

# Healthcare and Life Sciences toolkit



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## Introduction



The UK boasts a strong history of discovery in healthcare and life sciences. In the late 1700s, renowned English surgeon Edward Jenner developed the vaccine for smallpox. The development of the first vaccine was followed by many other significant breakthroughs in this field, including Sir Patrick Manson's discoveries in parasitology, Sir Alexander Fleming's discovery of penicillin and the discovery of the structure of DNA and antibody therapies. All of which have happened in the UK.

This long history of world-leading innovation in life sciences has drawn many of the world's most talented scientists to the UK to research and develop innovative drugs and technologies. It is also why the UK's health and life science sector has a reputation for bold, cutting-edge scientific research - making it a leading choice for scientific and medical meetings and events.

Building on this track record of scientific breakthroughs, the UK continues to be a **global hub for life sciences**. Its dynamic and globally competitive life science ecosystem is underpinned by partnerships and synergies across industry, academia, government, including its flagship **National Health**

**Service**, and numerous other health funders. Home to over **5,800 life science companies**, the UK has more medical products in development than any other country in Europe<sup>1</sup>.

A recent McKinsey report<sup>2</sup> shows that the UK also leads Europe in discovery research and life-science start-up funding. Investors can access talent, data and a world-class health-research infrastructure within a streamlined and competitive regulatory framework, making it easier to connect with new markets from the UK and beyond.

Continued investment in the Life Sciences sector is a priority for the UK Government. Global medicine spending is projected to increase by 2 to 5% annually, **exceeding £820 billion in 2024**.

The remarkable response of the UK's world-class life sciences sector to COVID-19 will become a blueprint to accelerate the delivery of life-changing innovations to patients as part of the government's new **UK Life Sciences Vision**<sup>3</sup>. The sector has been at the centre of the country's efforts to combat COVID-19 – from developing the Oxford-AstraZeneca vaccine to the world-leading recovery trial, identifying safe and effective therapeutics.

The Vision outlines seven critical healthcare missions to solve some of the biggest healthcare challenges of our generation, including cancer and dementia. Related investment in the 10-year plan will bring the total amount of funding available to the UK's most promising life sciences companies to £1 billion.

As evidenced in its critical role in the development of the COVID vaccine programme, the UK offers a unique proposition as being at the heart of a world-leading global life sciences hub, facilitating the network and connecting potential customers, collaborators, supply chain and innovation partners.

<sup>1</sup>Healthcare and life sciences, [great.gov.uk](https://www.great.gov.uk)

<sup>2</sup>The UK biotech sector the path to global leadership, [mckinsey.com](https://www.mckinsey.com) (Dec 2021)

<sup>3</sup>Life sciences vision, [gov.uk](https://www.gov.uk) (July 2021)





## Sector in Stats



- The UK is the **3rd global hub** for life sciences and top in Europe in financing and size of product pipeline
- The **top 25** global pharma companies and the top 30 MedTech companies are all represented in the UK
- The UK's growing life sciences cluster added **7,500 jobs** to the economy in 2018
- 5,800 businesses generate **£74 billion** in turnovers, with nearly 250,000 people employed in the industry
- Insight from more than **500 million** NHS patient 'days' is leveraged each year
- The UK has more biotech products in development than any other country in Europe, generating a turnover of **£80 billion and exports of £30 billion**
- Life sciences financing in the UK grew by **1000%** from 2012 to present
- The UK is home to **4** of the top **10** universities in the world for healthy subjects, and **2** of the top **3** universities for life sciences
- The UK receives the world's **2nd** highest government health spend in Research and Development
- Corporation tax is **19%** – the lowest in the G20





## Sub-sectors



### Biopharmaceuticals

UK researchers have played a key role in global science endeavours and breakthroughs, including the Human Genome Project, with the UK's **Wellcome Sanger Institute** leading nearly a third of the effort.

The **Human Genome Project (HGP)** was an international research project focused on determining the DNA sequence of the entire human genome. Beginning on the 01st October 1990, and completed in April 2003, the HGP allowed researchers to read nature's complete genetic blueprint for building a human being<sup>4</sup>. Almost all of the actual sequencing of the genome was conducted at numerous universities and research centres throughout the US, the United Kingdom, France, Germany, Japan and China.

This international effort to sequence the three billion DNA letters in the human genome is considered by many to be one of the most ambitious scientific undertakings of all time. The finished sequence produced by the HGP covers about 99% of the human genome's gene-containing regions with an accuracy of 99.99%.

The UK has also led many ground-breaking world-first research, such as the formation of the **UK Biobank**<sup>5</sup>, a large-scale biomedical database and research resource; the **National Institute for Health and Care Research**<sup>6</sup>; and the **100,000**

**Genomes Project** – Genomics England's very first initiative, sequencing 100,000 genomes from around 85,000 NHS patients affected by rare disease or cancer.

Building on these capabilities, the country has developed a core **biopharma industry** with **£36.7 billion** in annual turnover and a **service and supply chain industry** worth another **£18.4 billion** in 2019. The latest growth forecast for the industry estimates that the **global industrial biotechnology market** will be worth **£432 billion by 2026**.

Supported by a world-class talent base, the UK's vibrant, international biopharmaceutical industry benefits from a long-term vision and partnership with the government. Success stories include **Calysta** and **Ensus UK**, and among the new projects being identified across the UK are carbon fibre in the Tees Valley and Chemical in the Humber.

### Precision Medicine

Precision medicine, which refines our understanding of disease prediction and risk, onset and progression in patients, is a rapidly growing market. With its many Centres of Excellence, offering cutting-edge research and expertise, the UK is well placed to help businesses design and deliver solutions.

The global precision medicine market was valued at about £46 billion in 2019, with the UK alone making up **£2.4 billion**. Due to excellent research capabilities, unparalleled research data, leading and expert infrastructure and a supportive business environment in the UK, the precision medicine market is expected to grow significantly in the coming years<sup>8</sup>.

Research and stratification, diagnostic technologies and precision treatments that will treat illness more effectively are just some of the areas where businesses can work with the UK in precision medicine. The Industrial Strategy Challenge Fund, for example, invested **£210 million** into the sector via the **Data to Early Diagnosis and Precision Medicine Challenge** theme.

UK-led technological breakthroughs in genomics are also supporting accelerating cost reductions and expanding methods of applications. The National Health Service is the first worldwide service to introduce a genomic medicine service at scale and to apply whole genome sequencing in routine clinical care.

Government-funded infrastructure, such as Advanced Therapy Treatment Centres, has been established to work with industry on accelerating the development and introduction of precision medicine technologies. Hotspots for precision medicine in the UK include Scotland, the West Midlands and South East England.

### MedTech

#### World-leading vaccination programme

The UK has a vital role in global vaccine research, development and manufacturing. Besides its significant expertise in immunology, vaccinology, novel trials and delivery of vaccination programmes, the UK is one of the largest funders of the **Global Vaccine Alliance (GAVI)**.

In January 2021, the UK became the first country to administer the **Oxford University/AstraZeneca COVID-19 vaccine**, with an 82-year-old being the first to receive the life-saving vaccine outside of clinical trials at Oxford University Hospital. One year later, 2.5 billion doses of the UK-made vaccine had been distributed at cost to more than 70 countries. Established at the start of the Covid-19 pandemic, the **UK Vaccine Taskforce** will leave a legacy of investment and capability for wider vaccine development, manufacturing and delivery.

Investing over £500 million in its future global HQ and research and development centre in Cambridge, AstraZeneca has also invested £220 million in infrastructure at its campus in Macclesfield campus in Cheshire, making it the largest medicines manufacturing site in the UK.

<sup>4</sup>Human genome project, Genome.gov



## Research and development



- The UK government provides significant funding for health R&D, spending **£2.7 billion** in 2019, accounting for **more than 20% of the UK's R&D expenditure**. Alongside government support and tax relief, private sector finance is offered to biopharmaceutical companies operating in the UK. Significant capital is being poured into the sector, with life sciences financing in the UK **growing by 1000%** from 2012 to present<sup>5</sup>.
- Access to world-class universities and life sciences infrastructure including science parks, incubators and accelerators is available for companies to start up and scale up. Innovation support is also available from health technology assessment bodies, and the NHS.
- The UK's ambition is to remain a **leading global destination for cutting-edge clinical research**, committing to making the UK a more patient-centred, pro-innovation and digitally-enabled clinical research environment.

<sup>5</sup>[Ukbiobank.ac.uk](https://ukbiobank.ac.uk)

<sup>6</sup>[Nibr.ac.uk](https://nibr.ac.uk)

<sup>7</sup>[UK life sciences support; Precision medicine and genomics, gov.uk](https://www.gov.uk/government/topics/precision-medicine)

<sup>8</sup>[Precision medicine, great.gov.uk](https://www.great.gov.uk/precision-medicine)



**Any  
questions?**

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