British Heart Foundation response to Industrial Strategy

4. What are the most important subsectors and technologies that the UK government should focus on and why?

4.1 The Life Sciences sector and cardiovascular disease research

The Life Sciences sector is a cornerstone of the UK's economy and public health. It encompasses several fields including pharmaceuticals and medical technology, driving innovation and providing high-value jobs. In 2023, the sector generated a £108.1 billion turnover and for every £1 invested in medical research, the economy sees a return of 25p. This return is derived from public health benefits, job creation and innovation.

Continued Government investment is crucial to fostering new discoveries and ensuring that the UK remains at the forefront of medical advancements.

Cardiovascular (CV) research is particularly strong in the UK. Cardiovascular disease (CVD) remains one of the UK's biggest killers, causing one in four deaths in England and significantly impacting the economy through healthcare costs and lost productivity.

The British Heart Foundation (BHF), which is the largest independent funder of CV research, has been instrumental in cutting the number of people dying from CVD in half since its inception in the 1960s. This achievement underscores the importance of sustained focus on health research to continue discovering new treatments and improving patient outcomes.

Despite this work, CV research is severely underfunded compared its burden, especially in comparison to other diseases such as cancer. In the latest Health Research Analysis report, CVD was associated with a 13.1% disability adjusted life years (DALY) rate, yet it received just 7.4% of investment, half of which was provided by the BHF.

This underfunding has real-world consequences. While achieving economic growth is central to this Government, it remains that 30% or 1.3 million people who are economically inactive due to long-term sickness have a heart or circulatory disease. The Government cannot afford to delay the discovery of innovative CVD treatments that could help these individuals who all deserve a happy, healthy life and could be contributors to a thriving economy.

Ultimately, a focus on Life Sciences and health research aligns with the Government's missions to build an NHS fit for the future and stimulate economic growth. By investing in and supporting the Life Sciences sector, the Government can modernise the NHS, improve patient care, and drive economic prosperity.

4.2 University-led R&D activities

Universities are a key component of a thriving research ecosystem, driving innovation and economic growth through cutting-edge research and collaborations. Their role was

particularly evident during the Covid-19 pandemic, with the University of Oxford's development of the Oxford-AstraZeneca vaccine being a notable example. This vaccine has been vital in combating the virus globally, showcasing the importance of university-led research in addressing health crises.

Investing in university-led research and development (R&D) activities delivers proven returns on public funds: every £1 allocated in England through the Higher Education Innovation Fund (HEIF) resulted in around £10 of value, and every £1 of public funding invested in Russell Group university research was found to generate more than £8.50 for the UK economy.

Such feats consolidate UK universities' reputation for being the envy of the world, as evidenced by them consistently ranking highly in international league tables including Quacquarelli Symonds (QS). They also produce excellent research outputs, with 84% of 2,000 submissions from UK universities being classed as world-leading and internationally excellent in the 2021 Research Excellence Framework. These submissions were comprised of institutions' research environments, outputs and impact. The current issue of university sustainability is therefore a concern that requires urgent Government attention.

Charities play a key role in university-led research by providing essential funding, with members of the Association of Medical Research Charities (AMRC), including BHF, investing almost £2 billion in 2022. The Charity Research Support Fund (CRSF) is the primary way they achieve this.

Created in 2006 by the Labour Government, the CRSF is an agreement between charities, Government and universities for charities to cover the other "direct costs" of research including project-specific costs and consumables, while Government covers the "indirect costs", including non-project specific costs like institutional administrative fees and shared IT.

However, the CRSF has largely stagnated since its creation, while charitable investment has doubled in the past decade, increasing from £557 million in 2707 to £1.8 billion in 2023.

This funding model wherein Government isn't keeping pace with charity contributions is threatening medical research partnerships 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. 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.

4.3 Research within the NHS

Alongside university-led research, research done by healthcare professionals is a key component of medical research. Publications including NHS England's 2023 'Maximising the Benefits of Research: Guidance for Integrated Care Systems' highlight the benefits that

patients treated in research-active NHS sites experience, including improved outcomes and lower mortality rates. Engaging in research also benefits staff, who report improved job satisfaction, morale and reduced burnout. BHF's Consultant Research Awards provide NHS consultants the protected time they need to conduct research activities alongside their clinical duties, by paying for a portion of their time, which frees them up to conduct research.

Despite staff's interest in engaging in research, a 2021 Cancer Research UK report 'Creating Time for Research', which BHF contributed to, found that NHS staff lack the time, resources and support they need to undertake research. These findings were confirmed by a 2023 House of Lords inquiry into clinical academics, which concluded that the time clinical researchers and consultants can devote to research is increasingly under pressure.

Widespread and systemic change is needed to truly realise the benefits of a research active NHS. In an Association of Medical Science's 2023 report 'Future-proofing UK Health Research, a pilot in a number of hospitals was recommended, where a proportion of consultants were offered a contract that includes dedicated time for research. The purpose of this scheme would be to provide further data on the impact of this approach on a range of factors, including research activity, staff recruitment and retention, and patient outcomes. Establishing a pilot of this nature or expanding to include a broader range of healthcare professionals, could provide invaluable information on how protected time can contribute to addressing a range of the challenges faced by the NHS.

4.4 Health data and AI

Health data is vital in medical research, and it has the potential to unlock solutions to complex medical problems in new ways. The NHS's data assets are among the richest in the world, as they include comprehensive health records from millions of patients across the UK. This information is invaluable for research, enabling scientists to identify patterns, track disease progression, and develop targeted treatments. BHF-funded researchers regularly utilise these data assets to make advancements in CV research, leading to better patient outcomes and reduced mortality rates.

AI also holds immense potential to revolutionise healthcare and AI algorithms are already being used to detect early signs of diseases like cancer and heart disease, allowing for timely interventions that can save lives. However, there are barriers to fully realising AI's applicability in health and care settings.

As outlined in the 2019 NHS Long Term Plan, there is a need for a digitally literate research workforce however, the 2024 Darzi review into the state of the NHS highlights "low digital maturity" across the system and calls for a "major tilt towards technology to unlock productivity". The 2024 Sudlow review also highlights "ongoing headcount caps and skills shortages" as challenges to successful data infrastructure initiatives.

While the NHS does offer a Digital Learning Solutions service that is embedded in over 300 health and social care organisations across England, it only specialises in generic IT skills, and it is not mandatory. Staff having limited digital skills means that vast stores of NHS data are likely being underutilised, thereby delaying critical research and medical breakthroughs.

Recognising this, in 2023, the UKRI AI Centre for Doctoral Training in Digital Healthcare was launched. This £28 million initiative will train a new generation of PhD-level researchers, including clinical PhD fellows and allied healthcare professionals, to develop AI systems that address healthcare challenges with a focus on patient needs and societal values.

At the BHF, our Research Excellence Awards fund work in six of the UK's leading universities so that experts from diverse fields can come together to tackle the biggest questions in cardiovascular research, including improving diagnosis with AI. For example, BHF-funded researchers at Imperial College London have recently developed an AI model that can predict patients' risk of developing and worsening disease using an electrocardiogram (ECG).

Such upskilling will be crucial if the Government's health research AI ambitions, such as the £140 million NHS AI Lab which aims to accelerate the safe adoption of AI in health and care, are to be realised.

5. What are the UK's strengths and capabilities in these subsectors?

5.1 A strong science base

The UK boasts a robust science base that significantly contributes to its flourishing Life Sciences sector. According to recent data, the UK ranks highly in global research output and impact, maintaining the highest field-weighted citation impact (FWCI) among G7 countries. Nearly 60% of the UK's research publications in 2020 involved international collaboration, the highest among comparator nations.

Furthermore, this strong science base produces results that benefit both the national and international community. For instance, until the 1990s, getting a definitive heart failure diagnosis was difficult until BHF-funded researchers discovered a simple blood test that could transform the early diagnosis of heart failure by measuring the levels of B-type natriuretic peptide (BNP) in the blood. Today, the BNP test is part of the gold standard for heart failure diagnosis in the UK as well as internationally, with the European Society of Cardiologists and the American Heart Association recommending it in their guidelines due to its high diagnostic accuracy.

Such achievements underscore the importance of continued investment in the UK's R&D to sustain its leadership in the Life Sciences sector. By fostering a vibrant research ecosystem,

the UK can continue to make significant contributions to national and global health, as well as economic growth.

5.2 Strong cardiovascular research and medical research charities

The UK is renowned for its strong CV research base, which has led to significant advancements in the prevention, diagnosis, and treatment of heart diseases. This robust research environment is supported by the collaborative efforts of universities, healthcare institutions, and medical research charities. BHF is proud to have contributed to this through our support of researchers, research careers and centres of excellence in this vital area.

Medical research charities play a pivotal role in funding and facilitating this research. As mentioned previously, in 2022 AMRC member charities collectively invested nearly £2 billion in UK health research. This financial support ensures that researchers have the resources they need to pursue innovative studies and develop new treatments that can save lives.

The continued investment by medical research charities including BHF is also crucial for maintaining the UK's leadership in cardiovascular research and ensuring ongoing progress in combating heart disease.

5.3 NHS data

NHS data is invaluable for the Life Sciences sector and medical research, providing a rich and comprehensive resource that supports a wide range of studies. The NHS' extensive health records, covering over 55 million patients, enable researchers to identify patterns, track disease progression, and develop new innovative treatments.

NHS data also helps us to advance our medical knowledge and improve patient outcomes. For example, in 2023-24, the NHS Clinical Research Network (CRN) supported 6,074 studies across various health conditions, including cancer, heart disease, dementia, and depression. This demonstrates the significant role NHS data plays in facilitating clinical trials and driving medical research forward.

Currently, the NHS's Data for Research and Development Programme is enhancing the use of health data by creating secure environments for research, ensuring data privacy while maximising its potential for discovery research. This integration of rich health data with cutting-edge research methodologies is essential for tackling complex health challenges and developing innovative solutions.

6. What are the key enablers and barriers to growth in these subsectors and how could the UK government address them?

6.1 The UK lags behind other G7 nations for R&D funding

Historically, inadequate and unambitious funding of UK R&D has been a key barrier to growth. In the 2024 Autumn Budget, the Chancellor gave R&D a record £20.4 billion

investment for 2025/26, in recognition of the importance of R&D in achieving the Government's growth agenda.

Whilst this investment is positive, the UK still lags behind international comparators in terms of overall R&D investment as a proportion of GDP. Latest analysis shows that UK investment as a percentage of GDP was 2.4% for 2020, which was less than other countries including South Korea (4.8%), the United States (3.4%) and Germany (3.14%). This undermines the UK's status as a research-intensive country, and its ambition of becoming a world-leader in R&D.

As mentioned previously, within the overall R&D underfunding is CV research, which is also underfunded. Although CVD had a 13.1% DALY rate, it received just 7.4% of investment in 2022. Recent analysis by the BHF indicates that due to inflation, the Government will need to invest £259 million into CV research over the next decade, just to maintain research spending at these already too low 2022 levels.

The Government should provide ambitious, long-term funding for R&D in the 2025 Spending Review to ensure the UK is a leading country in the G7 on R&D investment.

Government should work with research councils and other funders to define a plan to increase CVD research funding to ensure that there is no shortfall over the next decade and investment is matched to its impact on individuals and society.

6.2 UK universities are struggling to remain financially sustainable

A key enabler to growth is the UK university sector however, universities are currently experiencing financial difficulties that have resulted in approximately 70 institutions adopting cost-saving measures, including cuts to jobs and courses.

This is partly due to the immigration policies of the previous Government, which included raising the cost of student visas by 35% earlier this year. Consequently, international student enrolment fell by more than a third in July alone, and research suggests that East Asian students are now more likely to attend their local institutions than those in the UK. These trends are damaging to the university system, which has long relied on international students' fees to subsidise its operational costs and to support research activities.

Recently, the Government's increased the maximum fees for standard full-time courses by 3.1% in alignment with inflation, effective from the 2025/26 academic year. While this may help to address universities' financial sustainability problems, more must be done to consolidate the reputation of UK universities and to secure the financial sustainability of university research.

The Government should create a Global Strategy for Universities as recommended in Universities UK's 2024 report 'Opportunity, growth and partnerships: a blueprint for change from the UK's universities', to strengthen the UK's reputation abroad.

6.3 The CRSF has not kept pace with inflation or rising charity investment

As outlined in Section 4.2, charities play an invaluable role in facilitating university-led research, and CRSF is an important contributor to recognising the value of charity-funded research.

When it was launched, the CRSF stood at £135.5 million, with a commitment to increase it to £270 million by 2010-11. Despite two small uplifts in the past decade, this has never been fully honoured and today, it stands at only £219 million. At the same time, charitable investment has doubled, increasing from £557 million in 2007 to £1.8 billion in 2023.

As a result, the real terms value of CRSF has fallen from 28p received by universities for every £1 of charity investment in 2010/11 to an expected 12p for every £1 by 2030.

These downward trends mean that universities will continue to struggle to cover the full economic cost (fEC) of charity-funded research, which is the total cost of undertaking a project, including all direct and indirect expenses. This therefore threatens the long-term sustainability and impact of charity-funded research, which constitutes a significant portion of university research.

The Government should almost double its contributions to the CRSF with a £195 million increase in current funding and work with charities and universities to find a sustainable long-term solution.

6.4 NHS staff do not have enough time to conduct research

Despite its benefits for both patients and staff and staff's desire to conduct more research in their roles, CRUK's 2021 report 'Creating Time for Research' found that staff often resort to taking annual leave to conduct research. This is despite NHS staff having programmed activities (PAs), which are allotments of time set aside for distinct activity, allocated for research activities.

Furthermore, in the 2020 “Research for all” survey by the Royal College of Physicians (RCP), 57% of doctors surveyed said that they would like to be more involved in research, and 67% said that dedicated time for research would make them more likely to apply for a role.

Targeted interventions that remedy the lack of time for research activities are urgently needed, if the Government is to create an NHS fit for the future.

As it considers the next iteration of the Long Term NHS Workforce Plan, the Government should work with the NHS and other stakeholders to explore solutions to this research inactivity, including trialing a pilot scheme that provides consultants with a contract that includes dedicated time for research.

6.5 Datasets are not representative of the UK's diverse population

Unrepresentative datasets can undermine the potential of data-led research to provide solutions for the whole population.. Representative datasets are crucial in medical research to ensure that findings are applicable to diverse groups. When datasets lack diversity, the

results can be biased, leading to treatments and interventions that are less effective or even harmful to underrepresented groups. This can exacerbate existing health inequalities, as certain groups may not receive the same quality of care or benefit from medical advancements, which is alarming when we consider that the UK is reported to have significant health inequalities compared to other European countries like Italy and the Netherlands.

This issue is compounded when we consider medical devices used to help diagnose disease. One device designed to spot the early signs of dangerous falls in oxygen levels during the Covid-19 pandemic, a pulse oximeter, was reported to be less effective at measuring oxygen levels in those with darker skin. This led to an NHS Health and Race Observatory report recommending an urgent review into the use of this device by the Medical and Healthcare Products Regulatory Agency (MHRA). And in some countries, medical algorithms use military personnel health data, for which women represent just 6% of the population. This leads to increased likelihood of misdiagnoses for heart disease in women compared to men, for example.

These disparities highlight the critical need for inclusive datasets that accurately represent all ethnicities and genders, so that we can ensure equitable healthcare outcomes for all.

Realising this problem, the NHS has launched the Data for Research and Development Programme, which aims to create more representative datasets by securely accessing and utilising NHS health data. While this initiative is a positive step towards addressing the issue, it needs to be significantly scaled up to fully tackle the problem of unrepresentative datasets in medical research. Expanding this effort will help ensure that medical research benefits everyone, regardless of their background.

The Government should take action to ensure representation in its research initiatives, including by publishing an AI in healthcare strategy which sets out plans to better regulate the datasets that AI technologies are trained with. This should be produced in collaboration with stakeholders including researchers, charities and public and patient involvement groups.

6.6 A clear and consistent regulatory regime is needed for AI

BHF welcomed the Government's manifesto commitment to improve public services through AI, and its expansion of the Department of Science, Innovation and Technology's (DSIT) size and scope to facilitate this. AI has huge potential to transform healthcare, including by improving diagnostics. For example, BHF-funded researchers at University College London and Barts Heart Centre Davie have developed a tool that can analyse heart MRI scans in 20 seconds and detect changes to the heart structure with 40% greater precision than a human can.

However, to realise AI's full potential in medical research, regulation is needed to ensure that there's transparency in the development of AI technologies, that health data is used

securely and that there are ethical standards in place to support the application of AI. Currently, there is no AI-specific legislation in the UK. Instead, medical AI is regulated by a patchwork of general legislation including the 2002 UK Medical Devices Regulations and the 2018 Data Protection Law, depending on whether an AI product is classed as a medical device by the MHRA.

This regulatory minefield hinders the potential use of generative AI in healthcare settings for functions including optimising GP notes, deciphering diagnostic images and medical charts, assisting with HR functions and translating instructions to patients into their native languages.

Although plans have been announced to establish a Regulatory Innovation Office which will update AI regulations, and the King's Speech mentioned requirements for those working to develop the most powerful AI models, clear regulatory requirements for software and AI are needed in healthcare and research to provide clarity and protect patients.

As part of an AI in healthcare strategy, the Government should create a regulatory framework that provides clarity and consistency for AI developers and users.

6.7 UK visa costs are significantly higher than competitor nations

The cost of UK visas for international research talent is a significant concern to maintaining and enhancing talent and international research collaboration. 2024 Royal Society analysis shows that total upfront immigration costs in the UK increased by up to 58% depending on visa type between 2021 and 2024. Notably, a family of four coming to the UK on the UK Global Talent Visa (GTV), which is the UK's premier route for research talent, can expect to pay £20,974 upfront. This is the highest upfront cost among comparator nations including the United States (£250) and Germany (£100). The immigration health surcharge (which needs to be paid alongside a visa application) also increased by 66%, to £1,035 per year.

For research organisations and institutions, high fees threaten their ability to attract the world's brightest and best. As of March 2024, 24% of BHF award holders reported that they did not hold British or British Dual nationality status, and as such, were international researchers that likely required visas to work in the UK.

Overall, high visa costs make the UK a less attractive destination for international research talent, which exacerbates the UK's long-standing STEM skills shortage that costs the economy £1.5 billion per year. High visa costs also undermine the Government's ambitions of the UK becoming world-class in R&D and of building international relationships.

To guarantee that top international CV research staff continue to support the UK's science base, the Department for Science, Innovation and Technology should work with the Home Office to review the impact of the UK's visa offering on recruiting international research staff, bring overall costs in line with international competitors, and simplify the application system to reduce the administrative burden on researchers.

6.8 International collaboration needs to be consolidated

International collaboration in life sciences is crucial for advancing our understanding of complex health challenges and developing innovative treatments for diseases. By pooling resources, expertise, and data from diverse global teams, researchers can tackle scientific challenges more effectively and accelerate the pace of discovery. Governments can facilitate these collaborations by providing financial support and creating policies that encourage cross-border partnerships.

BHF's Big Beat Challenge is an example of a successful international collaboration established by a charity. The £30 million challenge tasked researchers with forming international, multi-disciplinary teams to solve the most urgent problems for those suffering from heart and circulatory diseases. The winners of the challenge, CureHeart, aim to find new treatments for inherited heart muscle diseases.

The Labour Party's manifesto commitment to strengthen international relationships aligns perfectly with the need for international research collaborations. Its "Britain reconnected" agenda rightly emphasises the importance of forging new partnerships to deliver prosperity in the UK and abroad. By investing in collaborative R&D initiatives, the Government can consolidate the UK's existing partnerships while addressing global challenges such as CVD.

Charities have an important role to play in this agenda, and we would welcome Government collaboration with charities like the BHF to facilitate more international research projects like the Big Beat Challenge.

13. What challenges or barriers to sharing or accessing data could the government remove to help improve business operations and decision-making?

13.1 An appropriately funded, accredited and trustworthy network of Secure Data Environments

Good progress has been made to ensure that data can be shared and accessed easily and securely for research purposes. The 2022 Goldacre report recommended that Secure Data Environments (SDEs), formerly known as Trusted Research Environments (TREs), be created and made the norm for all analysis of NHS patient data records by academics, NHS analysts, and innovators. Today, there are 12 SDEs including the NHS SDE and 11 subnational SDEs, which are anticipated to become the default way that NHS health and social data is accessed for research and analysis purposes, by 2025.

Notably, the BHF's Data Science Centre (DSC) which is funded in partnership with Health Data Research UK, was the first SDE to be used for research during the Covid-19 pandemic. Through the DSC, BHF-funded researchers were able to investigate the impacts and effects of the virus on CVD in terms of diagnosis, management and patient outcomes.

Whereas before SDEs, researchers had to request the data that they needed from different providers with differing application processes, the new data storage and access platforms make it easier for researchers to access NHS health data through one portal.

Additionally, because SDEs operate like a reading library that prevents researchers from exporting any person-level data, the public can trust that their data is being used securely. The Government's plan to accredit SDEs will further strengthen trust in SDEs by holding SDEs to strict standards for security, privacy and data management.

Public trust is particularly important in relation to data access as demonstrated by past failures including the 2021 General Practitioner Data for Planning and Research (GPDPR) rollout. Designed by NHS Digital to improve healthcare planning and reduce the administrative burden placed on GPs, the GPDPR programme prompted more than a million of NHS England's 55 million patients to opt out of NHS data sharing due to their distrust in who the NHS would share their data with. This ultimately led to the programme being delayed twice before being suspended altogether.

To ensure that SDEs continue to improve the ease of accessing health data for research, the Government must use its next Spending Review to ensure that the central SDE and all subnational SDEs are on sustainable footing beyond 2025.

Further, all national organisations in the four UK nations should develop a UK-wide system for standards and accreditation of SDEs holding data from the health and care system.

As recommended in the 2024 Sudlow review, the Department of Health and Social Care should oversee and commission continuous engagement with patients the public, so that they can be involved in deciding how their health data is used and can understand the risks, benefits and safeguards that are in place. This would help consolidate public trust.

NHS Digital must draft and implement a comprehensive communications plan to educate the public and patients about SDEs, including their risks and benefits. It must also increase its public and patient involvement activities to establish and maintain trust in the SDE service.

28. How should the industrial strategy accelerate growth in city regions and clusters of growth sectors across the UK through local growth plans and other policy mechanisms?

28.1 R&D investment must be distributed more evenly across the country

The Industrial Strategy can accelerate growth across the UK by ensuring that R&D activity is equally distributed across the country. Historically, research activity in the UK has been concentrated in the Greater South East or the "Golden Triangle", which refers to London, Oxford and Cambridge. As a result, this region's life science sector attracts enormous investments including £2 billion in 2023 and supports 250,000 jobs.

This concentration of world-leading medical research institutions and hospitals also means that those living in this region have better health outcomes and life expectancy compared to areas without these facilities. This disparity contributes to the UK's existing health inequalities, which is counterproductive to the Government's ambition to halve the gap in healthy life expectancy between the richest and poorest areas by 2030.

Charities including BHF help spread R&D across the country, with BHF funding 41.8% of its projects outside of the Greater South East in 2023/24. And while approximately 49% of Government R&D funding was invested outside the Greater South East in 2023, a sustained effort is needed to ensure that the Greater South East receives long-term, equitable Government R&D investment.

Failing to take more action to spread research activity across the country, jeopardises the ability of city regions and clusters outside of the Golden Triangle to experience growth, thereby locking their inhabitants out of the economic and health benefits that intense R&D activity provides.

To ensure growth and positive health outcomes beyond the Greater South East, the Industrial Strategy must include a clear plan to increase R&D activity outside of the Greater South East, including a financial target that meets or exceeds 55% of domestic R&D funding.