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Strategic Skills Needs in the Bio-medical Sector

A report for the National Strategic Skills Audit for England 2010

Executive Summary 14
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Analysis › Understanding › Insight › Expert advice

The Bio-Medical Sector

The aim of the study is to assess the strategic skill needs of the bio-medical sector. This sector has been defined as the combination of the pharmaceutical, medical biotechnology, and medical technologies sectors; in other words, those industries which produce the drugs, therapies, and equipment for the health care system in the UK and abroad.

Because of major scientific breakthroughs over recent years which have the scope to radically improve the well being of the population - especially those currently suffering or at risk of chronic illness – the industry is very much seen as one with colossal future potential. From an employment and skills perspective there are many uncertainties relating to the situation in England but, on balance, the outlook is an optimistic one.

England currently has an enviable position in the global market given the level of research and development activity which is concentrated in the country, especially around Cambridge and the corridor from the west of London and along the Thames Valley towards Oxford. It also has a substantial manufacturing capacity to be found across the country but notably in the North West and South East.

Looking to the future, the key findings from the study reveal the following.

The Importance of the Bio-Medical Sector

- It an important sector for the national economy with respect to output and employment. It is also a principal constituent of the knowledge economy, with the pharmaceutical sector not only being the largest investor in R&D in the country, but also at the forefront of global developments to bring about a major transformation in the treatment of illness in the 21st Century.

- The investment in R&D reflects the pharmaceutical industry's strong demand for highly qualified scientists, engineers, and technologists, often qualified at postgraduate level with skills at the cutting edge of the latest scientific developments. The industry has been able to articulate precisely the scientific skills it requires over the medium-term even though it is difficult to quantify the level of skills demand.

- Arguably, the level of technological change is such that skill demand will always outpace skills supply. Of vital importance is the extent to which the supply-side can catch up with demand relative to that in other countries. Collaboration between higher education (HE), the health service, and industry through clustering and networking appears to be the principal mechanism though skills supply has largely been developed to support scientific and technological advancement.

- England is a dominant player in the global pharmaceutical market, though this is not the case in the medical technologies sub-sector. Much of the industry's success has been dependent upon the rich supply of research scientists extant in the UK, and the relative strength of the UK higher education sector in subjects allied to the industry. The relationship would appear to be mutually reinforcing with the capacity to attract highly skilled and qualified people from around the world.

Drivers of Change in the Bio-Medical Sector

- Forecasts of future employment and skill demand suggest that overall employment levels will remain more or less static. But as mentioned above there a number of uncertainties – threats and opportunities - which the industry faces over the medium-term, including, amongst others:

    - the capacity of scientific breakthroughs to result in new products and therapies which will replace those which are currently nearing the end of their patents;

    - the demand for health care which results from demographic change (e.g. people living longer with chronic conditions and the pressure this places on the health service);

    - environmental considerations (e.g. the need to reduce waste);

- constraints of health care expenditure (e.g. the need to constrain in some way the almost infinite demands being made on national health care systems to provide the latest treatments, and the need to develop treatments which might reduce health care costs – such as telemedicine);

- consumer demand and expectations (e.g. the willingness of patients to pay for new treatments);

- globalisation and corporate strategic choice (e.g. the corporate decisions which are made about where products are developed and manufactured to serve the global market).

- Technological change provides a number of opportunities for the industry, such as the development of the next generation of drugs which use biological rather than chemical processes. These are generally considered positive for the industry's development because they will generate a stream of new products and therapies. Given England's concentration of R&D activity, and the critical mass of research scientists in the country, it is well placed to retain its position as a pre-eminent centre of innovation and product development. But this cannot be taken for granted. It is important that investment continues in R&D both within the sector and in the external R&D sector (i.e. HE) to maintain this position.

Employment Levels

- The sector in England is estimated to employ around 95,000 people - and many of these people are occupied in skilled trades and machine processing jobs – with, in addition, a substantial number of people employed in the supply chain. Compared to the sector's position as a centre for innovation and product development, medium term prospects for employment in the manufacturing part are less clear.

- One version of the future sees mass production increasingly being transferred to lower cost countries as the leading companies look to cut their costs because of the increasing levels of investment required to successfully bring new products to market, and due to patents lapsing.

- More positively, as some drug treatments become more bespoke, requiring manufacture to exacting standards but in relatively small batches, this raises the prospect of niche production becoming important. Hence employment growth amongst the niche producers may replace any loss from mass production being transferred elsewhere.

- Though overall employment numbers are unlikely to show much growth over the medium-term with the numbers employed in each occupation, other than managers

and professionals, showing a decline, the workforce is relatively aged which suggests that there will be substantial replacement demands across the occupational structure of the sector. The challenge here is to attract people, especially young people, into an industry which signals that the overall number of people it employs is in decline.

Skill Demand and Supply

- As the foregoing has said, the future of the high-tech, knowledge intensive part of the industry is dependent upon the future supply of highly qualified scientists engineers and technologists. What is less clear is the extent to which the existence of a prestigious R&D sector is sufficient to safeguard manufacturing employment. This would appear to be subject to both the strategic choices the principal companies in the sector make about where they want to locate production and the extent to which developments in the sector push manufacturing increasingly towards niche manufacture.

- Without doubt the manufacture of bio-medical products is dependent upon intermediate level skills – skilled trade workers and technicians. Without a supply of these skills manufacturers are likely to face skill shortages which will impose constraints on production. Manufacturing is also dependent upon management being well versed in the skills required to operate in the sector of the market into which they may

find themselves migrating. For example, in the case of the production of goods which are becoming increasingly commoditised, then skill sets may need to migrate to focus more than ever on keeping costs down (e.g. lean manufacture, etc.).

The Future

- Whilst there are considerable uncertainties attached to the future direction of the sector there are grounds for substantial optimism for this country because of the range of new treatments which are likely to come on stream over the medium-term.

- Often the debate is very much focused on the pharmaceutical sector, and with good cause too given the colossal scale of its R&D investments and its capacity to bring on line those drugs and therapies which will safeguard the well being of the population. The medical technologies sub-sector receives much less focus because it is relatively small with respect to output, R&D and employment, and is not so recognisably a world leader compared to either the USA or Germany.

- It is readily apparent that developments in health care will be dependent upon medical technologies and that there is, through the use of communication technologies, the potential for the convergence of drug

therapies with medical technologies. Future demand for medical technologies could be a major source of employment growth and skill demand which might provide a boost for the country's engineering sector. The demand here, in the first instance, is to equip engineering firms with the strategic skills which will allow them to diversify into the medical market and negotiate access to health care markets both here and abroad. In the second instance, skill demand relates to manual engineering skills at Levels 2 and 3 which will be required to meet future demand. Engineering is a sector which has encountered relatively high skill shortages over the recent past and the types of skilled people they require are subject to considerable replacement demands over the medium term

- Overall, the assessment provided in this report suggests that there is significant employment potential in the sector which will be dependent upon skills supply being adequate at a number of levels. In pharmaceuticals the country is in an enviable position as a world leader and with respect to medical technologies there is considerable scope for the country's engineering sector to take advantage of an expanding market.

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