May 2025

British Heart Foundation response to the House of Lords Science and Technology Committee inquiry:

Financing and Scaling UK Science and Technology: Innovation, Investment, Industry

Key points

- The UK lags many G7 nations in terms of R&D investment, particularly government investment, which falls below the OECD average and major scientific competitors. This weaker investment risks long-term competitiveness and growth.
- The UK's Life Sciences sector is a crucial driver of economic growth and global research leadership. Government support for, and investment in, underfunded areas like cardiovascular disease (CVD) research could unlock significant economic and health benefits by aligning funding with disease burden.
- Universities are fundamental to driving innovation, but stagnation in research funding, particularly the Charity Research Support Fund (CRSF), threatens their ability to sustain world-class research. Similarly, research within the NHS enhances patient outcomes and supports the broader health economy, but financial and structural barriers hinder clinical research activity.
- High visa costs and restrictive immigration policies are making the UK less attractive to international researchers. Comparatively, the UK's visa fees are significantly higher than competitor science nations, contributing to a worsening STEM skills shortage and the financial instability of UK universities reliant on international students and researchers.

Policy recommendations

- Government should look to provide ambitious, long-term funding for R&D in the 2025 Comprehensive Spending Review and Autumn Budget to make the UK a leading country in the G7 for investment.
- The upcoming Industrial Strategy must set out a long-term, sustainable plan to increase public and private investment in the Life Sciences sector, to grow the sector's competitive advantage and allow it to contribute to the UK's growth missions.
- Government must outline cardiovascular disease as a priority area for R&D funding, to ensure there is no shortfall over the next decade and to safeguard the future of UK cardiovascular research and drive advances against some of the country's biggest killers. We need to see public investment in R&D increase, enabling a boost in cardiovascular disease research funding as a priority.
- Government should look to put the SDE programme on a sustainable footing, using the upcoming industrial strategy, 10 Year Health Plan and ultimately the Comprehensive Spending Review and Autumn Budget to provide the structure and long-term funding commitment to complete the programme without unnecessary delay.
- In delivering its upcoming Immigration White Paper, Government should look to address the impact of high visa costs and restrictions on the UK's ability to attract and retain top international research talent, as well as on UK Universities and their sustainability.
- To ensure a sustainable research base, as set out in the Nurse review, action is needed to make sure that more of the end-to-end costs of research are met, and there is an incentive to undertake charity funded university research. As agreed by the university and charity sector, this should include an additional uplift in CRSF in line with charitable investment and a focus on long-term sustainability.
- Government should consider the recommendations made in the OSCHR report on reversing declining clinical researcher numbers, chiefly removing the disincentives to conduct research while proactively valuing and promoting clinical research careers.

About British Heart Foundation

British Heart Foundation (BHF) is the nation's heart charity, representing more than 7.6m people living with heart and circulatory diseases in the UK.[1] BHF currently supports £430m of lifesaving research[2] across the UK, as well as over 1,200 research staff.[3]

Since BHF was established in 1961, the annual number of deaths from heart and circulatory diseases in the UK has fallen by nearly half.[4] Nevertheless, as the Labour Government's election manifesto rightly recognised, cardiovascular disease (CVD) remains one of the UK's biggest killers, leading to around a quarter of all deaths.[5] After decades of progress, premature deaths from CVD in this country are now rising. BHF analysis of official stats shows that in 2023, over 48,000 people in the UK died prematurely (before the age of 75) of cardiovascular conditions, which is an average of 940 people each week – and a 15-year high.[6]

As challenging as this picture may seem, we have a vital opportunity to reverse more than a decade of lost progress and get heart care back on track. A sustained and strategic focus on reducing the impact of, and improving outcomes from, CVD can deliver economic growth and promote a healthy nation, supporting the Government's ambitious missions to build a future-fit NHS and fix the foundations of the UK economy.

Scaling UK Science and Technology

1. Translating excellent basic science and technology into global companies has long been recognised as a problem for the UK. Many policy initiatives have tried to address this. What are the key barriers that the Government must address to fix this? What specific policies need to change? Why have previous attempts not succeeded?

a) What lessons can be drawn from international comparators for innovation ecosystems such as the US, Germany, France, Ireland, Sweden, the Netherlands, or Singapore? Which international innovation ecosystems offer the most relevant policy lessons for the UK, and why? Are there specific policies the UK should adopt or case studies from which we can learn?

The UK currently lags many G7 nations in terms of research and development (R&D) investment as a percentage of GDP, impacting the long-term competitiveness and stability of our science base. According to the latest OECD data, which reflects 2021 spend, the UK's R&D investment as a proportion of GDP (2.9%) is significantly lower than South Korea (4.9%), the US (3.5%), and Germany (3.1%)[7]. Of greater concern is the relatively low investment by Government in R&D as a percentage of GDP (0.57%), which sits below the OECD average (0.63%) and well below competitor scientific nations, whose government contribution to R&D was between 0.69% and 1.12% of GDP[8].

The UK should be a leading country in the G7 on R&D investment, it is central to Government's growth missions and is the foundation upon which the UK's economic prosperity, well-being, and global competitiveness rest. The strength of Government's own investment in R&D is fundamental to encouraging private sector innovation and investment in UK Life Sciences, acting as a catalyst, boosting the confidence of businesses to invest[9]. Government's recently announced record R&D funding was a very welcome boost for the sector. However, DSIT budget allocations amounted to a real terms flat cash allocation for UK Research and Innovation (UKRI)[10], the main arm for public investment in innovation. There is enormous value to be derived from investment in UKRI. UKRI's own analysis shows that £2 of private sector R&D investment is attracted by every £1 of UKRI investment, with further downstream indirect leverage. Ensuring long-term investment in the UK's innovation agency is necessary to ensuring the UK's R&D strength. The UK's weaker public R&D investment relative to international comparators underscores the need to learn from global leaders such as South Korea, Germany, and the US. Their public investment crowds in the private investment that sees their Life Sciences sector thrive. Government should therefore provide ambitious, long-term funding for R&D in the 2025 Comprehensive Spending Review and Autumn Budget to make the UK a leading

country in the G7 for investment. Within the upcoming Industrial Strategy government must set out a long-term, sustainable plan to increase public and private investment in the Life Sciences sector, to grow the sector's competitive advantage and allow it to contribute to the UK's growth missions.

c) What can the UK do to ensure that science and technology developed in the UK has the maximum economic and strategic benefit to the UK? Do other countries have policies—for example, in intellectual property—which have allowed them to retain more public benefit domestically?

The UK's strong science base benefits both national and global healthcare and outcomes, and has unique advantages that can be leveraged to deliver world leading innovations. This was most evident in the UK's rapid development of the Oxford-AstraZeneca COVID-19 vaccine, a collaboration between industry, universities and government to develop a world leading solution to a global problem.[11] However, the UK risks losing its status as a world leader in R&D without long-term strategic funding commitments and a structured plan to leverage its unique advantages.

NHS health data is a unique asset to the UK that supports medical innovation and economic growth by facilitating high-impact research. The NHS Data for Research and Development Programme aims to enhance secure health data access for research[12], bringing together a network of secure data environments (SDEs) to provide faster and more secure access to datasets for research purposes. The Government's new flagship Health Data Research Service is an ambitious and innovative venture that will likely utilise and expand upon the SDE infrastructure developed under the NHS Data for R&D programme, linking it with datasets in the devolved nations to benefit research across the entire UK. These programmes are vital to ensuring public trust in the use of NHS data for research and must be delivered with the resource to deliver clear, effective communication about how they ensure security and efficiency. However, to date, this programme has not been sustainably funded, being subject to short funding cycles requiring regular renewal. Government should look to put the SDE programme on a sustainable footing, using the upcoming industrial strategy, 10 Year Health Plan and ultimately the Comprehensive Spending Review and Autumn Budget to provide the structure and long-term funding commitment to complete the programme without unnecessary delay.[13]

Linked to this, Government has recognised the importance of artificial intelligence (AI) in research and healthcare. BHF-funded research has already helped to develop innovative tools leveraging these existing innovations, including a tool that rapidly analyses heart MRI scans with greater precision than humans.[14] These are driving impact within our health system, having been rolled out to the NHS in 2022. Trust in the use of AI in research and healthcare will depend on effective regulation that ensures transparency, explainability and accountability in the development of AI technologies. Such regulation must codify high ethical standards to support their application and require specific evaluation for unintended exacerbation of inequalities caused by data bias. Currently, there is no AI-specific legislation in the UK, but a range of programmes, including the MHRA's Software and AI as a Medical Device Change Programme and the AI and Digital Regulations Service, are seeking to fill this gap.

The Health Foundation has suggested that Government look to deliver an AI in Healthcare Strategy[15] that provides coordination and confidence in the use of AI within the NHS. As part of such a strategy, the Government could assess how a regulatory framework can best provide clarity and consistency for AI developers and users in its use of public health data.

e) Is the UK at risk of, or experiencing, brain drain for scientists, technologists, and entrepreneurs? How can the Government prevent this, and ensure the UK remains an attractive destination for internationally mobile talent, and actively seek out top scientists and innovators to move to the UK? How can the UK ensure that it trains sufficiently skilled people for its wider science and technology ambitions?

The UK's science base is reliant on international researchers to deliver the leading science and innovations it is known for. A 2024 BHF assessment found that 24% of our award holders were neither British nor British Dual Nationals, therefore were most likely international talent.[16] Access to this talent is vital to our activities as a medical research funder. However, changes to visa entry requirements, and an uncompetitive visa offering compared to competitor science nations risks the UK losing out on some of the top research talent that drives future success for the science sector.

High visa costs, particularly upfront costs, in part due to the immigration health surcharge, place a prohibitive cost on international talent. Visa fees have surged by up to 58% (2021–2024),[17] making the UK one of the most expensive destinations for international researchers. A family of four on the Global Talent Visa faces £20,974 in upfront costs—far higher than the U.S. (£250) or Germany (£100).[18] The immigration health surcharge has jumped 66% over the same period to £1,035 per year. These high visa costs contribute to the UK's worsening STEM skills shortage, which is currently costing the economy £1.5 billion annually.[19].

The UK's visa regime also undermines the sustainability of the UK's universities, a core component of its science base, with these institutions being vital to attracting, training, and retaining talent. As a result of changes to the costings and rules for UK student visas in recent years, which prevent many international student bringing dependents, recruitment of international students has decreased significantly overall, with 16 per cent fewer applications for visas in 2024 than in 2023.[20] Office for Students modelling suggests that, as a result, nearly three quarters (72 per cent) of higher education providers could be in deficit by 2025-26, and 40 per cent would have fewer than 30 days' liquidity.[21]

A lack of financial sustainability for our research institutions risks the UK losing top talent to more stable and sustainable international competitor nations. The imminent Immigration White Paper is an opportunity for Government to adjust its visa approach to support UK R&D. Within it, Government should look to address the impact of high visa costs and restrictions on the UK's ability to attract and retain top international research talent, alongside bringing visa fees more in line with international standards. Government must also look to deliver a sustainable solution for UK universities, and as part of this solution address the impact the UK's visa regime is having on the viability of Higher Education Institutions.

Strategic Priorities for UK Science and Technology in a Changing World

2. How should the UK's science and technology strategy respond to ongoing major changes in the economic, geopolitical, and technological landscape? What challenges and opportunities now face the UK's science and technology sector? What policy actions would you prioritise?

a) **Is there clear cross-government coordination on delivering the UK's science and technology strategy, including from the Treasury and central Government as well as DSIT? How could cross-Government coordination be improved?**
b) **Does the UK Government have the right strategic priorities for its R&D spend? For example, do the five critical technologies identified in the Science and Technology Framework align with the UK's strengths and weaknesses? What about the emerging prioritisation in the Government's Industrial Strategy? What implications will a required shift to defence spending in R&D have?**

To address the ongoing challenges within the R&D landscape, it is critical that science and technology policy takes a cross-Government approach. We welcome the inclusion of R&D in the development of the 10 Year Health Plan; it is important that the published plan and subsequent implementation joins up activity across DSIT and DHSC, in order to drive forward progress on both the health and growth missions.

Government announced a record R&D budget in April for 2025/26, which, whilst welcome, painted a mixed picture for the R&D sector. As previously stated, UKRI received an approximately flat cash settlement despite

record R&D funding, which, with inflation, amounts to a funding decrease for this year. As noted by the Campaign for Science & Engineering, this shift in R&D funding away from UKRI, the main funder of discovery research in the UK, will have an impact on the fundamental research underpinning the UK's R&D sector.[22] Whilst we are aware of many competing priorities in a challenging global context, Government must not lose sight of the long-term sustainability of R&D in the UK, and the profile that best fits that sustainability. Life Sciences has been a pillar of the UK's science success and must be supported to see it drive future successes for the UK economy.

c) Given that the UK cannot be world-leading in everything, which sectors should the UK prioritise (and de-prioritise)? Which sectors offer opportunity for the UK to obtain a strategic advantage, given global supply chains and the nature of the UK economy?

The UK must prioritise its Life Sciences sector, and within it, its medical research excellence, when considering where it both has a competitive and strategic advantage. The UK consistently ranks highly in global research output, maintaining the highest field-weighted citation impact (FWCI) among G7 nations[23], and is home to 4 of the top 10 global universities for life sciences and medicine.[24] This research excellence is invaluable in attracting the innovative talent and companies to the UK that will deliver a competitive advantage and growth for the economy.

The sector is a cornerstone of the UK's R&D ecosystem, generating £108.1 billion in turnover.[25] Investment in life sciences is both economically and strategically important for the UK's security and competitiveness. Every £1 invested in medical research within the UK also generates 25p in economic returns through job creation and public health benefits.[26] Investment is the catalyst for further economic returns that strengthen growth whilst fostering new discoveries and ensuring that the UK remains at the forefront of medical advancements.

Within the Life Sciences sector, Government now has the opportunity to deliver strategic investment in areas of medical research that have historically been underfunded relative to their burden. These areas, like CVD, have enormous potential, because we have the expertise and science base to deliver excellence, but to date they haven't received the extent of funding that would fully unlock this potential. Doing so could deliver significant economic and health benefits to the nation. CVD remains one of the UK's biggest killers, causing 1 in 4 deaths in the UK.[27] This is despite the work of the BHF, which has helped halve annual CVD deaths from heart and circulatory diseases since the 1960s.[28] In 2019, cardiovascular, stroke and blood disorders accounted for 13% of all years lived with a disability or lost to premature death in the UK. Despite this, together they received only 7% of public and charity research funding in 2022.[29] Long-term sickness due to heart/circulatory disease now accounts for 30% of the economically inactive population.[30]

Addressing this area of historic underinvestment will help to bring down disease burden, stimulating economic activity, and further drive innovation. Aligning heart disease research investment to its impact on the UK's overall health has been estimated to require £650m[31]. Our own analysis indicates that just to maintain an investment equivalent to the insufficiently low 2022 level of £291 per case in real terms, public investment would need to rise to £18.6m above inflation annually to 2035. This is a total increase in investment of £370m from 2025-2035. To ensure heart patients continue to benefit from the best and most innovative treatments, we need to see overall public investment in R&D increase, enabling a boost in cardiovascular disease research funding as a priority.

To achieve this, Government should work with research councils and funders to define a plan to increase cardiovascular disease research funding within the development of the new Industrial Strategy and subsequent Life Sciences Plan. As identified by IPPR, Government's own estimates that £1 of government investment stimulates about £2 of private investment means an aim to deliver an increase of £220m in public R&D investment could crowd in £430m of private investment, bridging the gap whilst stimulating growth and acting on disease burden[32]. A joined-up approach, clearly outlining cardiovascular disease as a priority area,

is needed to ensure there is no shortfall over the next decade and to safeguard the future of UK cardiovascular research and drive advances against some of the country's biggest killers.

d) Does the current scientific incentive structure, around funding, peer review, and publications, reward high-impact science and technology? How can it be reformed to do so without just adding more bureaucracy to the system? Are there any lessons the UK's public research funders, such as UKRI and ARIA, can learn from the field of metascience to maximise their impact?

University-led R&D activities

Universities drive innovation, delivering cutting-edge research. Funding for universities incentivises follow-on economic activity, drives innovation and boosts the economy. For instance, every £1 allocated through the Higher Education Innovation Fund (HEIF) generates £10 of value.[33] Public funding of research invested at Russell Group universities generates over £8.50 per £1 invested for the UK economy.[34] Our UK universities consistently rank highly internationally and produce world-leading research outputs. As such, charities invest significantly within the UK, with Association of Medical Research Charities (AMRC) alone investing £1.7bn in collective research spend in the UK.[35] The vast majority of this was within UK universities, with 87% of AMRC grants active in 2023 being held at universities. Despite this, there are growing disincentives within the research ecosystem to undertake charity funded university research, due to the stagnation of the Charity Research Support Fund (CRSF). This is particularly concerning given the growing issues of financial sustainability within these institutions, which undermines their ability to deliver world class science and innovation.

The CRSF is a partnership between Government, charities and universities, which was brought in under the last Labour government, and was a much needed and welcome policy at the time. Charities cover the directly incurred costs of the research they fund, as well as some directly allocated costs if they are in line with their charitable mission. However, they do not cover indirect research costs as these sit outside of their charitable objectives. Government therefore supports charity funded research at universities by providing a block grant to cover indirect costs, allowing universities to recover a greater amount of the full economic costs of research.

However, the amount Government has provided universities via the CRSF has stagnated. The Fund was worth £135.5 million, in 2006, when it was set up. It was supposed to reach £270 million by 2010-11 but it has yet to reach that, with the current value of the fund only £219 million.[36] During the same period charitable investment has almost doubled and research costs have ballooned.[37] Charity funded research now only covers roughly 69% of the full economic costs (fEC) of research even when the CRSF is included, despite the aim being 80%,[38] threatening the partnership between Government, charities, and universities. To ensure a sustainable research base, as set out in the Nurse review, action is needed to make sure that more of the end-to-end costs of research are met, and there is an incentive to undertake charity funded university research. As supported by the university and charity sectors, this should include an additional uplift in CRSF in line with charitable investment and a focus on long-term sustainability. This would incentivise the continued collaboration between charities and universities that have delivered lifesaving innovations and world-leading advancements.

Research within the NHS

Research-active NHS sites improve patient outcomes and reduce mortality rates.[39] Furthermore, NHS staff engaging in research report higher job satisfaction and reduced burnout.[40] That is why at BHF's funding supports this via our Consultant Research Awards, which provide NHS consultants protected time for research. However, a 2021 Cancer Research UK report found that many NHS staff lack time and resources to conduct research.[41] A subsequent 2023 House of Lords inquiry confirmed growing pressure on clinical researchers' time[42]. And even more recently, a report commissioned by the Office for Strategic Co-ordination

of Health Research (OSCHR) found that urgent action is required to address falling numbers of clinical researchers, which are roles vital to meeting the needs of the nation's health and economy.[43]

A 2020 survey by the Royal College of Physicians (RCP) found that 57% of doctors want more research involvement.[44] Clinically trained research staff in the NHS are central to the UK's global reputation for biomedical research and its applications to improving health, doing this by driving discovery research and innovation at the intersection between clinical and academic practice.[45] They also drive the UK economy through growth across the life sciences sector by attracting inward investment from global industries who recognise their unique and valuable position.[46]

The decline in these roles is due to a lack of incentives in terms of pay and career progression, financial pressures on universities limiting the recruitment opportunities for these roles, and NHS pressures, amongst others.[47] Government must explore solutions to NHS research inactivity, and the decline in the researchers essential to delivering that activity. The Health and Care Act 2022 established duties on NHS England and Integrated Care Boards to facilitate and promote research[48], but Lord O'Shaughnessy's recent review found that this duty is not being adhered too.[49] Widespread and systemic reform is needed to fully realise a research-active NHS, and this can be delivered via Government's upcoming 10 Year Health Plan. Government should consider the recommendations made in the OSCHR report, chiefly removing the disincentives to conduct research while proactively valuing and promoting clinical research careers to avoid further decline.

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