



Data Driven Health Innovation Pitchbook

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Content

Chapter	Subject	Page No.
1.	Introduction	3
2.	Executive Summary	5
3.	Summary of Regional Offer	8
4.	Opportunities	9
5.	Sector Ecosystem	23
6.	Sector Overview and Strengths	32
7.	Sector Trends and Customer Needs	37
8.	Skills and Talent	43
7.	Funding and Investable Opportunities	46
8.	Case Studies	48
9.	Appendices	52

Introduction

The West Midlands offers city centre lifestyles for health technology companies that want the full development cycle from early-stage research and validation to clinical development to manufacturing, production and launch all within short walking or commutable distances.

The West Midlands is home to a thriving life science sector.

Overall the sector supports **17,320 jobs** and a turnover of £6.5bn. Supporting over 600 companies in all sectors of life sciences. In the wider life sciences and healthcare provision there are 254,000 people employed – a larger labour pool and wider healthcare market than any other City Region outside London.

A particular strength of the region is its thriving med-tech sector with over 500 companies in the core, service and supply sectors of this industry. The region is home to a diverse spread of start-ups, scale-ups and established businesses. There are **9640 jobs** are in core Med-tech including digital health making it the 4th largest employer in this segment in the UK.

A further **1480** people are employed in med-tech service and supply. *(Source OLS)*

According to ONS (NOMIS) data there are 3275 people employed in medical devices across 3 LEP areas but with the greatest concentration in the Greater Birmingham Solihull LEP area which has a location quotient of two indicating that this LEP area has double the national proportion of employment in medical devices compared to England as a whole: a rich cluster of skill and capability.

The West Midlands accounts for 8% of UK turnover in the med-tech segment with a turnover of £1.7bn. In terms of value it is the biopharmaceutical service and supply segment that ranks most highly in terms of turnover at £4bn making it the second highest turnover region in this segment after the South-East and employs 4170 people.

Whilst the region has strength in a diverse med-tech cluster it is now leading the way in providing an opportunity and support for companies meeting growing demand for data-driven healthcare technologies across key sub-sectors including diagnostics, devices and a wide range of digital health innovation.

The ability to digitise and integrate clinical and genomic data and also, pathology and other health related data has enabled and driven demand for new health and care technologies.

Innovations such as AI and machine learning are radically changing and improving diagnosis and early intervention and the creation of tailored therapies.

The West Midlands is a leader in the integration of patient data and has built a skilled med-tech ecosystem to support companies working on data-driven health tech innovations such as wearable devices and remote and intelligent monitoring, diagnostic tools both for hospitals and for the community and many other applications such as mobile apps for education, support and therapeutic guidance.

The region is also one of the country's first 5G test beds that will provide an environment which will enable a new generation of health technologies.

The NHS and private healthcare providers such as BUPA, BMI, BHSF offer the potential for a large market for innovation and the region's highly developed clinical and academic base makes it particularly attractive for companies interested in R&D collaborations and product or service evaluation.

The West Midlands Technology cluster offers all the expertise and assets for data-driven health innovation to thrive including hospitals with three global digital exemplars, 6 universities with specialist Medtech research interests and 611 life science companies.

(Sources: OLS, 'UK Medical Technology Sector Statistics,' 2019; GlobalCityUK, 'Leading Global Competitors In Venture Capital & Private Equity,' accessed Jan 2021).

Why the West Midlands

The West Midlands has been in resurgence over the last decade. In the five years to the end of 2019, the West Midlands region boasted the one of the fastest five-year GVA growth rate of any UK region, ahead of London and the South-East. The revitalisation of many industrial sectors in the region to new build developments such as the Birmingham Health Innovation Campus, the Birmingham Biohub and the Serendip® Digital Health quarter. Health innovation in the region is increasingly synonymous with developments in data, diagnostics, digital health and devices

Scale & Location

- The West Midlands is home to a healthcare and life sciences industry on a grand scale. When all the aspects of the sector are considered together there are 254,000 people employed – creating a huge labour pool of skills as well as a significant local market for healthcare products.
- The central position of the West Midlands also ensures that 92% of all business units in Great Britain can be accessed in a 4-hour drive.

Manufacturing Experience

- The West Midlands creates more GVA from manufacturing than any other region and this depth of manufacturing expertise in the region has underpinned its importance in developing and manufacturing medical devices – it is a home to leading businesses in supporting assisted living, ophthalmic products and imaging, as well as single use / consumables for surgical procedures.

Innovation

- The West Midlands brings together the three major cities of Birmingham, Coventry and Wolverhampton and surrounding towns with leading universities and a young vibrant population to provide a location geared for innovation. There is a huge range of institutional activity supporting innovation and providing collaborative research opportunities focused on the 6 Universities of the region – and beyond.

Skills

- The scale of the available labour market is combined with the large graduate output from the region. The region produces over 11,000 graduates in the medical sciences and a further 6,000 graduates in the engineering and computing fields every year

Vibrancy

- The region is the UK's second largest urban area after London and has been number one regional capital (outside London) for start ups for seven years running. The City Region has also one of the youngest populations of any UK City Region and this will ensure that its position as having the largest working age population of any non-London City Region is maintained.

Competitiveness

- The region generates a high level of GVA at a relatively low cost for business. Labour costs in the West Midlands are almost 20% lower than the Thames Valley whilst Solihull for example generates the 8th highest GVA per filled job of 234 UK Local Authorities. This combined with an excellent quality of life and disposable income supported by median house prices costing just 5.5x median earnings (compared to the average UK city home price recorded at >8x earnings).

Executive Summary

The West Midlands is home to a thriving life science sector. Overall, the sector supports 17,320 jobs and a turnover of £6.5bn. Supporting over 600 companies in all sectors of life sciences. When the entire healthcare and life sciences sector is considered, the region employs 254,000 people – creating a market and a labour force greater than any other UK region outside London.

A particular strength of the region is its thriving med-tech sector with over 500 companies in the core, service and supply sectors of this industry. The region is home to a diverse spread of start-ups, scale-ups and established businesses. There are 9640 jobs in core Med-tech including digital health making it the 4th largest employer in this segment in the UK. The creation of the Serendip® Digital Health quarter in Birmingham has led to a concentration of start-up activity with these businesses joining established players in the West Midlands such as Dignio and Evolyst.

A further 1480 people are employed in med-tech service and supply. (Source OLS).

Building from the rich manufacturing sector, there are 3,150 people employed in medical devices across the 3 LEP areas with greater concentrations of employment than the English average in Coventry & Warwickshire and Greater Birmingham and Solihull. The region is involved in the development activity and manufacture for artificial joints (Smith & Nephew); devices for the mobility impaired (Evac & Chair's global Headquarters); and in Salts has one the UK's oldest companies.

The skills and capabilities in medical devices can be characterised as products for assisted living, ophthalmic strengths and single use items / consumables for surgery.

The West Midlands accounts for 8% of UK turnover in the med-tech segment with a turnover of £1.7bn. In terms of value it is the biopharmaceutical service and supply segment that ranks most highly in terms of turnover at £4bn making it the second highest turnover region in this segment after the South-East and employs 4170 people.

Companies such as AAH Pharmaceuticals have been attracted by the central locations as well as the large local market for their pharmaceutical logistics operation – whilst Clinigen offers a partnership to pharmaceutical businesses in developing, manufacturing and distributing pharmaceuticals from their global HQ in Burton-on-Trent.

Whilst the region has strength in a diverse med-tech cluster it is now leading the way in providing an opportunity and support for companies meeting growing demand for data-driven healthcare technologies across key sub-sectors including diagnostics, devices and a wide range of digital health innovation.

Alliance Medical based in Warwick provides a huge range of imaging services for diagnostics in the UK and internationally; The Binding Site is a diagnostics Company originally spun out of the University of Birmingham which now provides services across 100 countries whilst Altabioscience and Micropathology are examples of the new niche diagnostics companies emerging in the region.

The ability to digitise and integrate clinical and genomic data and also, pathology and other health related data has enabled and driven demand for new health and care technologies.

Innovations such as AI and machine learning are radically changing and improving diagnosis and early intervention and the creation of tailored therapies.

The West Midlands is a leader in the integration of patient data and has built a skilled med-tech ecosystem to support companies working on data-driven health tech innovations such as wearable devices and remote and intelligent monitoring, diagnostic tools both for hospitals and for the community and many other applications such as mobile apps for education, support and therapeutic guidance. This patient network has attracted trials companies such as Synexus to establish a base in the region.

The region is also one of the country's first 5G test beds that will provide an environment which will also enable a new generation of health technologies. This is already being used to link paramedics to hospital clinicians to improve the provision of care.

The NHS and private healthcare providers such as BUPA, BMI, BHSF offer the potential for a large market for innovation and the region's highly developed clinical and academic base makes it particularly attractive for companies interested in R&D collaborations and product or service evaluation.

The West Midlands Technology cluster offers all the expertise and assets for data-driven health innovation to thrive including 8 hospitals with three global digital exemplars, universities with specialist Medtech research interests and 611 life science companies.

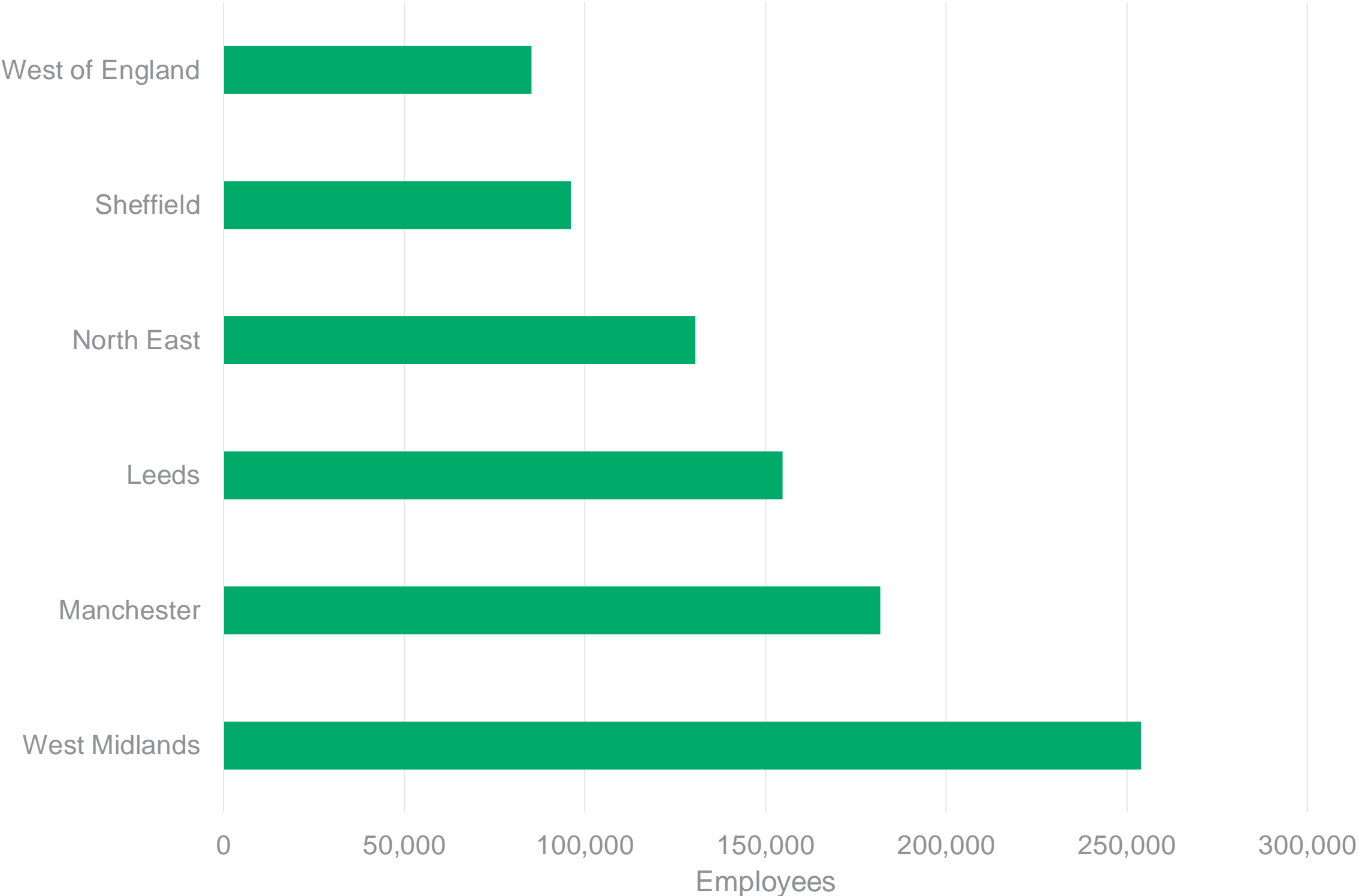
(Sources: OLS, 'UK Medical Technology Sector Statistics,' 2019; GlobalCityUK, 'Leading Global Competitors In Venture Capital & Private Equity,' accessed Jan 2021).

Executive Summary

Scale

- When the entire healthcare and life sciences sector is considered together, the West Midlands employs c254,000 and this is significantly more than the next closest City Region outside London with the Manchester City Region employing 182,000 (or almost 30% fewer people).
- This employment is spread across 10,700 business units within the City Region.
- The scale of the sector ensures that there is a huge skill base available across the region and a large-scale healthcare and life sciences market in the immediate area.
- When the concentration of employment is considered in comparison to England as a whole, the Black Country employs 2.2x the proportion of people in the manufacture of basic pharmaceutical products – and a greater proportion of people than England in hospital activities (1.3x); residential nursing care activities (1.3x); residential care activities for learning disabilities, mental health and substance abuse activities (1.8x); Other residential care activities (1.1x); Social work activities without accommodation for the elderly and disabled (1.4x); and other social work activities without accommodation (1.2x).
- The concentration of employment which exceeds England in Coventry and Warwickshire includes the manufacture of medical and dental instruments and supplies (1.9x); and other health activities (1.1x).
- The concentration of employment in Greater Birmingham and Solihull which exceeds England includes the manufacture of optical instruments and photographic equipment (1.8x); the manufacture of medical and dental instruments and supplies (1.1x); and research and experimental development on natural sciences and engineering (1.1x).
- The data by sub-sector is set out overleaf

Employment in healthcare and life sciences by selected LEP area 2019



Source: ONS BRES data

Executive Summary

Employment & Business Units in West Midlands by sector 2019

	Total Employees	Total Business Units
Manufacture of basic pharmaceutical products	185	10
Manufacture of pharmaceutical preparations	950	20
Manufacture of irradiation, electromedical and electrotherapeutic equipment	65	5
Manufacture of optical instruments and photographic equipment	140	10
Manufacture of medical and dental instruments and supplies	3,150	140
Technical testing and analysis	2,175	350
Research and experimental development on natural sciences and engineering	4,700	250
Research and experimental development on social sciences and humanities	110	15
Veterinary activities	2,550	310
Hospital activities	96,000	345
Medical and dental practice activities	19,000	2,340
Other human health activities	25,500	1,890
Residential nursing care activities	11,000	265
Residential care activities for learning disabilities, mental health and substance abuse	3,000	125
Residential care activities for the elderly and disabled	14,000	735
Other residential care activities	14,500	760
Social work activities without accommodation for the elderly and disabled	20,000	680
Other social work activities without accommodation	37,000	2,450
Total	254,025	10,700

Source: ONS BRES data and Business Count Data

Summary of Regional Offer: Strengths

The West Midlands offers life science companies the ability to carry out the full development cycle from early-stage research, clinical development environments to manufacturing and production for all sectors including; medical devices, diagnostics and drug development. This development cycle is underpinned by access to unique data sets and highspeed data transmission networks.

Scale	Above all, it is the scale of activity that creates a huge opportunity for life science businesses. Whether this is the scale of the workforce with 254,000 employed across the broad activities of health and life sciences or the market opportunities within the region combined with the 92% of businesses in Great Britain that are within 4 hours drive. The region therefore offers something unique in the UK before the various areas of innovation, research and business activity are begun to be considered.	Data	Home to two Health Data Research Hubs, specialising in acute care and ophthalmic data. Access to curated regional clinical and genomic patient data sets.
Market & Test Bed	Stable and diverse population. 6 million records with high prevalence of unmet medical need and in particular high incidence of rare diseases making WM an ideal test best for new therapies and technologies.	Diagnostics	Design, develop and validate diagnostics solutions using genomic data, bio-banks, digital pathology imaging labs using academic units with a strong industry focus.
Connected Sites & Facilities	An unrivalled concentration of world class life science facilities and sites all intrinsically connected supporting innovation and adoption	Devices	Centres of excellence that can help you design, develop, build and commercialise medical devices that meet regulatory approval. The entire sector is supported by the unrivalled manufacturing capability of the region.
Accessible patient Information	Healthcare and health research is underpinned by access to unique data health platforms (PIONEER & INSIGHT)	Digital	Connected infrastructure that allows for testing of devices using 5G networks, within a region that is using digital healthcare delivery for its general population.
Clinical Trial Capability	Access to many enabling organisations to initiate and support a wide variety of trials on innovative technologies	Trauma and Defence Medicine	Centre for Trauma & Defence Medicine research and home to the Royal Centre for Defence Medicine providing first class treatment for injured UK military personnel from around the world.
National & International Connectivity	Major international passenger & cargo airport, excellent road links enabling companies with a base in the region to connect with customers and collaborators and markets worldwide.	Manufacturing	Skilled manufacturing base for engineering of medical devices to drug design. Wide range of light industrial property and brown field sites for setting up a manufacturing unit. Opportunity to re-shore and build UK resilience.
Cost	For a major international location offers low operating and living costs compared to London and the South for companies looking for a UK base to establish and grow.		



West Midlands
Growth Company

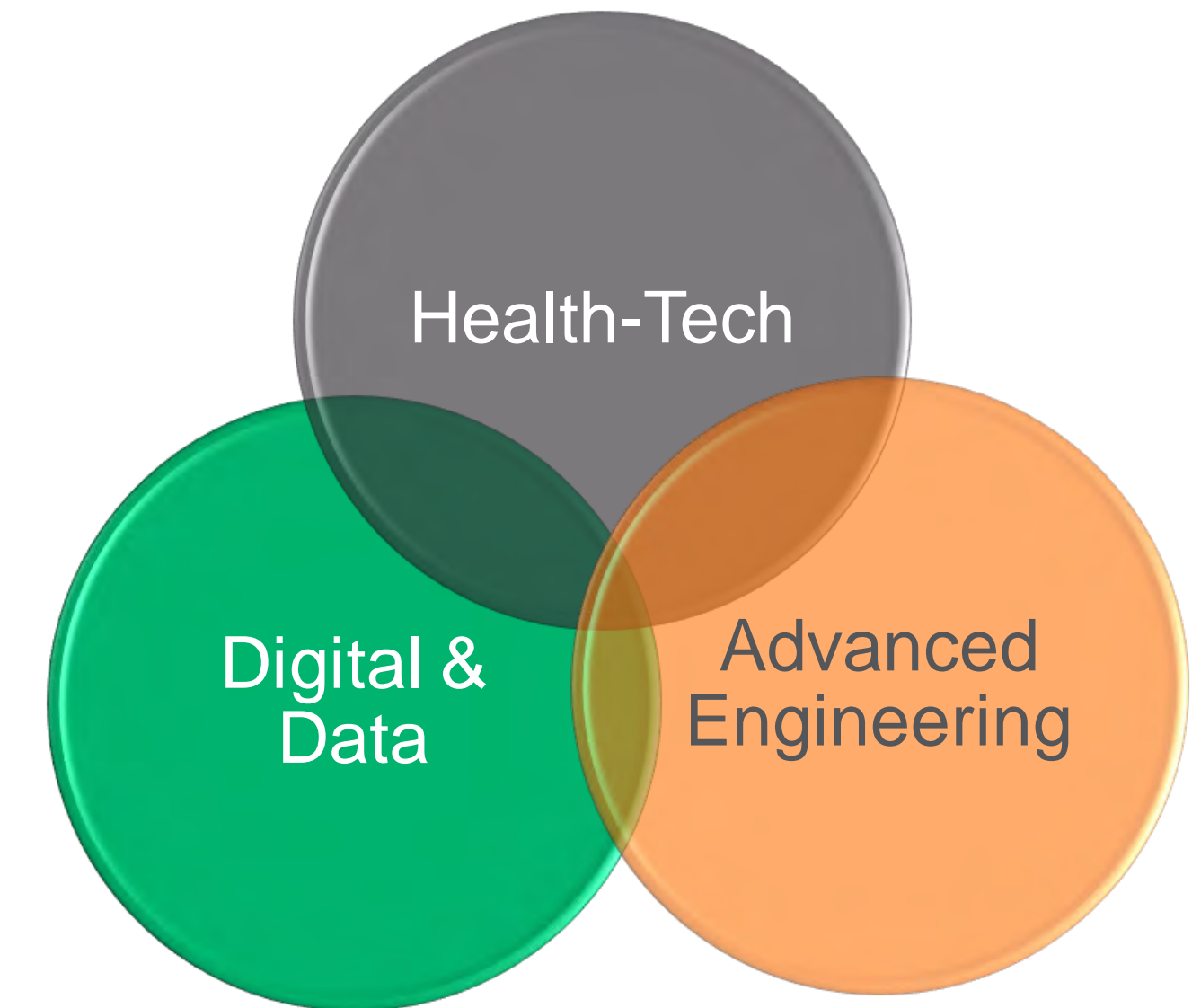
Opportunities: The Four D's



Data Driven Health Innovation

Data Driven Health Innovation

- **Diagnostics:** The West Midlands is recognised as a national leader in diagnostic capability with collaborative capability in leading edge AI applications and world renowned clinical and academic centers of diagnostic excellence as well as dedicated accelerators.
- **Digital Health:** The region has recognised global digital exemplars that is committed to improving health outcomes through digitally enabled care. The region provides a supportive environment for digital health innovation
- **Devices:** The West Midlands brings together data and multi-disciplinary support to enable companies with innovative devices and technologies to design, test, regulate and commercialize their innovation. The region also provides expert support for device prototyping and manufacture.
- **Data:** Unrivalled access to curated and integrated electronic clinical and genomic data underpins a range of leading opportunities in the West Midlands and offers opportunity for companies to harness data to design, test and commercialize their technology



Health innovation in the West Midlands I

The West Midlands is strong in many key areas of health innovation

Advanced Manufacturing and Engineering

The region supports world-leading industrial capability, supply chains and academic expertise including the application of artificial intelligence, automation, robotics and sensor technology, big data analytics simulation and modelling. These capabilities provide an ideal environment for companies to develop, prototype, test and manufacture their innovations in health-tech.

Digital and Data Analytics

Leading edge capabilities including patient data systems combining clinical and genomic data, big data analytics, artificial intelligence, sensor technologies, simulation and modelling combined with industry expertise in the development and regulatory approval of digital health applications.

Immunology & Immunotherapy

Birmingham Health Partners led the West Midlands Genomic Medicine Centre, UK coronavirus Immunology Consortium and provided leadership in infectious disease to the Milton Keynes Lighthouse lab.

Neuroscience: Adult and Child Brain Health

Aston University is recognised as innovative leaders in all aspects of child brain health and development including areas such as epilepsy, autism, ADHD and have one of only 3 child brain scanners in the world. Technological advances in tools to measure pediatric brain function and behavior attract significant industry-based investment. When combined with the expertise in adult brain research in UoB this represents an opportunity to attract diagnostic and monitoring devices area of strength and need.

Ophthalmology

The region is home to the INSIGHT Health data research hub for eye health at UHB and also the nationally and internationally recognised center for ophthalmic technology at Aston University which is a leading center for ophthalmic medical devices, diagnostic instrumentation and treatments for eye disease and offer opportunity to companies for innovative collaborations.

Healthy Ageing

Aston University, Centre for Healthy Ageing (ARCA) specialises in understanding, predicting and preventing age-related degeneration. Centre funded by the UK's major charities and research associations.

Health innovation in the West Midlands II

Clinical Trials: (includes TAP and specialist studies)

The West Midlands has a large ethnically diverse but stable population which makes it an ideal location for clinical studies. The region has one of Europe's largest concentrations of clinical trial activity for both drugs and medical devices through every stage of clinical development. The region has the capability to use its leading digital and genomic data bases to support design and implementation of studies of advanced and highly targeted therapies ensuring providing an attractive opportunity for pharma companies to position trials of novel agents and for clinicians to deliver internationally competitive studies rapidly and efficiently.

Translational Medicine

The West Midlands leads the way in supporting translational medicine with accessible institutions such as the Institute for Translational Medicine accelerating the development of drugs and devices by providing a platform for interaction between scientists, clinicians and industry and bring in access to the right infrastructure such as informatics and biodata. Birmingham Health Partners provide an industry facing team to facilitate access to collaborative research for industry.

Genomic Medicine

The West Midlands is home to the West Midlands Genomic Medicine Centre and the West Midlands Regional Genetics Laboratory (University Hospitals Birmingham). This is the largest genetics lab in the country. The genomic medicine centre is a leader in transforming diagnosis and treatment for patients with rare diseases and cancer bringing together genetic data from 16 hospitals across the region in the GENIE system. The centre is a trusted research environment and can interrogate data and advise companies on clinical trial planning.

Advanced Therapies and cancer

The Midlands-Wales advanced therapies treatment centre (MW-ATTC) works with Industry to overcome the current challenges to trial recruitment to cell therapy trials through an empowered trials network. Building on the success of the national Haemato-oncology Trials Acceleration Programme (TAP), the centre will establish a trials hub that can support highly effective and efficient trial models, rapid recruitment and matched genomic data. This will enable the region to rapidly deliver internationally competitive cell therapy trials. WM is also able to micro-manufacture cell therapies.

Trauma and defence medicine

The region is the UK's centre for trauma and defence medicine. The Queen Elizabeth Hospital in Birmingham (QUHB) has the largest single critical care unit in Europe. University Hospitals Foundation Trust Birmingham is also the location of the Tri-Services Royal Centre for Defence Medicine. Government initiatives such as the defence and security accelerator (DASA), provide opportunities and incentives for innovative companies to work with the challenges in defence and trauma medicine. The NIHR Trauma Management Med-Tech Cooperative in Birmingham provides and opportunity for industry to evaluate innovation in a leading centre.

National Centres of Excellence

The Queen Elizabeth Hospital Birmingham has the largest solid organ transplantation programme in Europe, the largest renal transplant programme in the United Kingdom and is a national specialist centre for liver, heart and lung transplantation and a regional centre for cancer studies and neurosurgery.

Diagnostics

The Market

- the global clinical diagnostics market was valued at around £40bn in 2020 and is expected to grow at a steady CAGR of 8.6% during the next five years. The growth of the sector is likely to be stimulated by the importance of diagnosis pinpointing specifically required medical interventions and in this manner can ensure that treatment is value based rather than volume based in stressed healthcare provision.
- The sector is strongly represented in the West Midlands as a result of the access to collaborative R&D facilities which can drive product development and also because of the size of the regional healthcare system with more people employed than in any other city region outside London.

Companies

Diagnosis is a specialist field and as a result there are a large number of small specialist companies operating in the field – including the following examples:

- **The Binding Site Group** - Founded by researchers at the University of Birmingham, The Binding Site provides specialist diagnostic products to clinicians and laboratory professionals worldwide and is represented in over 100 countries.
- **AltaBioscience** was established in Redditch in 1973 and provides analytical laboratory services in addition to custom syntheses of peptides, DNA oligos and both polyclonal and monoclonal antibodies. The testing services include amino acid analysis and protein sequencing in addition to other mass spec analytical techniques.
- **Severn Biotech** just to the south of the West Midlands in Kidderminster is a manufacturer involved in the diagnostics and testing sector. The original core business of oligo-nucleotide probes and primers for PCR and gene sequencing led to diversification into a laboratory reagents division specialising in the manufacture of liquid acrylamides buffers and electrophoresis materials and then later expansion into Peptide Chemistry as the demand for custom peptide molecules started to grow as the need to create polyclonal antibodies and epitope mapping increased.
- **Dignio** is a Norwegian diagnostic business producing measuring devices and a wider system of connected care. Dignio's platform integrates a set of devices for monitoring patients with such conditions as COPD, diabetes, cardiovascular diseases and cancer and the business has established its UK HQ in Birmingham.
- **Alliance Medical** – A large UK business based in Warwick providing a range of imaging services for the healthcare sector. Alliance Medical provides medical imaging services to support diagnosis to more than 400,000 patients in the UK each year, employing 850 people in a UK network of 50 centres and approximately 40 mobile scanners. The business also operates across Europe in Germany, Ireland, Italy, the Netherlands, and Spain.
- **Micropathology** - An independent rapid diagnosis & biomedical research company based within the University of Warwick Science Park, the business provides a clinically supported service for the rapid diagnosis and management of infectious and genetic disease
- Life science testing also has non-medical uses and the West Midlands also has a number of businesses providing bio-technology based testing activities in the food and industrial sector. This includes **Thermo Fisher Scientific** with a food hygiene testing facility in Rugby and **Cellfacts Analytics** who provide rapid microbiology instrumentation used in a number of industries and are based in Coventry.

Diagnosics

Genomics

- **West Midlands Genomic Medicine Centre** at Birmingham Women and Children's Hospital is the largest genomics lab hub in the country. The centre integrates clinical genetic data from 16 trusts on the GENIE system in a trusted research environment facilitating accelerated and efficient clinical study of many rare disease and cancers and offering opportunities for industry collaboration.
- **Birmingham Precision Medicine Centre** brings together in one place all the clinical and academic expertise to support trial design, 'omic' analysis, and patient data analytics to accelerate the development of innovative diagnostics and targeted healthcare. Expertise in genetic testing and patient stratification has led to accelerated trials models in blood cancers and is being extended support development of advanced therapies in other rare diseases.

In-Vitro Diagnostics and Molecular Pathology

- **Bio banking:** The region is also home to several research accessible biobanks and one of the first Health Technology Assessment (HTA) supported human biomaterials resource centres providing access to retrospective and prospectively collected and curated human samples supported by leading edge molecular pathology.
- **Mega Lab:** The West Midlands is home to the first UK diagnostic labs that will double UK testing capacity for Covid and future epidemics. epidemics as well as adding diagnostic capacity for other critical illnesses including cancer. The lab will employ around 2000 people and in addition to routine testing promises to become a focal point for diagnostic innovation and supply chain offering opportunity for industry.

Diagnostic imaging

- **Digital Pathology: PathLake:** Is one of five new centres of excellence in digital pathology and medical imaging developing and applying AI to advanced patient diagnosis and selection for personalised medicine. A consortium approach offers opportunity for industry engagement in exemplar projects.
- **West Midlands Diagnostics Innovation Community (DIAGCOMM)** will provide coordinated and focused support to emerging diagnostics companies in the West Midlands to accelerate product development, navigate complex regulatory and procurement regimes and bring innovative products to market.
- **Coventry University, Disease Prevention, Therapeutics and Diagnostics** Develop, test and implement clinical diagnostic, therapeutic and complex behaviour change interventions to improve health and healthcare in the community and NHS settings.

Digital Health

Digital health broadly covers areas such as mobile health, information technology as well as telehealth. The region offers a connected infrastructure for digital innovations in the real world.

- **The Regional Image Sharing Platform (RISP)** allows clinicians to instantly access and retrieve patient images, histories and reports across the region.
- The Royal Wolverhampton NHS Trust and University Hospitals Birmingham have integrated **Babylon Health**, a digital app into their care provision service. This allows a population of 4.2 million in the region to have access to an AI symptom checker for use at home.
- **The Institute of Digital Health** at University of Warwick aims to improve people's health and wellbeing through the use of innovative digital technologies.
- Coventry University - **Clinical Simulation Centre**. A unique facility that supports the training of clinical staff in surgical skills, operating theatre, paediatric and midwifery and paramedical training on an ambulance.

The region is scaling its infrastructure to help accelerate the role out of digital health products.

- In particular the West Midlands has invested in a **5G mobile telecom test bed**. 5G technology will be key in providing the infrastructure required to deliver remote health services over the next decade. By design, 5G's ability to deliver real-time information (low latency), ultra-fast speeds (critical for high-definition images and video), increased capacity and heightened security are going to be fundamental in scaling the patient benefits of remote healthcare and keeping medical records secure and private. The West Midlands 5g testbed has already showcased examples of 5G technology in healthcare, such as the use of live video streaming to provide specialist advice to ambulance paramedics.

Digital Health

Companies in the sub-sector

Deloitte estimated that the global market for digital health was worth £43bn in 2018 and of that the UK market represented £2.9bn with the recent sharpest growth in the sector driven by mHealth apps. The UK market is sizeable and represents about 7% of global opportunities.

There has been an increased focus on digital health during the Covid-19 pandemic and, in common with other tech sectors, this has accelerated take-up beyond the predicted trajectory.

The West Midlands has a strong ecosystem of health businesses based on data analytics and also providing digital health solutions. These businesses include:

- **Dignio** - Dignio is a Norwegian diagnostic business producing measuring devices and a wider system of connected care. Dignio's platform integrates a set of devices for monitoring patients with such conditions as COPD, diabetes, cardiovascular diseases and cancer and the business has established its UK HQ in Birmingham.
- **Evolyst** - Evolyst is a Birmingham based business and is a leader in delivering data led products that make a difference to the wellbeing of people and provides an occupational healthcare data platform.
- The Serendip® Digital Health quarter in Birmingham is home to a number of start-ups including :
 - **Kaido** – Team well-being app developer
 - **MedStars** – App to access trusted private medical practitioners
 - **Aptvision** – Enterprise software that provides end to end patient management workflow for healthcare providers
 - **Give Vision** - wearable vision aid for people with severe sight impairments

- **Amaven** – sport and training app for schoolchildren
- **Altruist Enterprises** - provider of resilience, stress management and mental health at work training, delivered both face to face and online
- **Inside Outcomes** - Inside Outcomes CIC supports businesses working in the public health, social care and third sectors and specialises in helping commissioners and providers of services to demonstrate their impact through evidence-based outcomes

Medical Devices

Manufacturing excellence in the rapidly growing medical devices and aging population sector. The strength of the region has developed from its manufacturing base and its very large healthcare sector.

The Association of British Healthcare Industries (ABHI) estimates that 50,000 people are employed in the medical devices sector in the UK and Standard & Poor (S&P) estimate that the sector will continue to grow at 4-5% per annum with the UK market estimated at £7.5bn making it the 6th largest market in the world.

The West Midlands is a leading UK location for medical device investment – with both Coventry & Warwickshire and Greater Birmingham & Solihull LEP areas employing a higher proportion of people in medical device manufacturing than the average across England.

The West Midlands has particular strengths in assisted living technologies, and this is highly relevant to the growing Age Tech market as well as ophthalmic products and clinical disposables amongst others.

The sector is typified by smaller specialist companies many of which are based in the West Midlands.

Assisted living technologies

This is an area of strength and businesses include:

Mobility

- **Handicare** – a leading Swedish manufacturer of stairlifts and technology for people with limited mobility established their UK base in the Black Country
- **Sunrise Medical** – the US wheelchair and mobility product business selected Brierly Hill in the Black Country for its UK base.
- **Evac & Chair** – An international leading business headquartered in Birmingham manufacturing evacuation products for those with limited mobility.
- **Gainsborough Specialist Bathing** – a UK business headquartered in Redditch providing specialist bathroom equipment and wet rooms for people with limited mobility.

Prosthetics

- **Ottobock** – leading German prosthetic supplier operates an orthotics & prosthetics service centre in Sutton Coldfield
- **Adapttech** – an innovative Birmingham based business that specialises in 3D scanning techniques for better prosthetic fitting.

Medical Devices

Joint replacement

- **Smith & Nephew** – the leading UK manufacturer has a joint replacement manufacturing and testing facility in Leamington Spa
- **Arthrex** – The German joint replacement business has recently established a major new HQ in Solihull.

Hearing Technology

- **Amplivox** – a leading UK manufacturer of audiological equipment based in Birmingham and creating products for hearing tests.

Other

- **Salts** – one of the UK's oldest companies based in Birmingham and manufacturing various stoma care products
- **Abena** – a Danish business focused on incontinence products with a UK HQ in Coventry.

Ophthalmic and imaging businesses

The West Midlands has a number of ophthalmic businesses focused on both eye care and ophthalmic medical equipment. These include:

- **Carl Zeiss Vision** – the German business has its UK headquarters and manufacturing site in Birmingham and is involved in lens production for eyewear and ophthalmic equipment.
- **Alliance Medical** – A large UK business based in Warwick providing a range of imaging services for the healthcare sector

- **Eyoto** – a tele-optometry business working on the provision of remote eye-testing.
- **BVI** – A large US healthcare group with a manufacturing site in Warwickshire and specialising in invasive ophthalmic devices for examination and surgical procedures

Clinical Disposables / Consumables

The manufacturing expertise of the West Midlands has also encouraged the development of a number of other miscellaneous important medical device / medical product manufacturers and these include:

- **Sterimedix** – Single use surgical item manufacturer based in Redditch
- **MDTI** – a US owned single use medical device business with a base in Wolverhampton
- **Kimal** – with its main base on the edge of the West Midlands in Bromsgrove, the business manufactures specialist surgical packs for use in hospitals
- **Speciality Fibres and materials** – A Coventry based manufacturer of specialist wound care dressings.

Other

The breadth of medical devices makes some businesses less easy to classify but they remain an important part of the West Midlands medical device community. These include:

- **Xstrahl** – a UK radiation equipment specialist with a facility in Walsall
- **Breas Medical** – the Swedish respiratory equipment manufacturer has located its UK HQ in Warwickshire

Medical Devices

The West Midlands has a diverse and growing Medtech sector backed up by world-leading research institutions, and large teaching hospitals. It is home to a mixture of established businesses, start-ups and scale ups and a world class university ecosystem to support companies in the region. For companies developing new devices and technology, the region has significant strength in clinical trials both in terms of infrastructure and expertise.

Medtech Region

- The region can provide an established collaborative hubs bringing together hospitals, universities and industry expertise to support device development in several centres of excellence.
- Expert help to accelerate the translation of novel medical innovations from bench through clinic to regulation, manufacture and commercialisation.
- West Midlands is home to the UK's only NHS academic centre for Regulatory science and innovation providing expertise to guide regulatory approach.
- Access to a range of the country's leading Health Tech incubators, accelerators and catalysts offering lab and office space and all aspects of scientific, clinical and business support.
- Home to UK's leading 5G test base with potential to test and enable a new generation of medical health-technologies.

Centres of excellence for device development and manufacturing

- **Healthcare Technologies Institute University of Birmingham.** Brings multidisciplinary experts together to advance new technologies and treatments to support the development of existing markets and stimulate new ones for small and medium sized Life Sciences businesses, enabling them to bring products to market quickly, at less cost with reduced risk.
- **Medical Devices Testing and Evaluation Centre (MD-TEC) and Data- Enabled Medical Technologies and Device Hub (DEMAND).** These are both accelerator initiatives designed to help SMEs get their technology to the right market at pace and with reduced cost and risk. They offer everything from clinical trial support to business and regulatory guidance.
- **The Centre for Custom Medical Devices (CMD).** Brings together multidisciplinary expertise to explore the full potential of additive manufacturing in the medical devices sector – creating a new generation of innovations that will enhance patients' quality of life.
- **NIHR Trauma management Med-Tech Cooperative.** Catalyst for the development of new medical devices, healthcare technologies and technology-dependent interventions in the NHS.
- **Manufacturing Technology Centre.** Provides integrated manufacturing system solutions for customers large and small, across a range of sectors.
- **Institute of Translational Medicine** Acting as a central hub for clinical trials acceleration and stratification, and clinical informatics, the ITM brings experts together to rapidly turn medical science into innovative patient and healthcare system applications. It does this by providing a platform for interaction between basic scientists, academic clinicians, clinical informatics, biostatisticians, trial design experts in biomarker development and validation to accelerate the development of drugs and devices.

Data: Underpins all opportunities

Patient Data:

- Access to large integrated and curated clinical and genomic patient data sets from a large, stable and diverse patient population of over 5.5 million with a high prevalence of cancer and rare diseases generating novel data types to deliver clinical gains.
- Genomics Networked Information Exchange (GeNIE) integrates genomic data across 17 trusts.
- University Hospitals Birmingham global digital exemplar is one of the most advanced electronic patient record systems in the world.
- Home to two of the countries Health Data Research Centres providing unique health data platforms – Pioneer & Insight.
- The region home to one of the country's first 5G test bed and has already run successful trials of remote and mobile imaging technologies running in real time.
- **Pioneer: The Health Data Research Hub for Acute Care**
Led by the University of Birmingham and University Hospitals Birmingham NHS Foundation Trust, in partnership with West Midlands Ambulance Service, the University of Warwick, and Insignia Medical Systems. Acute care is the provision of unplanned medical care; from out of hours primary care, ambulance assessment, emergency medicine, surgery and intensive care. There are opportunities for health researchers and innovators from within the NHS, academia, SMEs and industry partners to use these data and services to understand acute care processes and then model and test new approaches that could significantly improve the health care of the nation and help deliver a sustainable NHS.
- **Insight: The Health Data Research Hub for Eye Health**
INSIGHT is focused on eye health and wider health issues connected to the eye, including diabetes and dementia. We will make anonymised, large-scale data, initially from Moorfields Eye Hospital and University Hospitals Birmingham, available for patient-focused research. The data includes various types of eye imaging and associated patient health records. Using advanced analytics, such as artificial intelligence (AI), INSIGHT will allow researchers to develop new insights in disease detection, diagnosis, treatments and personalised healthcare.
- **5PRING : Acceleration and pre-acceleration 5G Testbed services**
Support to companies looking to trial out their 5G solutions or understand how their services would benefit from 5G usage utilising a private 5G network and testbed.. The programme also offers co-working space, 5G connectivity services, mentoring, access to the 5PRING partners networks and knowhow, training in entrepreneurship and business skills.

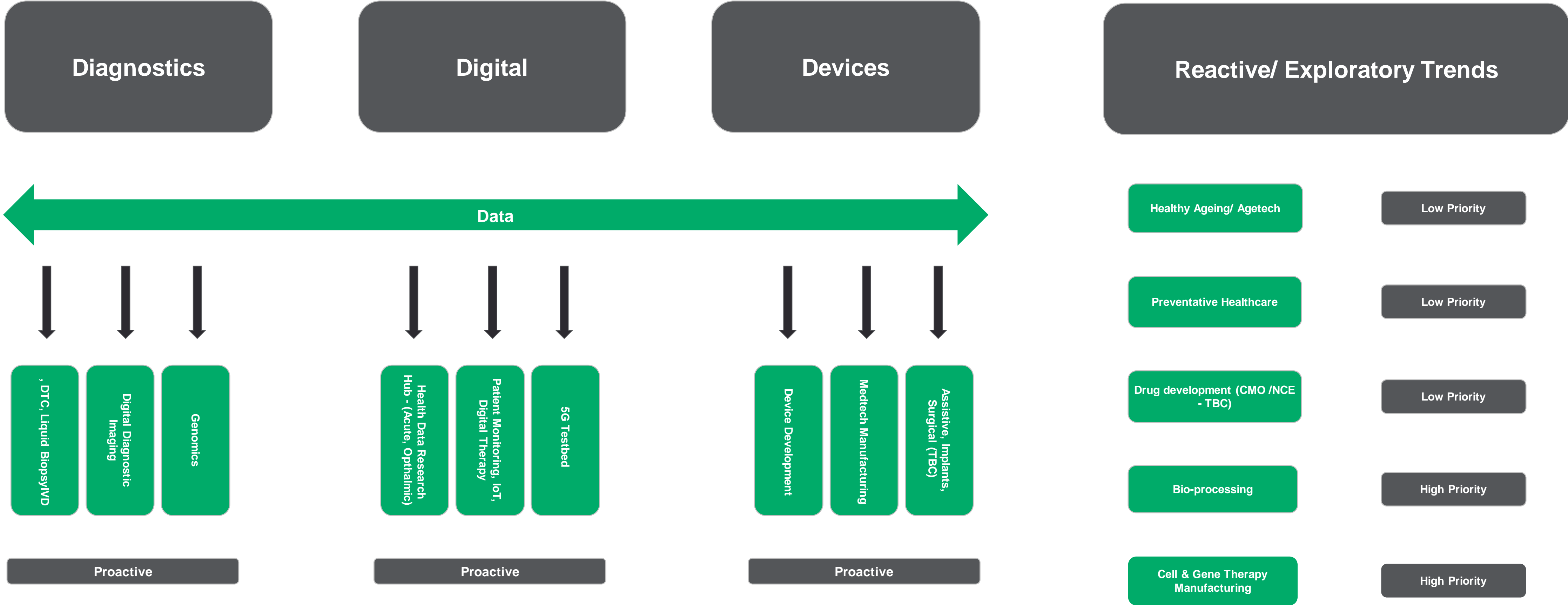
Wider Ecosystem

As might be expected within a region with such a large life sciences and healthcare sector, there is a wider range of businesses which have either invested in the region because of the strength of its market, geographic position and other healthcare assets or have grown organically as a business having being initiated from expertise likely to have been gained at one of the health and life science institutions in the region

Some of the health and life science businesses not involved in diagnostics, digital health or medical devices include:

- **Manx Healthcare** – and over the counter pharmaceuticals and preparations manufacturer based in Warwick
- **Fontus Health** – a pharmaceutical business formed in 2014 and based in Walsall with several products in its development pipeline and already established as a strategic supplier to the NHS.
- **Synergy Biologics** – A nutraceutical manufacturer focused on vitamin D based products and based in Walsall
- **Wave Live Sciences** – A US precision medicine business with a base in Birmingham, the company has the capability to design and manufacture stereopure oligonucleotides.
- **Haemonetics** – A US company involved in blood and plasma collection and product manufacture with a base in Coventry
- **Nanosyrinx** - A discovery stage biotechnology company based at the University of Warwick's Medical School developing synthetic biology approaches for a completely novel method for targeted drug delivery of therapeutic proteins and peptides, to the interiors of cells
- **Synexus** – this large UK clinical trial business has a large centre in Birmingham to undertake and manage clinical trials
- **Clinigen** – Headquartered in Burton-upon-Trent, Clinigen is a global, specialist pharmaceutical services and products provider partnering with pharmaceutical companies to manage data, trials and product distribution
- **Sterling Pharmaceuticals** – Sterling is a UK owned pharmaceutical manufacturing company with its HQ, R&D and manufacturing sites in Birmingham
- **Biotest** – a German company with a base in Birmingham focused on hematology and plasma-based therapies
- **Gifford Bioscience** – Based at the Birmingham BioHub, Gifford is a preclinical contract CRO specialising in receptor pharmacology
- **Advanced Dental Laboratories** – a dental crown manufacturer taking remote measurements and manufacturing personalised crowns which also reduces the supply time.

Campaign Themes: Propositions

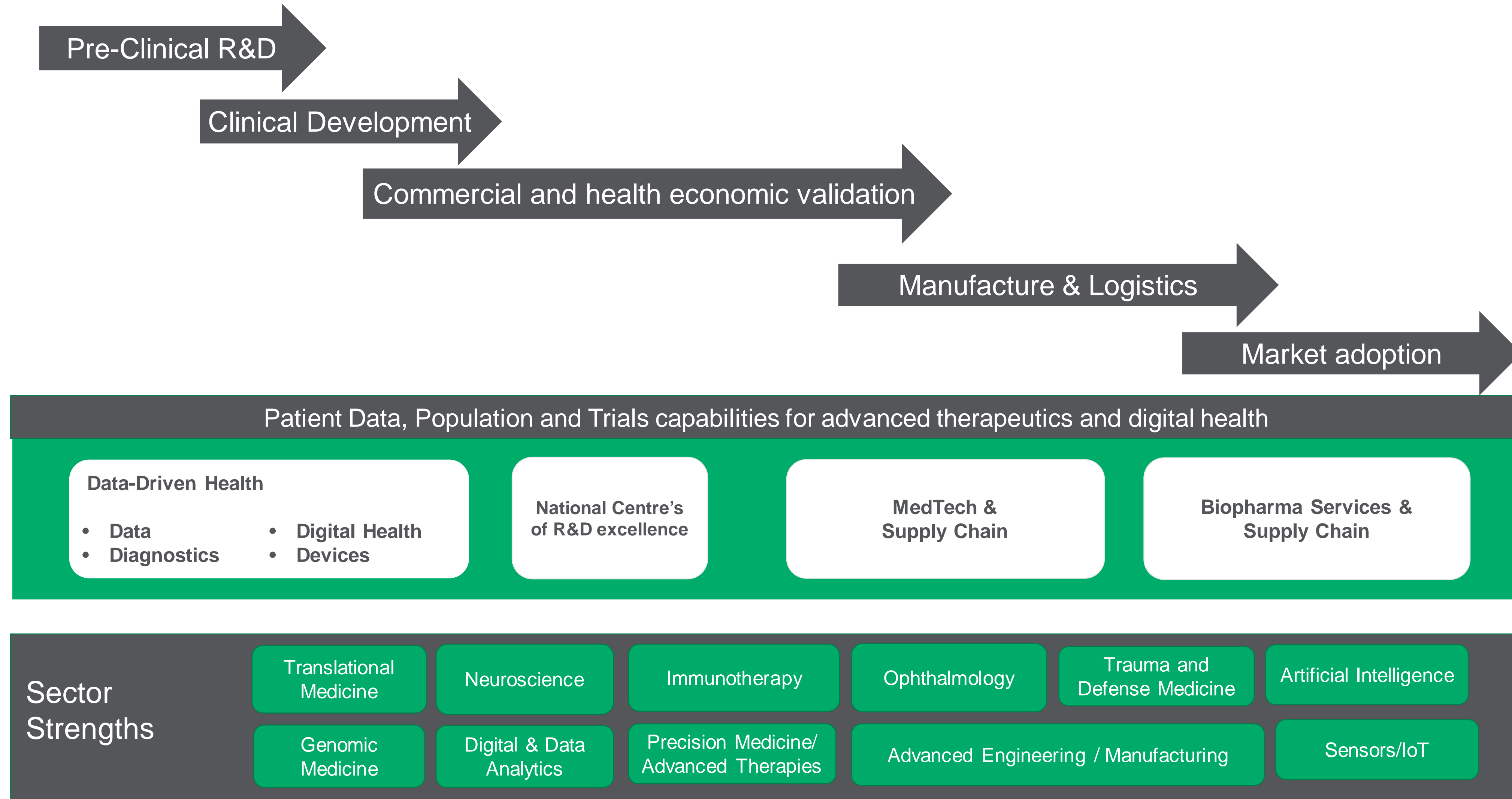




Sector Ecosystem



The Complete Innovation Journey: Concept to Market



Emerging Tech: Health Technologies

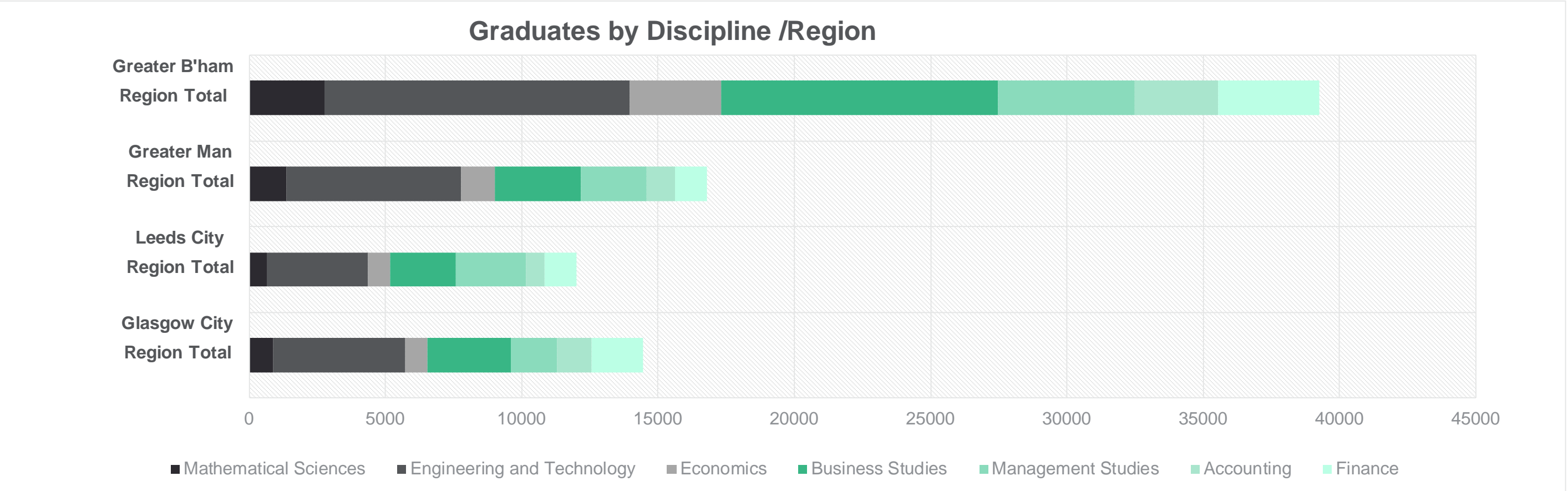
The future of life sciences will be driven by biological advances such as cell and gene therapy, engineering advances in sensors and material design and data analysis based on AI with access to genomic and clinical data.

Access to skilled highly qualified professions is critical for the development of the sector and the West Midlands is supported by 5 universities that produces over 11,000 graduates in the medical sciences and 6000 graduates in the engineering and computing fields.

Access to high quality resilient infrastructure such as 5G will support scientists and engineers as well as patients in accessing a range of services.

Access to physical infrastructure such as start up incubators and high-quality lab space are coming on-line to support the entrepreneurs in the region.

GRADUATES 19/20	Greater Birmingham Region Total	Leeds City Region Total	Greater Manchester Region Total	Glasgow City Region Total
Medicine & dentistry	1,105	750	850	760
Subjects allied to medicine	6,220	4,000	4,354	3,685
Biological & sports sciences	1,850	1,915	1,350	1,180
Psychology	1,940	1,485	1,295	795
ALL Medical & Biological	11,115	8,150	7,860	6,420
Mathematical Sciences	1030	265	700	365
Engineering & Technology	5130	2210	3610	2540



Source: HESA 2017/18 & HESA 2019/20

Ecosystem overview

The West Midlands provides an excellent environment for Investment:

A market and clinical trials test bed

With a stable and diverse population of over 6 million people with high unmet medical need providing an opportunity for high quality clinical research. The region is host to the UK's first multi-city 5G test bed providing unique opportunities to test innovative health technologies.

Collaborative ecosystem

Bringing together unrivalled multi-disciplinary expertise and leading centres of excellence to accelerate new technologies to market rapidly and additionally, provide unrivalled access to supply chain, prototyping and manufacturing support

Connected infrastructure

State of the art facilities incubators and accelerators connected into clinical academic and industry ecosystem that can accelerate and de-risk innovation

Access to talent

With five universities, nationally and internationally renowned hospitals and a strong & innovative cluster of companies, the region provides access to talent with all the diverse and specialist skills required in the sector.

A strong industry cluster

The West Midlands is home to the 4th largest cluster of medical technology, service and supply companies in the UK presenting an opportunity to grow in this industrial sector. (OLS Dataset).

Reduce costs, reduce risk

Salary and operating costs lower than key European clusters such as Germany, France and Belgium combined with a collaborative ecosystem that reduces risk (Source: fDi Benchmark from the Financial Times Ltd 2020).

Access to funding

The UK funding programmes are flexible, available and targeted. The region's cluster and academic institutions are open to work collaboratively to boost chances to access national funding opportunities from Innovate UK and SBRI. Regional funding such as Midlands Engine Investment Fund and Business Growth Programme 2 enable SMEs to grow their business and invest in skills development.

Logistics

Well served with road, rail and air links (passenger and cargo) the region provides an ideal central location from which to service and supply customers in all parts of the UK and internationally and is home to some major corporates.

Industry Partners

The West Midlands is a region determined to ensure that businesses find the right clinical, academic and business support that they need to develop, test and launch innovative products and services. Wherever you touch this collaborative ecosystem there will be someone to help you find what you need.

West Midlands Growth Company

Collaborating with local partners, the WMGC aims to secure new capital investment into the region's infrastructure, business and institutions. We will secure business relocation into the region and investment to key sites and projects to unlock potential for the West Midlands.

West Midlands Health Technologies Cluster Organisation

Aim to support health technologies businesses with innovative health technologies products or services in the West Midlands. WMHTC can support businesses hoping to set up in the West Midlands and enhance existing businesses. WMHTC can provide advice, supplies or investment.

Medilink Midlands

Medilink Midlands is the Midlands Life Sciences industry association whose aim is to help companies establish, develop and grow. Its network of more than 5,700 contacts in over 2,300 organisations represents all aspects of the sector; from multi-nationals to high potential start-up companies, as well as the NHS and Universities. Working alongside the Midlands Engine and other strategic alliances, Medilink Midlands' helps stimulate additional and value-added growth of the Midlands' prosperous community for Life Sciences.

Birmingham Health Partners

Birmingham Health Partners is a strategic alliance between **University Hospitals Birmingham NHS Foundation Trust, University of Birmingham and Birmingham Children's Hospital NHS Foundation Trust** bringing together clinical, scientific and academic excellence across an integrated medical and life sciences campus. Its short-term strategic objectives focus on the identification, adoption and spread of innovation and best practice, through the alignment of healthcare delivery, research and training.

West Midlands Academic Health Science Network

WMAHSN supports members in the West Midlands to overcome historic barriers to adopting innovation by forming closer links between the NHS, industry and academia, investing in trials and promotion. Our **Meridian health** innovation exchange is a pioneering interactive online exchange for anyone to share their innovations and ideas, build groups and networks and make contact with people whose innovations could change healthcare in the West Midlands.

Innovation Alliance for the West Midlands

The Innovation Alliance for the West Midlands is an alliance of organisations active or interested in science and technology-based innovation across the West Midlands. We have two principal objectives: Build and maintain a thriving innovation ecosystem Stimulate and catalyse a pipeline of innovation activity.

Incubators, Accelerators & Catalysts

The West Midlands can provide all the support needed to support innovation and grow businesses surrounded by a network of expertise.

Serendip WMAHSN Digital Health Incubator

The West Midlands Academic Health Science Network (WMAHSN) strives to make the West Midlands a healthier and more productive place, using technology to create economic growth and stimulate innovative ideas. Based at Bruntwood Sci-Tech's Innovation Birmingham, the region's digital tech campus. The programme provides 24 months of tailored business support to digital health companies an immersive, tech focused environment to accelerate business growth, a network of business mentors, and access to smart investment opportunities.

BioHub Birmingham

BioHub Birmingham is a full serviced biomedical incubator and accelerator designed to house life science companies from proof of concept through to expansion. The BioHub provides both shared laboratory and single-occupancy mixed office/ laboratory suites. Shared laboratory space tenants join a vibrant community of early-stage biomedical companies, on bespoke, flexible terms with flat monthly.

Precision Health Technologies Accelerator (PHTA)

The PHTA will be the University of Birmingham's signature innovation and incubation facility dedicated to the rapid development and translation of innovative therapies and technologies from idea to clinical evaluation. The facility will create new opportunities for businesses and entrepreneurs to innovate and grow their businesses and for academic and clinical leaders in the region to commercialise their ideas.

Health Tech Catalyst

Launched in Birmingham by Deloitte, the Health Tech Catalyst aims to accelerate health tech innovation in the Midlands and beyond, to help improve people's health and wellbeing. The Catalyst will engage with local, national and international partners to bring together researchers, industry and the NHS to create more commercial opportunities for innovators.

West Midlands 5G Accelerator – 5PRING

5PRING is the UK's first 5G commercial innovation centre and aim is to help organisations of all sizes harness the power of 5G to deliver growth and innovation throughout the West Midlands and beyond. Whether you are from the private or public sector, our cutting-edge facilities and expertise can help you understand 5G, its applications and how you can unlock its potential.

Spark: Business Incubation Centre

Based at the University of Wolverhampton Science Park, SPARK helps entrepreneurs that are creative or use technology in innovative ways to launch, develop and grow their businesses. This supportive eco-system is why incubated companies are far more likely to survive than those that go it alone.

STEAMHouse

STEAMhouse is a centre for innovation, creative thinking, prototyping and business development. Based in the heart of Digbeth, STEAMhouse supports entrepreneurs, sole traders, companies and citizens to build their businesses, develop products and services and bring amazing new ideas to life.

Deep Tech Incubator

The Deep Tech Innovation Centre supports students, researchers, alumni & local start-up companies to explore the commercial potential of their innovations in areas ranging from Advanced Materials and Biotechnology to Blockchain, Quantum Computing and Robotics. The Deep Tech Incubator is designed to train students, researchers, staff, alumni, local businesses and other Warwick pioneers in technology entrepreneurship. The programme provide the space and opportunity to empower pioneers to explore entrepreneurship as a viable and exciting career choice, helping to accelerate growth of their start-ups.

Centres of collaboration and innovation.

The West Midlands is home to some of the country's leading universities, and research translation centres open for collaboration with industry with many offering opportunities for co-located and well-connected workspace directly supporting opportunities for innovation in **Data, diagnostics, devices and digital health**.

Institute of Translational Medicine

The Institute of Translation Medicine, supports the development from bench to bed solutions in drug development, diagnostics and medical devices. **Find out more [here](#).**

Health Data Research Hub (HDR) - PIONEER & INSIGHT

PIONEER is focused Acute Care providing accurate and real time data for capacity planning and service provision. INSIGHT is focused on eye health data including diabetes and dementia. Both HDR's open to working with academic partners, public and commercial organisations. **Find out more [here](#).**

West Midlands NHS Genomic Medicine Centre

Originally part of the 100,000 genomes project and now responsible for paving the way for personalised medicine. **Find out more [here](#)**

Birmingham Precision Medicine Centre

Part of Birmingham Health Partners (BHP), to support industry's need in translational medicine from co-designing trials, performing complex 'omics' analysis to developing companion diagnostic tools. **Find out more [here](#).**

Birmingham Healthcare Technologies Institute

Institute supporting bringing in new medical technologies to market focusing on early detection of a range of diseases, repair and tissue regeneration in areas including detection of brain injuries, cancers, scar reduction and bespoke prosthetic devices. **Find out more [here](#).**

Medical Devices Testing and Evaluation Centre (MD-TEC)

Supports medtech and life sciences businesses access to state-of-the art simulation and usability facilities alongside dedicated medical device expertise from the academic and clinical environment. Services provided include; intellectual property, concept development, design of experiments, usability (user) studies and human factors engineering, clinical trials, funding opportunities, certification (CE mark) and quality implementation. **Find out more [here](#).**

Centre for Custom Medical Devices (CMD)

Metal additive manufacturing equipment and expertise to support the design, manufacture and evaluation of 3D printed metal implantable medical devices. **Find out more [here](#).**

Manufacturing Technology Centre

Part of the UK's High Value Manufacturing Catapult - The Manufacturing Technology Centre (MTC) based in Coventry develops and proves innovative manufacturing processes and technologies in an agile, low risk environment, in partnership with industry, academia and other institutions. They focus on delivering bespoke manufacturing system solutions for our customers. **Find out more [here](#).**

PathLAKE

Led by University Hospitals Coventry and Warwickshire NHS Trust The Consortium will bring together researchers from universities, several university hospital trusts and leading AI/software business developers in the field to create a national Centre of Excellence in AI in pathology, that will be linked to five digitised NHS pathology labs. **Find out more [here](#).**

Innovation Spaces linked to collaborative networks.

Birmingham Research Park

Birmingham Research Park provides secure, high quality office space, conference facilities and virtual tenancies, in a community of research-led companies. Tenants benefit from access to the world-class knowledge base and facilities provided by the University of Birmingham. Many have built successful businesses in sectors such as biotechnology, computer systems, medical diagnostics and scientific instruments. Birmingham Research Park is home to the BioHub Birmingham® which provides all-inclusive biomedical lab space for early-stage life science companies, who also receive business support through the BizzInn business incubator.

Birmingham Health Innovation Campus (BHIC)

One of seven of the UK's Life Science Opportunity Zones (LSOZ) offering a 4-hectare site adjacent to both the University campus and Medical School, and the Queen Elizabeth and Birmingham Women's hospitals. Focal point for new innovation and new investment in a growing health and life sciences cluster in the region. A collaboration between the University of Birmingham and Bruntwood SciTech, the new campus will transform health innovation for the region, delivering impact nationally and internationally.

Coventry Technology Park

Coventry University Technology Park encourages and supports the start up and development of innovation-led, high-growth, knowledge-based businesses. A 20-acre site comprising 14 unique dedicated business facilities, our city centre location puts our tenants in the heart of Coventry providing excellent access to the Midlands' major motorways and two international airports.

University of Warwick Science Park (UWSP)

UWSP provides an attractive, well-equipped environment for knowledge and technology-based businesses to grow. UWSP offers office space and workshop space across 4 sites in Coventry, Warwickshire and Solihull. Property includes a wide variety of unit sizes that are suitable for all stages of business.

University of Wolverhampton Science Park

University of Wolverhampton Science Park has become the home for around 100 businesses working in a broad range of technological and creative disciplines including software development, environmental management, engineering design and consultancy, photography and videography, graphics, website design, water technology, training and education, biocidal coatings, healthcare and business support service.

Edgbaston Medical Quarter

Home to the fastest growing regional cluster of healthcare and life sciences excellence with 36 centres of clinical and academic excellence, and 27 life sciences specialties, within the heart of the United Kingdom.

Birmingham Business Park

Set in 148 acres of mature parkland, Birmingham Business Park is the most established out of town business park in the Midlands. Home to over 150 companies boasting an impressive range of high-profile businesses including Computacentre, Fujitsu, IMI, Sulzer and Rolls Royce.

Longbridge Business Park

Situated south of Birmingham, the 45-acre employment led offers planning permission for a broad range of employment uses including office, technology, research and development, science and manufacturing. Only a short train ride away from Birmingham Health Innovation Campus and University of Birmingham, Longbridge can offer further opportunities for companies expansion and collaboration opportunities.

Wellesbourne Innovation Campus

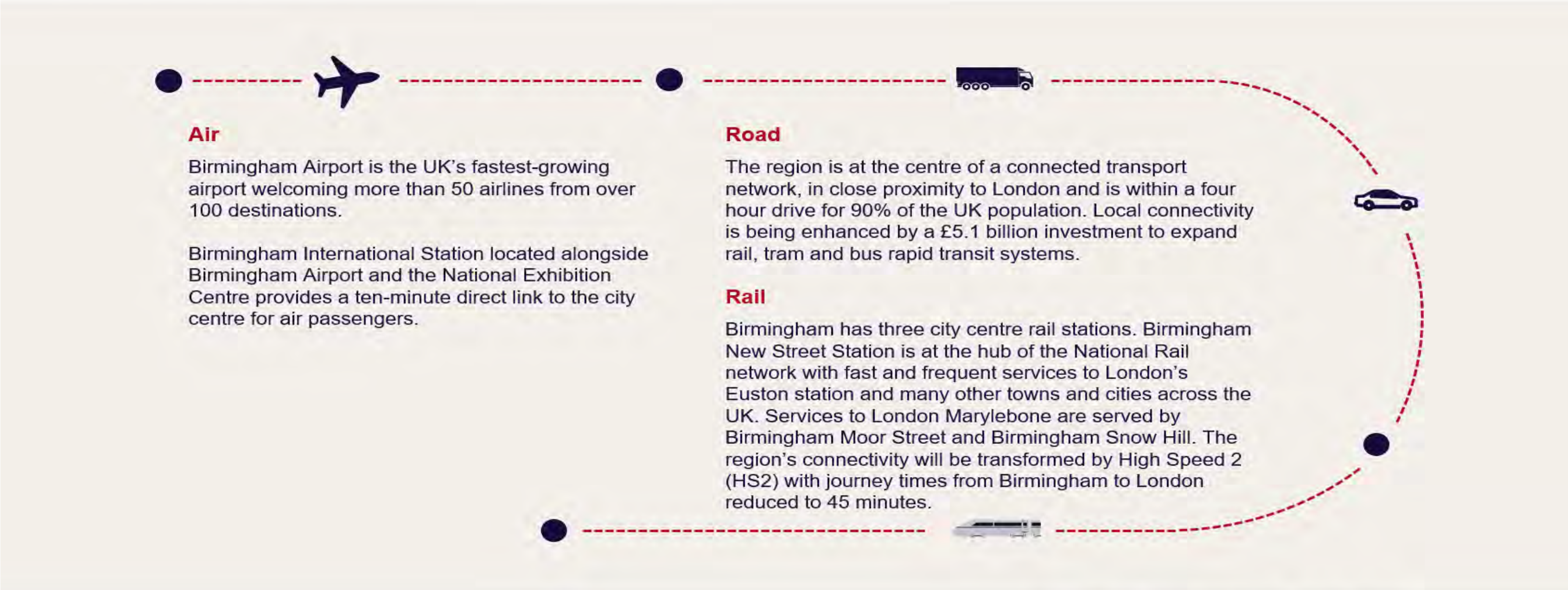
Set in 450 acres of land and 73,000sq ft in a range of offices and workspaces in Wellesbourne. The site offers an opportunity for businesses to locate themselves in a hub that encourages co-creation between academic and industry excellence, initially focusing on sectors aligned with the University's academic and commercial strengths and working closely with diverse regional partners and surrounding community.

Excellent connectivity: Access to customers & supply chains

Strong multi-modal transport connectivity across and into the region
Reinforced by strong access to East Midlands airport for freight

Get connected

A transport network providing excellent access to locations worldwide



Source: Invest West Midlands; HS2, 'Journey Planner'



West Midlands
Growth Company

Sector Overview & Strengths



Robot at: Node 104

Automated Imaging Disabled

Images		Estimated Imaging Dose (Gy)	
Acquired	1350	Expected	0.1958
Expected	1360	Expected	0.1973

Time (HH:MM:SS): 01 Oct 2019 12:04:46

Plan Name: zzPCKE2ESkullFixed
MU: 19128.09 / 893.47
Treatment Site:

Orientation: Head First Supine
Tracking Method: 6D Skull
Mode: Demonstration

Collimator Bypassed

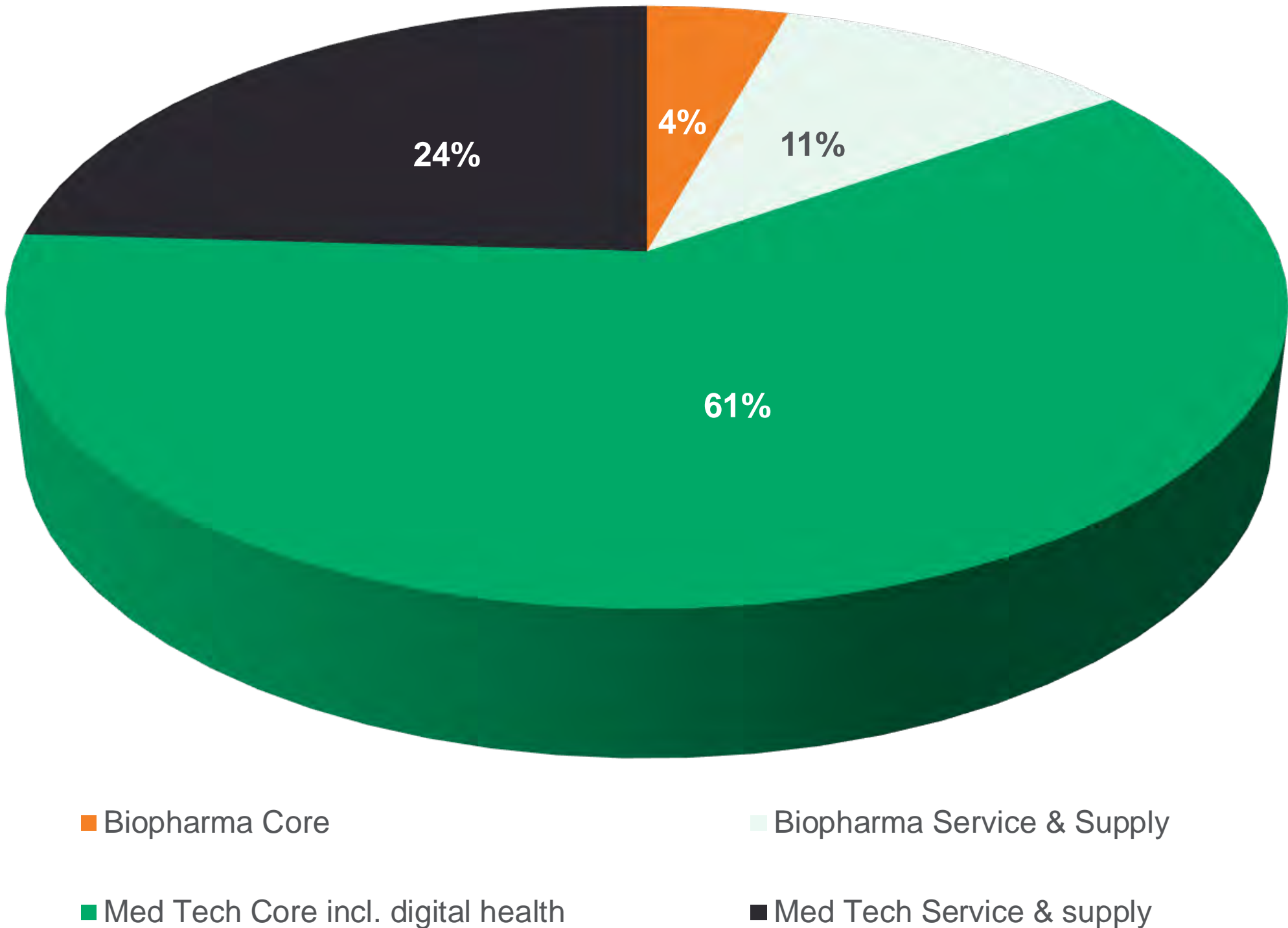
Beam's Eye View
Current Aperture Size: 35.0
Plan Aperture Size: 30.0

XRS A	XRS B
kV 124 mA 100 ms 80	kV 132 mA 100 ms 80

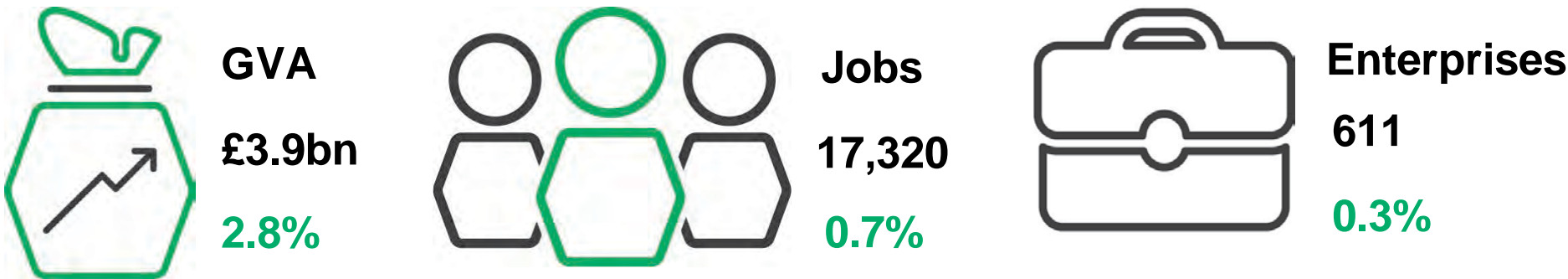
Life Science Sector Breakdown

- The West Midlands is home to a thriving life science sector over 600 companies supporting 17,320 jobs and a turnover of £6.5bn.
- A particular strength of the region is its thriving med-tech and sector, home to a diverse spread of start-ups, scale-ups and established businesses.
- 61% of the West Midlands life science cluster is Medtech focused including digital health employing over 9,600 people.
- The West Midlands also accounts for 8% of the UK turnover in the med-tech segment with a turnover of 1.7bn
- In terms of value it is the biopharmaceutical service and supply segment that ranks most highly in terms of turnover at £4bn includes major players such as McKesson/AAH and is the biggest sector turnover in the region making it the second highest turnover region in this segment after the South-East and employs 4,170 people.

West Midlands Life Science Businesses by Segment



Life Sciences (OLS)

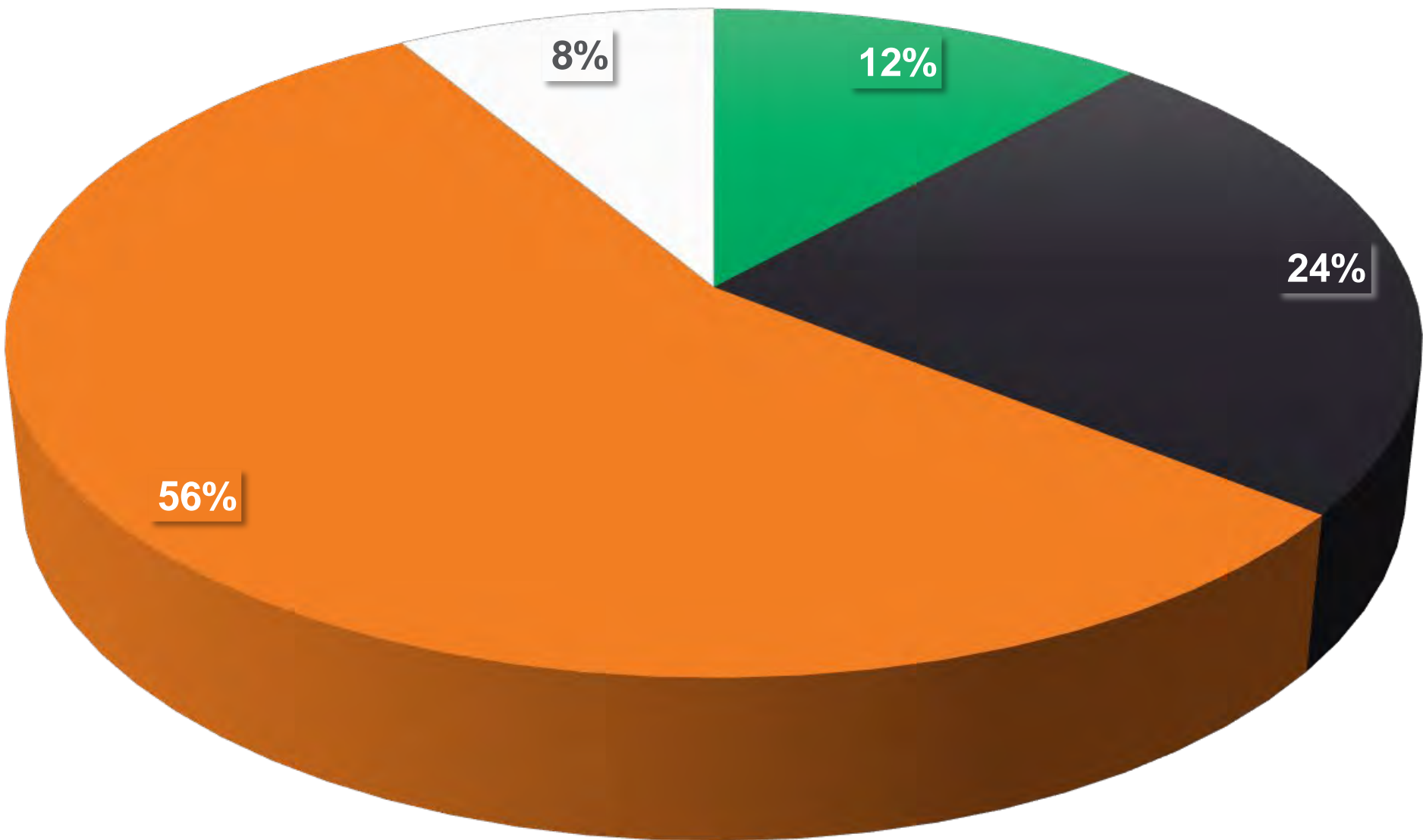


(Sources: OLS, 'UK Medical Technology Sector Statistics,' 2019; GlobalCityUK, 'Leading Global Competitors In Venture Capital & Private Equity,' accessed Jan 2021;). : BCEIU Analysis of ONS and Office for Life Sciences Data. West Midlands (NUTS1 Region Definition)

Sector employment in West Midlands compared to UK

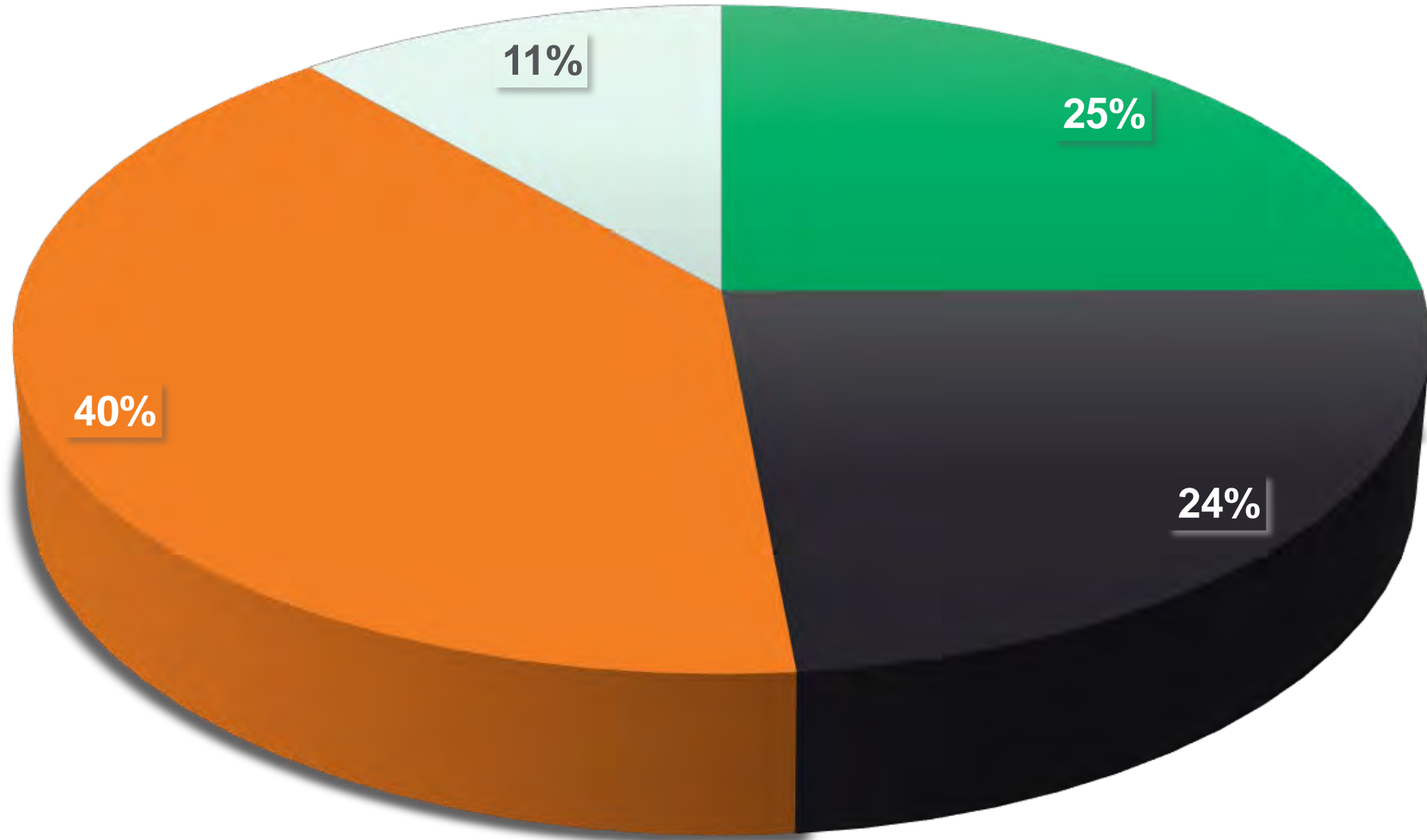
The West Midlands has a highly skilled workforce in medtech, digital health and biological sciences from chartered engineering experience to laboratory technicians

West Midlands Employment Segmentation



■ Biopharma Core
■ Biopharma Service & Supply
■ Med Tech Core incl. digital health
□ Med Tech Service & supply

UK Employment Segmentation

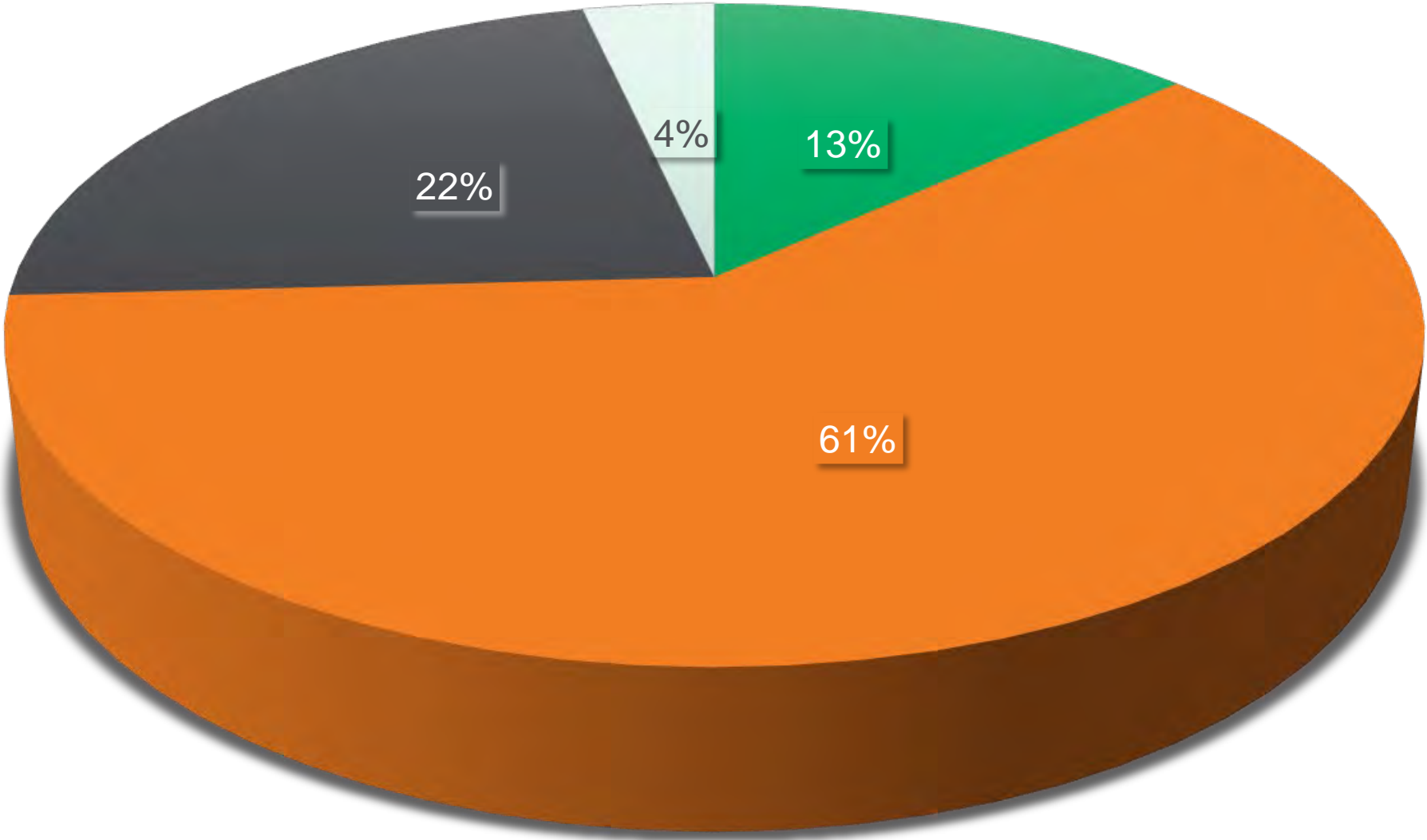


■ Biopharma Core
■ Biopharma Service & Supply
■ Med Tech Core incl. digital health
□ Med Tech Service & supply

Sector turnover in West Midlands compared to UK

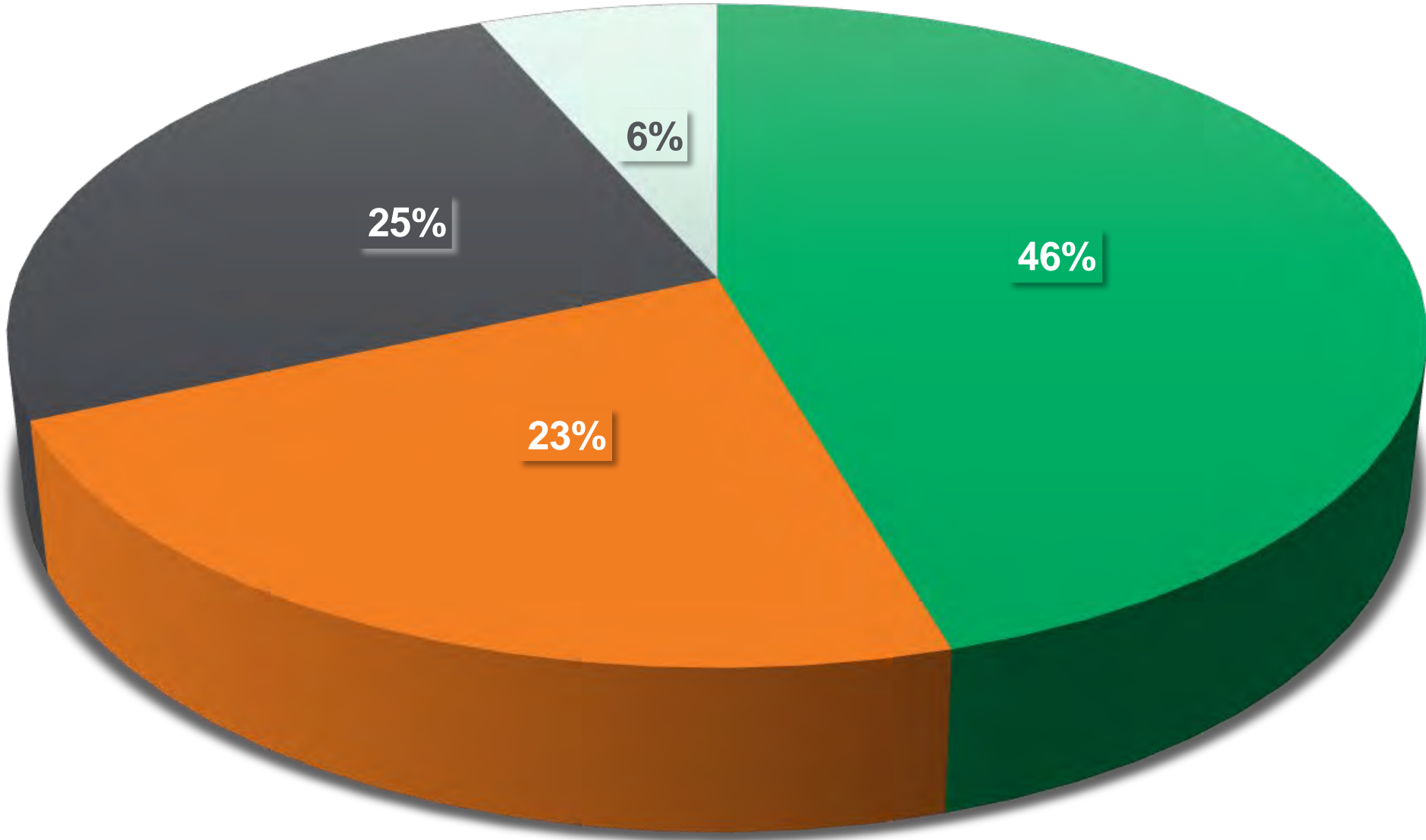
Biopharmaceuticals – Service & Supply accounts for 61% of turnover by sector. The highest proportion compared to the UK.

West Midlands Turnover Segmentation



■ Biopharmaceuticals - Core
■ Biopharmaceuticals - Service & Supply
■ Medical Technology - Core
■ Medical Technology - Service & Supply

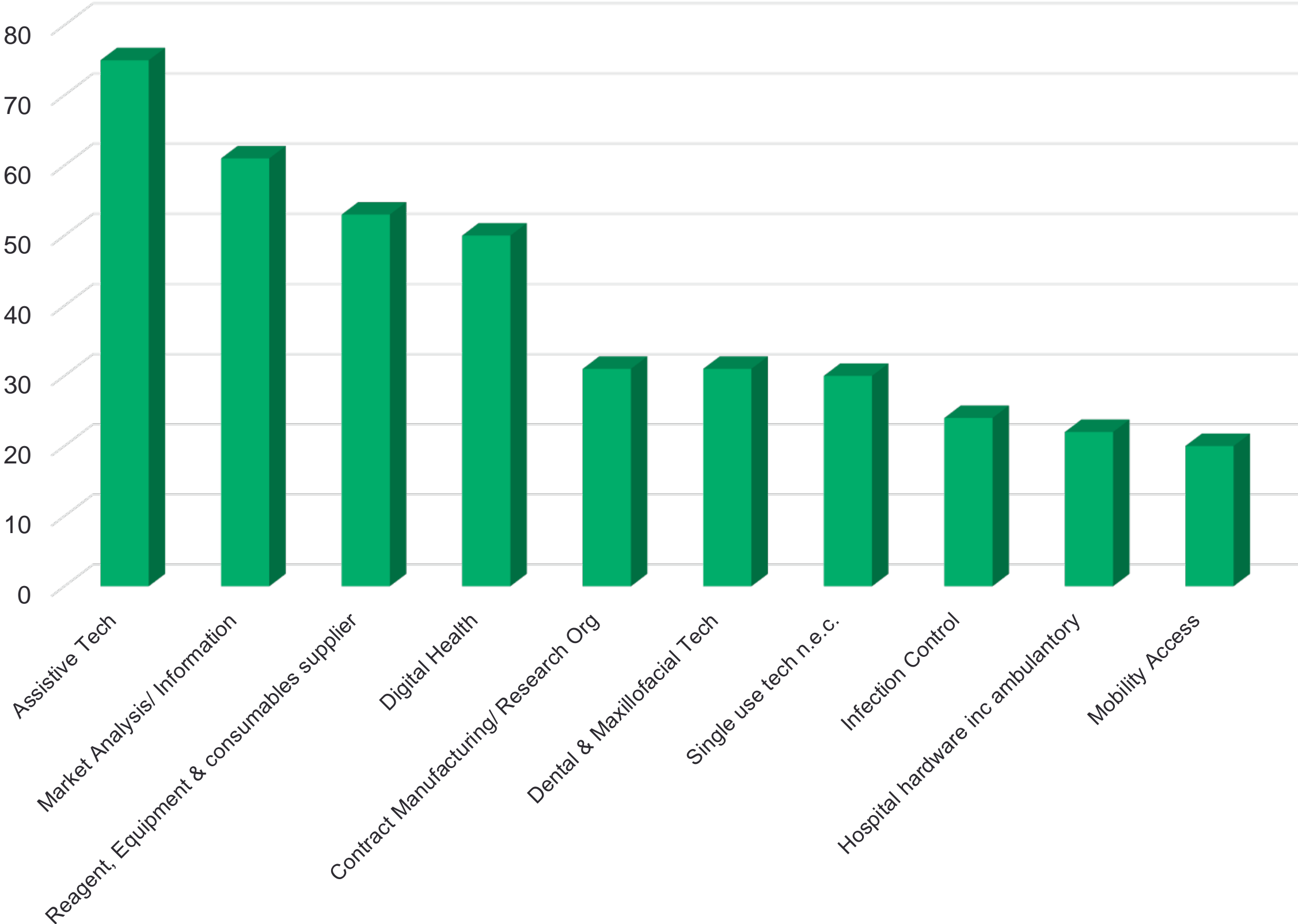
UK Turnover Segmentation



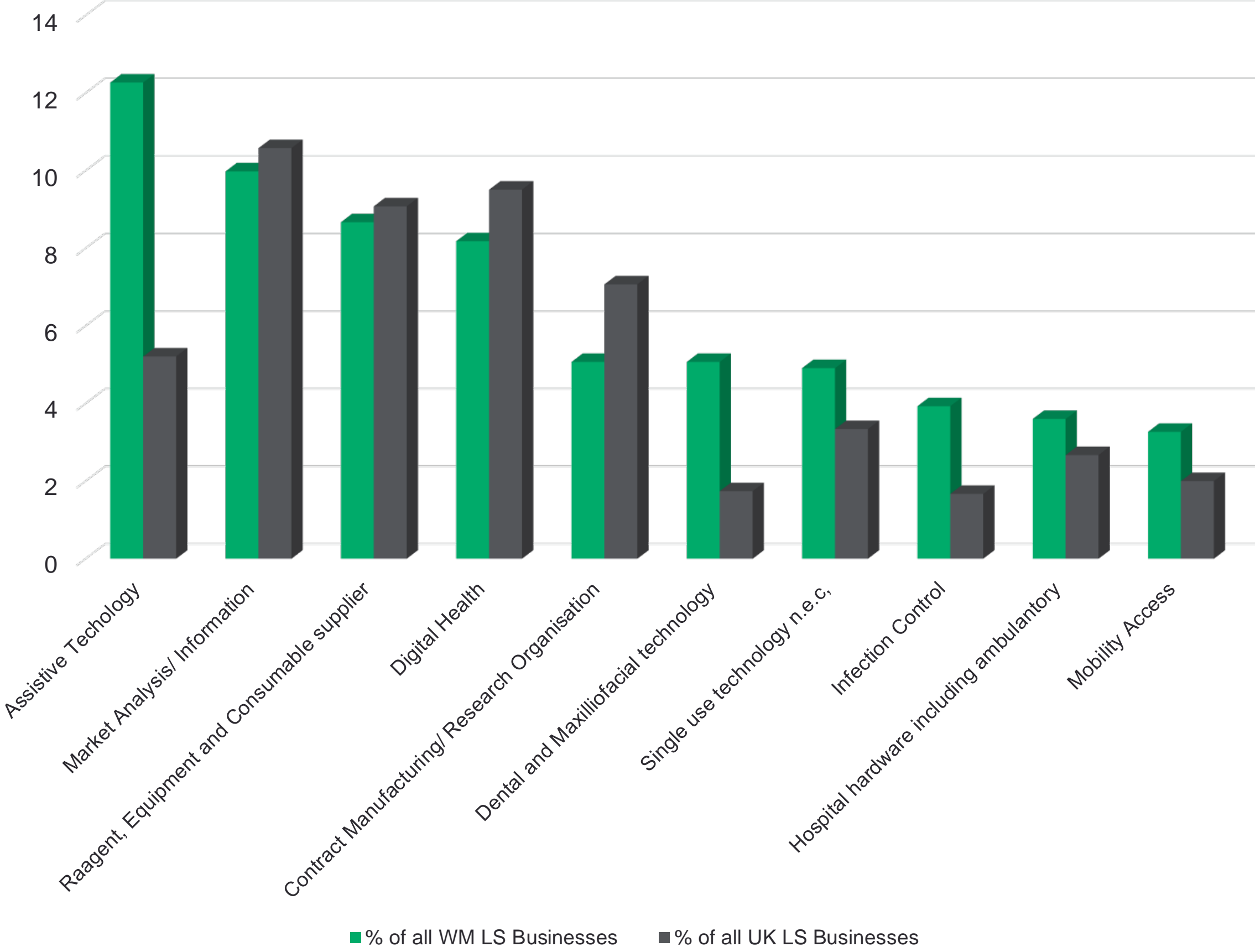
■ Biopharmaceuticals - Core
■ Biopharmaceuticals - Service & Supply
■ Medical Technology - Core
■ Medical Technology - Service & Supply

Segmentation of Life Science Companies

Life Science Segments with Most Businesses in the West Midlands



Top 10 WM Segments: % of all Life Science Businesses



(Sources: OLS, 'UK Medical Technology Sector Statistics,' 2019)



West Midlands
Growth Company

Sector Trends & Customer Needs



Global Life Science & Sector Trends

Artificial Intelligence (AI)

AI solutions apply to a wide variety of life sciences and healthcare areas ranging from image analysis to drug development.

Telehealth

Remote deliver of a range of clinical health services to patients ranging from GP type services to specialist medical support.

Medical Devices

Medical devices cover a broad range of applications. Trends in this area range from 3D printing to robotics for use in surgery and patient care.

Mental Health

The application of technology to problems supporting emotional, physiological and social well-being particularly through the use of digital technology.

Women's Health

Greater focus being given to women's health, with a range of different type of products and services ranging from fertility to menopause support.

Omics

A greater understanding of the various -omics data that is generated using sequencing techniques especially around the around of genomic, proteomic, metabolomic data

Cyber Security

As more healthcare solutions become digital, protecting healthcare providers from digital threats such as viruses, malware, phishing, cybersecurity will become a critical inclusion to digital health solutions.

Healthy Ageing

Companies providing solutions to manage common conditions as people age, assistive technologies to help improve a healthy lifestyle and overall wellbeing.

Diagnostics

Diagnostics is a diverse segment of the life sciences sector. A vast range of diagnostic technologies exists, where diagnosing a medical condition to monitoring a patient's condition will continue to see technological development.

Global Medtech Industry

Global Market Size and Growth

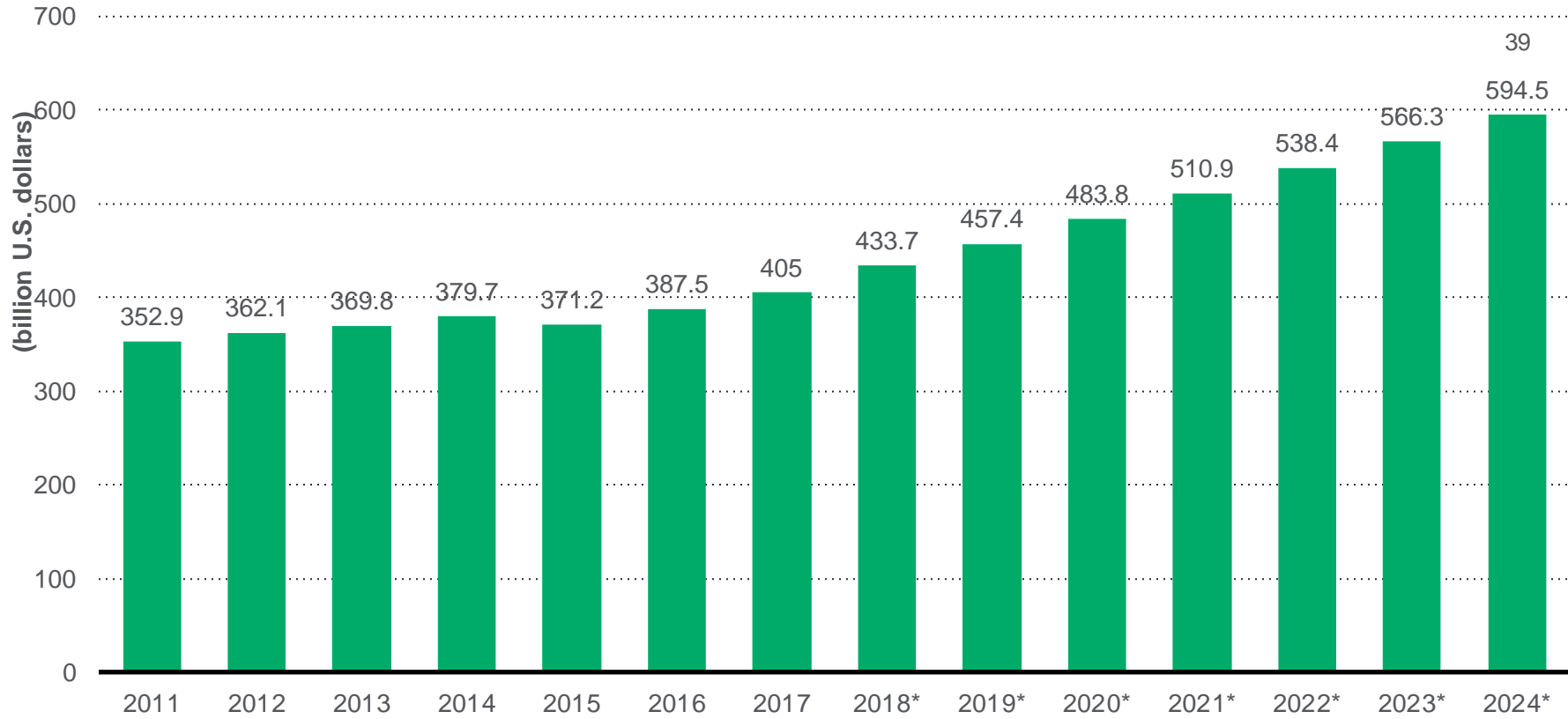


The value of the global Medical Technologies market is **estimated at US \$425.5bn in 2018** and is expected to reach **US \$612.7bn by 2025**.

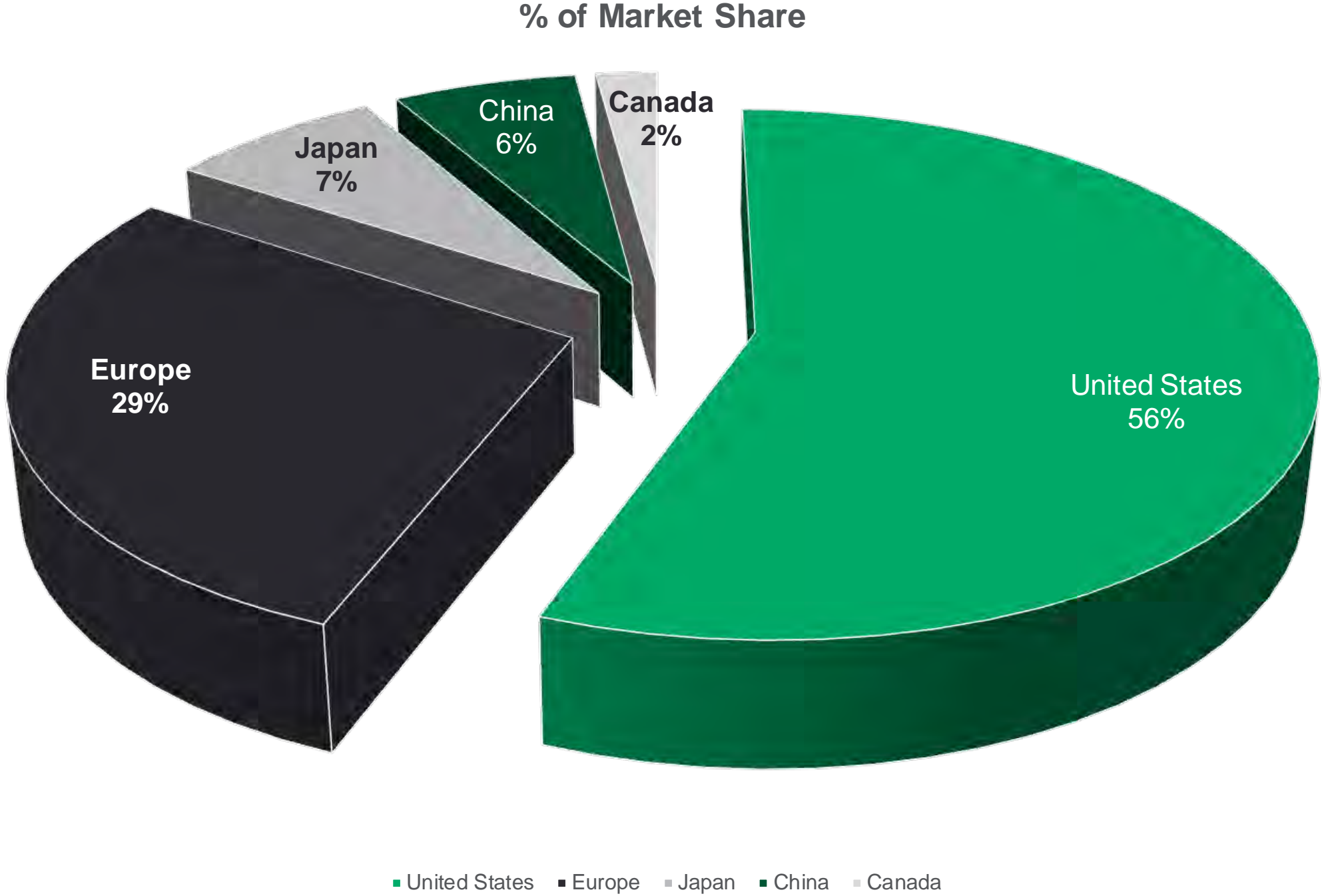


The market is expected to grow at a **CAGR of 5.4%** between 2018 and 2025.

Total global medical technology revenue, 2011-2024 (in billion U.S. dollars)



Global Medtech Markets



The above figures represent the World Medical Device Market Share based on manufacturer prices in 2017.

- As a region, the fastest growing market is Asia-Pacific.
- Other major market players: 13%

Source: Department for International Trade: Medical Technologies Proposition January 2021; Fortune Business Insights, 'Medical Devices Market', April 2019; EvaluateMedTech – World Preview 2018; Statista, 'Total global medical technology revenue from 2011 to 2024,' 2018; MedTech Europe, 'The European Medical Technology Industry in figures,' 2019.

European Medtech & IVD Market & Trends

European Market Facts & Figures



The European MedTech market was valued at **around €120bn** in 2018, making up an estimated 27% of the world market.



Europe had a **positive medical technology* trade balance of €11.7bn** in 2018. The biggest trade partners are the US, China, Japan and Mexico.



There are an estimated **32,000 MedTech companies** in Europe, 95% of which are SMEs.



In Vitro Diagnostics is both the largest and one of the fastest growing segments within MedTech. Cardiology is the second largest segment with diagnostic imaging coming in third.



Germany, France, the UK, Italy and Spain lead Europe's medical devices market. The same five countries lead the IVD market in Europe.

Major Trends Impacting the Global Industry

An Ageing Society

- By 2050, one in six people in the world will be over age 65 (16%), up from one in 11 in 2019 (9%), and the number of persons aged 80 years or over is projected to triple, from 143m in 2019 to 426m.

Rise in Multiple Chronic Conditions

- The World Health Organisation has warned against the rise in chronic conditions and those living with multiple conditions as sedentary lifestyles spread from the developed world to emerging economies. It expects that they will be 57% of the global burden of disease in 2020, compared to 46% in 2001.

Growing Concern over Future Epidemics

- Rising health concerns over recent pandemics, such as Ebola, H1N1 and particularly COVID-19, is driving greater demand for health services across the globe.

Technological Advancements

- Advancements in medical technology boost people's health and wellbeing and the economy, leading to investment opportunities, job growth and greater demand.

Growing Demand in Emerging Markets

- Emerging economies, especially BRIC and others in the Asia Pacific, are increasingly adopting technological advancements as their middle class grows. The growing prevalence of chronic conditions in their populations is also driving demand.

Sources: MedTech Europe, 'The European Medical Technology Industry in figures,' 2020; World Economic Forum, 'This is the biggest challenge to our health,' Dec 2017; PwC, 'Chronic diseases and conditions are on the rise', 2017; United Nations, 'World Population Prospects', 2019; Fortune Business Insights, 'In vitro Diagnostics (IVD) Market', 2018.

* Trade section does not include in vitro diagnostics in the figures for medical technology.

The UK Health Technology Market & Trends

UK Market Facts & Figures



The UK is the third largest market for medical technology in Europe, generating GBP 7.6 billion

- There are an estimated 2850 core medtech and digital health companies in the UK (
- The public healthcare system in the UK, The National Health Service (NHS) offers a single healthcare market of 60 million people.



The fastest growing segments of the UK industry by revenue are:

- medical imaging, with a compound annual growth rate (CAGR) of 10%
- in vitro diagnostics (CAGR 7%)
- drug delivery (CAGR 7%)



The fastest growing segments by employment are:

- digital health (CAGR 28%)
- drug delivery (CAGR 23%)
- single use technology (CAGR 19%)

Major Trends Impacting the UK (3)

Ageing Society

- The UK is an ageing society, with life expectancy beginning to plateau in line with other developing nations.
- Rise in multiple chronic conditions
 - Leading cause of death due to infectious diseases, followed by cardiovascular and cancer. Cardiovascular leading cause of disease for men and dementia for women. Increasing rise in diabetes.
- Growing concern over future epidemics
 - Rising health concerns over recent pandemics, such as Ebola, H1N1 and particularly COVID-19, is driving greater demand for health services across the globe.
- Technological advancements
 - Advancements in medical technology boost people's health and wellbeing and the economy, leading to investment opportunities, job growth and greater demand. Majority of investments into technological trends is through the NHS.
- Growing demand in healthcare delivery
 - Continuing growing demands on the NHS exacerbated by COVID-19. Increasing demands on life science sector to prove economic health value on new products and services.

Sources:

- (1) <https://www.investorsinuk.com/medical-technology/> (2) LSO DIT Datta set
(3) https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/945929/Chief_Medical_Officer_s_annual_report_2020_-_health_trends_and_variation_in_England.pdf

Strengths of Regional Offer

The West Midlands offers life science companies the ability to carry out the full development cycle from early-stage research, clinical development environments to manufacturing and production for all sectors including; medical devices, diagnostics and drug development. This development cycle is underpinned by access to unique data sets and highspeed data transmission networks.

Scale	Above all, it is the scale of activity that creates a huge opportunity for life science businesses. Whether this is the scale of the workforce with 254,000 employed across the broad activities of health and life sciences or the market opportunities within the region combined with the 92% of businesses in Great Britain that are within 4 hours drive. The region therefore offers something unique in the UK before the various areas of innovation, research and business activity are begun to be considered.	Data	Home to two Health Data Research Hubs, specialising in acute care and ophthalmic data. Access to curated regional clinical and genomic patient data sets.
Market & Test Bed	Stable and diverse population. 6 million records with high prevalence of unmet medical need and in particular high incidence of rare diseases making WM an ideal test bed for new therapies and technologies.	Diagnostics	Design, develop and validate diagnostics solutions using genomic data, bio-banks, digital pathology imaging labs using academic units with a strong industry focus.
Connected Sites & Facilities	An unrivalled concentration of world class life science facilities and sites all intrinsically connected supporting innovation and adoption	Devices	Centres of excellence that can help you design, develop, build and commercialise medical devices that meet regulatory approval. The entire sector is supported by the unrivalled manufacturing capability of the region.
Accessible patient Information	Healthcare and health research is underpinned by access to unique data health platforms (PIONEER & INSIGHT)	Digital	Connected infrastructure that allows for testing of devices using 5G networks, within a region that is using digital healthcare delivery for its general population.
Clinical Trial Capability	Access to many enabling organisations to initiate and support a wide variety of trials on innovative technologies	Trauma and Defence Medicine	Centre for Trauma & Defence Medicine research and home to the Royal Centre for Defence Medicine providing first class treatment for injured UK military personnel from around the world.
National & International Connectivity	Major international passenger & cargo airport, excellent road links enabling companies with a base in the region to connect with customers and collaborators and markets worldwide.	Manufacturing	Skilled manufacturing base for engineering of medical devices to drug design. Wide range of light industrial property and brown field sites for setting up a manufacturing unit. Opportunity to re-shore and build UK resilience.
Cost	For a major international location offers low operating and living costs compared to London and the South for companies looking for a UK base to establish and grow.		



West Midlands
Growth Company

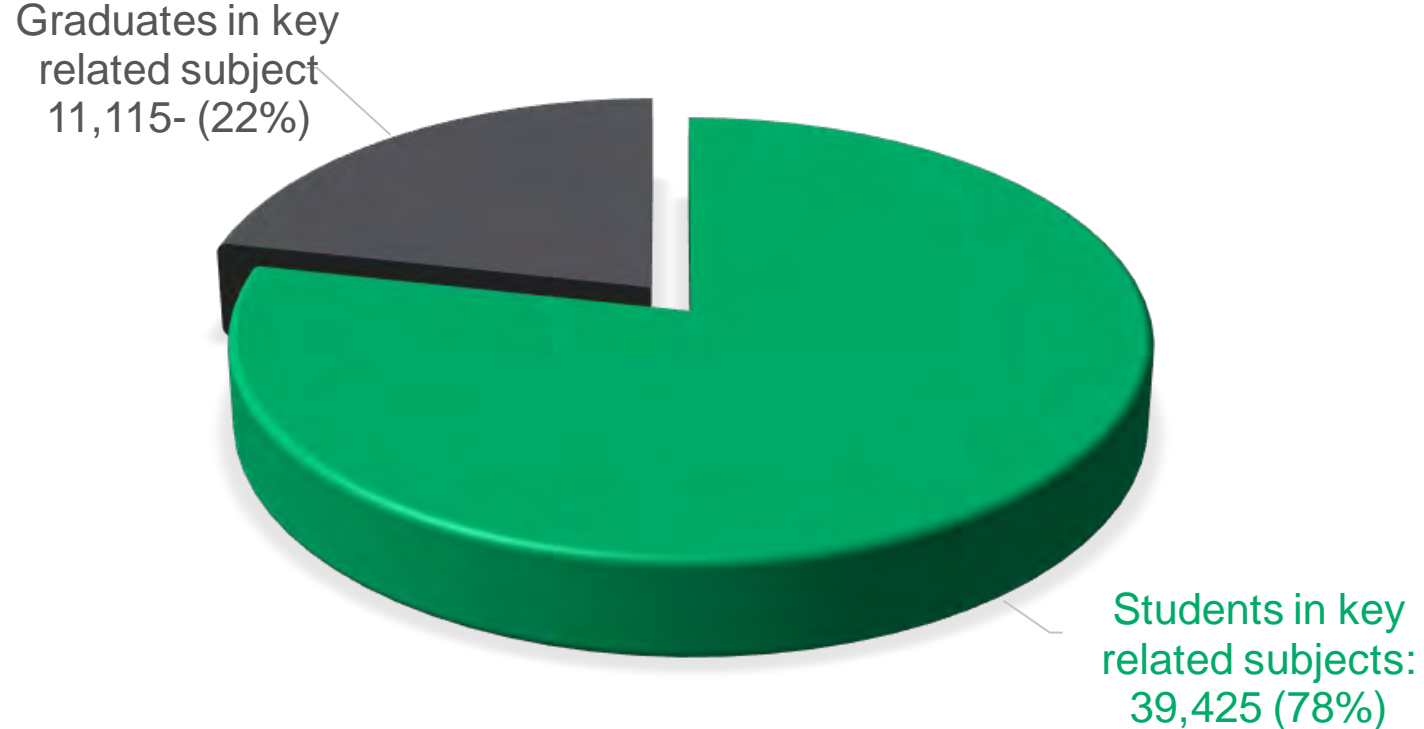
Skills & Talent



Leading Institutions Developing Talent

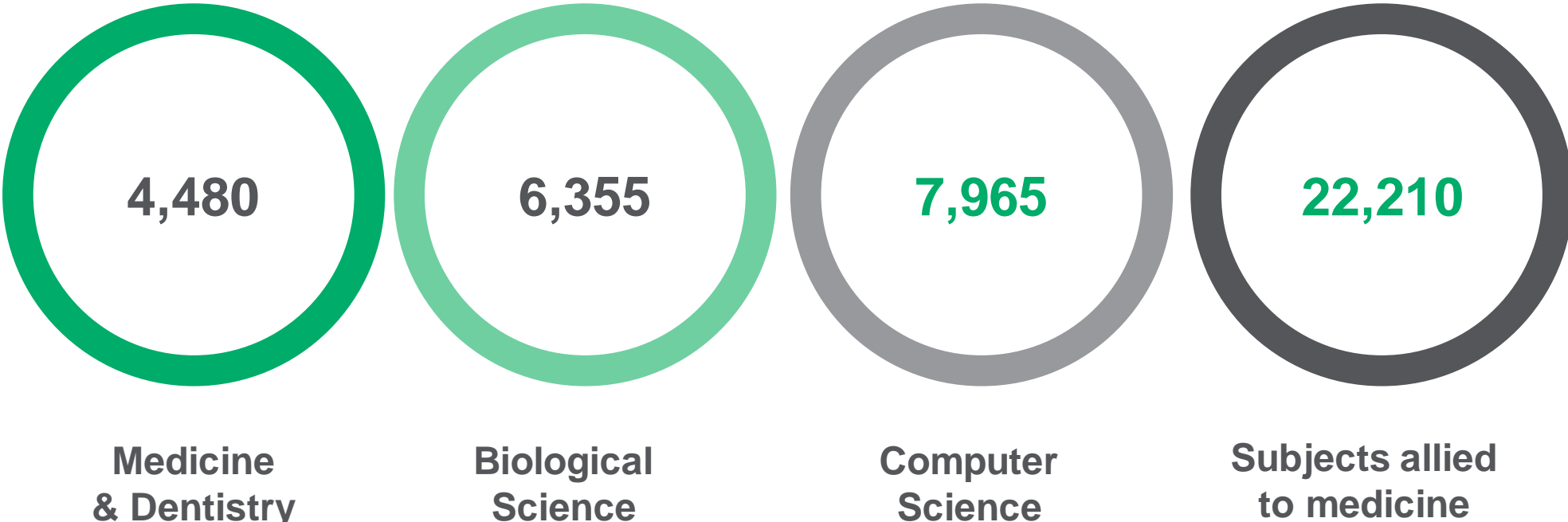
Leading Institutions developing a pipeline of talent for your business now and in the future.

The West Midlands region is perfectly places to benefit from a steady pipeline of students and graduates educated for the data-driven healthcare sector.



Globally ranked universities such as Aston University, University of Birmingham and University of Warwick are offering degrees in relevant courses.

Students currently studying at local HE institutes



Birmingham City University 26,925 students across all subjects	Birmingham City University is a large and diverse place to study. The university's School of Health Sciences is one of the largest and most diverse in the UK, and their Defence School of Healthcare Education provides healthcare education to Defence Medical Services personnel.
University of Birmingham 37,760 students across all subjects	The University of Birmingham is ranked amongst the world's top 100 institutions. Home to several Centres for Doctoral Training and the second largest Medical School in the UK.
Aston University 15,390 students across all subjects	Awarded University of the Year in 2020, Aston University's School of Life & Health Sciences is acknowledged as a UK-leading, with an outstanding reputation for teaching and research.
University of Warwick 10,960 students across all subjects	Home to Institute of Digital Healthcare, Centres of Doctoral Training and Warwick Medical School's leading research centres and facilities working with the international life sciences community. Ranked 8th in the UK (Guardian League Table 2021).
University of Wolverhampton 5,505 students across all subjects	Research Institute in Healthcare Science -partners with local UK National Health Service Trusts, including the National Cancer Research Institute-funded Black Country Cancer Research Network. Located on 4 campuses across the West Midlands
Other Universities in the region:	University College Birmingham - Awarded University status in 2012, home to School of Health, Sport and Food. Coventry University – Shortlisted for University of the Year (2021) and home to Centre for Sport, Exercise and Life Sciences.

Collaborative Centres of Academic Excellence

Aston University and Medical School

- Aston Institute of Health and Neurodevelopment
- Aston medical research institute: translational medicine for angiogenic and vascular protection
- Aston institute of photonic technologies with focus on optometry
- Aston research centre for healthy ageing

Birmingham City University

- Regions largest provider of qualified health and social care professionals.(talent)
- Centre of Life and Sport Sciences

Coventry University

- Alison Gingell Building includes a simulated house an ambulance cab and operating theatre and other realistic environments to give students and technologies a realistic environment to train and test.
- Centre for sport, exercise and life sciences.
- MATUROLIFE. 20 partners from nine European countries developing assistive technology and supporting independent living.

University of Birmingham and Medical School

- Birmingham Health Partners links the university with University Hospitals Birmingham and the academic health science network.
- Healthcare Technologies Institute.
- Institute of Translational Medicine
- Precision Health Technologies Accelerator

University of Warwick and Medical School

- Institute of Digital Healthcare
- Warwick Manufacturing Group

University of Wolverhampton

- Research Institute in Healthcare Sciences. Looks for advancement in understanding of cancer, diabetes, molecular medicine amongst others.

Dudley College

- The Black Country & Marches Institute of Technology opening in September 2021 will deliver higher level courses in a variety of sectors including in medical engineering & healthcare with digital technologies as a cross-cutting theme.



West Midlands
Growth Company

Funding & Investable Opportunities



Funding & Grants

Sector Funding

- MidTECH - NHS– SME Innovation Fund - The SME Innovation Fund will support innovations that have the potential to deliver a high impact for society, grow the reputation of the West Midlands health services and lead the adoption of new innovations in the NHS.
- Medicines and diagnostics manufacturing transformation fund - £20 million in capital grant funding to manufacture medicines and diagnostic equipment in the UK.
- Innovate UK- Biomedical catalyst 2021: early and late stage awards - UK registered businesses can apply for a share of up to £18 million to develop innovative healthcare products, technologies and processes.
- **UKRI - Pre-announcement: experimental medicine grants** - Apply for funding to investigate the causes, progression and treatment of human disease. Your project must include an experimental intervention or challenge in humans, focus on addressing mechanistic questions and be academically led.

Regional Funding

- Midlands Engine Investment Fund - MEIF provides over £250m of investment to boost small and medium business (SME) growth in the Midlands.
- Greater Birmingham EIS Fund - A fund enabling investors to build a portfolio of investments with the potential for attractive returns and tax relief benefits, by focusing on the UK's buoyant second city and wider region.
- Business Growth Programme 2 - BGP2 offers grants for SMEs of £2,500 to £1,000,000 and is designed to strengthen supply chains, stimulate innovation and help businesses grow.
- Property Investment Programme (PIP) - grant programme for SMEs to encourage the improvement and development of key vacant, derelict or underused properties and sites for economic use.
- Coventry and Warwickshire Green Business Programme - £1.25m of funding for small to medium-sized businesses to assist with their energy efficiency measures.
- Coventry & Warwickshire Innovation Programme - part-funded by European Regional Development Fund (ERDF) provides a range of assistance to SMEs to develop innovative and new to the market, products, services or technologies.

National Schemes

- Knowledge Transfer Partnerships (KTP) - The Knowledge Transfer Partnership (KTP) scheme helps businesses in the UK to innovate and grow. It does this by linking them with an academic or research organisation and a graduate. A KTP is part-funded by a grant.
<https://www.gov.uk/guidance/knowledge-transfer-partnerships-what-they-are-and-how-to-apply>
- Apprenticeships - An apprenticeship is a job with a structured package of training and development. Apprenticeships allow employers to develop sector-specific skills in their business, either by upskilling existing employees or recruiting new talent. Government funding is available for apprenticeship training and assessment.



Case Studies



Case study: Dignio

Why did they choose the West Midlands?

Dignio was established in Norway in 2010 with the ambition of enabling and empowering individuals with long term conditions to self-manage their health. Facilitating safe remote care and behavioural change, Dignio's Connected Care solution comprises software as a medical device and consists of a platform for healthcare professionals and a user-friendly patient app

Dignio chose to establish their first UK office in Birmingham in 2017 at the University of Birmingham Research Park. They are now based at the Institute of Translational Medicine, part of the estate of the University Hospitals Birmingham NHS FT. According to Managing Director, Dr Ewa G Truchanowicz, the ecosystem within and around the Birmingham Health Partners' footprint was brimming with support from experts and several networking and collaboration opportunities.

MyDignio has been commissioned by NHS Dudley Clinical Commissioning Group and will be used to monitor patients who have the virus at home - and follow up those whose clinical condition could deteriorate.

With good results from care homes with their partners at Mastercall and their ongoing project in Dudley, Dignio are building a team to meet the growing demands.

“We chose to settle in Birmingham first to benefit from its central location in the UK, enabling ease of travel within England. The support from the WMAHSN, which we subsequently benefitted from enormously in ensuring our product was a good fit for the NHS, has been one of the main factors in our decision.

Our team has since grown in response to the demands from the NHS and we continue to expand our presence in the UK.”

Dr EwaG Truchanowicz, Managing Director, Dignio



Case study: The Binding Site

Why did they choose the West Midlands?

Binding Site leads the way in providing innovative diagnostic solutions to clinicians and laboratory staff to significantly improve the diagnosis and management of patients across a range of cancers and immune system disorders.

Founded by researchers at the University of Birmingham in the mid-80s, Binding Site's manufacturing facility and its global distribution centre are both based within a few miles of there.

Binding Site continues to expand geographically, with over 3,000 customers in over 100 countries, and servicing them from its Birmingham base has always been a straightforward process.

"Being in the centre of the Country, we have easy access to motorways and airports and we've always had excellent support from the Chamber of Commerce. We wouldn't want to be anywhere else!"

"For us, it has always been practical to stay in Birmingham. Innovation is one of our core values and our close links to highly recognised academic institutions and research centres has been supportive for product development. The superb medical schools in the region have also delivered us a wealth of talented employees, including biochemistry graduates, year-out students and apprentices. The second city also offers a diverse recruitment pool for our non-scientific roles."

Charles de Rohan, Non-Executive Director and Former CEO, Binding Site



Case study: Adapttech

Why did they choose the West Midlands?

Adapttech knew it wanted to set up its headquarters in the UK. For a startup looking for small overheads, it made more financial sense to look outside of London.

Choosing to locate their HQ south-west of Birmingham's city centre, it places Adapttech at the centre of the region's life sciences cluster and its world-class innovation institutions.

The company is located next to both the Queen Elizabeth Hospital and the University of Birmingham – an institution renowned for world-class, highly respected biomedical courses. Operating three clinical trials units, the university campus is one of the two largest centres for clinical trials in the UK. With rapid expansion in mind, access to high quality, skilled graduate talent was a key consideration for Adapttech.

The investment in the West Midlands' infrastructure and connectivity was also a draw. With its R&D centre back in Porto, having a number of direct flights from Birmingham Airport was seen as helpful to its employees.

The West Midlands Growth Company has supported Adapttech throughout its move from Portugal.

“The West Midlands Growth Company advised us on prime office locations and has continued to support us in finding housing, as my co-founder Frederico Carpinteiro and myself move to be based in Birmingham permanently. We are looking forward to this transition and feel confident about our continued growth in Birmingham.”

Founder of Adapttech Mario Saenz Espinoza





Appendices



Regional Centres of Clinical Research Excellence

The Midlands has more clinical trial facilities than any other English region and conducts one in 5 UK clinical trials. The West Midlands hosts many of these providing a large diverse stable populations and a wide range of clinical settings in which to design and run innovative trial designs in support of industry.

- Advanced therapies facility (University of Birmingham)
- Arden tissue bank (University hospital Coventry)
- Cancer research UK centres (University and university hospitals Birmingham)
- Centre for clinical haematology (University hospitals Birmingham)
- Centre for computational biology (University of Birmingham)
- Centre for patient reported outcome research
- Centre for rare diseases (University hospitals Birmingham)
- Centre for translational inflammation research (University of Birmingham)
- Centre for vision & Hearing research (Aston University)
- Centre of precision rehabilitation for spinal pain (University of Birmingham)
- Clinical Immunology service (University of Birmingham)
- Elite centre for manufacturing skills (The black country LEP)?
- Health services management centre (University of Birmingham)
- Henry Wellcome building for Nuclear Magnetic Resonance
- Human Biomaterials resource centre (University of Birmingham)
- Institute for Mental Health (University of Birmingham)
- Institute of Digital Healthcare (University of Warwick)
- MRC Arthritis Research UK Centre for Musculoskeletal Ageing Research (University of Birmingham)
- NHS Blood and Transplant Service (NHSBT) (University Hospitals Birmingham)
- NHS Global Digital Exemplar (University Hospitals Birmingham)
- NIHR Applied research collaboration West Midlands
- NIHR Biomedical Research Centre in Inflammation
- NIHR Birmingham Clinical Research Facility
- NIHR Coventry and Warwickshire Clinical Research Facility
- NIHR Global Health Research Group on Global COPD in Primary care (University of Birmingham)
- NIHR Surgical Reconstruction and Microbiology Research Centre
- NIHR Trauma Management MedTech Co-operative (MIC). UHB
- NIHR Wellcome Trust Clinical Research Facility. (UHB)
- Phenome Centre Birmingham (University of Birmingham)
- Royal Centre for Defence Medicine (University Hospitals Birmingham)
- Science Technology and Prototyping Centre (Black Country LEP) ???
- Tommy's National Centre for Miscarriage Research (University of Birmingham Women & Children's Hospital)
- Transplant Unit Cardiothoracic, Liver, Kidney (renal) and Intestinal (University Hospitals Birmingham)
- Transplant Unit Liver (Birmingham Children's Hospital)
- UK's national sperm bank (Birmingham Women's Hospital)
- West Midlands Genomic Medicine Centre (University Hospitals Birmingham)
- West Midlands Regional Genetics Laboratory (Birmingham Women and Children's Hospital)

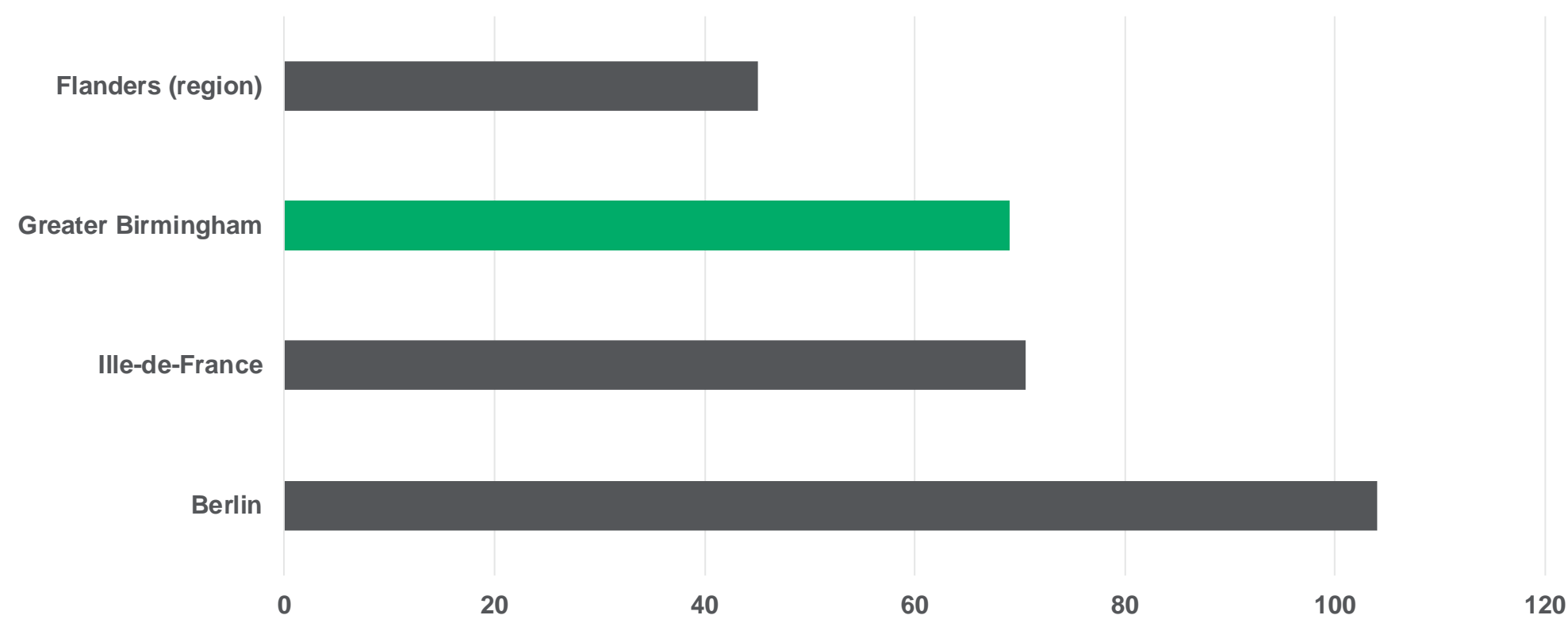
A competitive package vs leading life science clusters

The West Midlands has one of the youngest and most diverse cultures in the UK and Birmingham has been ranked one of the most popular regional cities for meetings, conferences and events. Birmingham ranks in the top 50 in Mercers Quality of Living report ahead of major global cities including Dubai, Hong Kong and Rome.



Competitive industrial space costs

The cluster centered around Greater Birmingham and Solihull offers low industrial space costs in-line with its European competitors.



Cost £GBP per square metre per annum

*Figures shown are for Greater Birmingham & Solihull LEP

Source: Business Leader, "What Makes Birmingham the Perfect Business Destination?" Oct 2019.
Mercer, 'Quality of Living City Ranking'



Cost effective salaries

Salary costs in the UK are competitively lower than other global locations.

	Laboratory Technician	Scientist	R&D Team Leader	Software Development Engineer
Greater Birmingham*	24,337	38,403	51,617	52,017
Ille-de-France	32,632	55,899	66,959	67,917
Berlin	37,291	56,120	70,697	71,075
Flanders (region)	40,199	65,562	78,543	78,653

Averages in £000s (European cities converted from €)

*Figures shown are for Greater Birmingham & Solihull LEP

Source: FDi Benchmark from the Financial Times Ltd 2020