Department for Education

Skills England: Sector skills needs assessments

Life Sciences

June 2025

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Summary

The UK life sciences sector holds enormous potential to drive economic growth while significantly improving health outcomes across the country. The sector generated over £100 billion in turnover in 2021/22, has a proven track record of excellence in developing COVID-19 vaccines and has introduced access to promising new vaccines targeting cancer.[1,2,3]

In this briefing we use the Office for Life Sciences (OLS) definition of the life sciences sector, which consists of two core industries: biopharmaceutical businesses, which develop and produce pharmaceutical products, and medical technology businesses, which develop and produce medical devices and software.[4] There is an integral link between the life sciences sector and the NHS. The NHS workforce is covered within the health and social care briefing.

At the time of writing, definitions of the eight Industrial Strategy growth-driving sectors are still in development. Our analysis uses the best available definitions and evidence, setting out what we already know and where further work is needed to understand the skills landscape within these sectors. The forthcoming Industrial Strategy Sector Plans will set out analysis of the highest growth potential subsectors.

Priority jobs and skills

UK life sciences is a growing sector. It employed 304,200 people in 2021/22 and has seen an overall upward trend since 2008/09.[5] There was a sharper increase of 15% between 2018/19 and 2021/22, partly driven by increased demand during the COVID-19 pandemic. It is not possible to determine how much of this increase was driven by the pandemic, but the sharper upward trend began in the pre-pandemic period of 2018/19 to 2019/20.

Different Life Science industries are growing at different rates.[6] Between 2018/19 and 2021/22, the biopharmaceuticals service and supply sector saw the largest increase in employment both proportionally (29%) and in absolute numbers (17,900 employees). However, core medical technology businesses remained the largest employer and accounted for 39% of employment in life sciences in 2021/22. These businesses employ high-level specialist skills which span traditional science and emerging technologies.

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[1] BioScience and health technology sector statistics 2021 to 2022, Office for Life Sciences (2024)
[2] The story behind the Oxford-AstraZeneca COVID-19 vaccine success, UKRI (2024)
[3] Thousands of NHS patients to access trials of personalised cancer 'vaccines', NHS (2024)
[4] These industries can be split into two further categories: businesses delivering core activities and those delivering specialist service and supply chains. In this report we include both types of business in our definition of life sciences.
[5] BioScience and health technology sector statistics 2021 to 2022, Office for Life Sciences (2024). Data collection began in 2008/09 and at the time of publishing is available up to 2021/22
[6] BioScience and health technology sector statistics 2021 to 2022, Office for Life Sciences (2024)

Employers in the life sciences sector identified four broad areas of priority skills need within the sector:

- Skills associated with innovation and emerging technologies (including advanced digital and AI);
- Specialist science and research;
- Regulatory and quality assurance;
- Transferable skills such as communication, leadership and entrepreneurship.

These are predominantly advanced skills requiring a mix of technical training and transferable skills, for example in communication of complex scientific information. There is an increasing demand for interdisciplinary skills, particularly the combination of scientific skills with digital and technological skills. These will be vital for interdisciplinary careers such as automated manufacturing, bioprocessing, personalised medicine and digital health.

The need for advanced digital skills that allow the sector to respond to and utilise new technologies was a strong theme in our engagement [7] with the life sciences sector. Recent employment trends illustrate the need for advanced and specialist digital skills; within the medical technology sector the digital health segment has been the segment with the highest employment since 2009/10, with substantial year-on-year increases between 2014/15 and 2021/22 (an overall percentage increase of 90%).[8] Analysis of online job postings within the life sciences sector was carried out externally by the Futures' Group.[9] It found that jobs within 'Information Technology and Computer Science' were the most frequently advertised by life sciences companies between April 2023 and March 2024, accounting for approximately 13% of all online recruitment activity in the sector.

The 'golden-triangle' of London, Oxford and Cambridge accounts for a significant proportion of life sciences employment. The South East has consistently been the UK region with the highest share of life sciences employment, accounting for 23% of total employment in the financial year ending 2022. The second highest region was East of England (14%), followed by London (11%), with the latter seeing a generally upward trend in its share since 2008/09.[10] There are established and growing hubs in other

[7] During this engagement process and the drafting of this publication, Skills England was set up in shadow form within the Department for Education (DfE). Skills England - GOV.UK

[8] BioScience and health technology sector statistics 2021 to 2022, Office for Life Sciences (2024)

[9] Life Sciences 2035: Developing the Skills for Future Growth, Futures Group (2025); Based on 65,000 online job postings from a list of approximately 5,800 life sciences businesses within the Office for Life Sciences Bioscience and Health Technology Sector Statistics 2021/22, supplemented by an additional 400 companies contributed by Futures Group members. This approach may include some activity outside the sector from companies operating across multiple industries. Online job postings reflect advertised jobs but do not necessarily correspond to positions that are filled.

[10] BioScience and health technology sector statistics 2021 to 2022, Office for Life Sciences (2024)

locations and feedback from life sciences employers highlighted the importance of continuing to build a diverse, nationwide talent pipeline.

Training routes into the sector

Life sciences is a highly qualified sector, with multiple industries that employ a far higher percentage of people with a degree level qualifications compared to the UK workforce as a whole. For example, in June 2024 the 'manufacture of basic pharmaceutical products' industry employed an estimated 69% of people with degree level qualifications or higher, and the 'manufacture of pharmaceutical preparations' industry employed an estimated 67%. This compares with an estimated 39% of employees in the UK workforce as a whole.[11]

The UK is well positioned to meet this demand, with a high proportion of graduates (8.7%) completing degrees in the relevant subjects of natural sciences, mathematics and statistics relative to comparator countries, ranking second behind India in 2021.

Graduate training alone is not always sufficient to meet sector skills needs. Employers highlighted a skills gap between graduate training and work-place readiness including in innovation and entrepreneurship as well as experience with novel technologies used by specialist businesses. Degree and master's level apprenticeships (Levels 6 and 7) are valued by the sector as routes to filling these skills gaps, either as an alternative to university training or by building on existing qualifications. In 2023/24, 27% of starts in apprenticeships identified as core to the life science sector were at Level 6 or 7 (18% at Level 6 and 9% at Level 7).[12]

The total number of starts in life science apprenticeships was 1,416, the highest yearly total recorded and an increase of 14% compared to the previous academic year. The largest total increase was for the Laboratory Technician (Level 3) apprenticeship, which increased from 341 starts in 2022/23 to 418 starts in 2023/24 (an increase of 23%).[13]

Securing the future workforce

The UK life sciences sector competes internationally for talent; professional qualifications embedded within apprenticeships align the UK with global benchmarks and help to attract global talent. Employers emphasised that maintaining the standard of UK training

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[11] Annual Population Survey Jul 2023-Jun 2024, ONS (2024)
[12] Skills England analysis of Apprenticeships 2023/24, DfE (2024) using apprenticeships listed in Life Sciences competitiveness indicators 2024, Office for Life Sciences (2024)
[13] Skills England analysis of Apprenticeships 2023/24, DfE (2024) using apprenticeships listed in Life Sciences competitiveness indicators 2024, Office for Life Sciences (2024)

is necessary not only to fill skills gaps but for the sector to continue to compete internationally and attract international investment.

The needs of the sector link with the NHS workforce in key professions, such as clinical researchers, meaning the success of both sectors relies on aligning skills development.

Employers highlighted the potential to continue to expand apprenticeship and other non-traditional training routes to build the future workforce. Existing apprenticeship routes were considered well suited to the sector's skills needs however it will be necessary to overcome cultural barriers. Despite the demand for practical, on-the-job training, apprenticeships continue to face a stigma within the life sciences sector, where academic qualifications are often viewed as the only viable path to a successful career.

Gaps in provision

- Access to training for small businesses: It was acknowledged that small and medium enterprises (SMEs) can struggle to invest in skills and training for their workforce, for example facing difficulty managing apprenticeships due to the administrative burden. Approximately 75% of life sciences sites belong to SMEs, employing 23% of the workforce.[14] These businesses are considered critical to innovation in the sector, in areas like personalised medicine.

- Bolt-on and stackable options: To address the need for quickly evolving, interdisciplinary skills our engagement suggested there is appetite for a more modular approach to training, to integrate foundational, digital, regulatory, and scientific skills. For example, a laboratory technician could undertake a focused module in data analytics to address immediate skill gaps rather than completing a multi-year course. Flexible and modular training could also help SMEs to invest in targeted upskilling without excessive resource strain.

- Keeping pace with new innovation and technology: Processes and technologies in life sciences are quickly evolving. There was interest from the sector in shorter intensive training offers relating to emerging skills (such as AI), which could be more frequently updated.

[14] BioScience and health technology sector statistics 2021 to 2022, Office for Life Sciences (2024)

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