g. to identify disease biomarkers
 - neurosciences, e.g. related to stroke, Parkinson's disease and hearing loss.
 - The Research Institute for Primary Care & Health Sciences is a centre of excellence for musculoskeletal and primary care research. The institute's mission is to deliver high quality multidisciplinary research to improve the content, delivery and configuration of primary care for the benefit of patients with musculoskeletal conditions, mental health problems and comorbidities. It is one of nine centres that form part of the NIHR School for Primary Care.
 - The David Attenborough Laboratories opened in May 2019 and will enable high quality research at the School of Life Sciences. The laboratories will make a significant contribution to the university's Global Health Initiative and will be home to researchers working on neurological disorders including Parkinson's disease, spinal injury, oncology, viral infections and carbohydrate biochemistry.
- 3.62 The University Hospitals of North Midlands (UHNM) is one of the largest acute provider trusts in the UK. The Midlands Partnership Foundation Trust (MPFT) located in Stafford is the largest community integrated Mental Health Trust in the UK. The specialist Robert Jones and Agnes Hunt Orthopaedic Hospital Trust (RJA) works in close collaborative partnership to deliver research with Keele University.
- 3.63 The Keele Deal is a plan for a £70 million investment and was launched in 2017. The deal has been led by Keele University and local councils to exploit the university's research and facilities to deliver greater business collaboration and economic growth. It aims to support 140 MedTech and healthcare businesses to collaborate with academics and the NHS. In particular, there are opportunities for MedTech SMEs to receive support to grow or diversify their business through the Business Bridge programme.
- 3.64 Keele Deal | Health is a strategic partnership, which will launch in autumn 2019, seeks to achieve alignment of the region's strategic health and social care partner's priorities and aspirations with Keele University's core missions around education, research and innovation.

Figure 3.7 MedTech Across Stoke-on-Trent & Newcastle-under-Lyme: Business Sites, by Employment and Other Assets



Source: Hatch Regeneris; S&O Data, 2017. Contains OS data © Crown copyright & database right, 2019.

Northamptonshire

MedTech Activity Across the County

3.65 The most distinct specialism in the Northamptonshire and South East Midlands LEP areas is in Infection Control (around 200 employees across 5 businesses). The majority within this segment are employed at B&V Chemical³¹, located in Daventry, close to the border with Warwickshire. B&V manufactures and distributes chemicals for water treatment globally. Key employers in In-Vitro Diagnostic Technology are:

- Horiba Medical (c. 180 employees³²): providing sales and support for the wider medical team within Horiba, which focusses on in vitro diagnostic systems and automated analysers for biological analysis in medical laboratories
- Swiss Precision Diagnostics (c. 100 employees³³): a leader in global research, design, production and supply of advanced consumer diagnostic products.

³¹ Part of the Suez Water Conditioning Services (WCS) Group

³² 2017 company accounts.

³³ *Ibid.*

Figure 3.8 MedTech Segment Concentration in Northamptonshire & the South East Midlands LEP Areas

	Infection Control	In vitro diagnostic technology	Orthopaedic Devices	Single use technology n.e.c.	Reagent, Equipment and consumables supplier	Ophthalmic Devices/Equipment	Mobility Access	Imaging / Ultra-sound Equipment & Materials
Employment	250	186	178	167	118	77	39	39
Businesses	5	2	5	7	8	2	1	1
LQ	2.9	0.7	0.7	0.6	0.5	0.5	0.4	0.3

Source: S&O, 2017; MINT Data, 2019; Hatch Regeneris. Employment data rounded to the nearest 10.

The Marches & Worcestershire

MedTech Activity Across the County and LEP Area

- 3.66 There are a combined 95 MedTech business sites across the Marches and Worcestershire, 10% of the total in the Midlands.
- 3.67 The Marches is home to around 600 employees across 10 sites in Assistive Technology, well above the national average for this segment. The major employers are:
- Helping Hand Co Ltd (c. 170 employees³⁴): is located close to Ledbury in Herefordshire and specialises in products for independent living including for pressure ulcer management and postural care
 - Hydro Physio (>100 employees³⁵): is located in Broseley close to Shropshire and manufacturing specialist pools for hydro aquatic therapy.

Figure 3.9 MedTech Segment Concentration in The Marches

	Assistive Technology	Hospital hardware including ambulatory	Assay developer	Contract Manufacturing /Research Organisation	Wound Care and Management	Cardiovascular and vascular devices	Surgical Instruments (reusable) n.e.c.	Education and Training
Employment	590	320	155	107	77	39	39	39
Businesses	10	4	1	3	2	1	1	1
LQ	6.6	5.1	89.3	2.9	1.5	1.5	1.0	8.2

Source: S&O, 2017; MINT Data, 2019; Hatch Regeneris. Employment data rounded to the nearest 10.

- 3.68 Worcestershire is home to around 400 employees across 9 sites in Assistive Technology (around 5 times the UK average). AKW MediCare Ltd in Droitwich Spa is one of the most significant employers, with around 175 people³⁶ working to manufacture, deliver and install accessible bathrooms.

³⁴ FAME data, 2019.

³⁵ S&O Data, 2017.

³⁶ 2017 company accounts.

Figure 3.10 MedTech Segment Concentration in Worcestershire

	Assistive Technology	Single technology n.e.c.	Reagent, Equipment use and consumables supplier	Digital health	Imaging / Ultra-sound Equipment & Materials	Dental & maxillofacial technology	Re-usable diagnostic or analytic equipment n.e.c.	Cardiovascular and vascular devices
Employment	390	177	111	60	47	43	39	19
Businesses	9	4	6	4	1	3	1	2
LQ	5.0	2.1	1.7	0.6	1.4	1.7	0.7	0.8

Source: S&O, 2017; MINT Data, 2019; Hatch Regeneris. Employment data rounded to the nearest 10.

Lincolnshire

MedTech Activity Across the LEP Area

- 3.69 The MedTech sector is relatively small in Lincolnshire, consisting of 25 businesses (2.6% of the Midlands total).
- 3.70 Lincolnshire has small pockets of MedTech employment within smaller and micro businesses, with no significant clusters identifiable.
- 3.71 In May 2019 Lincoln University secured planning permission to establish a new £21 million medical school. The new school will contain clinical and anatomy suites equipped with specialist diagnostic tools, dedicated clinical labs and virtual learning spaces (simulating hospital wards or a GP surgery) equipped with virtual and augmented reality technologies. Teaching and research undertaken within the school will be delivered in partnership with the University of Nottingham, raising the prospect of increased collaboration.
- 3.72 Lincolnshire and Rutland Innovation Support (LARIS) is a support programme delivered by the East Midlands Academic Health Science Network (AHSN) and Midlands Medilink, to develop the MedTech and life sciences sector in the two counties. This programme provides a package of services for businesses, including innovation vouchers, one-to-one advice with advisers and events aimed at stimulating collaboration and innovation between the areas academics, clinicians and businesses.

Figure 3.11 MedTech Segment Concentration in Lincolnshire

	Digital health	Implantable devices n.e.c.	Assistive Technology	Wound Care and Management	Single technology n.e.c.	Imaging / Ultra-sound Equipment & Materials	Re-usable diagnostic or analytic equipment n.e.c.	Regulatory Expertise
Employment	43	39	29	24	12	10	8	8
Businesses	3	1	4	2	3	2	1	1
LQ	0.3	3.4	0.2	0.3	0.1	0.2	0.1	2.2

Source: S&O, 2017; MINT Data, 2019; Hatch Regeneris. Employment data rounded to the nearest 10. NOTE: We exclude figures for the wider LEP areas covering North and North East Lincolnshire, which sit within Yorkshire & Humber. MedTech employment in the wider LEP areas is roughly 40 higher than within Lincolnshire alone.

4. R&D, Innovation and Collaboration

The Role of R&D and Innovation in Growth

- 4.1 Research and development and innovation activity is the core means through which the MedTech industry will deliver new advanced, flexible and efficient solutions in healthcare. Supporting R&D and innovation among MedTech businesses will be vital if the Midlands is to capture a share of the growing and changing MedTech market.
- 4.2 We highlighted earlier that the MedTech sector is a major contributor to a high productivity economy – registering GVA per worker that is more than twice the national all-economy average. We also highlighted the apparent under-performance of MedTech businesses in the Midlands when compared to the MedTech sector in other regions (see GVA per worker comparison in 0). Ensuring that businesses understand the value of R&D and innovation and are able to capitalise on opportunities for innovation and collaboration can drive increased productivity and register significant gains for the Midlands economy.

A Key Knowledge Gap

- 4.3 We have highlighted some of the breadth and scale of existing university and industry R&D facilities that are delivering MedTech research and innovation in the Midlands. Many of these facilities and institutions are already working alongside businesses to bring the next generation of MedTech products to market.
- 4.4 Nonetheless, little is known about the extent to which the wider business base is engaging in R&D and innovation, engaging with the knowledge base and other businesses, and the areas in which R&D support is most needed.

Existing Engagement in R&D and Innovation

- 4.5 The survey indicates that MedTech businesses in the Midlands are already engaged in a range of innovation activity, in particular early & later stage R&D. On average, more than a quarter of staff time (28%) is taken up by R&D.
- 4.6 Around 75% of businesses are engaged in some form of collaboration, with universities and other businesses, on at least a periodic basis. 38% of businesses engaged in B2B collaboration say that they work with other Midlands businesses. This rises to 77% for businesses collaborating with wider UK businesses. The vast majority of businesses that said they were engaged in university collaboration (and provided details of the location of those universities), were working with Midlands universities.
- 4.7 Around three quarters of businesses are engaged periodically, frequently or always, in integrating new technology in their business.
- 4.8 Larger proportions of businesses report that they are less frequently engaged in developing/implementing new production processes and in staff training.

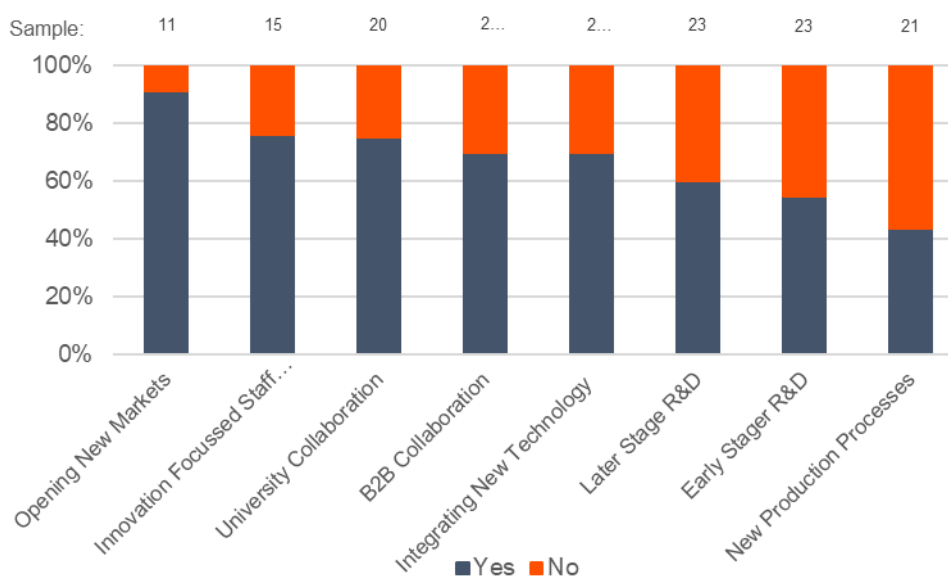
Table 4.1 How regularly are you engaged with the following R&D activities?

Area	Always	Frequently	Periodically	Rarely	Never	Total
Concept design/ prototyping	35%	35%	14%	7%	9%	100%
Later stage (e.g. manufacturing)	20%	33%	23%	10%	15%	100%
R&D with other businesses	17%	29%	29%	21%	5%	100%
R&D with universities	15%	27%	29%	17%	12%	100%
Integrating new technology	18%	26%	36%	15%	5%	100%
New production processes	13%	21%	21%	16%	29%	100%
Opening New markets	18%	23%	38%	18%	5%	100%
Innovation focused staff training	18%	26%	23%	28%	5%	100%

Source: Hatch Regeneris Survey 2019.

Demand for Increased Engagement in R&D and Innovation

- 4.9 The majority of businesses active in the areas of R&D and innovation set out above, wish to engage more in that activity. The areas of activity in greatest demand are research to understand new markets, innovation focussed staff training and university collaboration.

Figure 4.1 Would you like to do more of the following?

Source: Hatch Regeneris Survey 2019.

- 4.10 The main barriers to innovation, highlighted by businesses within qualitative free text responses to the survey, are:
- funding/access to finance (especially for early stage businesses)
 - time constraints
 - regulatory barriers
 - a lack of skills.
- 4.11 The main barriers to working with universities relate to:
- businesses' understanding universities strengths and specific academics' expertise
 - time constraints.
- 4.12 Individual businesses have highlighted a range of other barriers to university engagement, including access to funding that facilitates collaboration, developing programmes that suit both industrial and academics needs, and the complexity and timescales associated with collaborative work.
- 4.13 This points to a potential suite of activities needed to inform, facilitate and support increased business-to-business engagement, businesses engagement with universities and to overcome barriers to increased collaboration, innovation and R&D.

5. Sector Health & Resilience

Recent Trends

- 5.1 Producing a detailed picture of change in the MedTech sector at a regional level is difficult. As outlined in the 2017 Strength & Opportunities supplementary trends report, changes in the scope of data gathering and methodology mean that the most recent data cannot be compared on a like-for-like basis with past releases. The supplementary trends data is also limited; it does not provide a regional account of changes in turnover or a year-by-year account of changes in the number of business sites. Nonetheless, the data points to some important patterns of change.

Change in Employment

- 5.2 Employment in MedTech nationally has seen strong growth, of 17.5%, between 2009 and 2017. Employment in the East Midlands has also been strong, growing at over 15% between 2009 and 2017, and at the fastest rate of any region over the last three years of available data.
- 5.3 This is in contrast to the West Midlands, where employment has fallen by over 12% from 2009 (more than any region outside of the South West), and over 5% over the last three years of available data. The 2018 OLS Bioscience and Health Technology Statistics report suggests that the decline in the West Midlands can be attributed to a mixture of causes, including the successful promotion of investment options leading to overseas acquisition and restructuring.

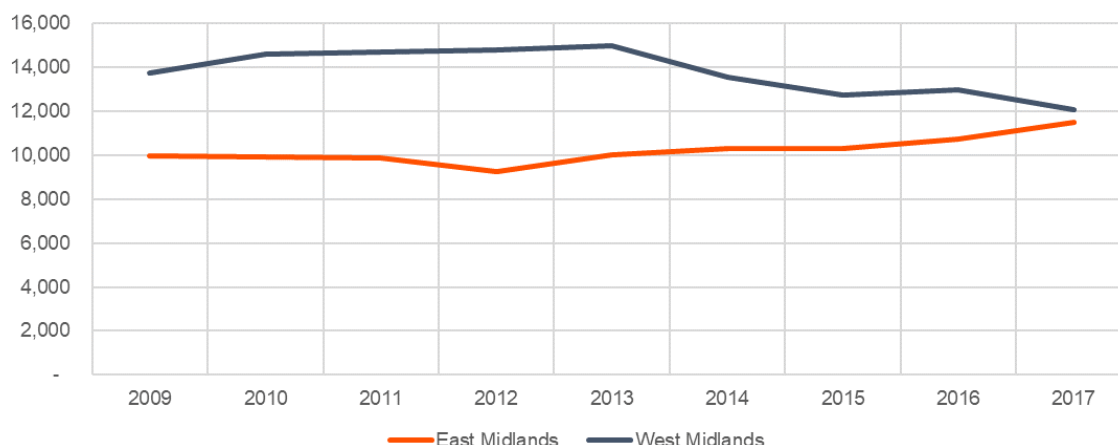
Table 5.1 Change in Employment by Region
Ordered by % change 2015-17

	2009-17		2015-17	
	Change	% Change	Change	% Change
East Midlands	1,510	15.1%	1,190	11.6%
Northern Ireland	800	56.0%	230	11.3%
North East	1,370	80.1%	270	9.6%
London	2,590	42.7%	590	7.3%
Yorkshire & Humber	4,050	41.3%	660	5.0%
South East	5,840	27.6%	990	3.8%
Midlands Total	-180	-0.8%	520	2.3%
South West	-1,120	-14.7%	50	0.7%
East of England	1,210	9.4%	-10	-0.1%
Wales	1,810	30.1%	-200	-2.5%
Scotland	-720	-8.3%	-280	-3.3%
North West	3,320	36.0%	-450	-3.5%
West Midlands	-1,690	-12.3%	-670	-5.2%
UK	18,970	17.5%	2,370	1.9%

Source: Strength & Opportunities Data, 2017.

- 5.4 Contrasting fortunes over the last eight years means that total employment in the East Midlands is now roughly on par with the West. It is likely that the growth in MedTech employment in the key clusters around Nottingham, Leicester and Loughborough has contributed to this.

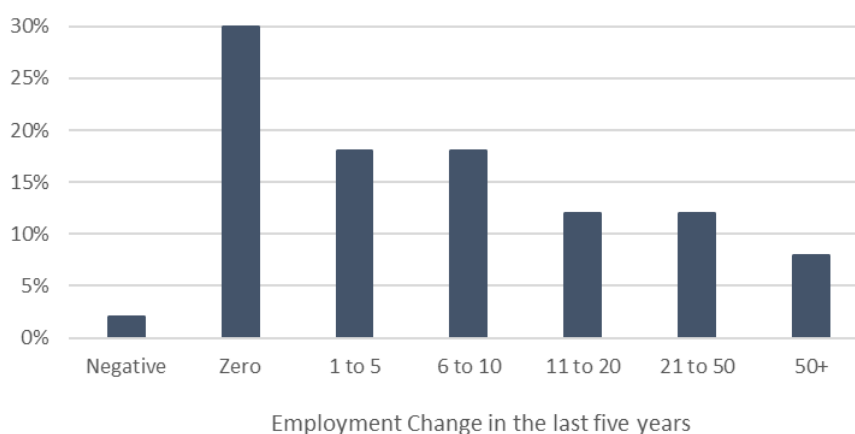
Figure 5.1 MedTech Employment, 2009-17



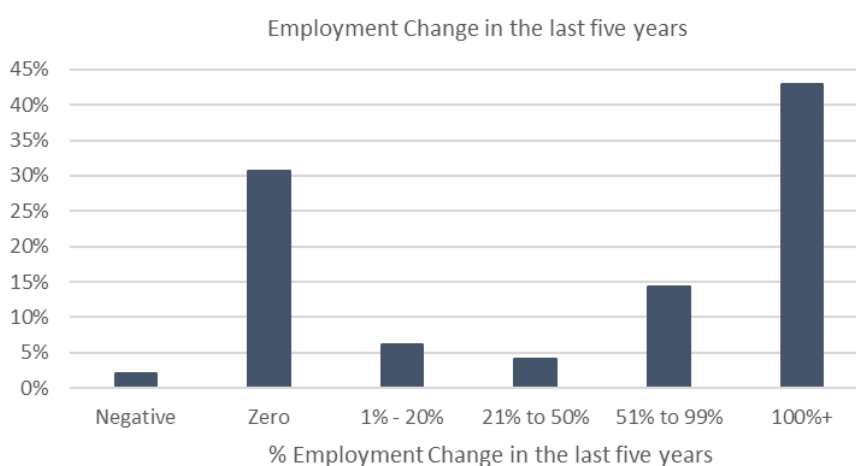
Source: Strength & Opportunities, 2017: Supplementary Report: Trends in the UK Life Sciences.

- 5.5 The survey provides another view of employment change. Almost a third of business say that they have remained static in terms of growth over the last five years. However, the majority of the remainder of businesses have registered some steady increase in employment numbers.
- 5.6 It is notable that during the period 2009 - 2019, the East Midlands has enjoyed continued SME focused business support interventions, primarily through ERDF part-funded programmes led by Medilink East Midlands that have not been available to West Midlands based SME businesses. Additionally, the West Midlands has seen considerable movement, restructuring and overseas acquisition that has reduced the apparent number and size of MedTech companies in the region. This trend continues in the 2018 data and is perhaps a result of the uplift in the region's promotion of investment opportunities via the Department for International Trade, Midlands Engine and West Midlands Combined Authority³⁷.
- 5.7 The vast majority of businesses responding to the survey are smaller or micro businesses. As a result, much of the growth in absolute employment shown in Figure 5.2 translates to a high growth performance among these smaller firms, with more than 40% of respondents increasing employment by 100% or more (Figure 5.3).

³⁷ For example, see thebusinessdesk.com/westmidlands/news/2030591-west-midlands-region-sees-81-increase-in-equity-investment-for-smaller-businesses

Figure 5.2 Employment Change over the Last Five Years

Source: Hatch Regeneris Survey, 2019.

Figure 5.3 Percentage Employment Change over the Last Five Years

Source: Hatch Regeneris Survey, 2019.

Change in the Number of Business Sites

- 5.8 The UK as a whole has seen a fall in the number of core MedTech businesses between 2009 and 2017, across almost 70 business sites. There has been a contrasting rise in the number of service and supply businesses, pointing to a broadening out of sector activity to incorporate a wider range of businesses serving the industry.
- 5.9 There were 73 fewer MedTech business sites within the West Midlands in 2017 versus 2009, the largest fall of any region and broadly mirroring the fall in employment. Despite a rise in employment, the East Midlands has also seen a fall in the number of business sites, albeit to a lesser degree.
- 5.10 London has shown by far the largest growth in MedTech businesses, albeit from a low base. Only three other regions have registered an increase in the number of business sites over the last eight years. Given positive employment and turnover growth in the sector, this potentially points to significant barriers to market entry for core MedTech firms.

Note: No year-by-year data is available for business sites.

Table 5.2 Change on the Number of Business Sites, 2009-17
Order by the Scale of Change

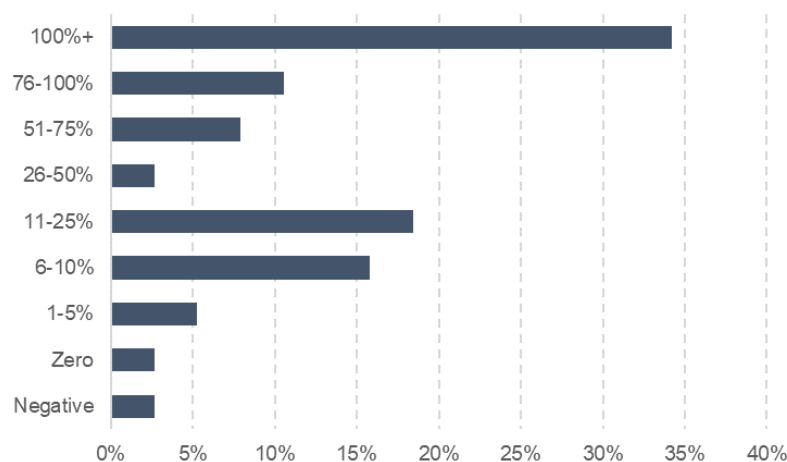
	Core MedTech	MedTech Service & Supply	Total
London	118	25	143
North West	17	0	17
South East	13	-2	11
Northern Ireland	4	1	5
East Midlands	-19	17	-2
North East	-15	2	-13
Wales	-18	5	-13
Scotland	-8	-6	-14
East of England	-16	-7	-23
Yorkshire & Humber	-28	2	-26
South West	-30	-2	-32
West Midlands	-85	12	-73
UK Total	-67	47	-20
Midlands Total	-104	29	-75

Source: Strength & Opportunities, 2017: Supplementary Report: Trends in the UK Life Sciences.

Future Growth Prospects

- 5.11 Despite some mixed messages from the data on past growth, businesses responding to the survey expect the future to look more buoyant. Most businesses are optimistic about future turnover growth.
- 5.12 Based on the survey, and on consultation with larger MedTech company leaders, the key drivers of growth will be new geographical markets (including in lower and middle income countries), technology and product development.

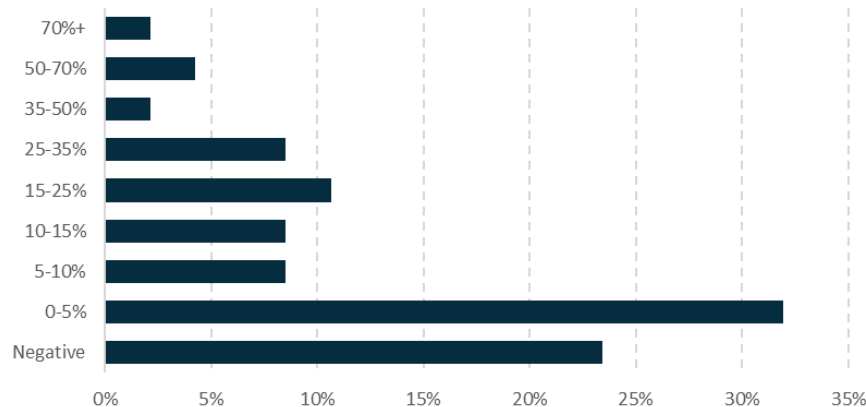
Figure 5.4 Expected Five Year Turnover Growth



Source: Hatch Regeneris Survey 2019.

- 5.13 Most businesses appear confident in their ability to cope with a future economic shock but noting that Brexit could cause some issues. That said, more than half of businesses responding to the survey (55%) report profit margins at 5% or below, including 23% that report negative profit.
- 5.14 This is likely to reflect significant numbers of businesses active in earlier stage and pre-commercialisation R&D, many of which will naturally be operating pre-revenue and may have access to growth capital funds. Nonetheless, helping businesses to access finance, understand and capitalise on emerging market opportunities and link with the wider industry and knowledge base active in MedTech will be key to securing greater financial resilience.
- 5.15 Just under a quarter of businesses (24%) say that they have at least considered relocating outside of the Midlands. One of the key reasons highlighted by businesses relates to accessing appropriate skills.
- 5.16 This suggests a requirement for comprehensive investment in support for MedTech businesses, and to market that support alongside the range of industry related investment being made in MedTech in the Midlands.

Figure 5.5 What Proportion of your Turnover is Profit?



Source: Hatch Regeneris Survey 2019.

6. Barriers to Growth and Supporting a Stronger, More Dynamic Sector

What is needed to create the next Smith & Nephew?

- 6.1 We spoke to a number of leaders from larger MedTech business. Among a range of questions that have informed this assessment, we asked them what conditions are required in the Midlands to facilitate the emergence of the next major market player in the MedTech market – the next Smith & Nephew, for instance. It is clear that no single factor would be at play; we summarise the key recommendations below:
- Focus on the future trends that will secure major growth: there is a consensus that technological advances and digital healthcare solutions will play a key role. Patient safety and care in the home will also continue to fuel new market opportunities.
 - Develop a cohesive supply-chain that can support the growth of larger/high growth firms
 - Encourage diversification: creating a large and high growth company will arise from exploiting multiple product and geographical markets
 - Ensure access to start-up funding for high growth early stage business ideas, including university spin-outs, despite high levels of InnovateUK funding into the region
 - Provide clarity and support to navigate costly Medical Device Regulations
 - Ensure access to a broad range of skills: in manufacturing, R&D, and for technical, commercial and business roles.

Barriers and the Focus of Support

- 6.2 Figure 6.1 shows the responses of surveyed businesses when asked about the barriers they face in generating increased productivity and business growth, and the types of interventions they would benefit from most in delivering this.
- 6.3 This points to some level of consensus cutting across the sector, on some of the major barriers to productivity and growth and the solutions required to navigate them. This includes access to finance and investment, clinical partnerships, skills and the means to better connect a fragmented sector.
- 6.4 It also points to a wide range of challenges and more specific needs that will depend on the circumstances of individual businesses.
- 6.5 Drawing on the survey responses (including qualitative open text responses) and insights from larger MedTech company leaders, we explore some of the key themes below.

Figure 6.1 Barriers and Support Needs to Productivity and Business Growth and Areas of Potential Support



Source: Hatch Regeneris Survey 2019.

Access to Finance

- 6.6 Among the 100+ firms (full and partial responses) that responded to the survey, access to finance and investment is cited by the largest number of businesses as a barrier to increased productivity and growth, be it for early/late stage new product development to expand productive capacity or introduce technology that drives new businesses processes.
- 6.7 The largest proportion of UK MedTech business (23%) raise finance through private equity or publicly backed funds (also 23%). A growing number (14%) raise investment through crowdfunding³⁸. Patient capital provides an alternative form of long-term investment to support early stage technology that requires a lengthy and complex development process.
- 6.8 Support should be focussed on ensuring there is the right type of finance available for businesses, be it in providing grants to invest in new facilities, equipment or processes, to undertake early and later stage product development or to access private investment.
- 6.9 Part of the picture here may be related to the number of specialist finance providers located in the Midlands. Just one business among 10 such UK firms is located in the region.

³⁸ Grant Thornton (2018). 'UK MedTech and the NHS'.

- 6.10 Midlands businesses looking for private investment are likely to need to seek finance outside of the region or through national and publicly backed support, such as that provided through:
- Innovate UK, NIHR, NHS England and the OLS to test new technology within the NHS³⁹
 - The Midlands Engine Investment Fund, a £250 million fund investing loan, equity and proof of concept grant finance in Midlands SMEs (including to date in advanced manufacturing, agri-tech, transport and MedTech businesses)
 - the Minerva businesses angel network, which has invested in 90 tech, fintech and MedTech companies and operates as a part of the University of Warwick Science Park to link investees into university R&D and wider business support provision
 - Grant Thornton's G Growth Fund to support access to growth equity for MedTech firms⁴⁰.

Access to Clinical Partnerships & Trials

- 6.11 There are 50 NHS Trusts, 49 Clinical Commissioning Groups, 117 clinical trials facilities and 149 NHS based organisations engaged in clinical research in the Midlands⁴¹. This presents an opportunity but also a complex picture for MedTech businesses that want to form clinical partnerships.
- 6.12 Access to clinical partnerships is highlighted as a major barrier by more than 40% of businesses. The same proportion support the creation of a gateway to make accessing clinical trials facilities easier.
- 6.13 Access needs to be simplified and support provided to understand and facilitate the routes into clinical partnerships. This support would require engagement from representatives spanning industry, the NHS, the wider medical sector and the public sector.

Facilitating Business and University Collaboration

- 6.14 After grant funding, the largest proportion of respondents (64%) support the development of a connected industry network, to facilitate increased business and academic engagement and collaboration. More than a third of businesses (34%) highlight access to businesses-to-business collaboration as a barrier to productivity and growth.
- 6.15 This points to the fragmented nature of the industry as it currently operates. There are a number of quotes from businesses responding to the survey highlight this point succinctly. For example:
- "The MedTech scene is quite fragmented and highly distributed – it is difficult to communicate our offering and find out about aspirations/requirements of companies/partners working in this sector"*
- "We are a network-driven business, so the more opportunities to meet like-minded, complementary businesses the better. In other UK regions, we find that "Innovation Centres"/"Science Parks" provide an excellent way to join companies together. It is a much more collaborative (rather than combative) world than 20 years ago."*
- 6.16 Ensuring that businesses can identify and capitalise on opportunities to work together and with the knowledge base will help to counter that fragmentation and secure outcomes in terms of innovation and growth. Alongside other measures, a more connected industry is likely to:

³⁹ [gov.uk/government/news/testing-new-medical-technologies-in-the-nhs-apply-for-funding](https://www.gov.uk/government/news/testing-new-medical-technologies-in-the-nhs-apply-for-funding)

⁴⁰ Grant Thornton (2018). 'UK MedTech and the NHS'.

⁴¹ Medilink Midlands and Midlands Engine (2018). 'Driving Life Sciences Business'.

- better position regional partners to understand the needs of the sector and develop strategies that meet its needs
- better highlight the strengths of the MedTech industry in the Midlands to others and help to secure inward investment.

Access to Skills & Skills Development

- 6.17 There are seven medical schools in the Midlands and 25 out of the 27 Midlands universities already offer courses connected to health⁴².
- 6.18 Nonetheless, almost 40% of businesses highlight recruitment and the availability of skills as a key barrier to growth and nearly a third of respondents support the need to develop a MedTech Skills Academy. Given that a significant 15% of businesses have also highlighted the skills of their existing workforce as a barrier, access to mid-career skills development, potentially within the Skills Academy, also needs to be considered.
- 6.19 Partners should work alongside the universities, colleges and industry to identify the most pressing skills gaps and to map existing provision. This will give a clear idea of the training and qualifications that need to be provided in the Midlands to give businesses access to the skills they require to grow.
- 6.20 Consideration should also be paid towards ensuring the retention of graduates looking to work in the sector. Ensuring that businesses are engaged in the formulation of any future skills provision, and that there is clear access to apprenticeships and in-work training can play an important role here.

Opening up Markets

- 6.21 When asked what markets they serve, respondents to the survey indicated that on average around 19% of their market lay within the Midlands. The largest share of the market was accounted for by the wider UK, at 48%. Europe and the rest of the world both accounted for between 16% and 17% respectively.
- 6.22 More than a quarter of respondents said that access to new markets (29%) and understanding market opportunities (27%) were barriers to their business. Facilitating clear paths to market entry will be crucial for early stage and established businesses, whether they are developing early and later stage products and technology towards commercialisation, looking to differentiate in a changing industry, access large and complex medical institutions or growing national and global opportunities.
- 6.23 Just under a fifth of businesses (18%) support the development of a defence medicine pipeline, delivered through military, academic and business partnerships to translate military innovations into civilian care. Defence Medicine is a relatively unexplored market in the UK. There is a missed opportunity here that Midlands partners could look to exploit to capitalise on opportunities for cross-over product development and deployment.
- 6.24 Providing access to market intelligence and support on market/customer scoping/engagement could help MedTech companies to better understand the breadth of opportunities they could capitalise on.

⁴² Medilink Midlands and Midlands Engine (2018). 'Driving Life Sciences Business'.

Access to Facilities for Product Development & Academic/R&D Research Expertise

- 6.25 In terms of access to R&D facilities and university collaboration, the largest proportions of respondents highlight the need for access to facilities for prototyping (31%) and knowledge exchange (22%).
- 6.26 Smaller numbers of businesses have pointed to the need to have access to appropriate facilities more generally (17%), research expertise (15%) and academic partnership/collaboration (11%).
- 6.27 Although this accounts for smaller proportions of the business base, such activity can stand to deliver major benefits in terms of innovation, market capture and economic growth in the Midlands. To bring these benefits about, future investment should be deployed to ensure that businesses are linked into the appropriate R&D and knowledge resources, and that plans for new facilities and collaboration are targeted towards identified business need.

Other Barriers & Needs

- 6.28 Other key barriers identified by businesses as barriers to productivity and growth include:
- regulatory frameworks that are typically easier for larger businesses to navigate
 - the economic uncertainty and potential threat to R&D skills and investment associated with Brexit.

7. Conclusions

7.1 Over the course of this review we have found that the MedTech sector in the Midlands is:

Ideally positioned to drive the UK's MedTech economy

- 7.2 The Midlands MedTech sector hosts the largest number of MedTech companies of any region in the UK (931 over 956 sites) and generates sizeable benefits for the Midlands and UK economy.
- 7.3 Estimated average GVA per worker within the Midlands MedTech sector is £66,000, 40% and 22% higher than in the wider Midlands and UK economy respectively. This generates around £1.6 billion in GVA annually in the Midlands and there is significant opportunity to improve this value further.
- 7.4 MedTech employment in the Midlands stands at 23,600. This is 20% higher than across the UK when taken as a percentage of total employed.
- 7.5 Clusters of MedTech activity are spread evenly across the East and West Midlands (with two main focal points in Birmingham and Nottingham).
- 7.6 The region's key industrial specialisms are found in the fields of assistive technology, hospital hardware, single use technologies and infection control, alongside a range of MedTech expertise within local clusters. These are complimented by a wealth of academic translational strengths in medical imaging, health data, rehabilitation, clinical trials and medical devices. Industry engagement specialisms include NICE standards, CE marking, NHS business plans and the regulatory landscape. Clusters of activity have grown around the Midlands endemic life sciences and manufacturing strengths, taking advantage of the significant investment in university and industry-led R&D facilities.

An optimal location to demonstrate how national outputs can be achieved within innovative SME-driven regions

- 7.7 The Midlands fosters a long-standing and fertile entrepreneurial community that has delivered not only the large number of MedTech companies present in the region, but also a business longevity notably higher than the national average⁴³.
- 7.8 Small-to-Medium sized Enterprises (10-249 employees) form the core of the Midlands MedTech sector, accounting for 34% of all businesses (323) versus 10% across the UK, proving that SME-driven economies can be a source of major employment as well as productivity and significant economic output nationally.
- 7.9 Furthering this, 85% of the 950 Midlands businesses (whose incorporation year is known) were established more than 10 years ago, with only 5% businesses aged 5 years old or less. This compares to 80% and 7% across the UK respectively. This highlights the sustainability of the region's economy and provides an opportunity to see long-term productivity uplift from future intervention and investments.
- 7.10 This longevity could be interpreted as a lack of interest in innovative activity, but the opposite is seen here. The region's companies are able to survive for such periods because they engage in significant R&D and innovation activity. On average 28% of staff time is spent on R&D, particular early and later stage. Three quarters of MedTech businesses are engaged in

⁴³ The survival rate up of businesses established in 2012 in Midlands is higher than across England and Wales over all time periods provided in 2017 ONS Business Demography data.

some form of collaboration and the same percentage are already integrating new technology into their businesses.

Primed to overcome its growth barriers and deliver significant economic uplift both regionally and nationally

- 7.11 As we have seen in this review, there are a number of barriers currently preventing the Midlands from reaching its full potential, including:
- Fragmentation of the supply-chain within and through the region (i.e. B2B)
 - Limited access to private investment (notably for start-up & scale-up) and grant funding
 - Limited awareness of opportunities (e.g. facilities, new markets and access to the NHS)
 - A disconnect between the ample research and skills base and commercial need
 - Lack of knowledge, funding and partnership to perform clinical trials
 - Insufficient access to technical support navigating regulatory hurdles within a complete testing environment
 - Time constraints to engage in additional activity.
- 7.12 This assessment has also identified interventions that would remove these barriers and deliver short-term impact upon the productivity of Midlands companies that would continue to grow into the medium-and long-term. These include:
- An agile Midlands-wide network, building on existing specialisms, to foster innovation-focused precompetitive discussions and collaborative activity across a community platform of academics, businesses and clinicians (ABC network). This will have the added benefit of developing a cohesive supply-chain, enabling more effective recruitment activity and bolstering B2B engagement and opportunity awareness.
 - Sector specific and Technology Readiness Level (TRL) appropriate financing from regional, national and international investors (including venture capitalists, business angels and patient capital investors). This portfolio must be complimentary not competitive with existing offers e.g. the Midlands Engine Investment Fund and Minerva.
 - Strategically coordinated and networked assistance, integrated with existing delivery partners to fill gaps in provision and support priority investments aligned to business need (e.g. testing and prototyping equipment, collaborative facilities, regulatory expertise and clinical trials). This activity should be linked to an innovation-focused training package for both business and academic staff.
 - A Midlands-level strategy, unanimously agreed with regional partners and connecting into regional/local policy, focussing on future trends and encouraging a diverse, technologically advanced market presence. This will provide the region with more focus, co-ordination and visibility. By pulling together infrastructure developments, expertise and industrial advances, such a strategy (delivered alongside the previously mentioned interventions) can transform the Midlands' individual assets into a highly successful Midlands-wide cluster.
- 7.13 The conclusions from this report align with the current findings and ongoing strategic work taking place at both a regional and local level. This is most notable in the Midlands Engine Strategy, the Local Industrial Strategies being developed within the region, the local cluster development work being undertaken (principally by West Midlands Combined Authority) and the Midlands Science and Innovation Audits. All of these strategic plans prioritise medical technologies as a core Midlands sector that is ideally positioned to grow into a national/international leader with the right level of support.



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