



Delivering the Life Sciences Vision

Opportunities for action in building a UK global hub for life sciences

February 2022

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About the author



Richard Sloggett

Richard Sloggett is the Founder and Programme Director of Future Health. He was Special Advisor to the Secretary of State for Health and Social Care from 2018-19 and previously led Policy Exchange's health and social care work. Richard is a regular commentator in the national media on health and social care including in The Times, Telegraph, Financial Times, Economist and on Times Radio, BBC and LBC. He has been named as one of the top 100 people in UK healthcare policy by the Health Service Journal.

During his time with the Secretary of State, Richard worked across Whitehall, the NHS and local government on major policy decisions including the NHS Long Term Plan, the creation of NHSX and the Prevention Green Paper. He also supported Ministers on global healthcare issues including preparations for the G7 and action on antimicrobial resistance. He has fifteen years' experience in public policy and healthcare, starting his career in Parliament before a successful career in public affairs where he led a team of 20 to the prestigious Communique Public Affairs Team of the Year Award.

Richard is undertaking his doctoral thesis in preventative healthcare systems at Liverpool University. He has a Masters Degree with Distinction from the University of Nottingham and a Bachelors Degree from the University of Durham.

About Future Health

Founded by former UK Government Special Adviser, Richard Sloggett, Future Health is policy research centre with a mission to advance public policy thinking that improves the health and wealth of peoples, communities and nations.

Healthcare systems around the world are facing significant challenges of demographic, societal and technological change. The importance of prevention and the development of new technologies have long been seen as ways to transform health systems to improve patient outcomes and performance, but progress has often been slow. COVID-19 is an inflection point, demonstrating the need and opportunity of investing in and delivering more effective and efficient healthcare services in the future. In undertaking cutting edge public policy research across key areas such as prevention, technology and links between healthcare and the wider economy, Future Health is working to support such positive changes and deliver policy that improves health outcomes and tackles health inequalities.



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Executive summary

The UK life sciences sector has rightly been identified as a strategic priority for Government in its quest to build a more innovative and dynamic economy.

Life sciences has been a long-term strategic sector bet for Government. The close working relationship between Government and the industry has delivered tangible results for public health domestically and internationally over recent years, most clearly evidenced during the Covid-19 pandemic, with the discovery of new treatments and vaccines.

This report shows that this has paid off, with the UK having a number of strengths at its disposal that can help it to continue to stay ahead of other countries in the years ahead. This is particularly critical as global competition for investment rises, with many countries across the developed world now making a similar bet on life science sector growth.

The public policy framework for this success has revolved around the creation and publication of several strategic documents and frameworks that have brought together key players across Government, industry and the NHS. This report finds that whilst a number of commitments within the documents have progressed, some have struggled to translate into action and tangible results.

The new Life Sciences Vision published in the summer of 2021 identifies four critical success factors for the future as collaboration with the NHS, Government research funding, improved healthcare data and access to funding for companies. In all of these areas recent efforts have been mixed, with some clear challenges emerging.

The UK's share of clinical trials is falling globally. The speed of implementing such trials – with notable exceptions during Covid – is slower than in many other countries. Access and uptake of medicines is behind other European countries. Ambitions on investment in research are yet to fully materialise. And health data infrastructure, a major enabler for change, remains fragmented.

The Spending Review allocated a welcome £95m for implementing the Vision. For it to effectively deliver and tackle the challenges above, this report advocates a three part framework. This includes a new and more balanced set of indicators to measure success, greater co-ordination of the different bodies involved in delivering the Vision and improved transparency and regular reporting.

An effective Life Sciences Vision implementation plan along these lines can support domestic economic growth, improve patient outcomes and help make sure that the UK stays competitive globally.



Summary of recommendations

This report makes recommendations in three areas for ensuring the effective implementation of the Life Sciences Vision.

Implementation metrics

A new set of metrics should be introduced to monitor the performance of the ambitions within the vision. The existing Life Science Competitiveness Indicators should be strengthened to include:

- More up to date data
- Greater balance of metrics across the different domains
- Improvements in contextual data to determine the performance level of the UK

Specific examples of reforming existing indicators and additions to cover changes to the MHRA, and new policies (such as the Innovative Access and Licensing Pathway) are included later in the paper.

Organisational co-ordination and prioritisation

There are a number of bodies that will be involved in the successful execution of the Life Sciences Vision across central Government, arms length bodies, the NHS and industry. It will be critical that those for delivering core elements of the agenda such as the MHRA and NICE have the requisite resource to deliver the ambitions of the Vision.

The Life Sciences Council should be utilised as a convenor for effective delivery of the seven missions within the Vision. National Clinical Directors in the seven mission areas should be included within the relevant working group discussions and to ensure translation through the NHS, a mandate should be set for Integrated Care Systems (ICSs) to prioritise research and support commercial trials.

Regular reporting and progress updates

In order to ensure the Vision is effectively implemented there should be regular reporting and progress updates. This should include:

- Setting ambitions and targets against the revised implementation indicators, so that UK progress can be assessed and performance contextualised globally. This could include setting targets for global trial recruitment, speed of NICE appraisals, levels of research funding etc
- Translating these targets into the annual Mandate set by the Government to NHS England to support effective NHS implementation
- The publication of an annual report on progress against the Vision to be laid before Parliament by the Secretaries of State for BEIS and DHSC
- Include a Life Science Vision Director on the Board of NHS England for the implementation period of the Vision – this could be a senior OLS or DHSC representative



Introduction

The UK Government response to Covid-19 has greatly benefitted from a strong life sciences sector. The development of vaccinations, treatments, new testing technologies and clinical trials have all been mission critical to effectively tackling the pandemic.

Westminster think tank Policy Exchange has noted that the UK has a long and proud history of life science innovation and recent successes have benefitted from consistent political support across party lines:

“Gordon Brown was a champion for research spending as both Chancellor and Prime Minister and oversaw the creation of the Technology Strategy Board in 2007 which was renamed as Innovate UK and has now been subsumed within UKRI. His successors have maintained this commitment, from the Sir Paul Nurse review commissioned by the Coalition, to Theresa May’s Industrial Strategy which put UK science at its centre, and now to our current Prime Minister with his manifesto commitment for the UK to spend 2.4% of total GDP on research and development.¹”

The Government’s new Life Sciences Vision seeks to “learn the lessons of this (Covid response) success and make this exception the new norm, bottling the formula developed to tackle Covid and applying it to the search for life-changing breakthroughs against other diseases.²”

The Vision is set around tackling seven Great Healthcare Challenges, covering:

- Dementia
- Cancer
- Vaccines
- Cardiovascular disease and obesity
- Respiratory disease
- Ageing
- Mental health

The document has been widely welcomed and supported; and is the product of strong Government and industry engagement.

However, implementation will be highly challenging. There have been several strategies, visions and industry-Government agreements over recent years. Indeed the Life Sciences Vision is the third national Government strategy for life sciences published in just the last five years. The delivery and implementation of ambitions within previous documents has often been mixed.

Effective delivery of the Vision will be particularly critical to the over-arching goal of building a ‘global hub for life sciences’, as set out in the Conservative 2019 manifesto; as there is growing competition for life sciences investment globally, that has only accelerated as a result of the pandemic.

Israel struck an innovative flexible agreement with Pfizer to roll out the Covid-19 vaccine, underpinned by better data and evidence collection. China hopes to make access to its Sinopharm vaccine more globally available through cross border collaboration and use this to increase confidence in its R&D capability.³ Singapore is investing significantly in making itself an R&D hub in South East Asia, and looking to significantly expand its manufacturing base.⁴

Even before the pandemic, research from PWC comparing the UK with other global hub competitors found that whilst the UK was a world leader in cutting edge science and skills, it was only in the middle of the pack on pharmaceutical company presence and cross border collaboration, and trailing on access to medicines.⁵

This short pamphlet commissioned by a group of leading UK life sciences inward investors:

- Analyses what has worked well and less well with regards to implementing UK life science strategy policy commitments
- Assesses what other markets globally are doing in key areas to attract life science investment
- Sets out proposals for inclusion in an effective implementation plan for the Life Sciences Vision

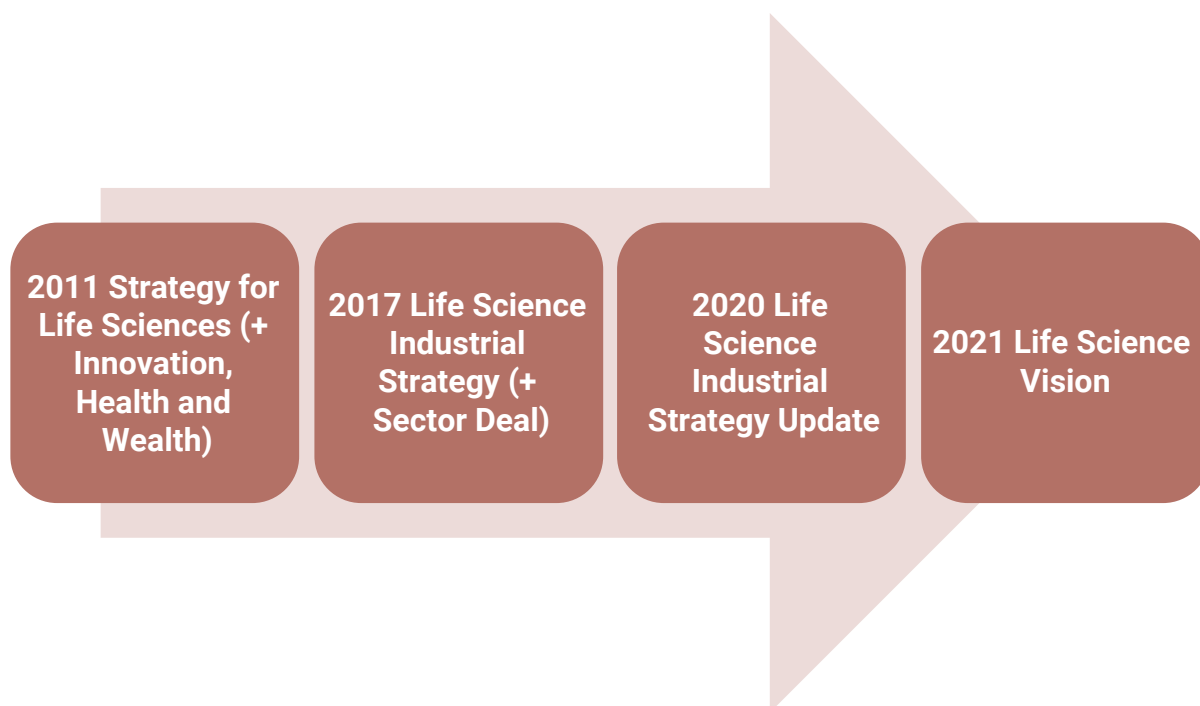


CHAPTER

2

UK life science strategies: recent history

The 2021 publication of the Life Sciences Vision follows a series of previous Government attempts to develop and deliver a strategic approach to life sciences policy. Since 2010 there have been a number of policy documents that have sought to do this including:



2011: Strategy for Life Sciences (and Innovation Health and Wealth)

The 2011 Strategy for Life Sciences noted that to “remain competitive, we must up our game in the UK. We must use our fantastic science base to its fullest potential and be at the forefront of life sciences in this new landscape.”⁶ The Strategy included an new Early Access Scheme to increase the speed and efficiency of routes to market for innovative breakthrough therapies and the launch through NIHR of a new clinical trials gateway.⁷

The Strategy was accompanied by a review of Innovation commissioned by the then Chief Executive of the NHS David Nicholson. The review entitled ‘Innovation Health and Wealth: accelerating adoption and diffusion in the NHS’ was published alongside the strategy and contained four sets of recommendations covering:

- Reducing variation and compliance – this included a NICE compliance regime to reduce variation and drive up compliance with NICE Technology Appraisals
- Metrics and information – this included an Innovation Scorecard to track compliance with NICE Technology Appraisals
- A system of delivery for innovation – this established regional Academic Health Science Networks
- Incentives and investment – aligning the financial, operational and performance incentives to support the adoption and diffusion of innovation

2017: Life Sciences Industrial Strategy (& two sector deals)

In 2017 the May Government launched its industrial strategy which included “a long-term vision for how Britain can build on its economic strengths, address its productivity performance, embrace technological change and boost the earning power of people across the UK.⁸” One of the priority areas was life sciences, where a separate industrial strategy was led and published by Government Life Sciences Champion Professor Sir John Bell to address a series of challenges under five key themes:

- Science: Continued support for the science base, maintaining strength and international competitiveness.
- Growth: An environment that encourages companies to start and grow, building on strengths across the UK, including expansion of manufacturing in the sector.
- NHS: NHS and industry collaboration, facilitating better care for patients through better adoption of innovative treatments and technologies.
- Data: Making the best use of data and digital tools to support research and better patient care.
- Skills: Ensuring that the sector has access to a pool of talented people to support its aims through a strong skills strategy.⁹

The strategy was followed by two sector deals that set out commitments and partnership for delivery. This included news that MSD was to make a major investment into the UK economy with a state of the art facility in London.¹⁰ A second sector deal followed in 2018 including further international investment and Government plans to expand genomics research and build digital innovation hubs providing expert clinical research data services, data analysis and sharing capabilities.¹¹

2020 Life Science Industrial Strategy Update

Shortly after the 2019 general election, the Government published a Life Science Industrial Strategy Update which sought to set out the achievements made since the 2017 Strategy was published. The Update paper noted that “a substantial majority of the objectives in the Life Sciences Industrial Strategy have been met and more are being delivered now.¹²”

Professor Sir John Bell noted that with a new government there was a “need to create opportunities for a new inflexion point taking the sector toward even more ambitious goals. There are opportunities now to capitalise on the wealth of genomic information by turning variants into insights about function, at scale. Similarly, we need to deliver on the ambition to transform our healthcare system to one that identifies disease earlier using risk and stratification to implement a broad strategy for public health.¹³”

The Update set out some of the achievements delivered since the 2017 strategy. These included:

- Increasing investment in UK science and committing to increase the proportion of UK R&D spending to 2.4% by 2027
- The creation of a Commercial Medicines Unit alongside a long-term pricing agreement between Government and industry
- The launch of the Accelerating Detection of Disease programme, a 5 million volunteer cohort with genomic and phenotype data
- Development of a centralised clinical trial hub
- Creating a dedicated life sciences scale-up investment programme
- Expansion of the world’s largest genomics project¹⁴

2021 Life Sciences Vision

The Prime Ministerial Foreword for the 2021 Life Sciences Vision sets an ambition for the UK to “regain our status as a Science Superpower by making our United Kingdom the leading global hub for Life Sciences.”¹⁵

The Vision is focused on four themes:

- Building on the new ways of working from COVID-19 to tackle future disease missions
- Building on the UK’s science and clinical research infrastructure and harnessing the UK’s unique genomic and health data
- Supporting the NHS to test, purchase and spread innovative technologies more effectively, so cutting-edge science and innovations can be embedded widely across the NHS as early as possible, and rapidly adopted in the rest of the world
- Creating the right business environment in the UK in which companies can access the finance to grow, be regulated in an agile and efficient way, and manufacture and commercialise their products in the UK

It’s also focused on seven healthcare missions that will “help the NHS solve some of the biggest healthcare problems of our generation.”¹⁶ The missions cover critical healthcare areas such as cancer, dementia and mental health. The Vision notes that success in tackling these “will have a disproportionately positive impact on people living in poorer areas of the UK, where the prevalence of long-term conditions and cancer is highest.”¹⁷

As Chair of the G7, the UK set out four priorities. Life sciences can play a major role in supporting all of them:

- Health security for all
- Clinical trials
- Antimicrobial resistance
- Digital health

The G7 communique following the summer summit set out the further actions to be taken to deliver on these areas and noted the importance of global co-operation on life sciences and clinical trials to advance improvements in global health and tackling future pandemics:

“We support the G7 Therapeutics and Vaccines Clinical Trials Charter, which sets out our shared principles to accelerate the speed with which clinical trials generate robust evidence and their findings can be implemented in this and future pandemics.”¹⁸

Further global meetings and summits are planned to deliver on this and the Life Science Vision is the central policy lever for the UK Government to drive forward the translation of these international commitments domestically.

Life Science Vision implementation

The 2021 Life Sciences Vision sets down four pre-conditions of success:

- NHS as an innovation partner
- Investment in science and research in Life Sciences must be grown and maintained
- The governance and oversight of health data
- Access to finance

These are running themes from previous strategies. In seeking to build an implementation plan for the 2021 Life Sciences Vision it is well worth exploring how previous strategies have fared with regards to each of these.

In 2015 the Office for Life Sciences published the Life Science Competitiveness Indicators to look at the health of the life sciences sector and implementation of the Strategy for Life Sciences. The first set of indicators were grouped into a series of headings across industry & employment, R&D, regulatory, clinical and demand-side indicators. The latest indicators were published in February 2021 and were initially delayed due to the pandemic.

Alongside the indicators a range of other information is available to assess the performance of the UK with regards to life sciences:

- Other Government research
- Academic studies
- Industry papers and data

The following grid uses a range of sources to assess areas of performance against each of the four pillars of success identified in the Vision. In doing so it is possible to identify both areas of strength and areas for development in each.

In building on the strengths and tackling the areas for development the Government will be in the strongest position to ensure the Life Sciences Vision is successfully implemented.

Life Sciences Vision Pillar	Area	Indicator	Areas of strength	Areas for development
NHS as an innovation partner	Clinical trials	Share of patients recruited to global studies	<ul style="list-style-type: none"> • Early stage trials - Analysis from the ABPI has shown that the UK leads Europe in early stage clinical trials with 89 trials initiated in 2020. The US, China and Australia occupy the top three places • Covid global leadership – The UK has initiated 60 commercial Covid-19 trials in 2020, third globally behind the USA and Brazil. The UK has rapidly set up the RECOVERY trial to find treatments for Covid-19 • Growth in ATMPs – The number of advanced therapy medicinal product (ATMP) clinical trials in the UK continues to increase year on year with 154 ongoing trials observed in 2020. This represents approximately 12% of all ongoing global trials¹⁹. There do though remain issues regarding the readiness of the system to appraise these products • Strong academic research – The UK is also a leader in academic research, being ranked in 2nd place behind the USA on share of life science academic citations²⁰ • World leading regulator – MHRA as a stand-alone regulator is open to evolving its regulatory framework and supporting novel trial design²¹ 	<ul style="list-style-type: none"> • Struggling competitiveness – Share of UK patients recruited to global trials has fallen from 3% to 2%²² • For Phase 2 the UK ranks 5th globally – 3rd in Europe behind Germany and Spain – with 201 initiated; USA ranks top with 953 • However, for later stage Phase 3 trials – which see larger numbers of patients treated with potentially life-saving treatments – the UK falls to 7th. It drops behind a number of European countries, with Germany, Spain, Italy and France all placing higher • The figures show a drop in the rankings for the UK across all phases since 2018²³ • Continuing pandemic impact – The pandemic has had a negative impact on new patients entering clinical trials with the UK particularly badly affected • Italy and Spain have recovered their non-COVID-19 research activity the fastest, with enrolment in June 2021 37% and 34% higher than in June 2019, respectively • The UK on the other hand has been unable to recover enrolment to pre-COVID-19 levels, with enrolment in June 2021 15% lower than in June 2019²⁴ • Data from the National Institute of Health Research in March 2021 found that 19% of commercial trials had still not restarted. Even where trials are open there are issues regarding costs, with variation of approaches, applications and implementation across different regions and part of the NHS a concern in the UK. Only just over 50% of trials meet their recruitment targets • Speed and efficiency of trial set-up – The UK was the 7th out of 10th fastest at transitioning from core package reception to patient enrolment amongst the comparator countries. The recent ABPI clinical research report argues that costing and contracting processes need to be made quicker, more transparent and less variable, ensuring the UK delivers on the commitments of the UK-wide vision for clinical research delivery²⁵

Life Sciences Vision Pillar	Area	Indicator	Areas of strength	Areas for development
NHS as an innovation partner	Access and uptake	Speed and volume of Technology Appraisals	<ul style="list-style-type: none"> • NICE approval rates – Between April 2019 and March 2020, 90% of products were approved by NICE. Between April 2013 and March 2020 the approval rate was 80% • Speed of NICE decision – Time from Market Authorisation to NICE approval was lower than 6 months²⁶ • Volume of decisions – NICE's capacity has been impacted by the pandemic but NICE still published 63 appraisals in 2020-21, more than in 2019-20²⁷ 	<ul style="list-style-type: none"> • Comparative product availability – Data from EFPIA published in April 2021, found that the UK was ranked sixth in EMA products available, below Germany, Denmark, Austria, Switzerland and Italy; with 28% of products not approved for use²⁸ • Optimised recommendations – Whilst NICE has approval rates of over 80%, there is a growing use of the 'optimised' recommendation, which recommends the product for use in a smaller group of patients than originally stated by the marketing authorisation. 253 of 909 appraisals since 2000 have now received an optimised recommendation²⁹
		Per capita uptake of NICE and non NICE medicines	<ul style="list-style-type: none"> • Pricing structures – The Government's Voluntary, Pricing and Access Scheme (VPAS) provides certainty to Government on branded medicines spending and is an opportunity to improve the uptake of medicines through the delivery of the agreement • Acceleration and flexibility of access – Initiatives such as the Commercial Framework, Accelerated Access Collaborative (AAC) and Innovative Medicines Fund present opportunities for more flexible commercial agreements and uptake support for the NHS 	<ul style="list-style-type: none"> • Low uptake – The UK has a relative uptake per capita of NICE approved medicines of 19% in year 1 where the average across comparator countries including Australia, France, Germany and the USA amongst others is 100%. This rises over 5 years to 66% in the UK • But perhaps of most concern with the data is the lack of change year to year. Products recommended by NICE and first launched between 2012-16 had a 17% relative uptake per capita rate in year 1 and a 71% in year 5 • The figures for non NICE medicines are similar, 18% in year 1 and 72% by year 5 • Slow uptake – A NICE approval is expected to result in access within 90 days across the NHS. However, data looking at the adoption of a NICE approved medicine shows that this is not uniform, and that it can take years for full adoption. Part of the challenge of this is due to the complexity of NHS structures³⁰
Investment in science and research	Government investment in health science and research	Spending on health research and development	<ul style="list-style-type: none"> • Government levels of investment – The UK is second only to the United States regarding investment in health research and development, investing \$3bn in 2017, the last year for when figures are available. The UK has consistently been in second place on this metric since it has been recorded. • The UK Government is committed to increasing spending on R&D to 2.4% of GDP by 2027. 	<ul style="list-style-type: none"> • Historical investment trends are static – Despite ambitions to increase R&D spending in the future, recent history suggests this will be challenging. The UK spent 1.6% of GDP on R&D in 2000; the figure is 1.8% in 2019. This remains below the OECD average³¹ • Industry investment in UK Life Science R&D has been fairly static over time at £4.5bn showing the difficulties for Government in encouraging private sector investment. Other countries do better at their private to public R&D ratio³² • Uncertainty on future funding in certain areas – Cuts to ODA funding are having an impact on international healthcare research and it is unclear whether funding for UK participation in Horizon Europe will be additional or come from existing UKRI budgets • Similar concerns have also been made about 'high risk research funder' ARIA

Life Sciences Vision Pillar	Area	Indicator	Areas of strength	Areas for development
Investment in science and research	Foreign direct investment	Life sciences foreign direct investment projects	<ul style="list-style-type: none"> • Levels of investment – The UK is 2nd of 15 countries for foreign direct investment projects. The 82 projects recorded saw the UK overtake China in 2019. When the analysis was first conducted in 2015 the UK was compared against a smaller group of countries and was behind Germany, which now finds itself in 6th place 	<ul style="list-style-type: none"> • R&D tax relief – The OECD currently ranks the UK's R&D tax relief scheme for SMEs as the 11th most generous of 44 countries. The UK's R&D tax relief scheme for large companies is currently ranked as only the 23rd most generous³³ • The Government is committed to looking at R&D tax relief. Including capital expenditure as eligible expenditure in R&D tax credits will mean higher growth and stronger public finances. A conservative modelling of the tax reform suggests that private sector R&D will be raised across industries by £1.2bn per year and UK GDP will be raised by £4bn over 10 years. Moreover, while the initial cost would be around £430m a year, additional tax revenues generated through higher GDP would mean the policy is cost neutral by year seven after implementation and will have paid for itself by year 12 • The UK is the 9th most competitive economy on the World Economic Forum index³⁴ • Increased R&D spending arising from R&D tax credit reform will create an additional 12,200 R&D jobs, largely in manufacturing. Manufacturing firms make up the majority of R&D spend, but also the majority of R&D capital spend. Hence, the manufacturing sector will disproportionately benefit from enhanced R&D tax credits. Our modelling suggests that of these additional jobs, almost 60% would be in manufacturing³⁵ • Manufacturing investment – A £20m Medicines Manufacturing Fund is welcome, albeit very limited in scope when compared to the scale of global competition
The governance and oversight of health data	Public trust and policy development	Government prioritising improving public trust	<ul style="list-style-type: none"> • Improving public trust – The new NHSX data strategy is clear that: "The public's data belongs to them so it's important it is safely and securely only used in ways that benefit everyone using the health system³⁶." • The Life Sciences Vision also notes the need to "work with the NHS, patients, the public and medical research charities across the UK to safeguard trust and transparency in how health data can be accessed to support R&D³⁷." 	<ul style="list-style-type: none"> • Continuing importance of permission – Ipsos Mori has found that a majority of the public is in favour of using health data to support commercial research, but permission is still a key part of people's attitudes to how their health information is used and shared³⁸ • Concerns about GDPR – Recent worries about the General Practice Data for Planning and Research scheme which seeks to collect primary care data in an anonymised fashion centrally to support research and service planning show how much further work is needed on this agenda³⁹
	Usability and harnessing the power of health data	Level of integration and usability	<ul style="list-style-type: none"> • National initiatives to strengthen data availability and quality – The UK has very good data assets, and a number of initiatives have been advanced to harness the potential of data, including Global Digital Exemplars, Health Data Research Hubs, Our Future Health and the Genomics England programme 	<ul style="list-style-type: none"> • Data fragmentation – Data-sets remain fragmented and accessibility is challenging. Electronic Health Record implementation is variable and inconsistent across the country⁴⁰

Life Sciences Vision Pillar	Area	Indicator	Areas of strength	Areas for development
Access to finance	Investment in UK life science companies	Share of global life science IPOs		<ul style="list-style-type: none"> Low level of IPOs – The UK recorded 1% of such IPOs in the latest set of figures from 2018; amounting to £63m. Annual comparisons are difficult due to the fluctuating nature of markets and innovations, but the first three sets of OLS indicators 2014-16 all recorded the UK as having 4% of such IPOs. Both 2017 and 2018 recorded just a 1% figure. The 2018 figure sees the UK rank 14th of 21 countries assessed⁴¹
		Levels of investment in UK life sciences	<ul style="list-style-type: none"> Increasing investment – Data from the BioIndustry Association (BIA) and Clarivate shows that the UK's biotech and life sciences sector is on the cusp of a golden age driven by strong demand from global investors for UK innovation, with £1.56bn invested in the last quarter (March 2021 – May 2021). This is the highest total amount ever recorded for a quarter since the trade association began recording this data. The BioMedical Catalyst is investing £18 million to develop innovative healthcare technologies and processes⁴² Development of new partnerships – The UK Government's partnership with the UAE on a sovereign investment partnership in life sciences will see £1bn invested 	<ul style="list-style-type: none"> Scaling up BBB – The British Business Bank will need increased resource to support the scaling up of UK life sciences businesses⁴³ Horizon Europe – Challenges regarding the Brexit process continue to create uncertainty regarding the associate status of the UK with regards to Horizon Europe and participation in the Innovative Medicines Initiative⁴⁴

Summary

The above table shows that the UK 's current performance on delivering against the Life Science Vision pillars is variable.

On the positive side the Government is supporting the life sciences sector with investment in research and development; and that in turn is helping to attract international inward investment. The UK leads Europe in early stage research, is attracting a high proportion of new clinical trials for ATMPs and is at the forefront of life science academic research. The UK is looking to tackle some of the long standing data challenges in the NHS, through a range of initiatives and an over-arching data strategy from NHSX. The wider industry-Government environment benefits from good partnership and a long-term pricing agreement.

However, despite this there remain challenges. The UK's R&D tax relief is not one of the most competitive schemes globally and the UK has been particularly negatively impacted in restarting clinical trials. Barriers to the access and uptake of new products exist. A number of welcome initiatives have been introduced to tackle this including the Accelerated Access Collaborative, Innovative Medicines Fund and the Cancer Drugs Fund. However the opportunities of delivering a more systemic solution aligned with the ambitions set out in the Voluntary Pricing and Access Scheme remain under-explored.

Data assets remain fragmented, inhibiting research and more flexible commercial agreements. Recent issues with information governance and privacy show the need to continue to handle such matters carefully. The UK also continues to see only a small part of the IPO market for life sciences and biotech.

Any implementation framework for the Vision will need to tackle these barriers and difficulties to be successful.



CHAPTER

4

The race for life sciences: a global race

The UK has a strong platform to build a global leading hub, but is not alone in seeing life sciences as a core part of its future. Indeed, a number of other countries, both large and small, are moving fast to attract the next generation of life sciences investment.

United States

President Joe Biden has proposed a \$2.3 trillion infrastructure investment plan, that includes significant new investment in US science.⁴⁵ The plan includes \$40 billion to upgrade lab facilities, \$30 billion for R&D that spurs innovation and job creation and \$50 billion for the National Science Foundation.⁴⁶ There is still uncertainty about whether the plan will materialise as it is currently the subject of negotiations with the US Congress.



China

China has risen from 29th in the Global Innovation Index in 2015 to 12th in 2021. The Government's Five-Year Plan, published earlier this year, has increased targets for growth in R&D investment, patent ownership, and value generated by the digital economy. The plan's target for 7% annual growth in R&D investment would see the country become the world's largest R&D spender.⁴⁷



France

France has just launched a France 2030 vision that includes an ambition to produce "20 biomedicines against cancer and chronic diseases including those related to age and create the medical devices of tomorrow."⁴⁸ This follows an announcement earlier this year of a new health innovation agency that will invest €1.5 billion in the development of drugs and devices. €2 billion will also be invested in health start-ups.⁴⁹



South Korea

South Korea's strength in innovation has been the result of a highly top-down model of collaboration between Government-industry and academia. In preparation for the fourth industrial revolution the Government in 2017 launched 'I KOREA 4.0' which focuses on "improving people's quality of life, expanding research capacity and strengthening major industries."⁵⁰ South Korea spends 4.5% of GDP on R&D. Private R&D spending accounted for nearly 80% of South Korea's total R&D spending in 2019, supported by R&D tax incentives and importation of foreign technology.⁵¹



Ireland



Ireland has a thriving life sciences sector, encouraged by the Industrial Development Authority (IDA) and Enterprise Ireland (EI). Relatively low business taxes are part of a package that includes R&D tax credits and incentives for capital investment in facilities. The IDA and EI are seen to be effective at being able to bring together different parts of Government and the health system to present a united and co-ordinated offer to life science businesses. Ireland sits fifth in the league table of life science foreign direct investments in the OLS Competitiveness Indicators and unlike the US, UK and Germany increased such investments from 2019 to 2020.⁵² As the only English speaking country with open access to the EU market and as a gateway between the US and the UK/EU, Ireland has ambitions to continue to invest and grow its life sciences inward investment.

Benelux



The Benelux region (Belgium, Netherlands and Luxembourg) hosts all the top 10 global biopharma companies and 110 medium to large biotech companies. It hosted more biotech launches than any other country in Europe, except the UK, between 2012 and 2018. Benelux is home to major venture-capital funds that represent 22% of all European V-C funds with a focus on life sciences. Biotechs from Benelux raised seven times more between 2012 and 2018 than between 2005 and 2011.⁵³ The region is eyeing an expansion of its life sciences sector and recently became the home of the European Medicines Agency, following Brexit. Life sciences and health is one of the Dutch government's nine top sectors. The Smart Industry Initiative looks to strengthen Dutch industries by promoting the use of cutting edge IT and technology, like 3D printing and nanotechnology.⁵⁴



Effectively implementing the Life Sciences Vision

When building an effective implementation framework for the Life Science Vision to compete globally it will be critical that:

- Implementation metrics are aligned to the success factors
- There are regular reports and progress updates
- The range of different organisations involved are co-ordinated, aiming at the same objectives and held to account

Implementation metrics

The Life Science Competitiveness Indicators have helped to track the performance of the UK life sciences sector in recent years. However there are a number of ways that the indicators could be strengthened:

- It is difficult to contextualise the indicator data, making it difficult to assess whether the UK is performing well, average, or below average in certain areas
- Some of the data is several years out of date, making it difficult to assess current performance and policy impact
- There is a large focus on metrics in certain domains such as investment and with less focus on other areas such as medicines access and uptake

The Government is looking to update the competitiveness indicators as part of a refresh exercise. As it does so it should consider the following improvements that can help support effective monitoring of the implementation of the Life Sciences Vision.

Reforming indicators

Some existing indicators would benefit from more information such as:

- Access to Finance – Indicators should be expanded to assess the proportion of IPOs globally by number of offers rather than just currency offer value
- Access to medicines – Indicators on access to medicines should be expanded to include the mean average time to first HTA output and ensuring that the figures delineate between ‘recommended’ and ‘optimised’ access decisions
- Investing in skills – The indicator on skills should be expanded to measure investment in future skills and capabilities across the life sciences base such as AI and computational computing

Additional indicators

New indicators to support the implementation of the Vision on research could include:

- UK participation in international research collaborations (including possibly the number of principle investigators based in the UK)
- The number of NHS organisations involved in clinical research

And with regards to the NHS as an innovation partner, there are opportunities to include indicators to measure the performance of new and existing policy levers not currently captured:

- MHRA – A new indicator on regulatory outputs now that the MHRA is operating within a Brexit environment. As an example this could include average time to market access from regulatory submission
- Accelerated Access Collaborative – The performance of products selected by the AAC for its Rapid Uptake Product programme
- Innovative Licensing and Access Pathway (ILAP) – Measuring the first NICE output for ILAP medicines relative to non-ILAP medicines. This would help to quantify claims of increased speed / access as a result of this new programme and inform discussions on how NICE and MHRA could collaborate going forward

Alongside improved and additional indicators are opportunities to drive the requisite improvement within them. One main immediate opportunity is the review of NICE methods, the effectiveness of which should be easy to assess through the Competitiveness Indicators by looking at trends in the access and uptake of new approved products.⁵⁵

Organisational co-ordination and prioritisation

There are a number of bodies that will be involved in the successful execution of the Life Sciences Vision, including:

- Central Government (No 10, HMT, Cabinet Office, BEIS, DHSC, OLS)
- Arm's length bodies (UKRI, NIHR, MHRA, NICE, Genomics England, HDRUK)
- NHS (NHSE/I, NHSX, NHSD, AHSNs, NHS commissioners - ICSs)
- Industry (across the range of industry bodies – pharmaceutical, diagnostics, med tech, digital etc)

The delivery of the seven missions within the Vision should be co-ordinated across these groups together in a sensible, pragmatic and collaborative fashion. It will also be vital that key organisations with lead responsibility for the implementation of the Vision, such as NICE and the MHRA, have the capacity to deliver.

Currently this sort of co-ordination is primarily done through the Life Sciences Council chaired by the Secretaries of State for BEIS and DHSC. The council meets twice a year, but it has a number of ongoing working groups below it progressing particular issues. The Life Sciences Vision and missions should now become the focal point for the Council and its work with appropriate structures and committees established. National Clinical Directors in the seven mission areas should be included within the relevant working group discussions.

It will also be important that the Vision is also prioritised within the NHS structures set out in the Health and Social Care Bill.

Given the commitment to make the UK a world leader in clinical research with faster and more efficient trials, the Government should include a mandate for ICSs to prioritise research and support commercial trials.

Regular reporting and progress updates

In order to ensure the Vision is effectively implemented it will also be critical that there is transparency, through regular reporting and progress updates.

A year after the publication of Innovation, Health and Wealth, the NHS published IHW: One year on. The document set out the actions the NHS had taken as a result of the strategy. Of the 31 indicators, it was claimed 25 had been delivered. However of the six that had not been completely delivered, two of the most important were 'aligning financial incentives' and 'strengthening the leadership and accountability for Innovation.'⁵⁶ There remain challenges for accountability with innovation delivery today. Regular reporting and progress updates can help tackle this, including:

- Setting ambitions and targets against the revised implementation indicators above, so that UK progress can be assessed and performance contextualised globally. This could include setting targets for global trial recruitment, speed of NICE appraisals, levels of research funding etc

- ## Summary of recommended approach for successful Life Science Vision Implementation



Conclusion

The dynamic, co-ordinated response to the Covid-19 pandemic from Government and the life sciences industry provides a strong foundation from which to build a global leading life sciences hub in the UK as outlined in the Conservative manifesto.

The UK has a number of areas of strength to move forward with. These include increasing levels of investment in research and a strong base of scientific skills and academic leadership. The Life Sciences Vision, with its seven healthcare missions, presents an opportunity to translate this into improvements in population health outcomes in important areas such as cancer, dementia and mental health.

However, as this report shows, the implementation of past visions and strategies has been mixed. Global competition for life science investment, which was already strong, has risen further. Other countries are identifying opportunities for differentiation and building attractive offers.

In order for the 2021 UK Life Sciences Vision to succeed effort will be needed right across the four critical success factors identified in the Vision: NHS partnership; Government funding; unlocking the power of data; and access to finance.

The forthcoming implementation plan for the Vision will be important for this and should adopt a three part framework to succeed. This should include a clear set of revised metrics across the different areas of the Vision, greater co-ordination of the different bodies and actors involved and setting clear targets and ambitions and reporting on them regularly.

The Government is right to identify life sciences as a sector for strategic investment, partnership and future growth. An effective implementation plan can help deliver on the opportunity and ensure the UK continues with its ambitions to lead the global race.



Endnotes

- 1 <https://policyexchange.org.uk/following-the-science-policymakers-deserve-their-share-of-praise-for-backing-a-sector-that-is-leading-the-uk-out-of-the-pandemic/>
- 2 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1000030/life-sciences-vision.pdf
- 3 <https://www2.deloitte.com/global/en/pages/life-sciences-and-healthcare/articles/global-life-sciences-sector-outlook.html>
- 4 <https://www.cbi.org.uk/media-centre/articles/decisive-action-to-boost-life-sciences-could-deliver-better-patient-outcomes-and-help-uk-pull-away-from-the-competition/>
- 5 <https://www.pfizer.co.uk/sites/pfizer.co.uk/files/201906/Driving-Global-Competitiveness-of-the-UKs-Life-Sciences-Ecosystem-250619.pdf>
- 6 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/32457/11-1429-strategy-for-uk-life-sciences.pdf
- 7 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/32457/11-1429-strategy-for-uk-life-sciences.pdf
- 8 <https://www.gov.uk/government/news/government-unveils-industrial-strategy-to-boost-productivity-and-earning-power-of-people-across-the-uk>
- 9 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/650447/LifeSciencesIndustrialStrategy_acc2.pdf
- 10 <https://www.gov.uk/government/news/government-unveils-industrial-strategy-to-boost-productivity-and-earning-power-of-people-across-the-uk>
- 11 <https://www.gov.uk/government/publications/life-sciences-sector-deal/life-sciences-sector-deal-2-2018>
- 12 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/857348/Life_sciences_industrial_strategy_update.pdf
- 13 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/857348/Life_sciences_industrial_strategy_update.pdf
- 14 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/857348/Life_sciences_industrial_strategy_update.pdf
- 15 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1000030/life-sciences-vision.pdf
- 16 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1000030/life-sciences-vision.pdf
- 17 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1000030/life-sciences-vision.pdf
- 18 <https://www.gov.uk/government/speeches/reinvigorating-our-system-for-international-health>
- 19 <https://ct.catapult.org.uk/clinical-trials-database>
- 20 OLS Competitiveness Indicators

- 21 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/999071/MHRA_Delivery_Plan_21-23_Final_210618.pdf
- 22 OLS Competitiveness Indicators
- 23 <https://www.abpi.org.uk/media-centre/news/2021/september/use-lessons-from-covid-19-to-revitalise-post-pandemic-clinical-research-environment-says-abpi/>
- 24 <https://www.abpi.org.uk/media-centre/news/2021/september/use-lessons-from-covid-19-to-revitalise-post-pandemic-clinical-research-environment-says-abpi/>
- 25 https://www.abpi.org.uk/media/8641/abpi_clinical-trials-report-2021.pdf
- 26 OLS Competitiveness Indicators
- 27 <https://www.nice.org.uk/about/what-we-do/our-programmes/nice-guidance/nice-technology-appraisal-guidance/data/appraisal-recommendations>
- 28 <https://www.efpia.eu/media/602652/efpia-patient-wait-indicator-final-250521.pdf>
- 29 <https://www.nice.org.uk/about/what-we-do/our-programmes/nice-guidance/nice-technology-appraisal-guidance/data/appraisal-recommendations>
- 30 http://www.pmlive.com/pharma_intelligence/NICE_but_not_enough_1352882
- 31 <https://data.oecd.org/rd/gross-domestic-spending-on-r-d.htm>
- 32 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/977265/Life_Science_Competitiveness_Indicators_2020_report.pdf
- 33 <https://wpi-strategy.com/site/wp-content/uploads/2021/02/RD-tax-credits-WPI-Feb-2021.pdf>
- 34 <https://tradingeconomics.com/united-kingdom/competitiveness-rank>
- 35 <https://wpi-strategy.com/site/wp-content/uploads/2021/02/RD-tax-credits-WPI-Feb-2021.pdf>
- 36 <https://www.gov.uk/government/publications/data-saves-lives-reshaping-health-and-social-care-with-data-draft/data-saves-lives-reshaping-health-and-social-care-with-data-draft>
- 37 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1013597/life-sciences-vision-2021.pdf
- 38 <https://www.ipsos.com/sites/default/files/publication/5200-03/sri-wellcome-trust-commercial-access-to-health-data.pdf>
- 39 <https://www.theguardian.com/society/2021/aug/22/nhs-data-grab-on-hold-as-millions-opt-out>
- 40 <https://www.abpi.org.uk/publications/unlocking-the-promise-of-uk-health-data/>
- 41 OLS Competitiveness Indicators
- 42 <https://apply-for-innovation-funding.service.gov.uk/competition/922/overview>
- 43 <https://www.bioindustry.org/uploads/assets/fc087ec2-ac56-4a6e-b117aa5edc643543/Becoming-a-life-sciences-superpower-Report.pdf>
- 44 <https://sciencebusiness.net/news/gabriel-confirms-uk-cant-join-horizon-europe-until-row-over-northern-ireland-protocol-settled>
- 45 <https://www.whitehouse.gov/briefing-room/statements-releases/2021/03/31/fact-sheet-the-american-jobs-plan/>
- 46 <https://sciencebusiness.net/news/biden-unveils-historic-325b-research-and-innovation-plan>

- 47 https://www.wipo.int/global_innovation_index/en/2021/
- 48 <https://www.elysee.fr/emmanuel-macron/2021/10/12/presentation-du-plan-france-2030>
- 49 <https://sciencebusiness.net/news/macron-unveils-eu30b-innovation-plan-make-french-industry-great-again>
- 50 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/926075/2020_South_Korea_Snapshot.pdf
- 51 <https://www.nature.com/articles/d41586-020-01466-7>
- 52 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1007243/Life_Science_Competitiveness_Indicators_2021_report_final.pdf
- 53 <https://www.mckinsey.com/~media/McKinsey/Industries/Pharmaceuticals%20and%20Medical%20Products/Our%20Insights/Biotech%20in%20Europe%20A%20strong%20foundation%20for%20growth%20and%20innovation/Scaling-innovation-How-Benelux-could-become-Europes-leading-biotech-hub-March%202020.pdf>
- 54 <https://www.government.nl/topics/enterprise-and-innovation/encouraging-innovation>
- 55 <https://www.nice.org.uk/about/what-we-do/our-programmes/nice-guidance/chte-methods-consultation>
- 56 <https://www.gov.uk/government/publications/creating-change-innovation-health-and-wealth-one-year-on>



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11 Tufton Street
London
SW1P 3QB

@fh_research

www.futurehealth-research.com

February 2021