

Future of UK Life Sciences: how to reshape the industry for the 2020s

A report by The Economist Intelligence Unit



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This report was written by Ana Nicholls and Tim Gamble of The Economist Intelligence Unit, based on a discussion with a panel of senior members of the life sciences sector. A list of panel members can be found at the back of the report.

Introduction: the future of UK life sciences

Brexit holds risks for the UK's life sciences industry, but it has already delivered one benefit: forcing policymakers to recognise the importance of the sector to the UK economy. In January 2017, when the then government launched its industrial strategy green paper, the life sciences sector was one of five UK industries to be named as a priority. For an industry that is sometimes vilified, this came as welcome recognition. Almost three years later, however, with Brexit imminent, it is still clear that the UK's life sciences industry will need to carve out a new global role if it is to thrive.

To clarify what that role would look like, in October 2019 The Economist Intelligence Unit convened a panel of senior people from the UK life sciences sector. The discussion aimed to identify the areas in which the UK could become—or remain—a global leader, and the regulations, policies and investment needed for that to happen. The discussion highlighted several areas on which the UK should focus:

- building international trade links with and beyond the EU;
- boosting the UK's reputation for research and development (R&D);
- developing innovative medicines, including cell and gene therapies;
- building up the UK's role in developing clinical trials;
- capitalising on progress already made in collecting joined-up health data across the National Health Service (NHS);
- expanding the international influence of thought-leading institutions such as the Medicines and Healthcare products Regulatory Agency (MHRA) and the National Institute for Health and Care Excellence (NICE); and
- developing healthcare innovations that build on the UK's strengths in other areas, including financial services, creative arts and education.

The starting-point is strong. The life sciences sector already contributes more than £70bn per year to the UK economy, according to government data, including 7.3% of manufacturing gross value added. Exports stood at £24.7bn in 2018. The sector employs around 240,000 people, including more than 40,000 in pharmaceuticals and a similar number in medical technology (medtech). But although the UK stands in fifth or sixth place globally on most of these attributes, it ranks higher for its scientific credentials. The Life Sciences Council puts the UK's share of academic citations for life sciences at 12%, the second-highest in the world—and at 18% for top-tier citations. Writing in English helps, but so does the UK's long history of innovation.

All of this gives the country something to build on. First, however, the life sciences sector needs to see off the threats posed by Brexit.

The Brexit challenge

Ever since the UK referendum in 2016 delivered a shock vote in favour of the UK's exit from the EU, companies in the life sciences sector have been living with uncertainty. Those that are well-managed have coped by drawing up contingency plans to fit every Brexit scenario, including detailed preparations for a no-deal Brexit. But as Brexit deadlines have come and gone, managers in the industry, like the rest of the UK population, have become impatient. In December's general election, that impatience resulted in a decisive victory for the ruling Conservative party, under Prime Minister Boris Johnson. The government now has a mandate to push forward with Brexit as soon as possible.

At the end of January 2020, therefore, the UK will officially leave the EU and enter into a transition arrangement that will keep trade terms broadly stable for now. However, another deadline looms at the end of the year, when that transition arrangement will end. That leaves only a very short timeframe to hammer out a more permanent trade agreement, given the number of important issues that remain to be resolved. Despite the Conservative government's assurances, more delays to the UK's final exit are possible. Moreover, the UK could still end up with a no-deal Brexit, or with a limited trade deal that leaves substantial parts of the economy still facing uncertainty for several years.

One of these areas could be life sciences. Even under a no-deal scenario, most pharmaceuticals are immune from new tariff barriers. However, regulatory barriers could prove a substantial additional cost, with the extent of the impact depending on the nature of the trade deal. In 2018 the EU accounted for 46% of UK pharmaceutical exports, according to the Office for National Statistics, and there were already signs that Brexit uncertainty was affecting sales. Total pharmaceutical exports were down by 9.7% year on year in 2018 to £25.5bn (US\$301bn), with those to the EU down by 19%. In the first 11 months of 2019, total pharmaceutical exports fell by a further 3% year on year.

To mitigate further declines and help companies prepare for the changes ahead, the government has issued Brexit guidance for companies. For the typical pharmaceutical company, this amounts to no fewer than 80 documents. Most companies have already transferred marketing authorisations, shifted and replicated their labs, rerouted logistics and built up the appropriate stockpiles. They have also checked the status of EU staff and reassured EU-based clients that are worried about their ability to deliver. In addition, those with EU funding or EU contracts have, in some cases, sought out new partners. All of this has had a cost, both monetary and in terms of management time. Day one of Brexit is just the beginning, however.

An end to uncertainty?

Thereafter, much depends on whether logistical problems ease and delays at customs begin to shorten as regulatory problems are ironed out. There is also the question of what happens to the sterling-euro exchange rate. As UK exports fall and the current-account deficit rises, currency values will be driven largely by investment flows, and those will depend on Mr Johnson's efforts to promote a pro-business agenda, including a stable relationship with the EU. As a result, sterling will remain volatile in 2020.

If the pound falls, UK exports could bounce upwards, as they did in 2016. There is also a chance that parallel trade will rise. Some pharmacies have already grasped the opportunity to export drugs

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intended for the UK market to EU markets prepared to pay a higher margin. Angela McFarlane, market development director at IQVIA, believes that the availability of products such as anticoagulants, statins and contraceptives is at risk. As of December 18th 2019 the government had issued temporary bans on exports of 33 vaccines and medicines including 19 hormone replacement therapies, in order to prevent shortages in the UK.

However, some analysts, such as Dan Mahony, a partner at research-based investment management company Polar Capital Partners, believe that, instead, there is a real chance that the pound will rise on any good news. This may unleash pent-up investment, pushing up capital inflows. After all, in comparison to many markets, the UK (for all its Brexit risks) is a safe haven. The inflow could strengthen, along with the pound, if the Bank of England indicates it is more willing to raise interest rates to reduce inflation. All of this would be likely to dampen exports still further, however.

Foreign fields

The second area where uncertainty will continue is over the UK's international relationships, both political and commercial. After all, the past three years of wrangling have only been over the withdrawal agreement with the EU. The permanent trade deal has yet to come, and negotiations will be equally fraught. Quarrels over tariffs, quotas and oversight will continue. For the pharmaceutical industry, there will be a tension between the need for UK-EU mutual recognition in multiple areas, and the UK's ability to introduce more flexible rules that will encourage innovation or speed the uptake of new medicines.

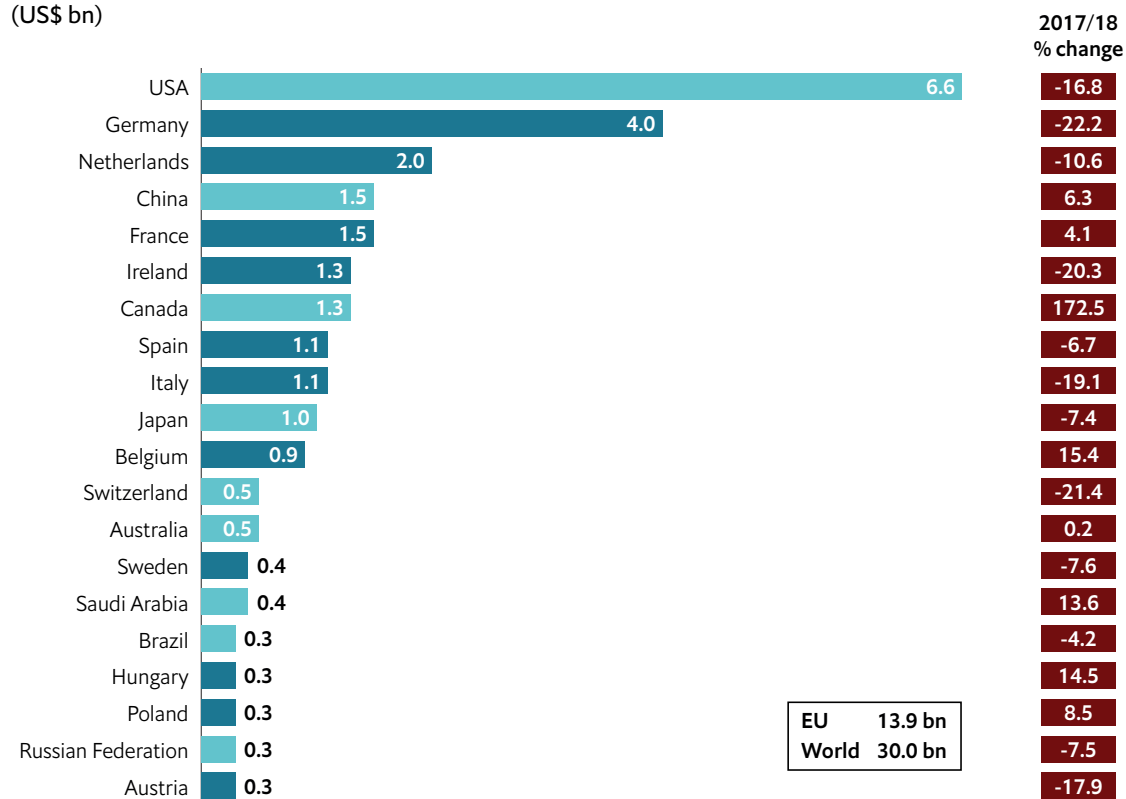
At the same time, the UK will need to forge new trade links outside the EU. For a start, there are about 40 countries that have EU free-trade agreements (FTAs), economic partnership agreements (EPAs) or mutual recognition agreements (MRAs) in place. By December 4th 2019 the UK had struck continuity deals with just 20 of these and some of the remaining countries—including Canada—are bargaining hard. A rollover is not necessarily simple. In addition, the UK must strike deals from scratch with important markets such as the US, China and India.

Beyond this lie the continuing political risks of Brexit. The process of leaving the EU has laid bare the disconnect between the UK's political parties and the electorate. Even more worryingly, Brexit has raised profound questions about the British constitution, and about the status of Scotland, Wales and Northern Ireland within the UK. After the strong showing of the Scottish National Party in the recent election, it has increased the risks that the UK itself—and indeed the EU—may fall apart.

For companies in the life sciences sector, all of this will mean continued uncertainty that may affect their performance for years to come. It will oblige them to remain flexible and to keep contingency plans in place. But it will not change companies' long-term strategic goals. The two overriding questions are whether the products they are selling meet a real need for patients, and whether the UK remains a suitable place to develop and make those products.

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UK pharmaceuticals exports by value, 2018 (US\$ bn)



Source: UN Comtrade.

Where the UK can win

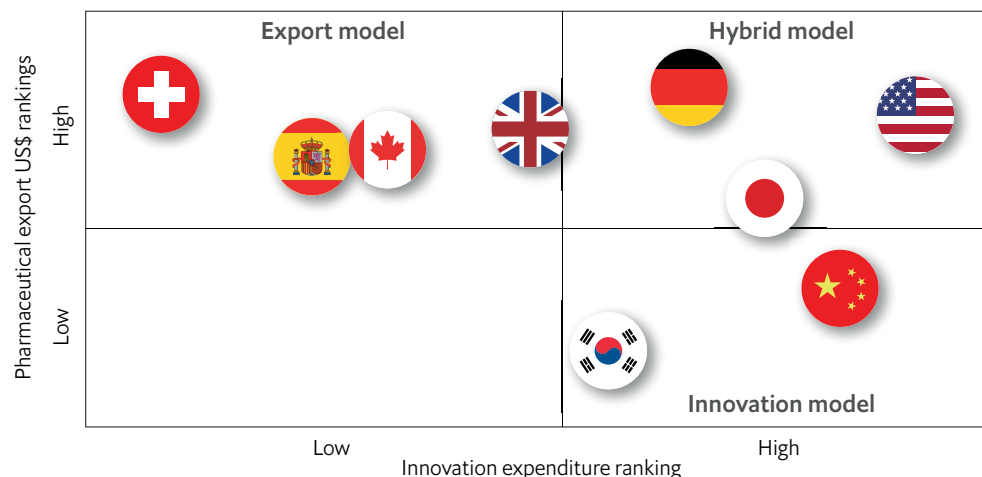
So, once the dust settles on Brexit, how can the UK life sciences sector start to carve out a global role? The answer lies in mapping the UK’s current strengths against the trends occurring in the industry. The development of personalised medicines, the search for value and efficiency, the development of Big Data, the need for elderly care, the rise of emerging markets: these all hold opportunities that the UK needs to grasp.

The government has already made a start on the process. In August 2017, just a few months after its industrial strategy green paper was published, Sir John Bell published a detailed strategy for the life sciences sector. This was followed by a Sector Deal, backed by 25 global companies, that unlocked funding for R&D, health data and innovation. Since then, several initiatives have emerged, including Digital Innovation Hubs, which aim to tackle Britain’s biggest health challenges, and the Accelerated Access Collaborative, which aims to roll out innovations to patients more quickly.

Professor Bell’s strategy also set out some ambitious targets for the sector. He calls for a rise in R&D spending from 1.6% to 2.6% of GDP within five years, including heavy investment in “moonshot” research. He advocates the recruitment of 2,000 new discovery scientists and the creation of life sciences clusters that would draw in global investment. He also wants the UK to create four companies with market capitalisation of over £20bn over the next ten years.

Professor Bell’s targets differ slightly from those outlined by the government, which is aiming for R&D spending to reach 2.4% of GDP by 2027 and 3% in the longer term. However—possibly to avoid the trap of picking winners—neither the government nor Professor Bell outlined where that research spending should be focused or how exactly it will help to build up the life sciences sector. We therefore asked our panel for their thoughts on the UK’s future direction, and how it can compete internationally.

Country ranking R&D expenditure and pharmaceutical exports



Sources: OECD; UN Comtrade.

The innovation game

Our panel, like Professor Bell, was convinced that the UK's future lies in capitalising on its reputation for innovation and research, which has fuelled the growth of its universities and earned several Nobel Prizes. Although UK exports may have fallen recently, longer-term prospects for innovative medicines—indeed for all types of healthcare innovation—are strong.

Many of those opportunities lie in China. For much of the past decade, its focus has been on uptake of generics: fast-growing demand has made it the world's second-largest market for prescription drugs (behind only the US). In terms of demand for new active substances (either small or large molecule), China has accounted for less than 1% of global sales over the past decade, against 65% for the US, according to IQVIA data.

In the past 18 months, however, this has changed. Tariffs have fallen, marketing approvals have soared and reimbursement has expanded, fuelling growth in innovative drug sales. Indeed that growth is described as “unprecedented” by David Peacock, managing director of MSD, a major UK pharmaceutical company. The opportunities for UK-based innovators are huge, but they need to be grasped before China becomes an innovator in its own right.

The UK's selling points

So, what kind of innovations should the UK focus on? For the life sciences sector, one answer seems to lie in genomics, primarily for diagnostics but also for preventative health. In the past few months, NHS England has become the first public healthcare system to use genomics in clinical care, initially for rare diseases and some types of cancers. A Genomic Laboratory Hub situated within the Addenbrooke's Treatment Centre in Cambridge offers testing for up to 10m people, in what will undoubtedly become a cornerstone of future care.

Allied to this, future areas of specialisation for the UK are likely to include promising cell and gene therapies. In March 2019 the UK government announced that it was to invest more than £1bn per year in a national platform for clinical research, including 60 cell and gene therapy trials. Investment in vector manufacturing includes the Cell and Gene Therapy Unit at King's College London, as well as the new Cell and Gene Therapy Catapult in Stevenage.

The UK can also capitalise on its role as Europe's major hub for clinical trials. It currently attracts at least one-quarter of the EU's clinical trial applications, and has developed a particular expertise in trials for advanced therapy medicinal products (ATMPs). Other promising areas include the development of more sophisticated medical software, or innovations enabling better old-age care (including neurology), or improvements in ambulance services.

Finally, Dan Mahony of Polar Capital Partners points to the promise of innovations that bring together several British areas of excellence, such as finance, creative arts and education. It would be possible, for example, to develop innovative financing models, including insurance, for cell and gene therapies; or mobile health apps that build on the UK's skills in video gaming; or medical education tools that take advantage of the UK's academic reputation.

Digging out data

More broadly, however, the panel agreed that the UK's key differentiator lies in its ability to bring together cohesive health data, genomics, its expertise in clinical trials and its world-leading role in

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the gathering of real-world data. This means benefiting from the data gathered through UK Biobank and Genomics England, and marrying them with data collected through NHS Digital or through the Prescribing Information System for Scotland, which covers social care as well as healthcare.

“If we get a well joined-up data set, we will be the world leader in this area, because of the richness of the data that we can get through the NHS,” points out Matt Cooper, business development and marketing director at the National Institute for Health Research (NIHR). These data would allow the UK to provide evidence that will underpin innovations and that could influence the shape of future healthcare systems. With its 70-year history of socialised medicine, the UK can play a particularly important role in developing China’s healthcare system, argues Steve Bates, chief executive of the BioIndustry Association.

AstraZeneca, for example, recently announced that it was to expand its R&D hub in Shanghai, which will lead its research into diseases that mainly affect Asia. The Cambridge-based company is also establishing an artificial intelligence innovation centre in China and is partnering with China International Capital Corporation (CICC), a Chinese investment bank, to build up a US\$1bn Healthcare Industrial Fund.

The same is true in manufacturing. Although the government aims to attract investment in UK manufacturing, it may make sense for many companies to locate some of their manufacturing facilities in their target markets. The challenge, therefore, is to encourage UK companies such as AstraZeneca to use their international growth to generate profits and investment at home, or to build UK skills through reverse technology transfer. That would make the UK life sciences sector less vulnerable to international competition.

How to get there

If the life sciences sector is to thrive after Brexit, the UK needs to build an ecosystem that allows skills and initiative to coalesce. There are three broad areas where our panel felt that improvements were necessary to realise the UK's potential in the sector: funding and financing, administrative and institutional barriers, and skills.

In the case of research funding, for example, the UK—despite its knowledge-based economy—spent just 1.69% of GDP on R&D in 2017, two-thirds of which came from the private sector. There is broad agreement that greater investment in R&D would bring substantial economic returns: £9 for every £1 invested, according to the London School of Economics. However, the Confederation of British Industry has warned that, at current growth rates, it could take until 2053 to meet the government's 2027 target of 2.4% of GDP.

Encouragingly, Brexit uncertainty—although it may have caused a hiatus—does not seem to have deterred investment in the life sciences sector. Indeed, according to Michael Garrison, director of the Commercialisation Institute at King's College London, the flow of capital into UK research is accelerating. Some of it is coming from traditional corporate investors, including MSD's new R&D hub in London, as well as AstraZeneca's new R&D headquarters in Cambridge. Some of it is coming from the government, as part of its life sciences strategy. However, an increasing amount is coming from China.

Although the research element of R&D is strong in the UK, many British start-ups falter when it comes to development. In part, this may reflect a lack of entrepreneurialism in the UK: many researchers here are academics, for whom money is not the primary motivation. There is also some risk aversion, including among financiers. Venture capital can be hard to come by. For development capital, therefore, many innovators head to US stockmarkets such as the NASDAQ, or seek out investment from China and elsewhere.

This is not, in itself, a problem. The BioIndustry Association's Steve Bates points out that the rise of Chinese capital means that UK research is no longer so reliant on US money, a competitive situation that, in effect, raises the value of UK innovation. However, the value of UK innovation would rise even more if it could move further along the development path, reducing risks for the buyer.

Institutional capacity

Encouraging a better flow of capital will require some government intervention. University-based clusters, such as the Cambridge Science Park, form a strong basis for research but need public support to attract more investment. Our panel also pointed to the Patent Box tax-incentive regime, matched private-public funding and the British Business Bank as initiatives that, in theory, are promising but that need streamlining and expanding if they are to prove helpful.

Creating a promising end-market for the product is also important, particularly in regard to investment in later-stage development or manufacturing. UK innovations need to be used and paid for once they emerge, which means that the MHRA needs to streamline the process of obtaining marketing approval, NICE needs to speed up its recommendations, and the NHS needs to encourage

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uptake. Brexit offers opportunities here, as long as the UK strikes the right balance between regulatory harmonisation with the EU and its ability to forge its own path.

This will be particularly crucial for clinical trials if the UK is to retain its position as one of the central trial locations in Europe. The government is aiming to attract 50% more clinical trials over the next five years, a target that recent growth rates suggest is attainable. However, that would be easier if the regulatory environment becomes more supportive. IQVIA's Angela McFarlane argues that doctors should be allowed to tell patients if there is a suitable clinical trial they could join, allowing them to access new cancer drugs, for example. Faster approval for new trials would help too: the UK is currently 65% slower than the US and 128% slower than Japan.

Creating the right regulatory framework will not only benefit the UK market directly but could also help to build the UK's reputation as a centre for excellence in healthcare. That would enable the UK to become a thought leader on health, so that its rules—whether for clinical trials, or for data and evidence collection—are adopted globally. There is scope for organisations such as the Medicines and Healthcare products Regulatory Agency (MHRA) or the National Institute for Health and Care Excellence (NICE) to remain thought leaders for international standards of care, health technology assessment and value-based care. This international influence would help the broader UK life sciences sector to maximise export opportunities. However, UK organisations also need to remain broadly aligned with EU regulations, and with standards set by international bodies such as the ICH.

Skilling the sector

The UK already has an international reputation for thought leadership, partly because so many policymakers and leaders in the life sciences sector trained at British universities. Many people in the life sciences sector are following an increasingly global career path. Although public concern over immigration was a factor behind the Brexit vote, the UK needs to remain part of the global circulation of intellect.

This will probably mean increasing the number of Tier 1 (Exceptional Talent) visas; currently, only a small share of the 2,000 Tier 1 visas each year are issued. In August 2019 the government proposed a new Global Talent visa for those with skills in science, technology, engineering and mathematics. Furthermore, the Migration Advisory Committee is looking into whether the UK should adopt an Australian-style points-based immigration system, which would replace the current Tier 2 visas for skilled staff.

Raising immigration barriers is only part of the challenge, however. The more significant issue is to ensure that the UK life sciences sector can attract the most talented people, which means building the innovation ecosystem. Even better, Brexit could refocus attention on the skills of the UK's workforce, as links deepen between the life sciences industry and universities. This would help to build a more sustainable future.

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Strategic priorities	Strategic goals
Science: Continued support for the science base, maintaining strength and international competitiveness.	To attract 2,000 new discovery scientists from around the world. To achieve a 50% increase in the number of clinical trials in the next five years, together with novel methodologies.
Growth: An environment that encourages companies to start and grow, building on strengths across the UK, including expansion of manufacturing in the sector.	To create four UK companies valued at > £20bn market capitalisation in the next ten years. To attract ten large (£50m-250m) and ten smaller (£10m-50m) capital investments in manufacturing facilities in the next five years.
NHS: NHS and industry collaboration, facilitating better care for patients through better adoption of innovative treatments and technologies.	For the NHS to engage in 50 collaborative programmes in late-stage clinical trials, real-world data collection, or in the evaluation of diagnostics or devices. For the UK to be in the top quartile of comparator countries, both for the speed of adoption and the overall uptake of innovative, cost-effective products, to the benefit of all UK patients by the end of 2023.
Data: Making the best use of data and digital tools to support research and better patient care.	To establish between two and five data hubs.
Skills: Ensuring that the sector has access to a pool of talented people to support its aims through a strong skills strategy.	To establish a migration system that allows the UK to recruit the best international talent.

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