



Future-proofing UK Health Research: a people-centred, coordinated approach



This report has been approved by the Academy of Medical Sciences' Council.

The Academy is most grateful to the members of the Steering Group and Patient and Carer Reference Group for undertaking this study. We thank the Academy's Officers, Council members, the external Review Group appointed by Council, and staff, as well as our Fellows and all those who have contributed through our evidence-gathering workshops and stakeholder meetings.

Contributions by the Steering Group and Patient and Carer Reference Group were made purely in an advisory capacity. The members of the Steering Group and Patient and Carer Reference Group participated in an individual capacity and not as representatives of their organisations.

The project was funded by a core grant from the Department for Business, Energy and Industrial Strategy (BEIS) but was carried out independently of Government. The Academy is also grateful to our funders, including the Jean Shanks Foundation, for their financial contribution to support this workstream. As a charity external funding and donations are vital to our work.

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Our solutions are centred on inspiring people and organisations to take collective responsibility for an ecosystem that allows public, private, charitable and NHS sectors to leverage one another's strengths in support of overall sustainability. This will require strong coordination across all stakeholders in health research.

Executive summary

For decades, the United Kingdom has been widely recognised as one of the best places for health research, with world-renowned academic research institutions, unmatched research potential of the NHS and a vibrant life sciences industry. This has made the UK a global magnet for talent and the knowledge generated has delivered benefits for people in the UK and around the world. However, this strength should not be taken for granted.

This report analyses reasons behind the UK's strength in health research and assesses the factors that increasingly threaten its ability to deliver the health and economic benefits we depend on. **We consider the steps required to take a holistic, inclusive and future-proofed approach to the sustainability of our health research ecosystem and the people and institutions on whom it depends.**

Why is health research important?

UK health research saves and improves lives domestically and around the world. UK advances in basic and discovery research have laid the foundations for many breakthroughs in healthcare, from enabling the sequencing of the human genome to improving our understanding of the human immune system to enable development of antibody therapies used to treat a range of inflammatory diseases. Research has also led to public health interventions such as the smoking ban, and driven technological advances like Magnetic Resonance Imaging (MRI).

The COVID-19 pandemic is a compelling example of the value of UK health research to the nation's health, wellbeing and health security: from our public health response and understanding the virus, to developing diagnostics, evidence-based repurposing of treatments, and development of novel vaccines. **The key to this world-leading effort was the balance of discovery, clinical and public health research across academic, healthcare and industry settings underpinned by collaborative partnerships between sectors and the involvement of patients, carers and the public.** This recent experience clearly demonstrates the vital link between the UK's strength in health research and our health security and resilience.

Health research indirectly benefits patients and researchers. The NHS is an extraordinary national asset and yet it faces many chronic challenges, including workforce issues, backlogs and keeping pace with emerging health trends and threats. Prioritising research in the NHS and other healthcare settings is core to the long-term resilience of both our health and health service. Research-active hospitals have better patient outcomes, including lower mortality rates, with the benefits extending beyond the direct research participants.^{1,2,3} Evidence suggests engaging in research can improve clinicians' job satisfaction, boost morale and reduce burnout.^{4,5,6,7}

The health research sector drives economic gains. In 2021, the UK life sciences industry employed over 280,000 people, of which almost 100,000 were employed at research and development (R&D) sites. Public sector investment also delivers a clear financial dividend: **every £1 of public investment in medical research delivers a return equivalent to around 25p each year, forever.**⁸

More broadly, a healthy nation is fundamental to the UK's prosperity. Health research fuels discoveries that keep people healthier for longer. A healthy population is essential for economic prosperity - better health increases the overall labour supply by increasing worker productivity and extending healthy working years.^{9,10,11} Meanwhile, poor physical and mental health does not just negatively impact lives, it can lead to economic inactivity, increased demands on health and social care provision, and reduced productivity and tax revenue.^{12,13}

Importantly, people strongly support spending on health research. Polling shows that the public see health as a research priority.^{14,15} Indeed, many people choose to fund health research themselves and medical research is consistently amongst the most popular charitable causes in the UK.¹⁶ Our own public engagement suggests people care about health research because it could benefit anyone at some stage in their lives.¹⁷

Key threats to the sustainability of the health research ecosystem

Despite the current strength and promise of UK health research, the system faces a number of issues. Our analysis, informed by a Steering Group, a Patient and Carer Reference Group and supplemented by evidence-gathering with individuals and organisations from all parts of the research system, identified four interconnected issues. In this report we present a range of solutions that will help to address these:

1. Research culture and career structures can be inflexible, precarious and exclusive, undermining the ability of diverse individuals with diverse expertise to fully explore their potential and be part of the health research system.

People are central to a sustainable health research system. However, conventional career structures remain precarious and there is evidence of a growing and, at times, unmanageable workload on the next generation of researchers. The system also fails to value critical career paths outside of the norm, with insufficient opportunities for team scientists and skills specialists. These factors combine with cultures that fail to include underrepresented groups and those whose expertise does not align with conventional research experience, including patients, carers and the public. Here we present a range of actions that will help to place people at the heart of sustainable health research.

2. There is a lack of multidirectional movement of research talent between public, private and charitable research sectors.

Limited understanding between sectors, poorly aligned incentives, and a perception of both personal and institutional risk from cross-sector mobility continue to create conditions in which movement between sectors is, at best, unidirectional and, at worst, disincentivised. This is to the detriment of the system as a whole - not enough people have a clear understanding of the needs of other sectors, making it more difficult for these sectors to work together effectively and ultimately stalling innovation. It also limits the range of career opportunities for individuals who feel unable to move between sectors, meaning cross-cutting skills and insights that can drive innovation and future impact are missed. This report offers solutions that can help to ensure people have the opportunity to develop careers that span sectors.

3. The existing funding model fails to cover the full cost of health research and relies on cross-subsidy.

The variety of health research funders in the UK creates a unique and interdependent funding system. However, the system is failing to live up to the sum of its parts, as the full costs of health research are not covered by any funder. The gap between the cost of research and the income received for that research is widening in academic institutions, making the system increasingly financially dependent on cross-subsidy from other sources, primarily international students' tuition fees. The failure to cover the full costs of research is detrimental to the institutions where it takes place, but also to all those who work with and within the system. Our findings show that the sector must work together to drive towards financial sustainability of health research.

4. Our healthcare system struggles to embed health research.

Clinical delivery pressures and a failure to value the contribution that research makes to healthcare are creating a healthcare system that is unable to prioritise research. Meanwhile, the people who drive research in healthcare settings enjoy limited opportunities. Clinical academics find it hard to develop their dual careers between academia and the NHS, whilst healthcare and public health professionals wishing to engage in research do not have adequate time or support to do so either from their employers or from their professional bodies. Here we offer solutions that will help to maximise our healthcare system's research potential.

Many of these issues exist across the R&D system and we found evidence of positive initiatives already underway to tackle them. However, we conclude that health research experiences specific challenges and has unique opportunities due to the blend of public, private and charitable funding; complex career pathways in NHS, academia and industry; importance of patient, carer and public involvement; and high cost of research.

Our analysis shows that some of these issues were exposed by the pandemic, although most pre-date the emergence of COVID-19 and many appear to be getting worse rather than better. External factors such as inflation threaten to further exacerbate these issues in the immediate future. Overall, the combined and erosive effect of these challenges presents a **real risk of steady decline**, to the detriment of the UK's health and wealth.

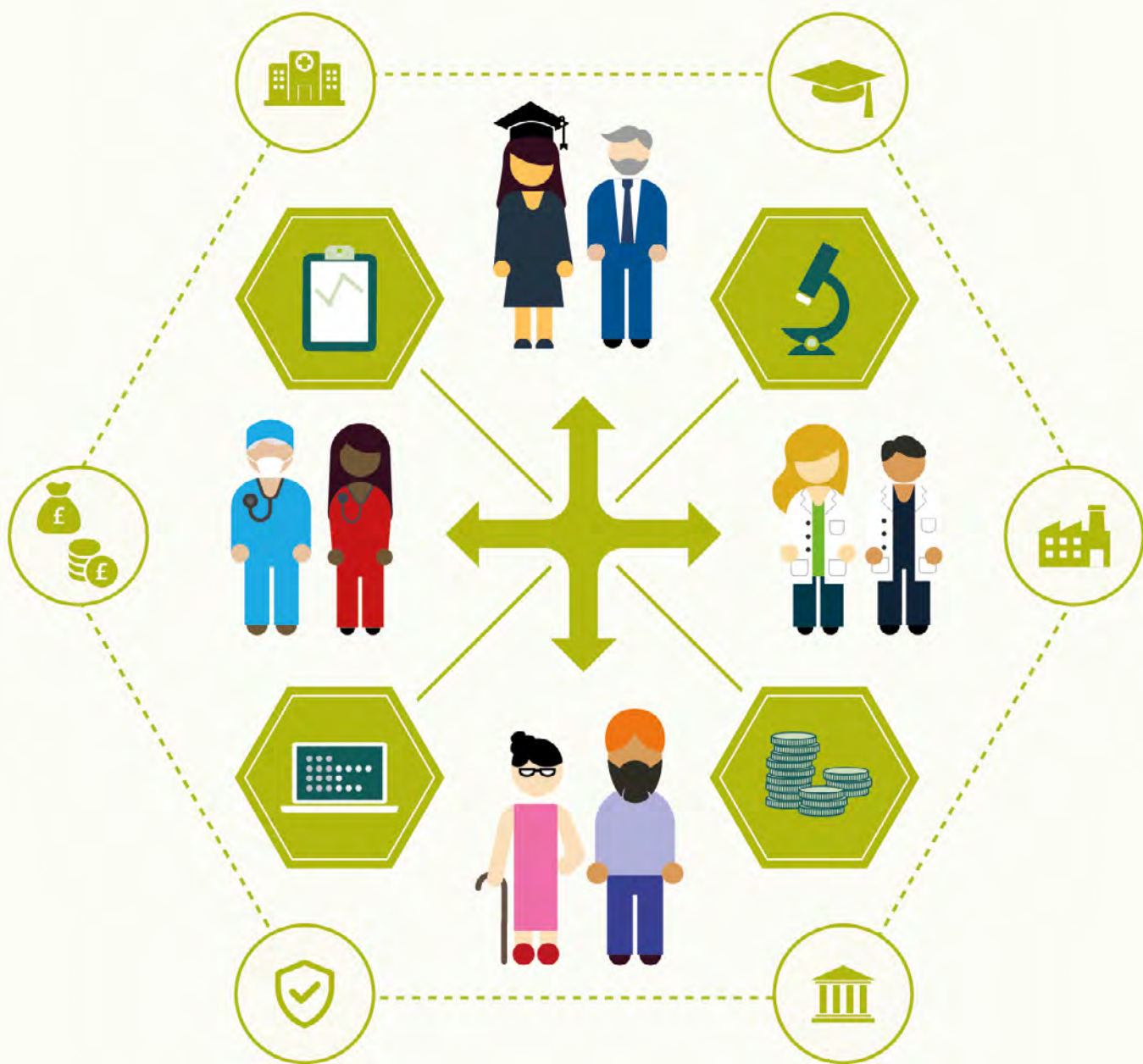
Our vision for a sustainable health research ecosystem

In this report, we take a **holistic approach** to these issues, informed by the views of today's leaders in research; patients, carers and the public; as well as the next generation of researchers. We seek to build on the strong history of collaboration to present solutions that will deliver a world-leading and sustainable health research ecosystem in the UK. Our solutions are centred on inspiring people and organisations to take **collective responsibility** for an ecosystem that allows public, private, charitable and NHS sectors to leverage one another's strengths in support of overall sustainability. This will require **strong coordination** across all stakeholders in health research.

Through the **coordinated approach that we propose in this report**, we believe that it will be possible not only to address the four issues we describe above, but also to train, support and empower the diverse research talent of the future, as well as providing a financially sustainable platform for ideas, innovation and partnerships to thrive. In doing so, we can continue to ensure the UK is amongst the best places in the world to conduct health research for the benefit of patients and the public.

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Solutions

Here we present a range of potential solutions to address the four key issues outlined above. In the report, we present a short (non-exhaustive) summary of some of the existing activities and initiatives that can contribute to the 'toolkit' that will help to deliver and implement each solution.

Delivering the solutions we propose needs to be underpinned by strong coordination across all stakeholders in health research, from basic biomedical through to clinical and applied research. This should include public and charitable funders, higher education institutions (HEIs), industry, patients, carers and the public, and NHS leaders. Whilst there is a strong history of coordination in health research through bodies such as the Office for Strategic Coordination of Health Research (OSCHR) and UK Clinical Research Collaboration (UKCRC), we believe that applying these principles to existing and new coordinating bodies will be vital to delivering the solutions set out in this report.

Three principles should underpin this coordination:

1. **Clear accountability for a coordinating body/bodies** including lines of reporting with other bodies.
2. **Representation of all key health research stakeholders** including public and charitable funders, higher education institutions (HEIs), industry, patients, carers and the public, NHS and public health leaders.
3. **Access to appropriate resource and data** to perform necessary functions.

To address this overarching challenge, the Academy of Medical Sciences will therefore commit to mapping existing coordinating functions in health research, before convening key stakeholders from across the sector, including existing coordinating bodies to consider:

- Strengths, challenges and gaps in existing coordination
- How the principles above can support enhanced coordination in health research

We will convene this group within six months of publication of the report.

This table summarises our specific solutions with key organisations responsible for implementing them identified on the left-hand side.

Key



Public funder



Charitable funder



Higher education institute



Government



Regulator



Industry



NHS

In order to future-proof the UK health research system, we must place people at its heart



1. To address the issue of precarity and inflexibility of research careers and expand the breadth of opportunity, we propose the following solutions:	
	<p>a. Public and charitable funders and employers should ensure that their respective funding and employment strategies provide greater security and career development opportunities for health researchers, including clear use of open-ended contracts wherever possible, and where it is not, use of redeployment practices; shared commitments between funders and employers on researcher salaries; and greater consistency for extending accrued benefit for individuals moving between fixed-term contracts within or (especially) between sectors.</p>
	<p>b. Academic employers should develop enhanced career paths for those working as part of interdisciplinary teams ('team science') and skills specialists including through the creation of clear structures for career progression.</p>
	<p>c. Public and charitable funders should expand the opportunities for, and recognition of, team science activities, including through the Future Research Assessment Programme (FRAP), tailored grant opportunities and co-investigator status.</p>
	<p>d. Funders and employers should continue to recognise the impacts of unavoidable disruption to research careers such as ongoing impacts of the pandemic on career progression including through use of COVID-19 impact statements and flexibility of promotion and reward procedures.</p>
2. To create a research culture that rewards good academic citizenship, values the well-being of researchers, and provides the time for researchers to innovate, we propose the following solutions:	
	<p>a. Funders and employers should increase access to inclusive research leadership training and give greater prominence to inclusive leadership and wider markers of good academic citizenship in reward and promotion.</p>
	<p>b. Public and charitable funders should include/introduce greater standardisation in their grant application requirements to reduce the workload of the research workforce, including reduced bureaucracy as recommended in the <i>Independent Review of Research Bureaucracy</i>.</p>
	<p>c. Public and charitable funders should introduce innovations in their grant-making processes that will help to reduce workload for researchers, such as including two-stage application processes, where detailed submissions are only required after preliminary assessment, and partial randomisation above a certain quality threshold for small awards.</p>

3. To increase the inclusivity of health research careers in the UK, we propose the following solutions:



- a. Funders and employers must coordinate efforts to improve the **collection and sharing of holistic data, across a range of protected characteristics, on the diversity of the health research workforce**. This should range from early career researchers, postdoctoral researchers (including those employed through research grants) through to senior leadership and Trustee levels.



- b. Individual funders and employers should use these data to **develop evidence-based delivery plans** to address any inequalities that are identified. This may include:
- i. **the design and delivery of targeted and specific interventions at particular career stages** and/or for particular underrepresented groups.
 - ii. activities targeted at diversity at senior leadership and Trustee positions in funders, charities and HEIs.



- c. The health research ecosystem must collectively renew its efforts to present and promote health research as an attainable and attractive career path for all, including through:
- i. **investing in awareness-raising initiatives** targeted at secondary school and undergraduate levels, with a particular focus on those who may not previously have considered research careers.
 - ii. diversifying routes of entry into research through apprenticeships and other routes.

4. To ensure the UK remains open to talent from across the globe, Government departments, funders and regulators should work together to remove barriers to attracting global talent:



- a. Home Office, UK Visas and Immigration and the Department for Science, Innovation and Technology (DSIT) must ensure that our **visa and immigration system works effectively, fairly and in an expedient fashion for health researchers working in public, private and charitable settings (as well as for their families) and is competitive** with other strong research nations.



- b. Public and charitable funders should consider the **inclusion of visas and Immigration Health Surcharge as eligible costs** in their research grants.



- c. Regulatory bodies such as the **General Medical Council (GMC) and Nursing and Midwifery Council must work with the Royal Colleges and other stakeholders to ensure that recognition of their clinical qualifications does not present undue regulatory or financial burden** on clinical academics seeking to bring their research expertise to the UK.

5. To properly value patient and public involvement in health research, we propose the following solutions:



- a. Public and charitable funders and employers should work together to **create a culture that truly values Patient and Public Involvement (PPI)** in health research through:
- i. **enhancing peer-to-peer support, career development and training opportunities for both the lived experience** and academic researchers they fund/employ.
 - ii. **demonstrating the value of lived experience researchers** through opportunities for co-investigator and/or co-applicant status on research funding, formal training, accreditation and honorary and temporary research contracts for lived experience researchers to ensure greater access to the research infrastructure in HEIs or other research settings.

5. (Continued)



- b. Public and charitable funders across the four nations of the UK should develop **consistent and fair remuneration policies**, particularly recognising both the true time committed and costs incurred by lived experience researchers.



- c. Public and charitable funders should **develop pre-award funding streams for PPI at the earliest stages of conception of research projects**.

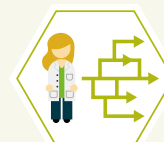


- d. **Coordination and collaboration between public and charitable funders** to provide strategic co-funding to address key gaps in the advancement of public involvement: the development of robust methodologies, learning and development, underserved community involvement and understanding impact.



- e. **Sharing of best practice across public and charitable funders** across the four nations of the UK including through clear, publicly accessible information on interventions and robust evaluations of their success.

In order to future-proof the UK health research system, we must ensure talented people have the opportunity to develop careers that span sectors



6. To create the conditions in which multidirectional movement between sectors is understood, attractive and attainable for individuals and organisations, we propose the following solutions:



- a. Employers across academia, industry and HEIs should **adopt hiring, promotion and reward procedures** that recognise and assess the value that candidates moving from different sectors can bring to their organisations and agree methodology to calibrate markers of achievement in those different sectors.



- b. **Secondments and joint appointments** between academia, industry, NHS, Government departments and agencies and other settings should be far easier and more attractive, including through:
- employers providing mechanisms to take the employee back at a grade commensurate with their experience
 - employers adopting streamlined and standardised policies for secondments and joint appointments wherever possible. In academic settings, Universities UK (UUK) should work with its members to support greater consistency.



- c. Research England and Higher Education Funding Bodies in the devolved administrations should ensure that the **FRAP incentivises and rewards HEIs for creating an environment that supports cross-sector mobility**.



- d. The Office for Life Sciences should **commission an audit and analysis of existing and recent cross-sector mobility initiatives** in health research to better understand existing successful cross-sector schemes at all career stages: what works; what doesn't work; and where there are gaps that need filling, including for lived experience researchers.



- e. The **BEIS R&I workforce survey should be expanded** to capture information on the prevalence, drivers and barriers to cross-sector mobility.



- f. Using information from this audit and survey, **public and private sector employers and funders should invest in tailored schemes to promote cross-sector mobility**.

In order to future-proof the UK health research system, we must ensure that the true cost of excellent health research is adequately covered



7. To fully understand the current failure to cover the full economic costs of health research, we propose that:

- a. **Public, charitable and industry funders are coordinated and transparent in their data collection and annual reporting on:**
- i. the **relationship between research funding and research costs.**
 - ii. the extent to which **research funders are achieving their own commitments to cover certain costs** of the research that they fund.
 - iii. expectations on matched funding from partners.
- b. there should be annual assessment of these data and a coordinated response to the trends they reveal.

8. To maximise the strength of the UK's varied, vibrant and collaborative health research funding system, funders across public, charitable and private settings must take a collective responsibility to work in partnership to sustainably fund health research. This should include:

- a. Governments across the four nations delivering **increased investment in the fundamental underpinnings of health research** that will support and leverage investment from other sources, including through:
- i. investment from Research Funding Councils across the four nations to ensure that **mainstream, un-hypothecated quality-related/Research Excellence Grant (QR/REG) funding keeps pace with other forms of investment.**
 - ii. Research Funding Councils across the four nations working with charities to **recommit to their shared objective to 'work together to improve the financial sustainability of [...] research'.** This should include consideration of **how Charity Research Support funding can leverage further charitable investment** and ensure that charity-Government partnership **funds the full economic costs at a level competitive with Research Council funding.**
- b. The Association of Medical Research Charities (AMRC) working with its members to **expand innovative models of partnership across the charitable sector** to ensure every pound of public money invested goes as far as possible towards improving people's health.
- c. The Association of the British Pharmaceutical Industry (ABPI), BioIndustry Association (BIA) and UUK working with their members to generalise and disseminate the **guidance and criteria for assessing the value of industry-academic collaborations** to ensure they represent value for money for both parties.

9. To achieve true financial sustainability, which attributes value to the full diversity of people and activities required for excellent research, it will be vital to allocate funding to the solutions set out above. This should include:

- a. Accounting for the true costs of supporting research career development, reducing the precarity of research careers and supporting meaningful PPI.
- b. Ensuring that the FRAP measures and rewards these approaches.

In order to future-proof the UK health research system, we must maximise the research potential of our healthcare system



10. To reassert the value of research as a core part of the NHS's business, we propose that:



- a. Every **Integrated Care Board (ICB), NHS Trust and Health Board** should have **responsibility for valuing and promoting research** across their organisations, and annually publish information on the outcomes and benefits of all research activities.



- b. **ICBs and Hospital Trusts** should seek to enhance opportunities to share **innovation and to learn** from one another's experience of developing and implementing their research strategies, including how they involve patients, carers and the public in the process.



- c. **ICBs in England and comparable bodies in the rest of the UK** should use their **annual business plans to set out how research can support clinical delivery**, including through enhanced job satisfaction, reduced burnout and improved retention; improving healthcare pathways through health systems engineering and health improvement research; fulfilling their existing duty to address health inequalities; and attracting industry investment that can create revenue and save money for NHS trusts.

11. To ensure that clinical academics (including doctors, dentists, nurses, midwives, allied health professionals (NMAHPs), registered public health practitioners) are supported to develop their dual careers, we suggest that:



- a. Royal Colleges, Deans of Health and Regulators should embed **flexibility in training** across specialities to reflect the dual-career nature of clinical academia.



- b. Public and charitable funders should coordinate with each other to ensure **balance across pre- and postdoctoral funding opportunities**.



- c. HEIs should **recognise the value of clinical academics to HEIs**, including through reinvestment in career opportunities for Senior Clinical Lecturers across doctors, dentists, NMAHPs and registered public health practitioners.

12. To ensure that the wider healthcare workforce has access to the training, support and time to engage in research:



- a. Undergraduate providers should enhance **exposure to research during training**, including through working with the private sector to increase access to industry placements.



- b. **Funders and HEIs** should improve access to research skills training across a wide range of areas from data and digital skills to PPI.



- c. HEIs should provide **greater support for integrated research teams that span university employees and those on NHS and other healthcare contracts**, including through:
- increasing the number of honorary academic appointments** offered to healthcare professionals that contribute significantly to research.
 - reward and recognition through the FRAP for HEIs that provide a research environment that is conducive to NHS-academia interactions.

12. (Continued)



- d. NHS organisations and funders should work together to develop a pilot in which **dedicated time for research is available to a proportion of healthcare professionals** wishing to engage in research.



- e. NHS Employers should work with organisations such as the University and Colleges Employers Association (UCEA) and the ABPI to create **clear and transparently governed mechanisms to allow people to work within NHS, academia or industry settings simultaneously**.

13. To truly maximise the research potential of the healthcare system, we must facilitate the use of patient data as a research resource for the good of all. This must be done in a way that:



- a. Learns from best practice across the four nations.



- b. Respects and protects the privacy, rights and choices of patients and the public.



- c. Includes patients and the public as active and meaningful partners in decisions about their data.



- d. Maintains trustworthiness in the responsible and effective stewardship of patient data within the NHS.



Introduction

Health research in the UK is a national asset, improving the health, wellbeing and wealth of the nation. The benefits of health research accrue to patients and society in the form of new treatments, diagnostics, healthcare interventions and improved understanding of good health and how to preserve it. These health benefits are supplemented by economic benefits including direct financial returns to the economy, a healthier population better able to work, and investment of high-growth industries creating highly skilled jobs. Beyond the UK, many of these benefits are spread around the world through improved global health.

The ability of our health research ecosystem to continue to deliver these considerable benefits must not be taken for granted and this report will consider the current challenges and opportunities faced by the health research sector. We place people at the heart of our approach, considering how our research system provides a wider range of talented people to contribute to health research.

The timeliness of this project

This project was launched in September 2021, at a time when the value of health research to national health, economy and security had been thoroughly demonstrated during the pandemic.

The pandemic also shone a light on many of the existing issues that we explore in the report, including precarious research careers, pressures on clinical academics, and a financial model reliant on cross-subsidy from international student fees. These issues compounded a number of years of uncertainty regarding the UK's participation in major EU R&D programmes including Horizon Europe, which itself expects to spend tens of billions of euros on health research between now and 2027.

However, there is evidence that many of these issues have persisted for many years. Even before the pandemic, a survey by Wellcome found that 36% of respondents were considering leaving the research sector entirely within the next three years.¹⁸ More broadly, recent international comparisons show a decline in the UK's global share of publications, citations, field-weighted citations and highly-cited publications.¹⁹ While strong ratings in these areas are not the purpose of health research, their decline is a signal to which we ought to pay attention. These comparisons of publication success show the UK's historical strength, but that strength is ours to lose and, without action, we stand to lose it.

A fall in the UK's global standing in research would not only weaken global science, but: impact our ability to attract global talent and investment; impair the ability of universities, the NHS and others to prioritise health research; and undermine our national health security.

As the UK Government and parties across the political spectrum place health research and R&D at the centre of their strategies for the future, our report sets out the steps needed to secure the foundations of the health research system.

Our project was conducted in parallel with the independent Nurse Review of the Research, Development and Innovation (RDI) organisational landscape.²⁰ We reached our conclusions independently of the Nurse Review, but are pleased to note many overlapping themes between the reports. Our solutions focus specifically on health research and therefore offer complementary and additive perspectives by providing specific actions for those operating in these disciplines.

Who is this report for?

This report has been prepared with input from across the health research system with the intention of informing decisions on the future of health research, wherever it takes place. Key audiences include policymakers in UK-wide and national Governments, public funding bodies, charities and industry. In addition, we highlight actions for leaders within HEIs, NHS and public health structures. In some cases, we suggest specific roles for membership bodies and trade associations representing their part of the sector. Finally, we hope that this report will support health researchers themselves in considering their own role in securing the future sustainability of the system.

Definitions and scope

What is health research?

When we say **health research** we mean all research-related activity that contributes to better health outcomes (see Box 1). When we talk about making the UK's health research system **sustainable**, we mean it must be able to continue to produce excellent health research, over the long term. We believe that research **excellence** must be capable of keeping pace with evolving sectoral and societal perceptions. For example, sustaining excellent research will continue to mean the production of new knowledge of basic biological processes and developing new innovations that improve the health of patients and the public, but it will also mean fostering and sustaining an improved research culture, truly embedding equity, diversity and inclusion (EDI) and wider involvement of patients, carers and the public in health research and encouraging multidirectional mobility between academia, the NHS and industry for researchers at all stages of their careers. We should not aspire to simply preserving the *status quo*.

Box 1: Defining health research

At its most basic level, by health research we mean **all research-related activity that contributes to better health outcomes.**

However, the health research ecosystem is broad and diverse. The definition therefore needs to be:

- **inclusive** of the diversity of activities, stages, and disciplines of health research. This includes the full pathway from basic to applied research, and the various settings in which these activities take place, whether in public sector (such as HEIs, government bodies, the NHS), public or charitably funded research institutes, private industry, or at general population level (such as for public health research, epidemiological studies and research outside of these disciplines that directly and indirectly influences health)

...and to recognise...

- the **interlinked** actors and stakeholders who produce excellent and impactful research when working together as a whole ecosystem. This includes career researchers operating in different disciplines across the public sector and private industry, clinical academics, frontline public health professionals, charities, patients, carers and members of the public who design, perform, participate in, lead on, and apply health research.

Therefore, for this report we consider health research to:

- **Be the breadth of excellent research-related activity that seeks to better understand the processes and factors which contribute to our health and how to improve it.**
- **Take place across the full span of research settings and is conducted by a diverse workforce together with patients and the public, and is funded by a range of public, private and charitable funders.**
- **Include the people and organisations that work together to increase our understanding and ultimately improve health outcomes for all.**

Our thematic scope was informed by consultation and defined by the Steering Group with a focus on four key areas:

- People, workforce and culture
- Cross-sector mobility
- Financial sustainability of health research in academic settings
- Research in healthcare settings

We recognise that health research is also influenced by a wide range of other related factors, including research integrity, regulatory approvals and adoption of health innovation. Our report touches on some of these issues, however we felt that they have either been covered in depth in other recent reports and activities^{21,22,23} or are the subject of ongoing reviews, for example the review on regulatory reform in key sectors led by the Government's Chief Scientific Adviser and independent advice on commercial clinical research being led by Lord O'Shaughnessy.^{24,25}

Our geographic scope is the United Kingdom, including health research in each of the four nations, recognising that there is much that is similar across the UK but also that there are opportunities for sharing of best practices derived from one or more of the constituent administrations.

International collaboration is essential to the conduct of health research. Whilst not a direct focus of this report, the Academy considers UK participation in pan-European research, for example through full participation in Horizon Europe, and access to a compelling framework for global collaboration, to be critical components of a strong health research system in the UK.²⁶

We recognise that some of the issues of sustainability we seek to address are relevant to other research disciplines. In some cases, we have relied on data across research more broadly and have indicated where this is the case. Where health research-specific data are available we have favoured these. The findings of the report and its recommendations are therefore most relevant to health research, however some of them may be pertinent for research in general.

Finally, we use the term **clinical academic** to describe any clinically qualified healthcare professional who also pursues a career in research (inclusive of doctors, dentists, NMAHPs, registered public health practitioners). Whilst we intend this term to be inclusive of all health disciplines, we understand that different disciplines face distinct challenges in clinical academic careers, which require bespoke solutions. Critically, differences exist between disciplines with established clinical academic career paths (for example in medicine) and disciplines where clinical academic paths are less established (for example in nursing, where it is more common for clinical academic nurses to work predominantly in a clinical or academic setting). Reference to clinical academics throughout this report is inclusive of all healthcare professions unless otherwise defined.

Conduct of the study

This study was conducted by a Steering Group led by two co-chairs, Professor Dame Julia Goodfellow FMedSci and Professor Sir Peter Mathieson FMedSci. The Steering Group comprised experts from a wide range of disciplines and institutions across the public, private and charitable sector. Steering Group members comprised Fellows of the Academy, emerging research leaders, patients and carers. Members were drawn from all four nations of the UK. The Terms of Reference and Steering Group members can be found in Annex II and III.

The working group were also supported by a Patient and Carer Reference Group (Annex III), the co-chairs of which sat on the steering group. This group played an important role in broadening the view of this project, identifying some of the barriers experienced by those who may traditionally have been excluded by the health research system and offering tangible and practical solutions to address these.

We gathered evidence from a range of sources including:

- A call for written evidence
- Five evidence-gathering workshops and roundtables:
 - Health research sustainability PPI roundtable discussion
 - Maximising the benefits of a diverse health research ecosystem for financial sustainability
 - Early and mid-career researcher priorities for sustainable research careers
 - FORUM workshop on the contribution of cross-sector mobility to the sustainability of health research in the UK
 - The NHS and the Long-Term Sustainability of Health Research roundtable discussion
- A series of public dialogue sessions run by Ipsos Mori in May 2022
- Desk-based research

Whilst we have sought input from a diverse range of sources, which we believe to be representative of the stakeholders of the health research ecosystem, our sample sizes are small and we have not undertaken a quantitative analysis.

We have not conducted any additional economic analyses of the health research ecosystem and its benefits but have drawn on the existing evidence base.

We have also drawn on previous Academy reports, including:

- Improving recognition of team science contributions in biomedical research careers²⁷
- Improving the health of the public by 2040²⁸
- Our data-driven future in healthcare²⁹
- Transforming health through innovation: Integrating the NHS and academia³⁰

More detail on this evidence gathering is found in Annex IV.

Structure of the report

This report is structured in four core chapters, as identified above:

- People, workforce and culture
- Cross-sector mobility
- Financial sustainability of health research in academic settings
- Research in healthcare settings

Each chapter summarises, in turn, existing strengths in these areas, weaknesses and/or barriers to fully exploiting these strengths and then a series of evidence-based recommendations. Relevant data and evidence gathered throughout this project are presented throughout each chapter.

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Chapter One: People, workforce and culture

Summary

- Excellent health research cannot happen without people and the UK's strengths are built on a system that has enabled many talented people to flourish.
- However, the historical model is no longer fit for purpose and presents too many barriers to too many of the people that are needed to produce health research that meets contemporary measures of excellence.
- Conventional career structures are precarious and place a growing workload on the next generation of researchers.
- Meanwhile, the health research ecosystem fails to value critical career paths outside of the standard trajectory to Principal Investigator, with insufficient opportunities for team scientists and skills specialists.
- Cultures and conventions continue to exclude underrepresented groups and those whose expertise does not align with conventional research experience, including lived experience researchers.
- Addressing these issues will be dependent on public, private and charitable funders coming together with employers to:
 - Provide more secure research careers through sustained improvements to employment practices across the sector.
 - Create a research culture that both values a wider range of markers of good academic citizenship and provides the time and opportunity for researchers to innovate.
 - Take an evidence-based approach to increasing the inclusivity of health research careers at all stages of the career trajectory, from increasing the diversity of those entering health research careers (including through expanding the routes of entry into these careers), to retaining a diverse workforce right through to senior leadership levels.
 - Remove barriers to global talent.
 - Properly value the varied involvement of patients, carers and the public to the health research endeavour, including through fair and consistent remuneration and enhanced access to skills development and peer-to-peer networks.

People are integral to delivering R&D ambitions

People, workforce and culture are critical to sustainable health research. Our historical strength in health research in the UK has been supported and sustained by generations of exceptional researchers who have excelled within the sector. However, the historical research career is no longer fit for purpose and in order for UK health research to continue to thrive, the system must evolve to value a modern approach to people, workforce and culture.

In the 21st century, excellent research is dependent on a diverse range of people across disciplines from basic biomedical research through to translational, clinical and population health research and many more. It also requires greater involvement of patients, carers and the public. Interdisciplinarity, team science and skills specialists are increasingly important to address health challenges. The future sustainability of health research is therefore dependent on creating a culture that values the breadth of talent needed for today's and tomorrow's research workforce.

To achieve our health research goals and to realise the current political ambition for increasing R&D activity and making the UK a global life science hub, we will also need a larger research workforce. This involves addressing the challenges above, but also ensuring the UK is an attractive destination for international talent, including through a favourable immigration system. Furthermore, we must broaden the range of talent attracted and retained in health research careers. To achieve this, we must widen the pools from which this talent is drawn and address the cultural barriers that can exclude some people from entering or remaining in health research.

Culture change should also drive the inclusion of the perspectives of patients, carers and public in the research that affects their health and/or that of their loved ones. Health research is enhanced by meaningful PPI, which can improve the quality, relevance and impact of health research for those whom it seeks to benefit most by involving them in the process.³¹

Strengths

A highly committed and skilled workforce

The UK is home to a highly trained and committed workforce who drive excellent, world-leading health research. This workforce is widely regarded as a huge asset of the UK's health research strength and a strong foundation on which to build the sustainability of UK health research.

In the Research Excellence Framework (REF) 2021, 82% of clinical research, 89% of biological sciences research and 92% of public health research in the UK was rated world-leading or internationally excellent.^{32,33,34} Amongst researchers themselves, 84% say they are proud to work in the research community.³⁵ However, as explored in more detail below, this workforce does not always feel valued or secure in their career.

A varied health research workforce has the breadth of skills required to address health challenges

The UK's health research workforce boasts a uniquely diverse range of disciplines, due to the interplay of academia, research in the NHS, industry and expertise from patients, carers and the public.

Maintaining this varied workforce is vital to sustain the full breadth of different skills required for excellent health research. It is also central to the multidisciplinary and diverse teams that underpin modern research.

Diverse research teams contain varied perspectives, backgrounds and experiences and are more likely to ask different questions and develop innovative solutions; in turn, these teams are better at problem solving.^{36,37,38} Gender-diverse workforces benefit from improved productivity, innovation, decision-making, employee retention and satisfaction, and promote the consideration of women-specific issues in life sciences research.³⁹ Underrepresentation of any group in science, technology, engineering and mathematics (STEM) roles limits diversity of thought, which has implications for idea generation and the applicability of research to society's needs.

Box 2: Initiatives from government, funders, universities and employers to support sustainable research careers

R&D People and Culture Strategy⁴⁰

The R&D People and Culture Strategy defines actions to achieve the UK Government's vision of 'a more inclusive, dynamic, productive and sustainable UK R&D sector in which a diversity of people and ideas can thrive'. The strategy recognises that people are at the core of R&D and that there is nothing more important for the delivery of this vision than attracting and retaining talented people in the research and innovation workforce. The strategy also recognises the critical importance of difference and variety in research.

Concordat to Support the Career Development of Researchers⁴¹

The Researcher Development Concordat is an agreement between institutions, funders, managers of researchers and researchers. The Concordat defines obligations for signatories to support the creation of 'an environment and culture across the whole ecosystem that celebrates mobility across sectors, diversity of experience and inclusive working conditions', for the benefit of the whole research community. The Concordat is intended to act as a continuous improvement tool to drive systemic change, and signatories are required to publicly report on their implementation of the obligations each year.

UK clinical academic training: principles and obligations⁴²

The principles and obligations documents for medics, dentists, nurses, midwives and health and care professionals define obligations of clinical trainees and their funders and host institutions in the UK. The documents, developed jointly by the Clinical Academic Training Forum, protect the continuous employment rights of researchers working between academic institutions and NHS Trusts (including maintaining parental and sick pay) and commit those responsible for clinical academic training to protect research time and ensure trainee-centred flexibility.

Independent Review of Research Bureaucracy (Tickell Review)⁴³

Whilst research bureaucracy is necessary to ensure appropriate spending and adherence to research laws and regulations, it contributes to excessive researcher workload. The Tickell Review sets out seven principles for cutting unnecessary bureaucracy to eliminate barriers to ambitious, ground-breaking research: harmonisation, proportionality, simplification, flexibility, transparency, fairness and sustainability. To enact these principles, the report defines a series of recommendations for Government, regulators, universities, funders and recipients.

New deal for postgraduate research⁴⁴

To support delivery of the workforce targets set out in the R&D People and Culture Strategy, UKRI are leading on the development of a New Deal for postgraduate research students. A quarter of UK doctoral students are currently supported by UKRI, and their policies have knock-on effects across the sector. The New Deal sets out to ensure that postgraduate research in the UK 'remains sustainable, open and attractive to a wide range of candidates (both from the UK and internationally)' and 'delivers the highly qualified and skilled researchers and innovators the UK and global societies need'.

Independent Review of the UK's Research, Development and Innovation (RDI) Organisational Landscape⁴⁵

The review of the UK RDI Landscape identified 'Talent' as key to the sustainability of the RDI landscape. The review recommended a role for Government in ensuring the availability of a well-trained RDI workforce at all levels. In particular, the review concluded that there is a need for career pathways for those roles that underpin effective research delivery, including technicians and project and programme managers. In addition, the review recommended the reform of training and career structures for early career researchers, including PhD students, postdoctoral researchers and starting faculty, as well as an emphasis on enhancing the range of career paths and permeability between different research settings.

International talent

Health research in the UK also benefits from talented people from across the globe. Across all disciplines, over one third of the total research workforce in academic institutions is comprised of non-UK nationals.⁴⁶ This highly international research workforce ensures both world-leading talent and adds further to the diversity of perspectives driving research excellence.

Clinical research workforce

Research in the NHS is a particular asset to the UK's health research ecosystem and ensuring that rewarding and attainable careers are available to researchers in the NHS is essential to the long-term sustainability of the wider health research environment. These issues are explored in more detail in Chapter Four.

Breadth of funding opportunities for researchers

Health researchers are supported by a huge array of funders (explored further in Chapter Three), including government, charitable and private funders. These funders have varying priorities and resources and are therefore capable of funding a variety of research types, which in turn affects the way in which they support researchers.

Larger funders with significant resources, for example Wellcome and UK Research and Innovation (UKRI), can provide longer-term career awards. Others, such as small medical research charities, may be better suited to fund capacity building in particular areas that may not be prioritised by larger funders. For researchers, this means that there is not just one source of potential funding for their research, giving them more freedom to develop tailored proposals for their research area. It also allows for different types of funding depending on an individual's career stage and provides alternatives for those without long-term funding.

Existing initiatives supporting sustainable research careers

Issues affecting health research (and researchers) have drawn increasing recognition in recent years and initiatives from government, funders and employers to support sustainable research careers show a consensus on the importance of the research workforce. Whilst problems in health research careers persist, initiatives such as those described in Box 2 indicate an appetite to improve the experiences of health researchers and commitment to positive change.

Patient and public involvement (PPI)

PPI is a critical element of excellent health research (see Box 3 on PPI). When afforded the opportunities to be fully involved in research, patients and carers have a role in a broad range of activities from defining research priorities, co-designing, reviewing and evaluating research proposals to jointly leading research projects.

Many funders in the UK, including medical research charities, ensure that the research they fund is informed by the priorities of patients, carers and the public. Recently, the Academy joined 12 organisations across the UK in signing up to a shared commitment that 'public involvement is important, expected and possible in all types of health and social care research'.⁴⁷ This commitment will help to drive up standards in health and social care research by ensuring public involvement is more consistent.

The involvement of patients, carers and public will differ between projects (see Box 3) and should be tailored to the needs of the research topic. To achieve these standards and maximise the strength of a committed and engaged patient and public community it is particularly important to ensure that their contributions are properly recognised and rewarded, as explored further below.

Box 3: Patient and public involvement (PPI) explainer

We define the term patient and public involvement to mean the practice of involving members of the public, people with lived experience of a health condition, patients, people with caring responsibilities and/or families at any stage of the health research cycle or its governance processes.

The purpose of PPI is to ensure that research is done 'with' or 'by' the public, not 'to', 'about' or 'for' them.⁴⁸ This report centres the principle that people who are affected by research deserve to have a say in it. PPI improves the relevance of research and produces outputs that are more reflective of people's needs; it therefore must centre equity, diversity and inclusion (EDI) and ensure proper representation of people with all protected characteristics to be effective.⁴⁹

Meaningful PPI is important, expected and possible in all health research.⁵⁰ The involvement of patients, carers and the public in health research should be tailored to the specifics of the research and therefore meaningful PPI can take many forms.⁵¹ Best practice PPI is centred on equal partnerships for equal benefit, known as co-production, and ensures that people have a genuine opportunity to influence research.⁵²

Some examples of how patients, carers and the public might be involved in health research are presented below. These categories and examples are not exhaustive.

- **Priority setting:** Patients, carers and the public are experts in their own lived experience. Initiatives such as Diabetes UK's Research Steering Groups and the James Lind Alliance Priority Setting Partnerships bring together patients, carers, clinicians and researchers to identify health research priorities.^{53,54} These agreed priorities are used by researchers and research funders to help identify research that will have the most impact.
- **The research cycle:** Patients, carers and the public can be involved in every stage of the research cycle, including in defining the research questions, preparing funding applications, designing research materials and supporting the delivery, interpretation and dissemination of research and its results. People with lived experience who influence or conduct research in this way may identify as lived experience researchers.⁵⁵ Patients, carers and the public can be involved in all forms of health research, from clinical research to basic biomedical studies.⁵⁶
- **Co-led, user-led and user-controlled research:** Lived experience researchers can lead research or partner with researchers with scientific expertise to collaboratively pursue research projects. Research that is co-led by lived experience researchers involves collaboration throughout every stage of the design, funding, management, delivery and publication processes.
- **Research funding:** Patients, carers and the public can influence decisions about investment in research by reviewing the relevance and potential impact of research proposals. This may involve including patients, carers and the public as equal partners in the research process, peer review process or on grant funding panels.
- **Research governance:** Patients, carers and the public can be involved in strategic decision making throughout research governance processes. This can include positions on research steering groups, oversight committees or clinical trial committees.⁵⁷

Box 3 (continued)

- **Research interpretation and implementation:** Patients, carers and the public can be involved in implementing research findings, such as in the development of health and care guidelines, recommendations and quality standards.⁵⁸

There are many important practical considerations to be made when involving patients, carers and the public in research, particularly to the emotional labour, accessibility of involvement and remuneration for an individual's time and expertise (with payment guidance determined by roles and responsibilities).^{59,60,61} These considerations are explored and embedded throughout this report.

Challenges and opportunities

The people working with and within the UK's health research system are its strongest asset and are key to its sustainability. However, whilst the current environment caters for the needs of some researchers, there are significant limitations to its ability to recognise the needs of future generations of researchers, people involved in health research more broadly, and the society around them. Here we consider some of those barriers, ranging from career structures to research culture and from workload to diversity, making recommendations for some of the possible solutions.

Career structures and culture

Career trajectory, job satisfaction and workplace culture define an individual's experience in their work, which in turn contributes to the successes and longevity of their career.

Rigidity and career structures

Health research consists of a vast range of disciplines and relies on people with diverse skillsets. During the course of our evidence gathering, we heard that not all of these skillsets and contributions are equally recognised, for example due to less developed career paths and less prestige attached to team science and interdisciplinary research roles. We also heard that this compounds the perception of the career 'pyramid', in which there are many more people obtaining PhDs than for whom the health research system can provide long-term careers.⁶²

In order to address this, we must ensure that the breadth of opportunity in health research matches the needs of the modern research workforce. Only then can we be confident that we will have a workforce able to address the health needs of the population.

Traditional academic career paths directed towards becoming a Principal Investigator will continue to play an important role, although we must ensure that a more diverse range of people enjoy these opportunities, explored in more detail below. However, the needs of a modern research workforce will also evolve. This will require greater opportunities for flexible careers that span the breadth of the research sector allowing bi-directional and reversible mobility across public, private and charitable research settings (explored more in Chapter Two).

Team science and interdisciplinary approaches will also be increasingly necessary to address the multifactorial issues affecting individual and population health. This can include research technicians, skills specialists (for example bioinformaticians and statisticians), public health practitioners, and lived experience researchers. Many of the findings of the Academy's 2016 report on *Improving recognition of team science contributions in biomedical research careers* remain pertinent today.⁶³

For skills specialists, there is a need for HEIs and other employers to further develop the tailored career paths, as has already been introduced at the University of Glasgow and some other universities.⁶⁴ This should be complemented by more open and transparent approaches to attributing credit that appropriately recognises the roles of individual contributors.⁶⁵

Meanwhile, the boundaries between 'health research' and other disciplines will continue to blur. Interdisciplinary research is increasingly commonplace, including with disciplines that traditionally sit outside of 'health'. For example, skills in data and artificial intelligence (AI) will be increasingly important for our understanding of preventative healthcare. As the Academy recommended in our 2016 report *Improving the health of the public by 2040* we must expand opportunities for people with diverse disciplinary backgrounds to engage in research on health.⁶⁶

Similar trends emerge when we consider career opportunities for clinical researchers where greater opportunities for NMAHPs must complement efforts to address a worrying decline in the capacity of our broader clinical workforce to engage in research. These issues are explored in more detail in Chapter Four.

The overriding message here is the need for flexibility, breaking down rigid perceptions of what it is to be a health researcher, such that a wider diversity of people and expertise can contribute to health research.

With this in mind, it is vital to ensure that national exercises to assess research excellence are able to measure, reward and therefore incentivise HEIs to provide the flexible, interdisciplinary and team science career opportunities that will underpin health research. This is echoed by the recently commissioned report on the Future Research Assessment Programme (FRAP), *'Harnessing the Metric Tide'*, which stated that a central purpose of these exercises should be supporting the needs of a 'diverse, engaged, content and motivated population of researchers and research enabling staff'. As noted throughout this chapter, we believe that there is an opportunity now as the next national exercise is being designed through the Future Research Assessment Programme (FRAP) to place support for people and their careers as central criteria for research excellence.⁶⁷

Precarity

A substantial portion of the academic research workforce in the UK is employed on fixed-term contracts. Data are not available for health researchers specifically, but across all disciplines UK higher education providers employed nearly a third (32%) of their staff on fixed-term contracts in 2020/21.⁶⁸ This figure was higher for women (34%) than men (31%). Fixed, short-term contracts are particularly common amongst postdoctoral researchers. Recent growth in the portion of the workforce with non-permanent positions, sometimes referred to as the research precariat, can be attributed in part to increasing numbers of PhD/doctorate holders that have not been matched by expansion in permanent academic positions.⁶⁹ This problem is not unique to health research, nor the UK, but it contributes to an environment in which only 29% of researchers feel secure pursuing a research career and where the majority (78%) think that unhealthy competition has created aggressive and unkind working conditions.⁷⁰

Whilst postdoctoral career precarity is not unique to health researchers, it was identified as a significant issue and a priority area for intervention by early and mid-career health researchers during our evidence gathering.

As explored in Box 2, the sector has also made commitments in this direction through initiatives including the *Concordat to Support the Career Development of Researchers* and the *Clinical Academic Training: Principles and Obligations documents*.^{71,72,73,74,75}

These commitments show important recognition of the shared approach that is required to addressing precarity in research careers. However, as explored in the recent *Highlight Report of the Concordat* and heard through engagement with early career researchers, there is more to be done.⁷⁶ The Report recognises the need to improve annual reporting on how signatories achieve their commitments. Meanwhile, we heard that many trainee researchers are either not aware of these commitments (in the Concordat or principles and obligations documents) or do not feel that they are being upheld in their own career development.

Finally, we also heard that duration of funding awards for early and mid-career researchers can influence stability of research careers. A number of funders, including Wellcome, have recently sought to address this by extending several of their award lengths.⁷⁷ We support this approach, but continue to believe that a range of funding opportunities of differing lengths can add value to the research environment. Whatever individual funders offer, it is vital that funders take steps to ensure that the researchers they fund have access to effective career development support and planning, as set out in the Concordat for Career Development.

Lack of consistency between funders and employers

For health researchers, movement between employers and institutions is a common occurrence and can have benefits for both individuals and institutions, including in helping researchers find the most suitable research environment for their work. Whilst funders rarely explicitly require movement, we heard that some researchers still perceive that movement is necessary or expected in order to progress. We heard that this can be particularly challenging for those with family or caring commitments and can be exacerbated by possible loss of access to accrued benefits such as parental leave, sickness and pay when moving between employers.

For clinicians working between HEIs and NHS Trusts, their continuous employment rights are protected through the Principles and Obligations documents and signatories of these should work to ensure these principles are upheld and widely communicated with researchers.^{78,79}

COVID-19 and health research careers

On top of the challenges explored through this chapter, COVID-19 exacerbated existing challenges in health research careers, increasing career precarity and uncertainty, and caused particular disadvantages for those at important transition points in their careers.⁸⁰

Health researchers were integral to the UK's pandemic response and the efforts and expertise of researchers in the UK saved millions of lives globally.^{81,82} However, we also saw immense disruption to biomedical and clinical research, with lasting impacts still being experienced by many facets of the health research environment. Critically, financial support for health research dropped significantly in 2020, with AMRC member charities reporting a 40% decrease in spend.⁸³ Rapid research into COVID-19 deprioritised other important research areas, exacerbated as a result of the financial hit that some medical research charities faced. Clinical academics faced specific challenges during the height of the COVID-19 pandemic, the impacts of which are still ongoing. Estimates suggest that over 1,500 clinical academic medical trainees in England were deployed to clinical duties in 2020, representing over 90% of all trainees on the Integrated Academic Training (IAT) pathway, who were therefore unable to pursue their research in this time.⁸⁴

Some of these impacts have diminished, for example charity expenditure on research has recovered well. However, others will have a long-term impact. Many researchers will experience the effects of disruption from the pandemic over many years and it is important that funders and employers continue to recognise and account for these impacts including through ongoing use of COVID-19 Impact Statements.⁸⁵

Solution 1: To address the issue of precarity and inflexibility of research careers and expand the breadth of opportunity, we propose the following solutions:

- a. Public and charitable funders and employers should ensure that their respective funding and employment strategies **provide greater security and career development opportunities for health researchers**, including clear use of open-ended contracts wherever possible, and where it is not, use of redeployment practices; shared commitments between funders and employers on researcher salaries; and greater consistency for extending accrued benefit for individuals moving between fixed term contracts within or (especially) between sectors.
- b. Academic employers should develop enhanced **career paths for those working as part of interdisciplinary teams ('team science') and skills specialists** including through the creation of clear structures for career progression.
- c. Public and charitable funders **should expand the opportunities for, and recognition of, team science activities**, including through the FRAP, tailored grant opportunities and co-investigator status.
- d. **Funders and employers should continue to recognise the impacts of unavoidable disruption to research careers such as ongoing impacts of the pandemic on career progression** including through use of COVID-19 impact statements and flexibility of promotion and reward procedures.

Toolkit includes:

- **Concordat on Researcher Development**⁸⁶ – agreement between universities, research institutes and funders to support the career development of researchers in the UK (see Box 2).
- **Principles and Obligations for clinical academic training**⁸⁷ – document that sets out principles and obligations of funders, employers and trainees to support clinical academic training for all UK institutions and early career clinical researchers in receipt of nationally competitive funding for clinical academic research training (in medicine, dentistry, nursing, midwifery and other allied health professions) (see Box 2).
- **MRC Impact Awards: Outstanding Team Impact**⁸⁸ – prize that celebrates an ‘inspiring and successful’ team whose collaborative team science approach has made a major impact in medical research.
- **FRAP**⁸⁹ – programme that aims to explore possible approaches to the assessment of UK higher education research performance (following on from the Research Excellence Framework). Through dialogue with the higher education sector, the programme seeks to understand what a healthy, thriving research system looks like and how an assessment model can best form its foundation.
- **Cross-funder statement on COVID-19 in future grant applications**⁹⁰ – statement that commits funders to understand the impacts of COVID-19 disruption on their research and use this information when assessing individuals’ outputs, research achievements, and career progression.

Research culture and good academic citizenship

Workload and competition

Enhanced opportunities and flexibility can help the system to cater for a wider variety of health researchers. However, we heard that expectations placed on individuals by the existing academic career and funding structures continue to become more, rather than less, demanding. Meeting the expectations (real and perceived) of employers and funders regarding research output, teaching, administrative load and other measures of ‘good academic citizenship’ were felt to be increasingly challenging. In fact, for most health researchers, research is one element of their role. This must be balanced with teaching and/or clinical commitments. These dual or multiple roles can be complementary and mutually beneficial, but can also pose challenges for researchers, particularly where there is an imbalance. This is addressed particularly in the context of clinical commitments in Chapter Four.

Our findings for health research are echoed across the research ecosystem. The 2021 UCU workload survey, which was completed by 13,000 members and non-members, found that across disciplines ‘87% of HE staff said that workload size or intensity had increased over the past 3 years, with more than two thirds (68%) saying that it had increased significantly’. Furthermore, over 40% (44.4%) of teaching and research staff reported that their work was either ‘unmanageable most of the time’ or ‘entirely unmanageable’.⁹¹

This is coupled with a view expressed by many researchers that they spend a growing proportion of their time preparing grant applications, again supported by the 2021 University and College Union (UCU) survey, which showed that over 25% of research-only staff felt they spent more time on grant writing than three years previously (although this figure was down from over 45% in 2016). Simultaneously, grant success or award rates have consistently fallen with MRC award rates falling to 17% in 2020/21, down from 20% in 2015/16 and Wellcome award rates falling to 11% in 2019/20, down from 15% five years previously.^{92,93} This adds to the burden on individuals and contributes to a sense of inefficiency and even wastefulness in the system. We also heard that growing workload and competition stifles innovation in academic research by creating a disincentive for researchers to take risks.

Whilst the variety of funding sources available for health research is a significant advantage for the sustainability of the research environment (as explored above), it also creates a fragmented funding landscape that can be complex to navigate, particularly for researchers at early career stages and for lived experience researchers. Importantly, a lack of alignment of application processes between funders was highlighted to us as a significant issue. This was perceived to contribute to duplication of effort, the risk of self-plagiarism and further drains on researchers’ time, something also noted in the recent Tickell Review of research bureaucracy.⁹⁴

Whilst these factors affect all researchers, we heard that they particularly impact people working less than full time, people who have taken time out of research for illness, disability or parental reasons, and people who have entered a research career through non-traditional routes.

In response to the growing burden on researchers and decreasing success rates, public and charitable funders of health research should work together to explore opportunities for both greater standardisation in their grant application requirements (including through use of the Resumé for Researchers) and consider innovations in their grant-making processes. This may include considering two-stage application processes (as also recommended in the *Independent Review on Research Bureaucracy*⁹⁵), where detailed submissions are only required after a preliminary assessment, which in some cases require only a page of essential information about the research proposal.

Funders should consider other innovations, such as partial randomisation of funding for small awards above a certain quality threshold. Partial randomisation is increasingly being trialled to randomly allocate funding to applications that have been peer reviewed and are recommended for funding. Trials in Switzerland, Austria and New Zealand have been underway since as early as 2013 and received broadly positive feedback from applicants and reviewers. In 2021, the Research on Research Institute Launched a Randomisation project to review and learn from best practice around the world.⁹⁶ Subsequently, in 2022 the British Academy launched its own trial of partial randomisation for the Small Research Grants worth up to £10,000.^{97,98}

Markers of success and research leadership

Historically, success in research careers has often been reduced to an individual's publication or grant award record. There have been initiatives to replace or augment these traditional markers of esteem, and whilst traditional markers retain value, many research funders have become more flexible in their expectations of researcher success, including through the recent development of the Resumé for Researchers, which seeks to recognise a more rounded view of academic indicators.⁹⁹

We heard that research leadership is also an undervalued skillset as demonstrated by Wellcome's recent survey on research culture, which found that:

'Only 44% of those in managerial roles believed good management and leadership was recognised at their workplace, and few respondents overall (5%) identified promotion to a managerial role as a marker of a successful career.'

Moreover, the same survey found that only 48% of respondents in management roles said that they had received training on managing people.^{100,101} Once again, these trends are not unique to the UK and similar results were recently found in surveys of researchers in Germany.¹⁰²

In June 2020, the Economic and Social Research Council (ESRC) published the *Fit for the Future: Research Leadership Matters* report, which set out a range of recommendations for enhancing our understanding of research leadership in the social sciences.¹⁰³ This included ways in which leadership training can be embedded in the continuous professional development of researchers from mid-career up to senior leadership. There are opportunities for health research funders to lead a similar approach across health disciplines. Schemes such as the Academy's FLIER programme (explored in detail in Chapter Two and Box 7) are designed to enhance the quality and interdisciplinarity of health research leadership. Within this, the Academy also encourages the notion of inclusive leadership where leaders work towards full equity of opportunity for all through seeking and celebrating diversity in all its forms.¹⁰⁴

More recently, in January 2023, the UK Young Academy (UKYA) was launched with its first cohort of 67 members drawn from across disciplines and working in academia, charity organisations and the private sector.¹⁰⁵ The UKYA, first announced as part of the R&D People and Culture Strategy, is a network of early career researchers and professionals that has been established to enable the next generation of research leaders to work together to help tackle local and global issues and promote meaningful change.¹⁰⁶

Initiatives such as these demonstrate both the appetite and potential of researchers to explore the boundaries of their expertise and to apply them to important societal challenges, thus displaying values associated with good academic citizenship.

Career development

Alongside the vital role of funders and employers in providing opportunity for researchers, there is also responsibility of researchers themselves to play an active role in their own career progression and for research managers to support them in doing so. For example, the Concordat on Researcher Development, outlines a responsibility for funders, employers, researcher managers and researchers themselves to focus on career development. The Concordat states that funders, employers and managers of researchers should support 'a minimum of 10 days professional development pro rata per year' and that researchers themselves should take full advantage of these opportunities. Similarly, many of the solutions we propose in this report can only be successful if individual researchers choose to actively engage in them and are supported to do so.

Solution 2: To create a research culture that rewards good academic citizenship, values the well-being of researchers, and provides the time for researchers to innovate, we propose the following solutions:

- Funders and employers should increase access to **research leadership** training and give greater prominence to inclusive leadership and wider markers of good academic citizenship in reward and promotion.
- Public and charitable funders should include/introduce greater **standardisation in their grant application requirements** to reduce the workload of the research workforce, including reduced bureaucracy as recommended in the *Independent Review of Research Bureaucracy*.
- Public and charitable funders should introduce **innovations in their grant-making processes that will help to reduce workload for researchers**, such as including two-stage application processes, where detailed submissions are only required after preliminary assessment, and partial randomisation above a certain quality threshold for small awards.

Toolkit includes:

- Independent Review of Research Bureaucracy**¹⁰⁷ – review commissioned by UK Government to advise on a substantial reduction in unnecessary research bureaucracy in government and the wider sector (see Box 2).
- Resumé for Researchers**¹⁰⁸ – narrative CV designed to help researchers evidence a wider range of skills and experience when applying for funding opportunities.

Inclusivity

Inequalities in health research careers

The health research workforce is not representative of society (see Box 4). Systemic challenges, such as those explored above, disproportionately affect people with certain protected characteristics and as a result women, people with disabilities, people from certain minority ethnic groups, and people who identify as LGBTQ+ are underrepresented in the health research workforce.¹⁰⁹ This is caused by a combination of these individuals being less likely to embark on a research career in the first place or less likely to stay in one long-term. This has significant consequences for individuals choosing to pursue careers in health research, as well as the system, through limiting the pool of talent from which health researchers are drawn. This constrains the diversity of ideas and experience that can be applied to health research challenges and can limit the type of research done, with health challenges faced by under-served or marginalised groups being less well-studied.

We heard from biomedical, clinical and health researchers that the current career structures and system appear to be built by, and for, the people who historically had access to careers in research and that these must change to support greater diversity and equity of opportunity in the future.

Diversity data are key to understanding these problems and designing the activities to address them. This is improving, including through activities such as the *National Institute for Health and Care Research's (NIHR) Diversity Data Report*.¹¹⁰ Similarly, the British Heart Foundation has produced a roadmap for change informed by data.¹¹¹ Meanwhile, Health Data Research UK (HDRUK) has launched a Health Data Science Black Internship Programme in partnership with the 10,000 Black Interns initiative.¹¹²

In HEIs, the lack of diversity at Trustee level (just 2.6% of Trustees in the Higher Education sector are Black) has led to the creation of the 'Bridging the board diversity gap' programme led by Perrett Laver, which seeks to address lack of representation in HEI boardrooms.¹¹³

However, there is still much more to be done. Diversity data on postdoctoral researchers employed on research grants are not routinely collected. Importantly, diversity data collection tends to focus on specific protected characteristics and not holistic data on the intersectionality of researchers across a range of protected characteristics. There is also more to be done to understand diversity at senior leadership and Trustee level across the whole sector. Improving data collection in these ways should be the foundation on which organisations design and deliver effective strategies to improve the diversity of the health research workforce.

It will also be important for organisations from across the sector to understand and engage with their own biases and structural discrimination. Wellcome's update on their anti-racism programme and the Academy's response on Race and the Academy demonstrate that there is much more to be done. See Box 5 for further details on the Academy's work on EDI.^{114,115}

Awareness of and access to health research careers

During our public dialogue (see Box 6), we heard that many members of the public lack an awareness of the possibilities that exist in health research careers and perceive that there are few options to enter research other than through undergraduate training.

Whilst early-stage education is beyond the scope of this report, it is important to recognise that many of the issues of diversity in the research workforce cannot be solved without diversifying the pool of talent considering health research careers at the earliest stage. Many organisations including the British Science Association and STEM Ambassador Programme are already doing excellent work in this area and will be vital to continuing to raise the profile of research careers to school age students.^{116,117}

It is, nevertheless, the responsibility of the whole sector to support initiatives, led by experts in engagement, that promote health research careers at school and undergraduate levels, with a particular focus on those who may not previously have considered research as a career opportunity.

At later career stages, expanding routes of entry, including through learning from existing apprenticeship schemes, such as those run by the Science and Technology Funding Council (STFC) and in the pharmaceutical sector can also play a role in diversifying the health research workforce.^{118,119}

Box 4: Equity, diversity and inclusion in the health research workforce

Whilst the past decade has seen progress, the diversity of the health research workforce in the UK fails to represent the population across career stages.

Undergraduate:

At undergraduate level the proportion of black students taking STEM subjects at UK universities has increased in recent years, however, outcomes remain unequal. White students are twice as likely to attain a first-class honours degree at graduation than black students. Black students are also more likely to leave STEM education and careers at every stage of the career pipeline.¹²⁰

Research workforce:

Less than 10% of life science professionals and 15% of academics are from a working-class background.¹²¹

Despite a 30% increase in women holding clinical academic positions since 2011, they only account for one third of the workforce FTE.¹²²

The proportion of black and minority ethnic researchers in the clinical academic workforce has remained at ~15% since 2011.¹²³

Meanwhile, estimates suggest that LGBTQ+ people are between 17–21% less represented in STEM fields than would be expected.¹²⁴

Positions of seniority:

Moreover, it is widely acknowledged across the health research sector that people with certain protected characteristics are underrepresented in positions of seniority. In clinical academia, women currently make up 50% of lecturers, but only 39% of senior lecturers and readers, and 25% of professors. Black and minority ethnic clinical academics make up 23% of lecturers, but only 13% of professors.¹²⁵ The proportion of female clinical and health researchers applying for NIHR career awards decreases from 77.8% at pre-doctoral level to 37.0% at Senior Investigator level. The percentage of NIHR award holders from minority ethnic groups also declines by career stage, and researchers from a minority ethnic group are less likely to be awarded NIHR funding for research programmes.¹²⁶

At the undergraduate level, 8.1% of UK domiciled students enrolled onto STEM related subjects at UK universities are black. However, only 0.5% of STEM professors in the UK are black (3.5% of black STEM researchers hold professorship positions compared to 11.9% for white STEM researchers).¹²⁷

Diversity within the Academy of Medical Sciences:

The Academy's elected Fellows, who are the UK's leading medical scientists from hospitals, academia, industry, and the public service, represent an indication of the demographic landscape of health research at senior levels. Overall, only 21% of the current Fellowship is female and 8% of the Fellowship identifies as Black, Asian, or from a Minority Ethnic group. In 2022, 17% of newly elected Academy Fellows identified as Black, Asian, or from a Minority Ethnic group, a much larger proportion in comparison to any previous year.¹²⁸

Box 5 – Summary of the Academy's activities to improve equity, diversity and inclusion in our culture and work

The Academy is committed to addressing issues of underrepresentation across all our activities and in health research careers more widely. Whilst several examples of our work in this area are provided, we are always learning and recognise that we still have a long way to go.¹²⁹

Data are critical for us to understand the extent of underrepresentation in health research. The Academy has collected and published diversity data spanning all our activities since 2014 and we are now working to ensure that our data allow for a more holistic understanding of protected characteristics.¹³⁰ Initiatives focussed on a particular protected characteristic, such as the Academy's SUSTAIN programme for female researchers, can be effective in improving the representation and experience of these individuals. However, we know that initiatives like these are not necessarily designed to respond to people whose identity comprises multiple underrepresented protected characteristics. Making our data collection more holistic will help us to make future initiatives more intersectional and improve representation across the board.

Effectively addressing EDI problems requires expertise, time and often money. The Academy employs an EDI Manager and hosts an EDI Forum of voluntary staff members; EDI Forum Leads are rewarded and recognised for this additional work and contributing their lived experience and expertise. Our EDI Forum directs the internal EDI agenda of the Academy which includes internal policy training and learning resources for staff. Our EDI Manager led the development of our EDI Strategy, which accompanies our 10-year Strategy.

The Academy's Fellowship is not reflective of the society in which we live, and our 10-year Strategy sets the ambition to change this. To diversify the selection of candidates for our Fellowship we are reviewing our election processes to minimise bias and make them accessible. We also provide nomination guidance and an annual Nominations' Masterclass to encourage Fellows to be more visible to potential nominees by connecting with EDI professionals and networks in their organisations.

Working collaboratively to learn and share best practice is essential to enact real change in the diversity of people choosing to embark on and remain in health research careers. The Academy is a member of the Equality, Diversity and Inclusion in Science and Health (EDIS) Research Network, the Employers Network for Equality & Inclusion and the Proud Science Alliance. The Academy is also committed to using our position and status to provide platforms to small, grassroots organisations in health research by actively seeking partnerships and collaboration with these groups.

Box 6: Summary of Public Dialogue on the future of health research in the UK¹³¹

Context and methodology:

The Academy held three workshops over May-June 2022 with a total of 44 members of the public, to explore public views and priorities around the importance and sustainability of health research. Participants received information about the sector during the session to help them engage in a more informed 'dialogue'. Recruitment was balanced across UK nations, genders, age group, socio-economic and ethnic background.

Awareness and views of health research:

- Health research **meant different things to people, but was seen as incredibly important**, with an understandable strong association with COVID-19 and vaccines.
- There was generally **low awareness of how health research is funded**, with an **assumption it is charity-funded**.
- After receiving further information, participants were generally **'positive' and 'uplifted' about the potential of health research**.
- Some members of the public were **surprised at the level of Government and industry funding** for health research.

Funding and financial choices:

Long-term goals and challenges:

- Participants **initially felt industry should be responsible for funding the majority of health research** particularly as they were perceived to profit from selling the products of research, but as more sector information was introduced to the dialogue, **more people thought government should be funding more health research**.
- Some also expressed **concern about the future of charity funding**, in light of the cost-of-living crisis.

Participants' priorities for the future of health research:

- Greater **transparency about industry contributions and profits**, and an assessment of profit-based models in general.
- **Regulation of charities to ensure funds go to research** and researchers' salaries, and not to 'top executives' within funding organisations.
- **More ring-fenced government funding** for research.

Sustainability of the workforce:

Long-term goals and challenges:

- Participants were initially unaware of the challenges faced by those working in health research but became **increasingly concerned that a poor working environment for researchers could lead to poor outcomes** for their research and the wider population.
- There was empathy for researchers and a belief **they should be valued for their important contribution to society**.
- **Diversity and geographical spread** in the workforce were seen as important.

Participants' priorities for the future of health research:

- Public honouring and **celebration of researchers**.
- **A greater variety of paths by which to enter the workforce**, and **education in schools** and colleges about careers in research.
- **Expand research operations outside of universities in Cambridge, London and Oxford**, utilising existing hospitals and other settings around the country.
- **Reducing inequalities and improving access** for women and people from minority ethnic background, to retain and boost a diverse workforce.

Solution 3: To increase the inclusivity of health research careers in the UK, we propose the following solutions:

- a. Funders and employers must coordinate efforts to improve the **collection and sharing of holistic data, across a range of protected characteristics, on the diversity of the health research workforce**. This should range from early career researchers, postdoctoral researchers (including those employed through research grants) through to senior leadership and Trustee levels.
- b. Individual funders and employers should use these data to **develop evidence-based delivery plans** to address any inequalities that are identified. This may include:
 - i. **the design and delivery of targeted and specific interventions at particular career stages** and/or for particular underrepresented groups.
 - ii. activities targeted at diversity at senior leadership and Trustee positions in funders, charities and HEIs.
- c. The health research ecosystem must collectively renew its efforts to present and promote health research as an attainable and attractive career path for all, including through:
 - i. **investing in awareness-raising initiatives** targeted at secondary school and undergraduate levels, with a particular focus on those who may not previously have considered research careers.
 - ii. diversifying routes of entry into research through **apprenticeships** and other routes.

Toolkit includes:

- **EDIS**¹³² – coalition of organisations working to improve equality, diversity and inclusion within the science and health research sector.
- **Clinical Academic Training and Careers Hub (CATCH)**¹³³ – website promoting the value of clinical academic careers and a useful resource for clinicians with interests in mental health research.
- **INSPIRE**¹³⁴ – Academy scheme designed to engage medical, dental and veterinary undergraduates in research.
- **STEM Ambassadors**¹³⁵ – programme where people with industry experience or professional knowledge of science, technology, engineering, and mathematics (STEM) subjects volunteer to work with young people to inspire the next generation to follow a STEM career.
- **British Science Association**¹³⁶ – charity that develops science engagement programmes for audiences underrepresented in, and underserved by, science.
- **Science and Technology Facilities Council (STFC) apprenticeships**¹³⁷ – 4-year advanced engineering apprenticeship accredited by the Institution of Engineering and Technology.
- **Governance Apprenticeship Programme**¹³⁸ – programme that aims to increase diversity at board level in mission-driven sectors.

Barriers to International Talent

As noted above, the UK's highly international research workforce is a huge strength. Historically, the UK has benefitted from international talent.

A recent report by UKRI on the *Global Mobility of Research Personnel*, found that the UK, through its global reputation and world-renowned research institutions, is an attractive destination for international talent.¹³⁹ However, the attractiveness of the UK as a destination for top talent must not be taken for granted. Changes to immigration policies in recent years have made it more expensive and more difficult for researchers from EU nations to come to the UK. Meanwhile, global competition for research talent is increasing and we heard some evidence that researchers in the UK are finding it more challenging to recruit international talent, particularly at post-doctoral level.

The steps taken by the UK Government to address the attractiveness of the UK, including through the launch of the Global Talent Visa (GTV) designed to attract research talent to the UK, are welcome, as is the subsequent launch of the Global Talent campaign, which seeks to attract R&I talent.¹⁴⁰

However, the Government's R&D Roadmap notes:

*'The visa system can still be seen as an obstacle with significant bureaucratic and cost barriers especially once family members are factored in...These cost barriers can be particularly stark for early career researchers and technical professionals.'*¹⁴¹

These high costs are exemplified by comparing the upfront costs faced by GTV holders to other comparable international visas (Table 1).¹⁴² These costs accrue for dependants, adding further barriers for those researchers with families from relocating to the UK.

Table 1: Upfront cost of obtaining a five-year UK Global Talent Visa (exceptional talent) compared with other leading science nations, figures correct May 2020^{143,144,145}

Country and visa category	Total cost to employee
Japan - Researcher Visa	£0
Spain - Residence Permit for Researchers	£64
S. Korea - E3 Research Visa	£99
Netherlands - Researcher	£145
Australia - Temp Activity Visa - Research (408)	£154
Australia - Research Student	£154
Sweden - Residence Permit for Visiting Researchers	£160
Germany - Scientific Visa for Researchers	£170
Italy - Research Permit	£207
US - J1 Research Scholar	£258
France - Talent Passport - Researcher	£313
India - Research Visa for all levels	£608
UK – Global Talent Visa	£2608

Further complications can arise for medically qualified researchers, where entry to the Specialist Register is a condition of eligibility to take up an appointment in any fixed term, honorary or substantive consultant post in the NHS.¹⁴⁶ Doctors who have not trained in an approved programme (e.g. overseas) can demonstrate their knowledge, skills and experience are equivalent to that of the relevant Certificate of Completion of Training (CCT) curriculum via the Certificate of Eligibility for Specialist Registration (CESR). Clinical academic medics from overseas typically pursue entry to the GMC's specialist register through the Academic or Research CESR route.

This application involves demonstrating equivalence of research training, knowledge and skills consistent with practice as a consultant in the UK health services, as well as having made a significant contribution to their chosen academic field. Whilst this process provides important checks and balances to ensure overseas qualified clinically academics are fit to practice, we heard that the process is complex, lengthy and overly bureaucratic, reducing the attractiveness of the UK to clinical researchers who qualified overseas.

It is also crucial that the UK's private sector is able to access the global expertise and talent it needs. ABPI recommend that international research talent should be developed 'at a level never seen in the UK before', building on efficient visa and administrative processes, ample exposure to international networking and partnership opportunities for researchers, and a 'best-in-class' approach to diversity and inclusion.¹⁴⁷ UKRI have also conducted a consultation to understand how UK R&D-intensive businesses use the immigration system, and how they can be better supported.¹⁴⁸

Solution 4: To ensure the UK remains open to talent from across the globe, Government departments, funders and regulators should work together to remove barriers to attracting global talent:

- a. Home Office, UK Visas and Immigration and the Department for Science, Innovation and Technology (DSIT) must ensure that our **visa and immigration system works effectively, fairly and in an expedient fashion for health researchers working in public, private and charitable settings (as well as for their families) and is competitive** with other strong research nations.
- b. Public and charitable funders should consider the **inclusion of visas and Immigration Health Surcharge as eligible costs** in their research grants.
- c. Regulatory bodies such as the **General Medical Council (GMC) and Nursing and Midwifery Council must work with the Royal Colleges and other stakeholders to ensure that recognition of their clinical qualifications does not present undue regulatory or financial burden** on clinical academics seeking to bring their research expertise to the UK.

Insufficient opportunities for patients, carers and public

In health research, PPI is now a requirement for research funding in many schemes and there is growing recognition of the value this brings to health research. However, the standard of involvement is not universal across health research.

Recent work, such as the shared commitment to public involvement led by the Health Research Authority (HRA) and NIHR and signed by 14 other organisations set out important principles for embedding PPI into health and social care research.¹⁴⁹ This is complemented by an independent review commissioned by MRC that considered public involvement in non-clinical health and biomedical research.¹⁵⁰ Combined, these reports show encouraging recognition of the value of PPI to all health research and the importance of purpose-led and context-dependent engagement in areas such as non-clinical research. Importantly, they also demonstrate that there is more to be done.

Our Patient and Carer Reference Group helped us to understand that opportunities to engage in health research can be hard to access and off-putting for those who have no prior experience in health research. We heard that these disincentives are compounded by lack of access to appropriate training, peer-to-peer support and mentoring for both lived experience and academic researchers looking to engage in PPI. However, the greatest potential barrier to patients, carers and the public engaging in health research was considered to be cultural, with many describing remuneration, terminology, poor understanding of the emotional impact of ill-health or caring responsibilities, and poor integration into research teams as contributing to a perception that lived experience researcher expertise is undervalued.

We heard that existing guidance and policies do not recognise all the ways in which patients, carers and the public are involved in research, that remuneration can be slow and complicated, particularly for those receiving benefits, and that there is a lack of consistency across the sector. We also heard that terms such as 'lay' undermine the value of patient, carer and public involvement in research, and that power hierarchies in research teams and a lack of consideration of accessibility needs can create further disincentives for involvement.

In addition, we heard that there are limited opportunities for patients, carers and the public to co-produce and co-lead research and even when undertaking these roles their contributions may not be properly recognised. In particular, a lack of funding at early stages for patients to develop their own ideas or be involved in the development of a research project is prohibitive to some and can prevent their ability to be involved in

research prior to the successful funding of a project. This is often the stage at which the input of patients, carers and the public can be most important. Positive examples do exist, including the NIHR-funded Centre for Dissemination and Engagement, but more can be done to develop innovative models to provide greater support for PPI at the earliest stages of health research. This is covered in more detail in Chapter Three.

Solution 5: To properly value patient and public involvement in health research, we propose the following solutions:

- a. Public and charitable funders and employers should work together to **create a culture that truly values Patient and Public Involvement (PPI)** in health research through:
 - i. **Enhancing peer-to-peer support, career development and training opportunities for both the lived experience** and academic researchers they fund/employ.
 - ii. **Demonstrating the value of lived experience researchers** through opportunities for co-investigator and/or co-applicant status on research funding, formal training, accreditation and honorary and temporary research contracts for lived experience researchers to ensure greater access to the research infrastructure in HEIs or other research settings.
- b. Public and charitable funders across the four nations of the UK should develop **consistent and fair remuneration policies**, particularly recognising both the true time committed and costs incurred by lived experience researchers.
- c. Public and charitable funders should **develop pre-award funding streams for PPI at earliest stages of conception of research projects**.
- d. **Coordination and collaboration between public and charitable funders** to provide strategic co-funding to address key gaps in the advancement of public involvement: the development of robust methodologies, learning and development, underserved community involvement and understanding impact.
- e. **Sharing of best practice across public and charitable funders** across the four nations of the UK including through clear, publicly accessible information on interventions and robust evaluations of their success.

Toolkit includes:

- **Putting people first – embedding public involvement in health and social care research**¹⁵¹ – shared commitment to public involvement to drive up standards in health and social care research signed by UK organisations including The Health Research Authority (HRA) and NIHR.
- **NIHR: Research Design Service Centre for Engagement and Dissemination**¹⁵² – service that provides free and confidential advice on research design, writing funding applications, and public involvement to health and social care researchers across England.
- **NIHR Payment guidance for researchers and professionals**¹⁵³ – guidance on principles for payment for PPI activities.¹⁵⁴
- **Independent Public involvement landscape review**¹⁵⁵ – a review of public involvement in MRC-funded research, with a specific focus on non-clinical health and biomedical research.

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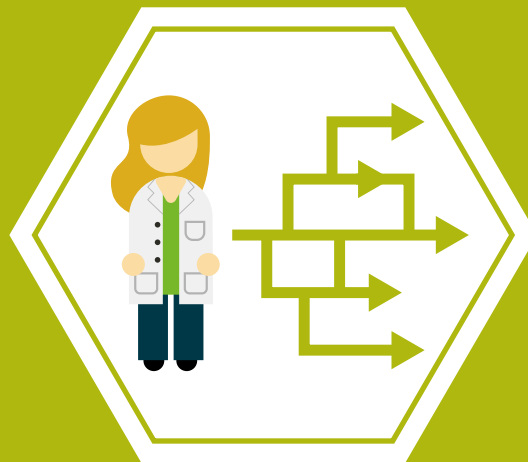
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Chapter Two: Cross-sector mobility

Summary

- Giving researchers access to research careers that span different sectors (academia, industry, NHS, Government) can enhance the skills and knowledge of individuals.
- Cross-sector mobility can make careers in health research more appealing and varied; increase understanding between sectors; and ultimately improve the way these sectors work together to boost the resilience and sustainability of the system.
- There are many good examples of initiatives that support mobility, however, limited understanding between sectors, poorly aligned incentives and a perception of both personal and institutional risk from cross-sector mobility continue to create conditions in which movement between sectors is, at best, unidirectional and, at worst, disincentivised.
- To create the conditions in which multidirectional movement between sectors is understood, attractive and attainable for individuals and organisations we propose:
 - Employers adopt hiring, promotion and reward criteria that recognise and assess value of cross-sector mobility.
 - Employers adopt streamlined processes for secondments and joint appointments.
 - Creating incentives for HEIs to promote cross-sector mobility through the Future Research Assessment Programme (FRAP).
 - Improving the evidence base of both existing schemes promoting cross-sector mobility and the drivers/barriers for individuals, in order to expand the range of schemes available to support cross-sector mobility.

What is cross-sector mobility?

Health research spans sectors broadly encompassed by academia, industry and the NHS, with Government, charitable and social care also relevant in some disciplines.¹⁵⁶ We consider cross-sector mobility to be when an individual performs health research in multiple sectors over the course of their career. Movement between sectors can be gained via permanent jobs, secondments (or similar placements) or joint appointments.

We focus on movement between substantive roles rather than considering cross-sector collaborations more broadly. We recognise that collaborations play a positive role in fostering a more mobile workforce, and vice versa.

An individual need not (but should be able to) move back and forth between sectors, but at the system level movement should be bi-directional, with a focus on porous boundaries between sectors that facilitate exchange in every direction.

Benefits of cross-sector mobility

Through our written consultation and a workshop, we identified many benefits of greater movement between sectors, which suggest that enhancing it would improve the sustainability of the health research system. Ultimately, this must be with a focus on better outcomes for patients and the public.

Overall

The evidence we heard – from academia, charities, industry the NHS and more – indicates that cross-sector mobility promotes **mutual benefit**: by enhancing the overall quality of the UK's health research talent pool from which all sectors draw; by strengthening understanding between sectors, and thereby their ability to collaborate effectively and benefit from each other's skills, knowledge and resources; and by enabling effective joint responses to major challenges and opportunities.

One important caveat is that enhanced cross-sector mobility will best contribute to the sustainability of the system in these ways if it is **bi-(or even multi-) directional**, allowing research staff to move in all directions. While movement between sectors cannot – and perhaps should not – always be symmetrical, it is important to ensure that research staff are enabled to move to and from each sector according to the needs of their career.

The concept of mutual benefit can help reframe tensions between sectors about whose responsibility it is to enhance movement between sectors.

Individuals

At the level of the individual, cross-sector mobility and early exposure to different sectors can lead to improved **understanding** of other sectors, enhanced **skills** and ultimately greater **employability**. Making it easier and more appealing to move between sectors would also expand the range of career options for health researchers.

In these ways, enhanced cross-sector mobility has the potential to contribute to the sustainability of UK health research by: **attracting and retaining** staff, especially younger generations and emerging research leaders who are perceived to place a high value on agility and personal development; **empowering** those younger cohorts to develop a sense of ownership over, and investment in, the health research system that they will 'inherit'; and promoting **career resilience** by increasing employability and broadening the options for work, thereby strengthening individuals' chances of sustaining a successful and fulfilling career over the long-term. A better understanding of the perceptions of current and future generations of researchers will inform the best way to nurture and capitalise on these anecdotal cultural changes.

Institutions

Many of the benefits described above are passed on naturally to the institutions for whom the individuals work. For example, a benefit of cross-sector mobility, which was reported across sectors, is the chance to gain first-hand **experience**, and therefore more accurate **understanding**, of the processes, constraints, incentives and drivers of behaviour in other sectors. This would in turn support 'myth-busting', or the correction of false **expectations** about other sectors. While this begins with individuals, the benefit is passed onto the institutions for whom they work, as an important precursor to more effective collaborations with institutions in other sectors.

Similarly, institutions who employ individuals with experience of different sectors are likely to be more **resilient** as they benefit from a broader range of skills, knowledge and experience, drawn from other sectors. One aspect of this is that greater movement between sectors was thought to contribute to the **diversity** of views within institutions and sectors, which in turn supports creativity and drives innovation.

How cross-sector mobility boosts innovation

A recent report from the Royal Society noted that despite these cultural and systemic impediments to movement between academia and industry, porosity between sectors supports innovation, and is an important tool in increasing the effectiveness of research. The links between investment in R&D and local growth are also greater when research and local industry align.¹⁵⁷

The concept of resilience through porosity was raised particularly in the context of **major health challenges**, which require the expertise and skills of individuals and teams from varied perspectives. For example, the challenges of social care or climate change, or the opportunities of AI, may benefit from researchers with greater understanding of different sectors.

How cross-sector mobility can accelerate research

A recent report on climate change and health, jointly produced by the Academy of Medical Sciences and the Royal Society, highlighted a strong need for transdisciplinary, systems thinking approaches to the complex interaction between climate change mitigation and health. Climate change offers a clear example of a large-scale, complex challenge facing multiple sectors and disciplines, where porosity between sectors is likely to improve and accelerate research and the delivery of its outputs.¹⁵⁸

How cross-sector mobility can help tackle major challenges

Wellcome's Collaborative Awards in Science existed to 'fund teams of researchers, consisting of independent research groups, to work together on the most important scientific problems that can only be solved through collaborative efforts. This often involves collaborations across organisations, national borders, interdisciplinary science and partners outside of academia.' These awards have closed as Wellcome pursue a new strategy, but they clearly articulated the need for support for cross-sector mobility to tackle major challenges.¹⁵⁹

Challenges and opportunities

In broad terms, cross-sector mobility can happen if five conditions are met:

- There are **opportunities** for people to move sector.
- Individuals **know** about the opportunities and how to take advantage of them.
- Individuals have the **skills and understanding** to thrive in different sectors.
- Individuals **see value** in moving sector.
- **Employers are motivated** to encourage and promote opportunities for researchers to move between sectors.

Below we consider each of these conditions in turn, considering barriers, existing evidence of good practice and opportunities to learn from these. Many of the themes explored below may also relate to cross-sector collaboration, however the comments below primarily focus on the conditions that affect the ability of individuals to move between sectors. Broadly, our findings align with the *Independent Review of the RDI Landscape*, which concluded that there is 'insufficient permeability of ideas, people and technologies between different sectors'.

Opportunities for people to move sector

Throughout our evidence gathering we heard that for many researchers a poor understanding of the demands of working in different research settings contributed to low awareness of how and why they might benefit from moving, temporarily or permanently, to other sectors. This can contribute to inaccurate expectations of other sectors and/or frustrations about a lack of information or opportunity.

However, despite this general challenge, we identified a wide range of schemes and opportunities designed to support cross-sector understanding and mobility for health researchers, particularly between academia and industry. In fact, latest data from the ABPI's survey of their members show that industry-academia links are at an all-time high, with increases in apprenticeships, undergraduate placements, and postdoctoral researchers placed in industry compared to previous survey findings from 2019.¹⁶⁰

Undergraduate and postgraduate

At early stages of research careers, there is a range of placements and internships across undergraduate and postgraduate education designed to embed exposure between sectors. For example, at undergraduate level many universities offer sandwich courses with a year in industry.¹⁶¹ At PhD level, the ABPI industry-academic links survey revealed an almost 10% increase in PhD studentships with industry links since 2019, up to 601.¹⁶² Support at the doctoral level includes UKRI's Industrial Cooperative Awards in Science & Technology (ICASE) programme.¹⁶³

Meanwhile, the Professional Internships for PhD Students (PIPS) scheme, which requires all Biotechnology and Biological Sciences Research Council (BBSRC)-funded PhD students to undertake a three-month internship outside of academic research, increases exposure to research in academic settings as well as research adjacent careers such as policy, grant-making and public engagement.^{164,165} Similar schemes exist for PhD students funded through other means to gain experience in policy across Parliament, the academies and the third sector.^{166,167}

Early- to mid-career opportunities

In clinical training, we heard of joint training in Edinburgh for clinical pharmacology and medical oncology, which includes a placement in industry.¹⁶⁸ A previous workshop held by the Academy and the ABPI identified an opportunity for industry to engage with the GMC and Royal Colleges to make the case for opportunities for exposure to other sectors during medical training – for example through joint training such as in Edinburgh, or placements as mentioned above.¹⁶⁹ In Glasgow, more formalised partnerships between the University of Glasgow and the NHS Greater Glasgow & Clyde (NHSGGC) Health Board have also opened up opportunities for newly appointed consultants, undergraduate medical students and PhD students to gain exposure to research careers (see Case Study 1).

Exposure to other research settings can and does take place throughout research careers. The ABPI industry-academic links survey found 564 postdoctoral researchers working with pharmaceutical industry, double the figure from 2019.¹⁷⁰ Meanwhile, the Academy's FLIER programme features opportunities for cross-sector immersion and convenes individuals from different sectors to learn from each other (Box 7).¹⁷¹ Participants commonly report a 'cohort effect', learning much from each other and forming new connections across different sectors related to health research. Case Study 10 also explores a scheme run by Astex and CRUK Newcastle Drug Discovery Unit, open to early/mid-career researchers in pre-clinical and clinical translational research, offering deep immersion into charity, NHS and industry settings.

Box 7: Academy of Medical Sciences Future Leaders in Innovation, Enterprise and Research (FLIER) programme

The Academy's FLIER: Future Leaders in Innovation, Enterprise and Research programme, aims to equip emerging leaders across academia, industry, the NHS and government with the skills required to manage projects or teams in an increasingly interdisciplinary and cross-sector context, and opportunities to apply such strategic and higher-level operational skills to a work-based project.¹⁷²

More recently, the Academy has launched a new cross-sector programme designed to promote networking and ultimately provide opportunities for secondments (explored in Box 8).

Box 8: Academy of Medical Sciences Cross-Sector Programme

A new programme from the Academy will seek to boost connections and activity between sectors in areas of specific priority to health research. This includes data analytics and artificial intelligence for genomics, pathology, drug development and medical imaging, and cell and gene therapy.¹⁷³

The scheme proposes to encompass two components:

1. Establishment of local networks or '**hubs**', with the aim of connecting people from all relevant sectors through networking events, building on existing regional infrastructure.
2. Building on the connections made, funding will also be provided by competitive selection to support **flexible movement 'secondments'** of researchers between academia, industry, and the NHS, leading to sharing/acquisition of skills, the generation of ideas and new cross-sector collaborations.

The UKRI Innovation Scholars programme, was also highlighted during our evidence gathering and lauded by many as providing excellent opportunities for cross-sector mobility, however some felt it was too bureaucratic. There may be much to learn from what its participants valued and how a similar scheme could be made more effective in future.¹⁷⁴

Public health

In public health, secondments and joint appointments have enabled academic researchers to work in and with government agencies and other policy organisations. A recent Academy workshop on 'embedding evidence in public health' highlighted the role these initiatives play in improving interorganisational relationships, allowing 'cross-pollination of ideas' and building a skills base in knowledge brokerage.¹⁷⁵ Schemes include the ESRC and Arts and Humanities Research Council (AHRC) Policy Fellowships for researchers to spend 18 months with a UK or devolved government department.¹⁷⁶ Funding for a further 22 fellowships was announced in July 2022.¹⁷⁷ However, it was noted that opportunities such as these are not easily accessible for researchers across the range of careers stages and disciplines. Furthermore, changes to public health structures, such as the creation of the UK Health Security Agency (UKHSA) and Office for Health Improvement and Disparities (OHID) may present opportunities to embed these opportunities in the functioning of these newly established bodies.

A key feature of many of these initiatives is their focus on promoting skills and understanding that will enable people to work across sectors, moving in a multidirectional manner rather than simply providing the skills to move from one sector to another.

One area where we saw limited evidence of opportunity for training and exposure to cross-sector opportunities was for lived experience researchers. Whilst most lived experience researchers will not be looking for cross-sector opportunities to explore new career options, we heard that greater exposure to research in different settings, including through peer-to-peer support and mentoring, could improve the quality and consistency of PPI across sectors.

Awareness of opportunities and how to take advantage of them

Despite the many examples listed here, it was clear from our evidence-gathering that there is generally low awareness of the opportunities that already exist for individuals to move between sectors and that a number of the schemes that were most valued are no longer in existence. This makes it difficult to take full advantage of the schemes that exist, replicate those that work(ed) and learn from those that do not.

Skills and understanding to thrive in different sectors

Many of the schemes outlined above are specifically designed to provide the skills, networks and understanding required for individuals to thrive in different research settings. However, we heard that there are skills and cultural differences between sectors that can inhibit cross-sector mobility.

The ability to work across and between sectors is enhanced through soft skills – such as team working, entrepreneurship, leadership, and PPI. In particular, communication and teamworking skills are essential for working in integrated teams that bring together people from different disciplines and/or sectors.

We heard that exposure to entrepreneurship and enterprise training at early career stages, particularly undergraduate level, can help to furnish the next generation of researchers with the skills required to excel in multiple sectors. Organisations such as Advance HE have developed an 'Enterprise and Entrepreneurship Education Framework' intended to help institutions provide the right activities and experiences to support their students understand how enterprising and entrepreneurial behaviours can help them in their future careers.¹⁷⁸ Many HEIs also provide support for their students to gain entrepreneurial skills, for example, the Faculty of Engineering at the University of Sheffield runs an award-winning 'technology strategy and business planning' module that introduces 'concept, strategy, and techniques behind a business plan based on the exploitation or development of identified technological opportunities'.¹⁷⁹ Nevertheless, we heard that access and uptake of these courses could be improved and more could be done to embed these training programmes and opportunities across careers stages.

We also heard that access to **coaches and mentors** with experience of other sectors is limited and this may influence the ability of individuals to adapt to and understand the sector to which they are moving. Similarly, it was noted that the value attached to personal development of staff varies between sectors.

Whilst personal development and opportunities to explore careers in different sectors is included in the Concordat on Researcher Development, we heard anecdotally that few researchers in academic settings felt empowered to take full advantage of these opportunities. This was identified as a significant area of difference between industry and academia.

Understanding of the drivers of research in different sectors can be equally important in enabling individuals to thrive. For example, at a joint workshop held by the Academy and the ABPI, attendees noted the **difference in how time and finances are valued across sectors**. In industry, time is critical, which demands shorter timeframes despite increased costs, whereas academia often focuses on the most effective use of resources, which may increase time. A lack of appreciation of this fundamental difference can impede effective partnerships. Therefore, increasing the number of individuals with experience in different sectors offers a promising route for promoting mutual understanding and appreciation of these differences.¹⁸⁰

There is also **variation in approach to discovery science across sectors, which can contribute to differing markers of success for individuals**. For example, industry research may prioritise finding and pursuing a promising avenue to allow rapid commercialisation, whilst academic research is more likely to pursue a complete understanding of a biological system. Both of these approaches are important to fulfil sector goals and advance scientific understanding but may not always align, particularly if measures of success for individuals (and therefore employability) differ.¹⁸¹

Appetite to move sector

Opportunities, awareness and understanding can all lay the foundation for individuals to pursue cross-sector mobility. However, it will only happen if it is seen to be appealing and capable of furthering the career opportunities for individuals considering moving between sectors.

Much of this chapter has dealt with the **trust** and **mutual recognition**, driven by awareness and understanding, which can make cross-sector mobility appealing.

However, we heard researchers express concern that moving between sectors continues to feel like a leap of faith, with a persistent perception that movement is unidirectional. At the individual level, this is manifested by **concerns about the risks** that moving between sectors may pose for careers, including:

- Differences between sectors in measuring success.
- Relatedly, difficulty in establishing recognition.
- Loss of professional identity.
- Perceived insecurity of 'starting again' in a new sector or 'moving on' from one's current sector (not considering returning as an option).

Despite these concerns, we heard that some schemes effectively mitigate these concerns, for example, through guaranteeing the security of individuals' roles during secondment – such as the AstraZeneca & King's Health Partners secondment scheme explored in Case Study 5. We also heard that current and future generations of early career researchers may hold different views on cross-sector mobility and may be more receptive to the opportunities it presents.

It would be helpful to understand these attitudes, including how they differ between career stages. This speaks to a more general concern throughout our evidence-gathering, that there is insufficient evidence to confidently assess the scale of movement between sectors, where it is working best, where there are gaps, and which areas need most targeted action.

It would be informative to address this lack of quantitative evidence, for example, with a survey of individuals working in health research, to better understand their incentives and behaviours.

Motivation of employers to encourage and promote cross-sector movement

Related to the concerns at the individual level, there are perceived risks at the institutional level, where attitudes of aversion to ‘loss of personnel’, or ‘extraction’ of research staff from one sector, form barriers to movement. This institutional mistrust was reported to be more common in some sectors than in others – for example, there are widespread concerns about a **‘one-way door’ out of academia**, which makes it difficult for researchers to return after spending time in industry or government.

This can be compounded by the **institutional incentives** that can conspire against employers from supporting their employees to move between sectors. For example, extreme pressures on clinical delivery within the NHS reduce incentives for NHS employers to empower their staff to explore opportunities to work across sectors (explored further in Chapter Four). For universities, institutional incentives to perform well in the REF have historically created perverse incentives such as creating ‘disadvantages [for] researchers who seek flexible career structures, whether this is to undertake work with industry or support government in policy making’, or reducing the value that universities place on integrating NHS-employed staff in research teams.^{182,183} This has contributed to a conservative approach to recruiting staff from outside of academic settings and allowing their own staff to explore secondments and opportunities in other sectors. Whilst changes to the most recent exercise (REF2021) were intended to address these issues, we await further analysis of the results to determine the effectiveness of these changes.

In addition, the Concordat on Researcher Development has recognised that ‘moving between, and working across, employment sectors can bring benefits to research and researchers’ and institutional signatories commit to ‘support opportunities for researchers to experience this’. Embedding these principles into practice must be a strong feature of the next steps of implanting this Concordat. Meanwhile, the National Centre for Universities and Business (NCUB) has recently launched a Cross-Sector Mobility Taskforce to produce recommendations on how improving researcher mobility could enhance innovation outcomes across universities and businesses.¹⁸⁴ This is expected to report in summer 2023 and may produce compelling insights into delivering the change in culture that we are advocating for.

Finally, cross-sector mobility will provide most value to organisations if movement can be multidirectional and unbureaucratic, in line with the principles set out in the recent *Independent Review of Research Bureaucracy* (harmonisation, proportionality, simplification, flexibility, transparency, fairness, sustainability).¹⁸⁵ Specifically, the review noted two areas of particular relevance including:¹⁸⁶

- The role of professional services including human resources in supporting secondments and joint appointments.
- Use of standard templates for contracts and collaboration agreements, recognising that this would not just be faster, but would also facilitate third-party collaborations.

Solution 6: To create the conditions in which multidirectional movement between sectors is understood, attractive and attainable for individuals and organisations, we propose the following solutions:

- a. Employers across academia, industry and HEIs should **adopt hiring, promotion and reward procedures** that recognise and assess the value that candidates moving from different sectors can bring to their organisations and agree methodology to calibrate markers of achievement in those different sectors.
- b. **Secondments and joint appointments** between academia, industry, NHS, Government departments and agencies and other settings should be far easier and more attractive, including through:
 - i. Employers providing mechanisms to take the employee back at a grade commensurate with their experience.
 - ii. Employers adopting streamlined and standardised policies for secondments and joint appointments wherever possible. In academic settings, Universities UK (UUK) should work with its members to support greater consistency.
- c. Research England and Higher Education Funding Bodies in the devolved administrations should ensure that the **FRAP incentivises and rewards HEIs for creating an environment that supports cross-sector mobility**.

- d. The Office for Life Sciences should **commission an audit and analysis of existing and recent cross-sector mobility initiatives** in health research to better understand existing successful cross-sector schemes at all career stages: what works; what doesn't work; where there are gaps that need filling, including for lived experience researchers.
- e. The **BEIS R&I workforce survey should be expanded** to capture information on the prevalence, drivers and barriers to cross-sector mobility.
- f. Using information from this audit and survey, **public and private sector employers and funders should invest in tailored schemes to promote cross-sector mobility**.

Toolkit includes:

- **Concordat on Researcher Development**¹⁸⁷ (see Box 2).
- **R&I workforce survey**¹⁸⁸ – Government sponsored survey that aims to collect evidence on the R&I workforce to create a better evidence base for policy decision-making in relevant government departments.
- **FRAP**¹⁸⁹ – (see page 25).
- **NCUB Cross-sector Mobility Taskforce**¹⁹⁰ – A taskforce comprising business and university leaders to identify opportunities for easier movement between academia and industry.
- Academy of Medical Sciences schemes:
 - **Cross-Sector Programme**¹⁹¹ – event programme hosted in hubs across the UK that brings together innovators, researchers, health professionals and policymakers working across the life sciences sectors through networking events and a collaborative funding scheme to promote health innovation.
 - **Future Leaders in Innovation, Entrepreneurship and Research (FLIER)**¹⁹² – (see Box 7).

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Chapter Three: Financial sustainability of health research in academic institutions

Summary

- The UK's health research system benefits from many world-leading academic research institutions coupled with a diverse funding system including public, private and charitable organisations. The strength and financial sustainability of these institutions underpins both the training of research talent and their ability to contribute to the health and wealth of the UK.
- However, the full costs of health research are not being covered by any funder.
- The gap between costs of research and the income for research is widening in academic institutions.
- This is making health (and other) research increasingly financially dependent on cross-subsidy from other sources, primarily international students' tuition fees.
- The failure to cover the full costs of research is detrimental to the institutions where it takes place, but also to the researchers, including lived experience researchers, who work with and within the system.
- To address this growing gap, we propose:
 - Greater coordination between health research funders to understand, publish, and respond to data on the relationship between research funding and research costs.
 - A collective responsibility to sustainably fund health research, including through: Government investment in the underpinnings of health research through unhypothecated and infrastructure funding that can leverage funding from other funders; expanding innovative funding partnerships between charitable and public funders; and guidance on assessing the value of industry-academic partnership.
 - Allocation of adequate funding to the full diversity of people and activities required for excellent research, as set out in Chapter One.

Definition and significance

Excellent health research that delivers benefits to the public and the economy cannot be conducted without a sound financial foundation to securely support the broad range of people and institutions that underpin our current research strength. Nor will we be able to achieve the contemporary 21st century excellence in research to which we aspire without having the funding models that allow an even broader, and more representative, range of people engaging in research. Therefore, financial sustainability of research must be a central component of any objective to be a 'science and technology superpower'.

In the UK, health research takes place in a range of institutions and is funded by a unique array of different organisations from the public, private and charitable sectors (see explainer). This chapter will explore the benefits of this ecosystem of funders, including the unique role played by each funder. It will focus on research in academic research institutions, where health research is generally (if not universally) a financial loss-making activity because the full costs are not covered by research income. The result is that health research is supported through cross-subsidy from other sources of income, typically international students' fees.

Whilst this model has sustained the UK's excellence in health research over many years, a number of factors, explored in more detail below, are threatening to undermine the foundations of our health research system. In order to ensure that the UK health research system can sustainably deliver lifesaving and life-enhancing research it must be, and remain, not just financially viable, but financially attractive for academic institutions to fund and conduct health research.

Achieving this will be to the benefit of the full breadth of health from discovery research to translational research - from finding new treatments and diagnostics to developing preventative interventions that support public health (see definition in Box 1). It will also be to the benefit of the breadth of people who contribute to these diverse kinds of research – from curiosity-driven scientists to researchers working in clinical healthcare settings, and from technicians and skills specialists to lived experience researchers.

This chapter explores the strengths and weaknesses of the current model and provides solutions that could future-proof the financial sustainability of health research.

Strengths

Diversity of the health research funding system

Health research in the UK benefits from a diverse array of funders. We have excellent public funders in the form of UKRI and its Research Councils, the NIHR in England alongside Health and Care Research Wales, the Chief Scientist Office in Scotland and the Department of Health in Northern Ireland. Overall, in 2019, it is estimated that 21% (approximately £2.7 billion) of the UK government's R&D spend focused on health.¹⁹³

Within public funding, we have a dual support system for research in academic settings (enshrined in law in the 2017 Higher Education and Research Act), which provides funding for both specific projects (hypothecated) and for strategic use (unhypothecated). Hypothecated funding (also called response mode funding) is delivered by a range of organisations including UKRI's Research Councils. In health research, this is primarily, although not exclusively, delivered through the MRC, with health-relevant strands also funded by the Engineering and Physical Sciences Research Council (EPSRC), BBSRC and ESRC, as well as Innovate UK (although the latter is largely in the private sector).

In England, the formation of the NIHR has transformed funding for health research since its establishment in 2006. Specific funding streams for health research also exist in various forms across the nations of the UK through Health and Care Research Wales, the Chief Scientist Office in Scotland and the Department of Health in Northern Ireland. However, the scale of funding delivered for health research through these routes is proportionally less in Scotland, Wales and Northern Ireland.¹⁹⁴

Meanwhile the second branch of the dual support system, provided by the four UK higher education funding bodies (Research England, Scottish Funding Council, Higher Education Funding Council Wales, and Department for the Economy in Northern Ireland), ensures that response mode funds are complemented and supplemented by unrestricted funding, also called 'unhypotheated' funding, which is allocated through block grants, usually annually, for HEIs to deploy strategically. Unhypotheated funding is delivered through a variety of mechanisms and plays a critical role in supporting health research as set out in **Box 9**.

Box 9: Examples of unhypotheated funding

Mainstream QR/Research Excellence Grants (REG): Often referred to as block grants, these funds are allocated to HEIs by the Higher Education Funding bodies in each nation of the UK according to formulae that consider a range of things, including 'research excellence' as measured by the UK-wide REF and volume of research activity.^{195,196,197,198} Each funder has different stated objectives for QR, however, they all consider it as unhypotheated funding for HEIs to spend strategically in support of the dual support system. In Scotland, the Scottish Funding Council also specifically state that this REG includes 'contributions to the full economic costs from Research Council, charity, European and other research income'.¹⁹⁹

Charity research support element: Referred to by different names in each nation, the charity research support elements are commonly known as the Charity Research Support Fund (CRSF). Administered by the Higher Education Funding Councils (HEFCs) in each nation of the UK, these funds are intended to contribute towards the full economic costs of research funded by charities in HEIs. This is particularly important in health research where research is most heavily dependent upon charitable funding. The CRSF was first established in England in 2006 at £180 million 'to achieve a partnership with charity funders of research that will ensure financial sustainability by the end of [that] decade'.²⁰⁰ At the outset, it was indicated that Government expected its investment would increase 'in support of approximately the current volume of [charitable] activity'.²⁰¹

The UK's dual support system was frequently highlighted in our evidence gathering as one of the UK research sector's greatest assets, with unhypotheated funding providing: the foundation upon which research excellence can be built, leverage for response mode funding, and a degree of strategic independence for outstanding research institutions.

The UK also hosts a vibrant research charity sector, of which medical and health research charities are the largest component. Within the charitable sector, there is further diversity, with very large charities such as Wellcome, Cancer Research UK and British Heart Foundation investing hundreds of millions of pounds each year in UK research, as well as over 100 small and medium sized charities providing investment in disease-specific and patient-centric research. This sector, represented by the AMRC, collectively invested £1.55 billion in health research in 2021.²⁰² Many, although not all, charities rely on public donations to fund research and their often disease-specific approach allows unique relationships with patients, carers and the public. Collectively this ensures that UK health research seeks to reflect the health needs of the public across the UK, in a way not found in other parts of the R&I landscape nor in other countries where charities generally represent a lower portion of overall investment in research.

EU funding has also historically played a significant role in the UK's health research system. For example, analysis from 2014/15 Higher Education Statistics Agency (HESA) data showed that clinical medicine and biosciences were the first and second largest recipient of EU research funding across all disciplines, receiving £120 million and £90 million, respectively, in that year alone.²⁰³ As explored below, UK exit from the EU and uncertainty over participation in future EU research programmes continues to present specific challenges to the UK health research system.

Industry is the largest investor in UK health research and the pharmaceutical industry has consistently been the largest 'business sector performing R&D in the UK', funding over £5 billion of research in 2020.²⁰⁴ The biotech sector also plays an important role in attracting funding for the development of new innovations in health, as well as keeping the UK internationally competitive in the growth of its economy, jobs and new technologies. In 2021, a record £4.5 billion of investment was attracted to UK-headquartered life sciences and biotech companies, of which over £2.5 billion came from venture capital, with £1 billion of that raised in the early-stage investment (seed funding and Rounds A and B).²⁰⁵

Whilst the majority of this research takes place in industry settings, industry investment in health research in UK academic institutions has an important role to play in the overall ecosystem. This often takes the form of research collaborations designed around projects of mutual interest and where techniques, skills and resources available in public and private settings are complementary to one another. The latest data from the ABPI's survey of academia/industry links show that industry-academic links are at an all-time high.²⁰⁶

During our evidence gathering, the unique attributes of each group of funders were perceived as follows:

- Public investment in health research supports excellent science through response mode funding and unhypothecated investment, as well as providing a foundational basis for research by investing in talent, infrastructure and institutions.
- Medical research charities were considered additive to existing public investment, placing high importance on addressing unmet needs (e.g. rare diseases) and the priorities of patients, carers and the public.
- Industry contributions were considered central to driving impact and translation of many kinds of research.
- Investment by HEIs, which is linked to both unhypothecated public investment as well as their own funds (e.g. generated through student fee income and conferencing revenue), was considered important to the development of long-term strategic priorities of HEIs as well as covering some of the indirect costs of research.

At its most effective, this diverse landscape of funders enables complementary, coordinated action across the whole ecosystem of health research. This was particularly apparent in the accelerated development and rollout of the Oxford/AstraZeneca COVID-19 vaccine (see Case Study 12).

In this scenario, long-term investment from the Government and UKRI, predating the pandemic, alongside a short-term investment boost from the non-profit sector in the initial weeks of the pandemic, supported a concerted effort spanning vaccine research, the mass manufacture of materials, and the rollout of doses to the public.

Other instances of successful, long-term investment from a range of funders, particularly for discovery research, are laid out in more detail in Case Studies 2 and 3. In these examples, sustained investment in researchers and institutions has led to the advancement of important therapies, improved our response to epidemics (Case Study 2), and promoted multibillion-pound growth in the biotech sector (Case Study 3).

Excellence in UK academic institutions

As explored in the recent *Independent Review of the UK's Research, Development and Innovation (RDI) Organisational Landscape*, research takes place in a diverse and complementary range of settings including academic universities and research institutes, and public sector research establishments (PSREs).²⁰⁷ This is equally true of health-related research, where research also takes place in the NHS and wider health structures. In this chapter we focus on the UK's excellent academic institutions.

In the UK, the majority of public and charity-funded research (across disciplines) takes place in HEIs, for example in 2019, 78% of Research Councils, Higher Education Funding Councils (HEFCs) and charitable (private non-profit) investment in R&D was in UK HEIs.²⁰⁸ Although comprehensive data are not available for health research, this is also borne out by AMRC members, who invest 88% of their research funding in HEIs, and by NIHR which invests substantial funding in both academic institutions and the NHS.

In summary, health research is the single largest source of research income for HEIs – in 2016/17 (the most recent year available) more than half (54%) of total HEI research income (£5.802 billion) was health-related.²⁰⁹

As also demonstrated by the *Independent Review of the UK's RDI Landscape*, the UK's university sector is world-class, with 4 of the world's top 20 universities based in the UK, including 5 of the top 20 universities for clinical and health research.²¹⁰ In the most recent national research assessment exercise (REF2021), over 80% of research outputs submitted in Medicine, health and life sciences (Main Panel A) were deemed to be either world-leading (4*) or internationally excellent (3*) (see Case Studies for further examples).

Importantly, HEIs are also able to host the vast range of health research required to drive real health improvements from discovery science to public health. They are also able to host the breadth and diversity of research required for modern multidisciplinary approaches that encompass disciplines from engineering to social sciences.

Finally, as explored in Chapter One, these institutions play a critical role in training the next generation of researchers in world-leading research-active environments. This is vital not only to attracting talented people into research careers, but also in ensuring that education provided to people studying in these institutions is informed by the very best research and leading researchers in their own fields.

In addition, the UK is home to many outstanding Research Institutes (also referred to as Independent Research Organisations or IROs) – for example, the world-renowned Laboratory of Molecular Biology (LMB) has produced 12 Nobel Prizes.²¹¹ The Beatson Institute in Glasgow has been producing world-leading cancer research for over a century.²¹² The Francis Crick Institute is the largest biomedical research laboratory under one roof in Europe, and organisations such as the UK Dementia Research Institute provide a vital translational role in harnessing clinical resources to deliver treatments to patients.^{213,214} Each of these institutes possess their own unique architecture, source of funding, relationship with universities, and focus - adding further diversity to the system. The *Independent Review of the UK's RDI Landscape* concluded that IROs 'play a unique, beneficial role in the UK's landscape' and set out some of the ways in which they could further complement the existing research system.

Challenges

Covering the full cost of health research

However, there are very real challenges to the health research system and the financial sustainability of our academic research institutions, with research costs incurred by HEIs consistently exceeding research income (Figure 1). Some of these issues are well established and have been subject of significant reviews in their own right, including the 2010 report on *Financial Sustainability and Efficiency in Full Economic Costing of Research in UK HEIs* led by Sir William Wakeham (see Box 10).²¹⁵

Box 10: Summary of Wakeham Report on Financial Sustainability and Efficiency in Full Economic Costing of Research in UK Higher Education Institutions²¹⁶

This report, commissioned by Research Councils UK (RCUK) and Universities UK (UUK) in 2010, concerns the financial sustainability of research undertaken by universities and other higher education institutions (HEIs) in the UK. Its purpose was to assess the state of research funding, to reflect on whether the sector is using funding appropriately to ensure sustainability, and to consider whether HEIs are efficient and economical in their use of public funding.

Box 10 (continued)

After reviewing annual Transparent Approach to Costing (TRAC) returns from several years, the report concluded that there was evidence at a national level to suggest that the income HEIs receive to conduct research was insufficient to cover the real cost of the research. They also found that the metrics employed to measure financial sustainability were not necessarily being used effectively by individual institutions, or at the level of national policy development to promote financial sustainability.

The report recommended that HEI governing bodies develop institution-wide strategies for financial sustainability, with appropriate procedures to measure success. Funding Councils were also recommended to consider how these metrics could be incorporated into annual accountability reviews, in addition to consideration of research volume. Finally, both Funding Councils and Research Councils were recommended to review how their policies could contribute to efficiency gains, specifically through the introduction of annual targets for HEIs and through encouragement of more intensive utilisation of existing institutional research assets.

Many of the recommendations set out in that report remain pertinent. However, the problem is getting worse (as demonstrated in Figure 1) and the gap between research income and research cost is widening in UK HEIs. This growing gap has the potential to seriously undermine the ability of our world-leading research institutions to continue delivering excellent health research, and training the research workforce of the future. For this reason, the Government's R&D People and Culture Strategy recently committed to 'initiate a review of the impacts of the approach to funding under the full economic cost (fEC) regime for research grants, with a focus on the pressures it may create for research organisations'.²¹⁷ Emerging findings from this work, which is being conducted by UKRI, are in line with our own and we look forward to further engaging with UKRI on this issue.²¹⁸

Here we consider what is unique in health research where the range of public, charitable and private funders create a particular challenge to financial sustainability. Moreover, we believe that the financial sustainability of our health research ecosystem is intimately linked to its ability to achieve a more inclusive definition of 21st century excellence, whether it is a research culture that truly values and supports researchers, or properly embedding and providing remuneration for the full participation of patients, carers and the public in health research. Whilst some of these activities may increase costs, for example, through increased costs of staff development and training or properly funded PPI, we believe the true value of the research produced will be increased.

At present, public and charitable funders of health research are not paying the full economic costs for research conducted in UK universities. The reasons behind this failure to cover the full costs of research are varied. Given the range of research funders, it is unsurprising that each funder is subject to its own restrictions for what they are able to pay. For example, charities cover the directly incurred costs of research (they may also pay some directly allocated costs of research in some cases, where it is in the charitable objectives to do so, but they do not generally contribute a percentage overhead towards general university infrastructure.^{219,220,221,222} Research Councils commit to covering 80% fEC, a rate set in September 2005, when it was anticipated that the remaining 20% would be met from HEIs' other income streams, including core research funding.²²³ However, as explored below, Research Councils are not currently achieving this commitment. NIHR commits to cover 80% of fEC for research that takes place in HEIs, or 100% of the direct costs of research that takes place in the NHS or research institutes. Some indirect costs may also be covered by NIHR for research in charities, research institutes, and commercial organisations.

Meanwhile, industry investment into HEIs is influenced by a combination of factors including 'fair value calculations' for clinical research and a bundle of broader measures for investigator-led research. These aim to take into account the full value of investment in a research collaboration, including in-kind support and access to proprietary technology, techniques or data. Even within the private sector, industry is often seen to have the deepest pockets, but most R&D intensive SMEs are pre-profit and constrained in the costs they are able to incur when investing in research collaborations with HEIs.

Box 11: Full economic costing – terminology

The **full economic cost** is the full cost to an institution of undertaking a specific activity, in this case research. It includes direct and indirect costs.

Directly incurred costs are directly charged to a project as money spent and are supported by an audit record. Examples of these include project specific staff costs, consumables, travel and equipment.

Directly allocated costs are costs for resources used by a project that are shared by other activities. Examples include a proportion of a lead investigator or shared technician's time.

Indirect costs are non-specific costs charged across all projects for underpinning resources. These costs are diverse and examples range from estates, shared IT and administration, to university human resources costs and libraries.

A worsening picture

Data on the nature of the research funding deficit in health research specifically are not published and, therefore, we must rely on figures for research across all disciplines, which shows that as total research income in UK HEIs has increased, the percentage recovery of the fECs of research has decreased.

- Between the academic years 2010-11 and 2019-20, the percentage of fECs of research covered by research income has decreased from 78% to 70% (Figure 1).
- In the same period the percentage of fEC covered by Research Councils has declined from 75% to 71% (figure 2).
- Meanwhile, the percentage of fEC covered by the combined incomes from charitable research funding and charity support elements has fallen from 72% in 2016/17 to 68% in 2019/20 (Figure 2).

Whilst we cannot fully explain why overall cost recovery is falling, the trend is exacerbated by a range of factors. As shown in Figures 3 and 4, growth in Research Council, charitable and industry income has not been matched by growth in QR nor Charity Research Support Element.

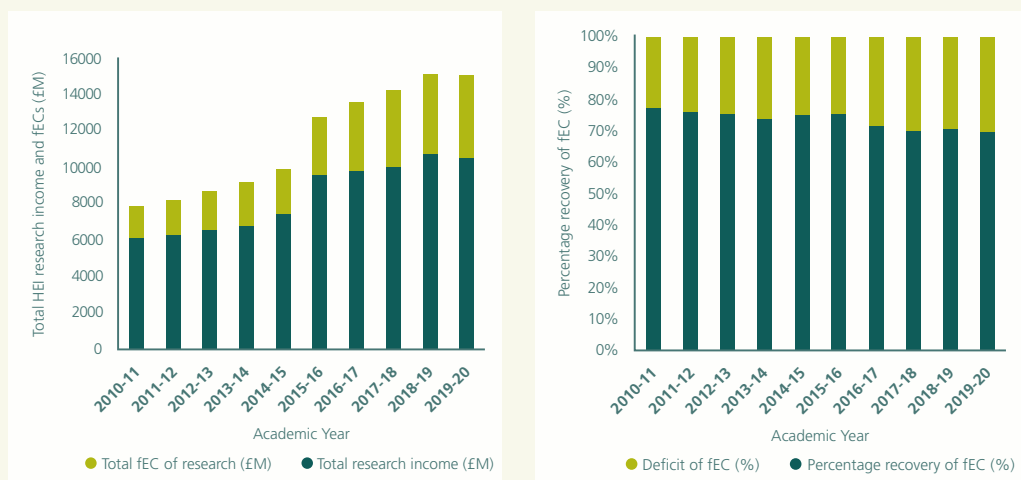
Mainstream QR has seen recent growth in cash terms in England, however, this has not been matched in other nations in the UK. Moreover, even in England, this uplift followed a 13% real terms reduction in QR funding from 2010-11 to 2017-18 and a substantial reduction in the ratio of QR:response mode funding.²²⁴ The recent increase in QR in England does not sufficiently make up for long-term decline of its value.

Meanwhile, the value of the Charity Research Support Fund (CRSF), which was established in 2004 so that 'charities and Government [...] work together to improve the financial sustainability of [...] research', has stagnated. In England, the fund has seen only a 3% increase in England since 2010 and no increase in Scotland, Wales or Northern Ireland since 2015, as shown by Figure 4. Therefore, the real-terms value of the fund has declined. In England, the CRSF has declined from 28p for every £1 of charity investment in 2010/11 to less than 20p per £1 in 2017/18. Analysis by Public First suggests that, based on current trends, the CRSF is expected to provide less than 12p per £1 of charitable investment by 2030.²²⁵ Therefore, the link initially conceived between growing charity investment and support from Government has been broken.

The data presented in Figures 1 and 2 that we have used to explore the decline in coverage of full economic costs of research are primarily collected via the Transparent Approach to Costing (TRAC) methodology used by the higher education sector to help them cost their activities. One of the functions of TRAC is reporting on the financial health of the sector. A recent review of TRAC conducted by KPMG found that the TRAC dataset provides a unique role in the sector and has no other equivalent data set, however, there are opportunities to increase the usefulness of the dataset, and the understanding of how it can be used. This is consistent with our own observation that greater disaggregation of data could help to fully understand the trends in financial sustainability of health research specifically.²²⁶

Our own analysis supports the findings of the *Independent Review of the UK's RDI Landscape*, namely that 'research activities cause deficits for the higher education sector, a trend which is increasing over time'.

Figure 1: Total research income has increased over the last decade whereas recovery of the full economic cost (fEC) of research has decreased over this same time period



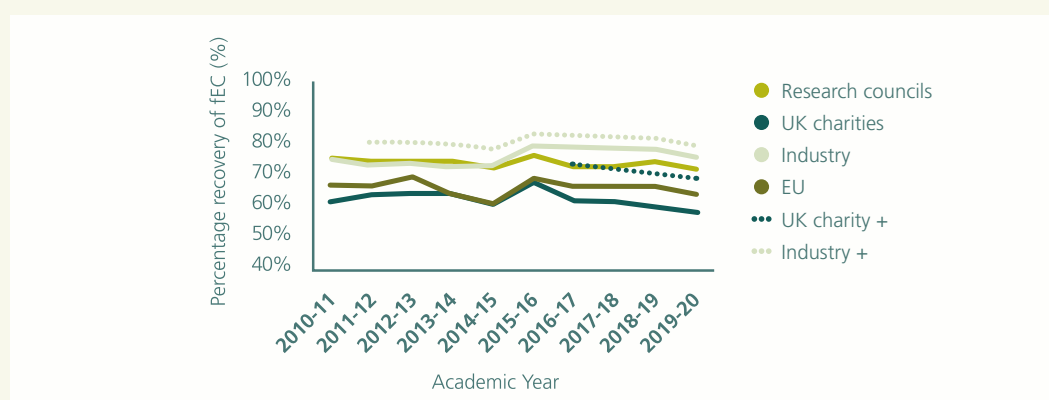
Total research income across UK HEIs has increased from £6.1 billion over the last ten years to an income of £10.5 billion in the academic year 2019-20.

Sources: Publications - Office for Students (accessed March 2022). [ARCHIVED CONTENT] Archive - Higher Education Funding Council for England (nationalarchives.gov.uk) (accessed March 2022)

As total research income in UK HEIs has increased, the percentage recovery of the fECs of research has decreased. Between the academic years 2010-11 and 2019-20, the percentage recovery of the fECs of research has decreased from 78% recovery to 70%.

Sources: Publications - Office for Students (accessed March 2022). [ARCHIVED CONTENT] Archive - Higher Education Funding Council for England (nationalarchives.gov.uk) (accessed March 2022)

Figure 2: The cost recovery of research differs between industry, public, and charity funders, but has generally seen a slight decline in recent years

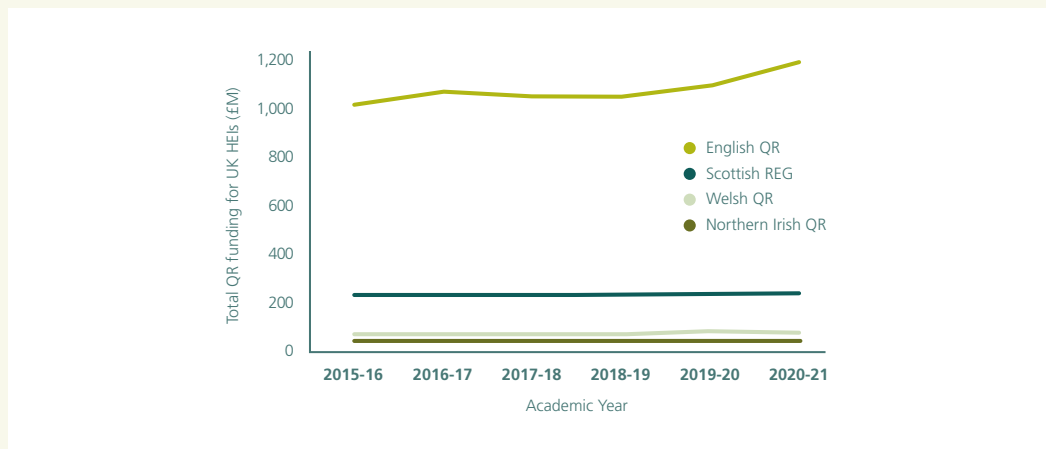


This graph provides an insight into the effect of the government funded QR charity support funds (UK charity +) and QR business research element (Industry +) on the recovery of the fEC.

Data for the charity support elements in Scotland, Wales and Northern Ireland are not available for all time points but the snapshot of data from academic years 2016-17 to 2019-20, illustrates the increased recovery of fECs for charity funded research supplemented by these QR support funds across all four nations. The 'Industry +' only includes the additive effect of Research England's QR business research element.

Sources: Publications - Office for Students (accessed March 2022). [ARCHIVED CONTENT] Archive - Higher Education Funding Council for England (nationalarchives.gov.uk) (accessed March 2022)

Figure 3: Quality-related (QR)/ Research Excellence Grant (REG) funding across the UK's four nations

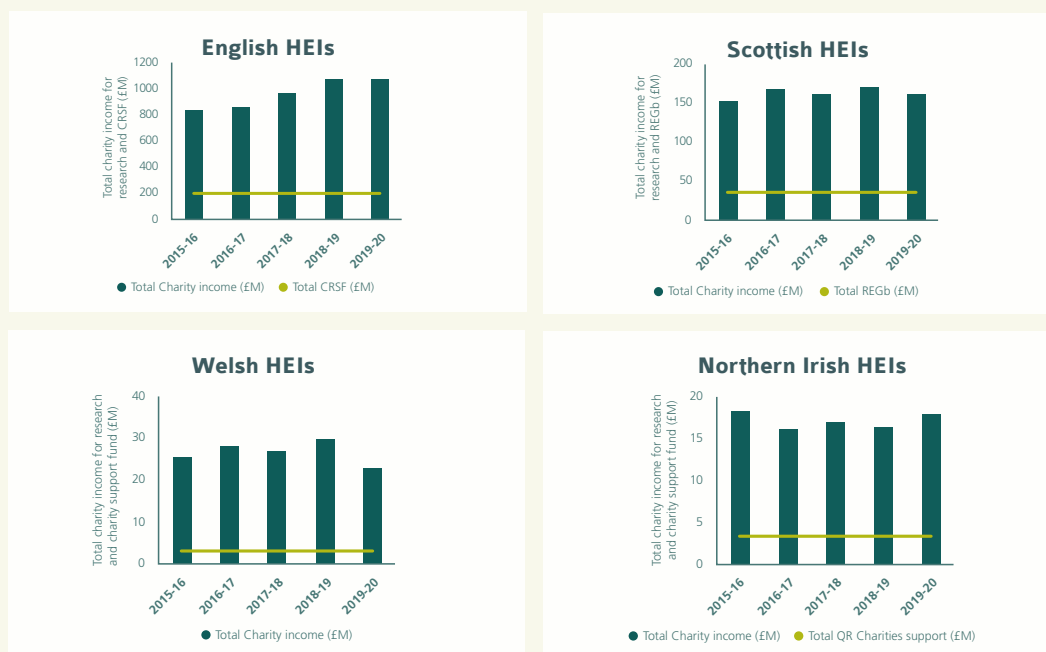


QR funding is provided to UK HEIs by Research England, Scottish Funding Council, Northern Irish Department for Economy and the Higher Education Funding Council for Wales.

Total mainstream QR funding (named the Research Excellence Grant in Scotland) has not substantially increased in Wales, Northern Ireland or Scotland over the period of 2015-16 to 2020-21.

Sources: Research funding (sfc.ac.uk) (accessed March 2022). QR funding: supporting information for 2021 to 2022 – UKRI (accessed March 2022). Higher Education Quality-related Research (QR) funding | Department for the Economy (economy-ni.gov.uk) (accessed March 2022). W21/15HE: HEFCW's Funding Allocations 2021/22 - HEFCW (accessed March 2022)

Figure 4: The Charity Research Support Fund (CRSF) has remained constant across the UK's four nations



Each UK nation has a quality research (QR) fund for charity-funded research. These have broadly remained relatively flat in cash terms since their inception. In England, research income from charities has increased from £686M to £1.1B from academic year 2010-11 to 2021-22, whilst the RE QR charity support fund has increased from £198M to £204M during this same period.

Sources: Research funding (sfc.ac.uk) (accessed March 2022). QR funding: supporting information for 2021 to 2022 – UKRI (accessed March 2022). Higher Education Quality-related Research (QR) funding | Department for the Economy (economy-ni.gov.uk) (accessed March 2022). W21/15HE: HEFCW's Funding Allocations 2021/22 - HEFCW (accessed March 2022)

Reliance on cross-subsidy

Ultimately, this combination of factors has produced an increasing reliance on cross-subsidy, particularly from international student fees income. In fact, international student fees not only provide cross subsidy for research but also UK home student fees. Recent work by the Russell Group shows that this is already causing a strain on HEIs.²²⁷ The erosion in the real-terms value of fees, alongside universities stepping up to meet increased expectations (for example, digital teaching innovations and wellbeing support for students), as well as the increasing volume and cost of research, has led to a rapidly rising deficit. The average deficit English universities incur per home student per year is projected to rise from £1,750 in 2021/22 to around £4,000 by 2024/25. If these funding shortfalls are not addressed, there will inevitably be impacts on universities both in their teaching and, importantly for this report, their research capacity.

The nature of this cross-subsidy between teaching and research varies significantly between nations of the UK due to substantial differences in the funding of domestic undergraduate students.²²⁸ In England, fees have been capped at £9,250 since 2017/18, whilst in Scotland, undergraduate education is funded by Teaching Grants from the Scottish Funding Council. These vary according to subject but result in an, on average, substantially lower per-head income from undergraduate teaching in Scottish institutions than other nations in the UK. Meanwhile, tuition fees are capped at £9,000 and £9,250 in Wales and Northern Ireland, respectively (£4,630 for NI-residents 2021/22).^{229,230} These differences present differing financial implications in each nation.

International students are a valued part of the UK higher education system, contributing to the diversity and vibrancy of university campuses through introducing cultures, skills, and insights. They also bring considerable economic benefits. The total gross benefit of the 2018-19 cohort of international students to the UK economy was estimated at £28.8 billion. On average, international students made a £40 million net economic contribution to the UK economy per parliamentary constituency.

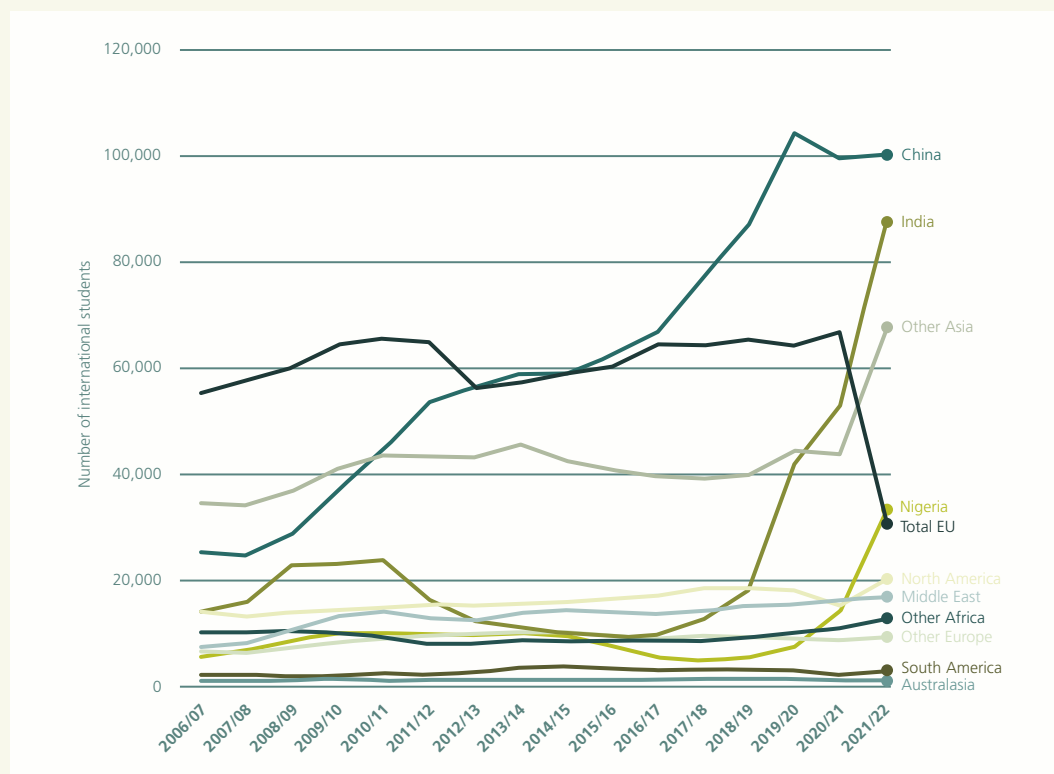
International students accounted for 22.0% of the total student population in 2020-21. 15.7% of all undergraduates and 39.1% of all postgraduates were international students. However, the UK dropped to the third most popular study destination for international students in 2019 as Australia overtook the UK for the first time.²³¹ During the pandemic, UUK warned of the possible dire consequences to research if international student fee income fell to levels that were feared.²³² Thankfully, this did not come to pass and international student numbers are so far robust.^{233,234}

Figure 5 shows the number of first year international students by country or region from 2006/7 to 2021/22. Chinese students have been the most dominant international student population in recent years, though students from India and other Asian countries are trending towards a similar figure. Meanwhile, the number of EU students has dropped dramatically, which is likely to reflect the impact of Brexit.

However, the pandemic has demonstrated the fragility of this source of income, which is subject to external events, increasing global competition, and geopolitics, as well as domestic policy decisions. A high proportion of students from a few nations demonstrates a lack of resilience in this revenue stream for UK HEIs. Moreover, if the UK Government were to change its immigration policy for international students, for example, limiting the numbers able to study in the UK, or the amount of time students are able to work in the UK after graduating, there would be a significant impact on research and HEIs.

Ultimately, we reach the same conclusion as the RDI Review, which stated that 'while it is a strength of the UK's higher education sector that it can attract large numbers of international students, over-reliance on this large but potentially volatile source of funds, especially if concentrated in specific countries, to underpin UK research, is a cause for concern.'

Figure 5: First year international students by country/region of origin



Source: HESA Higher Education Student Statistics: UK, 2021/22 statistical bulletin. <https://www.hesa.ac.uk/data-and-analysis/students/where-from> (accessed February 2023)

Uncertain times

Inflation

Current high rates of inflation are increasing costs of a wide range of activities associated with health research, with particular rises in energy costs and cost of living for staff. Many funders and employers are already responding, including the decision by UKRI to raise its minimum PhD student stipend from 1 October 2022, whilst universities across the UK have announced or are considering additional cost-of-living payments to students and staff.^{235,236,237} Meanwhile, income for universities has not kept pace with inflation, with, for example, tuition fees capped at the same levels.^{238,239}

Brexit and Horizon Europe

Over recent decades, health research in the UK has drawn significant benefit from EU funding. However, in the years since the referendum, ongoing uncertainty on the ability of the UK to participate in EU R&D funding programmes, such as Horizon Europe, has undermined sector confidence. At the time of writing, the UK Government's preferred position remains participation in Horizon Europe as an 'associated Third Country', as was set out in the UK-EU Trade and Cooperation Agreement in 2020, however, the path to achieving this appears challenging. The UK Government has set aside funding for association to EU programmes or a set of alternatives if this cannot be achieved.

COVID-19 and charities

As noted above, the UK's vibrant charity sector is an enormous strength of the health research system. However, the pandemic hit medical research charities hard, with a rapid and precipitous drop in fundraising income. Whilst most charities are now recovering well, this may take place at different rates for different charities.

Consequences for excellent research

As outlined above, the sustainability of our research institutions is, in and of itself, important to the UK's health research system. However, financial sustainability has further knock-on effects on the ability of the system to produce excellent research.

Research culture and financial sustainability

Recent surveys have documented a perceived link between funding processes and research culture, with lack of job security and lack of career flexibility (as discussed in Chapter One) considered to negatively affect research culture and the ability of individuals to generate the best research.²⁴⁰ For example, the length of grants was perceived to have a knock-on effect on researchers' employment contract length, whilst it has been acknowledged that research assessment exercises such as the REF can inadvertently promote 'tactics designed to maximise REF performance that may not be harmonious with the longer-term fostering of quality research'.²⁴¹ The REF was also cited during our own evidence gathering as placing arbitrary barriers to porosity between industry and academia, where staff coming from industry may not have publications ('outputs') that would be submissible for the REF, and were therefore less attractive potential recruits to universities seeking to boost their performance in the REF. As noted in Chapters One and Two, the reform to the REF through the FRAP provides opportunities to address these issues.

Funding for patient and public involvement

During evidence gathering, our Patient and Carer Reference Group reported the barriers that the current financial model places on meaningful PPI, some of which have been explored in Chapter One. Specifically, limited funding is available for patients, carers and the public to engage in the development of research projects at outset and prior to funding decisions. A small number of funders offer 'pre-funding', including through the NIHR Centre for Engagement and Dissemination, however, it is not universally available and the scale of funding is often low compared to the time commitment of lived experience researchers, particularly those playing a lead role in co-design or co-production.²⁴² This can limit the ability of lived experience researchers to commit time to the development of a research proposal. Case Studies 6 and 7 show how the inclusion of patients and carers across the whole research process has proven vital in identifying evidence gaps, enhancing research design and informing strategy.

As explored in Chapter One, this contributes to an overall research culture in which the value provided by patient and public involvement is not uniformly recognised and rewarded.

Solutions

The interdependency and diversity of the health research system is one of its most valued characteristics. This must underpin its sustainability, providing resilience to the system. This arises both through accepting that different funders within the system play unique and defined roles, as well as understanding how these strengths can be further leveraged through partnership and coordination. The health research system is already full of excellent examples of partnership working between funders, institutions, and sectors, and many of our solutions build on these examples (see Case Studies 4, 5, 9, 10 and 12).

Understanding the scale of the problem

As health research funding has grown over recent years, so has the gap between the cost of research and research income. However, at present, we do not have the necessary data to understand the precise nature of this gap across all funders in health research. This impairs our ability to take an evidence-based and partnership approach to addressing this issue. We propose a coordinated approach to addressing this.

Solution 7: To fully understand the current failure to cover the full economic costs of health research, we propose that:

- a. **Public, charitable and industry funders are coordinated and transparent in their data collection and annual reporting on:**
 - i. the **relationship between research funding and research costs.**

- ii. the extent to which **research funders are achieving their own commitments to cover certain costs** of the research that they fund.
 - iii. expectations on matched funding from partners.
- b. There should be annual assessment of these data and a coordinated response to the trends they reveal.

Toolkit includes:

- **Transparent Approach to Costing (TRAC)**²⁴³ – methodology developed with the higher education sector to help them cost their activities. This is an activity-based costing system adapted to academic culture in a way that aims to meet the needs of the main public funders of higher education.

A collective responsibility for financial sustainability

We recognise that creating a financially sustainable health research ecosystem is not the responsibility of any single funder or group of funders. It is a collective responsibility of all stakeholders within the system. However, within that collective responsibility will sit a number of specific actions that individual organisations should take. Here we set out specific solutions.

Using the data set out above, it should be the responsibility of each funder to ensure that they are at least meeting the funding commitments set out in their own funding policies, something which does not currently appear to be happening consistently (Figure 2). Meanwhile, HEIs and Research Institutes must ensure that they continue to invest these funds both efficiently and in the underpinnings of contemporary research excellence (as explored in Chapter One).

The role of Government

Alongside funding excellent research through response mode funding, we see a vital role for Government investment in the fundamentals of our R&D system, such that public money is able to leverage further follow-on investment from medical research charities and from business. For example, Case Study 4 shows how the UK Biobank leveraged more than five times the Government's contribution from industrial and charitable funders.

As noted above, the dual support funding, including through QR and Charity Research element, represents a key resource for strategic investment in research in UK HEIs and is a critical part of this underpinning investment. However, neither QR, nor the CRSF, has kept pace with growth in other parts of the system. Figure 3 demonstrates the particular need for review of the scale of this support in Scotland, Wales and Northern Ireland, where there has not been substantial increases over the period of 2015-16 to 2020-21. We note that previous reports focusing on research funding in Wales have recommended that this be addressed.²⁴⁴

We also note that different Funding Councils in the four nations each take a slightly different view on the purpose of QR/REG. Whilst all acknowledge it is to be spent strategically by HEIs, to our knowledge, only the Scottish Funding Council specifically states that money allocated through REG is intended to support the 'contribution to the full economic costs from Research Council, charity, European and other research income (including private, public and the third sector (charities, voluntary and social enterprise))'. This is particularly significant for health research where income from diverse sources, including charities and other government sources (specifically NIHR in England), contribute to the wider financial sustainability of the endeavour. A shared view across the four nations on the purpose and scale of QR would therefore be beneficial.

Meanwhile, the CRSF plays an important role in supporting some of the indirect costs of health research funded by charities, however, our data demonstrate that the fund is decreasing in real-terms value and that the partnership between public and charity investment is in need of renewal. We heard that, whilst the CRSF in its present form is highly valued, it is worth considering whether there are opportunities to increase its impact and its power to leverage further investment in health research.

For example, we heard compelling arguments that this process should consider how Government-funded support can leverage further investment from charities. One model worth further consideration and explored by Public First in their recent analysis was **matched funding, whereby every pound of Government investment is tied directly to crowding in more charitable funding through match-funding**.²⁴⁵

The role of charities

Taking steps to increase public investment in public-charitable partnership could enhance the leveraging power of the Charity Research Support Funds. We would anticipate, therefore, that charities in turn consider their own ability to recommit to this partnership.

When the CRSF was first conceived it was based on charity-government partnership underpinned by principles of co-investment and the development of 'new models of partnership funding that enable all charities to develop their commitment to research in a sustainable way'.²⁴⁶

The UK continues to benefit enormously from over 150 medical research charities and the sector already works well to coordinate its efforts with support from the AMRC. Maximising the power of charitable investment through continued innovation in partnership is vital. Many examples of partnership exist, from co-investment in shared challenges to charities with aligned objectives choosing to merge (see Case Study 9, Connect Immune Research collaboration between Versus Arthritis, MS Society and JDRF).^{247,248,249}

The role of industry

Meanwhile, for academia-industry collaborations, a better understanding of the relative contributions made by each partner would be beneficial. Some companies have **developed criteria for assessing the value of academic collaborations**. These include 'the alignment of objectives, value and cost to the company, quality of research, expected timelines and likelihood of success, quality and frequency of communication and credibility of collaborators'.²⁵⁰ Greater consistency and guidance on these calculations would help smooth these partnerships.

Solution 8: To maximise the strength of the UK's varied, vibrant and collaborative health research funding system, funders across public, charitable and private settings must take a collective responsibility to work in partnership to sustainably fund health research. This should include:

- a. Governments across the four nations delivering **increased investment in the fundamental underpinnings of health research** that will support and leverage investment from other sources, including through:
 - i. investment from Research Funding Councils across the four nations to ensure that **mainstream, unhypothecated quality-related/Research Excellence Grant (QR/REG) funding keeps pace with other forms of investment**.
 - ii. Research Funding Councils across the four nations working with charities to **recommit to their shared objective to 'work together to improve the financial sustainability of [...] research'**. This should include consideration of **how Charity Research Support funding can leverage further charitable investment** and ensure that charity-Government partnership **funds the full economic costs at a level competitive with Research Council funding**.
- b. The Association for Medical Research Charities (AMRC) working with its members to **expand innovative models of partnership across the charitable sector** to ensure every pound of public money invested goes as far as possible towards improving people's health.
- c. The Association of the British Pharmaceutical Industry (ABPI), BioIndustry Association (BIA) and UUK working with their members to generalise and disseminate the **guidance and criteria for assessing the value of industry-academic collaborations** to ensure they represent value for money for both parties.

Financial sustainability to drive contemporary excellence

In parallel with the solutions proposed above, it will be vital to invest in diverse talent, people, and careers, as well as meaningful PPI explored in Chapter One.

Solution 9: To achieve true financial sustainability, which attributes value to the full diversity of people and activities required for excellent research, it will be vital to allocate funding to the solutions set out above. This should include:

- a. Accounting for the true costs of supporting research career development, reducing the precarity of research careers, and supporting meaningful PPI.
- b. Ensuring that the FRAP measures and rewards these approaches.

Toolkit includes:

- **Concordat on Researcher Development**²⁵¹ – (see Box 2).
- **FRAP**²⁵² – (see page 25).
- **NIHR: Research Design Service and Centre for Engagement and Dissemination**²⁵³ – (see page 38).
- **NIHR Payment guidance for researchers and professionals**^{254,255,256} – (see page 38).

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Chapter Four: Research in the NHS and other healthcare settings

Summary

- The UK's healthcare system offers enormous potential for clinical research through a single healthcare provider, an extremely developed health research infrastructure, and a committed clinical research workforce.
- However, clinical delivery pressures and a failure to value the contribution that research makes to healthcare are creating a healthcare system that is unable to prioritise research.
- Meanwhile, the people who drive research in healthcare settings enjoy limited opportunities. Clinical academics struggle to develop their dual careers between academia and the NHS, whilst healthcare professionals wishing to engage in research do not have adequate time nor support to do so.
- To firmly establish the NHS and other healthcare settings as sustainable parts of the health research ecosystem we propose:
 - Measures to reassert the value of research as a core part of the NHS's business, including through monitoring and publication of metrics on research activity, and published research strategies that are developed with patient and public involvement at Board and Trust level.
 - Greater support for clinical academics (including doctors, dentists, nurses, midwives, allied health professionals, and registered public health practitioners); including through flexibility in training; redressing the balance of investment in funding opportunities at pre- and post-doctoral career stages; and reinvestment in senior clinical academic posts in universities.
 - Provision of training, support and time for the wider healthcare workforce to engage in research, beginning at undergraduate level and continuing throughout career development. For example, through access to research skills training, university research infrastructure, protected research time for research-engaged clinicians, and opportunities for joint appointments between NHS and employers in other sectors.
 - Enhanced use of patient data as a research resource in a way that respects and protects the privacy, rights and choices of patients and the public; involves them in decisions about their data; and maintains trustworthiness that data will be responsibly handled within the NHS.

Context

Health research can play a vital role across a range of healthcare and community settings, including primary, secondary and tertiary care. Many of the comments in this chapter relate specifically to research in the NHS but, in England, new Integrated Care Systems (ICSs) provide an opportunity to consider research in care settings. Meanwhile, changes to public health structures in the UK (UKHSA), England (OHID) and Scotland (Public Health Scotland) provide opportunities to consider health research in the population more broadly. It is important to note that health research also occurs outside of healthcare and community settings, integrating aspects of natural, social and health sciences, the arts, and humanities, to directly or indirectly influence the health of the public.²⁵⁷

Regarding research in the NHS, we recognise that the NHS is not a single organisation and is distinct in each nation of the UK. However, there is more that binds these NHS bodies together than there is that sets them apart and they share many of the same challenges and opportunities. Maximising the research potential of the NHS is an enormous asset to the UK's health and will be extremely influential for the future of the health research system in the UK.

As the national healthcare provider with cradle-to-grave records for the population, the NHS holds a unique dataset for research. Moreover, the potential to deliver clinical research, including in experimental medicine approaches, provides the opportunity for health research in the UK to be globally leading.

The benefits of this will not only accrue to the health research system, but also in national health and wealth more broadly. For example, these assets provide an enormous incentive for industry investment in the UK – potentially leading to more trials, and opportunities for drug and device development, which can create revenue for the NHS and better health outcomes for the population. Meanwhile, a clinical workforce that is more widely engaged in research may contribute to an NHS that is more permissive of innovation and adoption of new approaches.

However, the NHS is under extreme and sustained pressure, as explored in more detail below. Therefore, it is vital to consider two important points. The first is that research is not a luxury - it is a vital component of the NHS's duty and the basis of its ability to improve not only the standard of care provided to patients, but the health of the whole population. The second is that research can help to address some of the challenges faced by the NHS. Research boosts job satisfaction and can help to reduce burnout, offering a potential solution to some of the staff retention issues currently affecting the health service.²⁵⁸ Research may also help to address some of the issues of backlog that are facing the NHS through health systems engineering. Finally, it is also increasingly apparent that research in healthcare settings has the power to drive enormous health improvement, even for those not directly involved, as health outcomes are better in research-active settings.^{259,260,261}

Regarding research into broader population and public health, there are again new structures in place, including nationwide in the form of UKHSA and in the nations of the UK through OHID and Public Health Scotland, which must also embed health research in their remit.

Strengths and opportunities

A large amount of transformative health research has emerged from the NHS over its more than 70-year history (see Case Studies). Research is embedded in the NHS constitution (in England)²⁶², and is supported by a committed and engaged workforce of clinical academics (medics, NMAHPs), specialist research delivery staff, and a passionate (if overstretched) clinical workforce.

The UK boasts an extremely developed health research infrastructure, funded in England through NIHR, and including Biomedical Research Centres (BRCs), the Clinical Research Network (CRN) and Applied Research Collaborations (ARCs). In Scotland, a centralised system supported by NHS Research Scotland includes Clinical Research Facilities (CRFs).²⁶³ Whilst in Wales, a range of centres are supported through Health and Care Research Wales²⁶⁴, and in Northern Ireland, the Northern Ireland Clinical Research Network (NICRN) is supported by HSC R&D Division.²⁶⁵

This clinical research infrastructure delivers high quality health improvements and economic benefits. For example, between 2016/17 and 2018/19, research supported by the NIHR's CRN generated an estimated £8 billion of gross value added (GVA) and 47,467 full time equivalent (FTE) jobs.²⁶⁶

This publicly funded research infrastructure is also complemented by the UK's leading life sciences sector, which in turn enhances the research potential of the NHS.

Research activity in the NHS also has a direct financial benefit both in terms of additional public funding and industry investment. The NIHR research capability funding stream delivers funding to NHS organisations that undertake NIHR research, to help them maintain research capacity and capability, including through investment in staff. Meanwhile, commercial clinical trials generate additional financial benefit through both revenue and savings in pharmaceutical costs. Analysis of the NIHR CRN portfolio between 2016/17 and 2018/19 revealed that for each patient recruited into commercial clinical research studies, NHS Trusts in England received an average of £9,189 in revenue from life sciences companies, as well as a pharmaceutical cost saving of between £4,143 and £7,483.²⁶⁷ Case Study 11 illustrates how public funding and partnership with industry has led to multimillion pound savings for the NHS.

The research system also benefits from a highly engaged patient community, which has had greater exposure to research participation and involvement in part due to visibility of clinical research during the pandemic (e.g. Vaccines, Recovery trials, ZOE app).^{268,269,270} The pandemic did, however, highlight the need to engage better with minority groups and those with less access to healthcare, as well as with other underserved groups, such as pregnant women, in research design.

In England, a strengthened mandate to 'promote or otherwise facilitate' research was included in the Health and Care Act 2022, which created ICSSs, placing research in NHS on a statutory footing.^{271,272} A recent joint statement from the Royal College of Physicians (RCP) and NIHR sets out some of the ways in which these new structures can support health research to improve patient care (see Box 12).²⁷³ This builds on political will and consensus across the sector that embedding research in the NHS is central to the health and wealth of the nation (see Box 12).

The House of Lords Science and Technology Committee's 2022 inquiry into clinical academics in the NHS also concluded that embedding research in the NHS can mitigate ongoing crises in its workforce and improve patient outcomes.²⁷⁴ Both the Committee and the Independent Review of the RDI Landscape highlighted the vital role that clinical academics and research-active clinicians hold in driving forward clinical care and highlighted many of the dangers to NHS research explored throughout this chapter.²⁷⁵ Themes from both of these reviews, such as reasserting the value of research as core NHS business, and enhancing career opportunities for clinical academics, are reiterated in our own Solutions.

Finally, NHS patient data has enormous potential to power research that will generate major improvements in patient care. Moreover, work by organisations such as Understanding Patient Data shows that people are 'generally comfortable with anonymised data from medical records being used for improving health, care and services, for example for research, provided there is a public benefit'.²⁷⁶

This understanding of patient data as a resource to be used responsibly, but highly effectively, for breakthroughs in health research is demonstrated by the success of the UK Biobank (Case Study 4). UK Biobank is a globally accessible database comprising the genetic information of around half a million participants. It was used by hundreds of research groups during the COVID-19 pandemic, and has the potential to improve diagnosis, treat, and prevent diseases, to the benefit of millions of people.

Role of NHS research in COVID-19

During the pandemic, the power of research in the NHS gained new national profile. Trials such as the RECOVERY Trial, which began in March 2020 and recruited over 47,000 patients to test treatments for the virus, showed the power of research in the NHS to directly improve people's health and the nation's health security. The trial's core principles - simpler processes for consent, greater transparency with the public, and wider use of digital technologies to facilitate patient participation and data collection - were key to its success in including large numbers of people and quickly identifying effective therapies.

The lessons learned from the RECOVERY Trial are already being explored to improve trials for other longstanding conditions such as heart and kidney disease, and diabetes. See Case Study 13 for more details on how this approach is being applied in other disease areas for the benefit of patients and clinicians.²⁷⁷

Public health

In public health, the UK Committee for Strategic Coordination of Health of the Public Research (SCHOPR) was established to 'provide strategic direction, enhance coordination and identify priorities for improving the health of the public research' between all funders across the four nations. SCHOPR has produced a set of public health research principles and goals and initiated activities with local authorities, public health practitioners and funders to promote research and evidence-based policy in public health.²⁷⁸

Box 12: Strategies and relevant reports

- In 2022, the Royal College of Physicians (RCP) and NIHR published a joint position statement on *Making research everybody's business*.²⁷⁹ This statement recognises that research must be normalised as core business in the NHS and sets out recommendations for stakeholders across the health and care system to make research a part of everyday practice for all clinicians. RCP and NIHR recommend that trusts, health boards and ICSs recognise research as direct clinical activity and reward this in local and national awards whilst securing support for clinical research at senior levels. Importantly, they also recommend that trusts, health boards and ICSs protect time for research in the job plans of research leaders, which is particularly important for developing more inclusive research careers.
- In 2022, the GMC published a statement on *Normalising research – Promoting research for all doctors*, which aims to enable a culture in the workplace where doctors are encouraged to be research-aware and research-active.²⁸⁰
- In 2021, the UK Clinical Research Recovery Resilience and Growth (RRG) Programme published the *Future of UK Clinical Research Delivery*, outlining its ambition to create a 'patient-centred, pro-innovation and digitally enabled clinical research environment' across the NHS.²⁸¹ This was followed in June 2021 with the phase 1 *2021 to 2022 implementation plan* and June 2022 with the phase 2 *2022 to 2025 implementation plan*.^{282,283} This latest phase of implementation is centred around the five main themes of the vision: clinical research embedded in the NHS; patient-centred research; streamlined, efficient and innovative research; research enabled by data and digital tools; and a sustainable and supported research workforce.
- The *2021 Life Sciences Vision* defines the UK Government's goals for the sector in the next decade, with the ultimate ambition of cementing the UK as the leading global hub for Life Sciences and becoming a 'Science Superpower'.²⁸⁴ The Vision utilises the UK's research and innovation response to the COVID-19 pandemic as an exemplar and sets out the aim to apply this to other significant health challenges: cancer, dementia, mental health, obesity, ageing, respiratory disease and vaccines. To achieve this, the Vision recognises the need to utilise the UK's existing strengths, such as its world-leading expertise and infrastructure, whilst also introducing new ways of working seen in the pandemic. The Vision sets out four critical preconditions to success:
 - Securing the NHS as an innovation partner
 - Growing investment in life sciences
 - Simplifying the governance of NHS health data
 - Ensuring access to private finance.
- Alongside the Academy's own reports and the Government strategies outlined above, there are a number of other relevant and aligned recent reports including the GMC Statement on *Normalising research – Promoting research for all doctors*, Cancer Research UK's *Creating Time for Research*, the Royal College of Physicians' *Research for all*, and Health and Care Research Wales's *Making research careers work: a review of career pathways in health and social care in Wales*.^{285,286,287,288}

Challenges and weaknesses

Clinical delivery

Despite these opportunities, there are significant barriers to research in the NHS. Perhaps most significantly, the challenge of service delivery, which is under extreme pressure, particularly since the pandemic. In April 2022, data showed that the waiting list in England alone exceeded 6.5 million people.²⁸⁹ Similar problems are affecting the NHS in all nations of the UK.

We heard that NHS institutional leaders are therefore necessarily and understandably focused on addressing targets such as waiting time in A&E, bed occupancy, and other markers of clinical delivery. There is a strong political desire and public expectation that waiting times should be addressed.^{290,291,292}

Clinical workforce

These backlogs contribute to the clinical workforce becoming increasingly stretched and burnt-out, such that research is often perceived as an 'optional extra' that they do not have time or energy to engage in. Job vacancies are extremely high and recent reports show nurses leaving the profession at record levels.²⁹³ In primary care, recent polling by the Royal College of General Practitioners found that 39% of the GP workforce across the UK are seriously considering leaving the profession within the next five years.²⁹⁴

Whilst many surveys suggest that more clinicians would like to engage in research, even before the pandemic, clinical demands and pressures on time were perceived as the greatest barriers to becoming involved in research.²⁹⁵

Backlogs in clinical research

Post-pandemic pressures have also damaged the clinical research pipeline with insufficient capacity in the system, limiting the capacity even for industry trials. Recent data from an ABPI report on '[r]escuing patient access to industry clinical trials in the UK' demonstrate that patient access to industry research on the NIHR CRN has fallen by 44% between 2017/18 and 2021/22 (from over 50,000 participants to less than 30,000).²⁹⁶

We heard many reasons for this, including not enough doctors and nurses to deliver trials, delays in setting up trials and too many trials that will struggle to recruit participants and yield results in appropriate timeframes. The NIHR-led Research Recovery Group has therefore set up the Research Reset programme, which is focused on streamlining the current clinical trial portfolio with the aim of restoring capacity to the system to improve the delivery of NHS research.²⁹⁷

Clinical academic workforce

Many of the issues above are compounded by the fact that the clinical academic workforce is under pressure. Clinical academics in medicine, and some in nursing, midwifery and other allied health professions, hold joint appointments between academia and the NHS. Information on the numbers of clinical academics across all of these disciplines is not available, but in medicine there have been worrying trends in recent years.

Data from the Medical Schools Council (MSC) *Clinical Academic Survey* show a 4% decline in clinical academic numbers over the last decade (positions at professor, senior lecturer, and lecturer level). Further analysis of these figures reveals that this decline is particularly acute at the mid-career level (senior lecturer), where there has been a 25% decline in numbers across the UK. Despite increases at more senior levels (professorship), when clinical academics at consultant level are expressed as a proportion of the whole consultant workforce, we can see a steady decline from 8.55% in 2011 to 5.7% in 2020. The proportion of clinical academic GPs in England has remained stubbornly low with just between 0.6% and 0.7% of total numbers of GPs over the same period.²⁹⁸

Data on the number of research-active NMAHPs at all career stages are not available, although we are aware that the Clinical Academic Roles Implementation Network (CARIN) is seeking to address this.²⁹⁹

Despite growth at early career levels, which has been sustained thanks to substantial investment from a range of funders in doctoral training across all medics, dentists and NMAHPs, the lack of post-PhD level career opportunity presents a significant challenge for the pull-through of the next generation of clinical academic talent.

There are also specific challenges associated with clinical academic training for medics, where training is lengthy and the career is perceived as exclusive.³⁰⁰ The creation of a new Specialist Foundation Programme presents an opportunity to ensure that a wider cross-section of trainees has access to the benefits of clinical academic training, potentially contributing to a more diverse pool of clinical academics.³⁰¹

Further changes to speciality training are also underway and it will be critical that their implementation achieves the flexibility required to sustain clinical academic training alongside speciality and general training.³⁰² In doing so, it will be vital to work with trainees to ensure that the proposed flexibility is fully embedded as set out in the Shape of Training Review in 2013.³⁰³

For NMAHPs, developing careers in clinical academia can be even more challenging as defined career paths and training programmes are not as well established.³⁰⁴

Trends in private healthcare

More UK patients are seeking private healthcare since backlogs were exacerbated by the pandemic, which threatens to create a two-tier system.³⁰⁵ Self-pay healthcare is showing significant growth and is predicted to expand by another 10-15% over the next three years - such demand might impact on the NHS workforce if more healthcare professionals choose to work in the private sector. We heard anecdotal reports of the negative effect this is having on NHS staff morale in some parts of the country. We were also warned of the possible knock-on effect this may have on the research workforce. If there is a significant shift to private healthcare, either from patients or healthcare professionals, then the NHS's unique status as a centralised healthcare system and therefore a rich research environment could be affected.³⁰⁶ However, it is worth noting that some private healthcare providers have partnerships with academia, allowing for research and innovation to take place in these settings.³⁰⁷

Public health

A 2022 Academy workshop identified the challenges in building and maintaining the relationships between new public health structures (particularly in England), academia and local government. Competing priorities and time pressures across all systems inhibit the ability to invest in sustainable, inclusive and diverse relationships at the organisational level.³⁰⁸

Solutions

We believe that many of the solutions presented in the Academy's 2020 report on *Transforming health through innovation: Integrating the NHS and academia* remain as relevant now as they were when the report was first drafted (see Box 13).

Box 13: Academy recommendations for Transforming health through innovation: Integrating the NHS and academia³⁰⁹

1. Creating a healthcare system that truly values research.
2. Fully integrating research teams across academia and the NHS.
3. Providing dedicated research time for research-active NHS staff.
4. Ensuring undergraduate curricula equip healthcare staff with the skills to engage with research.
5. Incorporating flexibility into postgraduate training pathways.
6. Streamlining research through joint research and development offices.

Reframing the value of research

The clinical delivery pressures faced by the NHS risk presenting an insurmountable barrier to implementing these changes. Therefore, it is critical to ensure that research is perceived as a core part of the NHS's business and **a solution to its problems**.

In England, the new mandate to 'promote or otherwise facilitate' research in the Health and Care Act 2022, presents exactly that opportunity.^{310,311} Furthermore, the requirements of the Integrated Care Boards (ICBs) to report on how they will fulfil this new strengthened mandate in their annual business plan presents an opportunity for ICBs to consider how research can address their first order problems of clinical delivery.

We heard that, as these new structures establish themselves and begin reporting on these new requirements, **sharing of experience and innovation between ICBs, Health Boards, and hospital trusts may create the space for NHS structures across the whole UK to learn** from one another.

Previous Academy reports have also identified the need for NHS bodies to work with relevant stakeholders from across the UK to co-develop a set of research metrics.³¹² Reporting on these agreed metrics through annual publication has the potential to transform the value attributed to research by ICBs, Health Boards and hospital trusts as well as informing workforce and job planning.

Solution 10: To reassert the value of research as a core part of the NHS's business, we propose that:

- a. Every **Integrated Care Board (ICB), NHS Trust and Health Board should have responsibility for valuing and promoting research** across their organisations, and annually publish information on the outcomes and benefits of all research activities.
- b. **ICBs and Hospital Trusts should seek to enhance opportunities to share innovation and to learn** from one another's experience of developing and implementing their research strategies, including how they involve patients, carers and the public in the process.
- c. **ICBs in England and comparable bodies in the rest of the UK should use their annual business plans to set out how research can support clinical delivery**, including through enhanced job satisfaction, reduced burnout and improved retention; improving healthcare pathways through health systems engineering and health improvement research; fulfilling their existing duty to address health inequalities; and attracting industry investment that can create revenue and save money for NHS trusts.

Toolkit includes:

- **NHS R&D Forum³¹³** – UK professional network for the research management, support and leadership community in health and care.

People and workforce

As highlighted in Chapter One, people are central to the sustainability of health research in the healthcare settings. In the NHS this includes clinical academics in medicine, nursing, midwifery, and allied health professions. It also includes research delivery staff, a research-engaged workforce, and patients and carers. In wider population settings, it will include public health practitioners and leaders of public/community engagement. Achieving the aims of this report and making research in the healthcare settings part of a sustainable health research system will require all of these people to have the skills, experience and time to engage in research alongside their other duties. We are pleased that both the House of Lords Science and Technology Committee and the *Independent Review of the RDI Landscape* review also reached this conclusion.

Securing the clinical academic workforce

Sustaining the clinical academic workforce across medicine, nursing, midwifery, and allied health professions, and providing them with opportunities to develop careers across the NHS, academia and industry settings, will require a range of activities to address the challenges of this dual career with specific focus on flexibility in training and a clear career path for those who choose to undertake this career.

Finally, as outlined in Chapter Two, opportunities for working across sectors, and between the NHS, academia, and industry, should be accessible to a wider range of clinical academics. A number of schemes already exist, including those highlighted the Case Studies, and the life sciences sector should look to work with partners in academia and the NHS to expand access to these opportunities.

We offer a range of solutions to this below.

Solution 11: To ensure that clinical academics (including doctors, dentists, nurses, midwives, allied health professionals (NMAHPs), and registered public health practitioners) are supported to develop their dual careers, we suggest that:

- Royal Colleges, Deans of Health and Regulators should embed **flexibility in training** across specialities to reflect the dual-career nature of clinical academia.
- Public and charitable funders should coordinate with each other to ensure **balance across pre- and post-doctoral funding opportunities**.
- HEIs should **recognise the value of clinical academics to HEIs**, including through re-investment in career opportunities for Senior Clinical Lecturers across doctors, dentists, nurses, midwives, allied health professionals, and registered public health practitioners.
- The life sciences sector should collaborate with increased support for career opportunities for clinical academics through secondments, collaborations and pre- and post-doctoral studies.

Toolkit includes:

- Shape of training review**³¹⁴ – review that looked at potential reforms to the structure of postgraduate medical education and training across the UK.

Research-engaged clinical workforce

A research-engaged clinical workforce will rely upon a range of measures, from exposure to research activities at early stages of training through to access to training and resources to sustain a research interest, and ultimately the time in which to pursue this. We offer a range of solutions to this below.

Exposure to research at early stages of training across medicine, dentistry, nursing, midwifery, and other allied health professions will be vital to both introduce the next generation of clinicians to research, but also to diversifying the future clinical academic workforce. Existing schemes, such as the Academy's INSPIRE scheme, which is designed to engage medical, dental and veterinary undergraduates with research, could be supplemented by similar schemes focusing on increasing research exposure for undergraduate NMAHPs and public health trainees.³¹⁵

Meanwhile, the recently launched Clinical Academic Careers Training Hub (catch.ac.uk) provides an online resource for aspiring clinical academics to find out more about career options across all four nations of the UK. Furthermore, enhancing access for medical, dentistry, nursing, and midwifery students to the existing range of industry placements for undergraduate students could help to improve understanding of industry-sponsored clinical research.

Research-engaged clinicians will then require access to skills training, career development opportunities, and research infrastructure throughout their careers to sustain their research interest. Training in research skills, from digital and data processing to PPI (see Chapter One), will be necessary to ensure our clinical workforce has the skills necessary for contemporary health research. Meanwhile, opportunities for those on NHS contracts to access research infrastructure in universities can also help to support a research-active clinical workforce. Schemes such as CARP, run jointly by NIHR and MRC, provide research-qualified health professionals in the NHS or public health settings, who are not currently undertaking any substantial research activity, the opportunity to form a collaborative research partnership with researchers in universities, including protected time and funding to enhance their research skills and experience (see Case Study 8).³¹⁶

As recommended in the Academy's 2020 report, this should be complemented by HEIs increasing the number of honorary academic appointments offered to healthcare professionals that contribute significantly to research. The successor to the REF should also ensure that contributions of these individuals are appropriately recognised and HEIs are rewarded for providing a research environment that is conducive to interactions between healthcare professions and academia.

Protected time for research

Crucially, we heard that protected time for research in job plans of those who wish to engage in research could have a transformative effect. This is echoed in a joint statement from RCP and NIHR which called for 'ring-fenced time for research in job plans of those who want to have a substantive research leadership role'.³¹⁷

In our 2020 report, we recommended a pilot in a number of hospitals, where a proportion of consultants is 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. We continue to believe that 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.

Cross-sector mobility and research leadership

Cross-sector working and mobility, as explored in Chapter Two, can also be a driver of meeting the skills need of a research-active NHS. The life sciences sector should work collectively with NHS employers and other stakeholders to support this and develop careers that provide the flexibility for staff in the sector to work in simultaneous settings.

Solution 12: To ensure that the wider healthcare workforce has access to the training, support and time to engage in research:

- a. Undergraduate providers should enhance **exposure to research during training**, including through working with the private sector to increase access to industry placements.
- b. **Funders and HEIs should improve access to research skills training across a wide range of areas, from data and digital skills to PPI.**
- c. HEIs should provide **greater support for integrated research teams that span university employees and those on NHS and other healthcare contracts**, including through:
 - i. **Increasing the number of honorary academic appointments** offered to healthcare professionals that contribute significantly to research.
 - ii. Reward and recognition through the FRAP for HEIs that provide a research environment that is conducive to NHS-academia interactions.

- d. NHS organisations and funders should work together to develop a pilot in which **dedicated time for research is available to a proportion of healthcare professionals** wishing to engage in research.
- e. NHS Employers should work with organisations such as the University and Colleges Employers Association (UCEA) and the ABPI to create **clear and transparently governed mechanisms to allow people to work within NHS, academia, or industry settings, simultaneously**.

Toolkit includes:

- **INSPIRE**³¹⁸ – (see page 34).
- **NIHR/MRC Clinical Academic Research Partnerships (CARP)**³¹⁹ – funding scheme designed to provide research-qualified health professionals not currently undertaking any substantial research activity, the opportunity to form a collaborative research partnership with established biomedical and applied health researchers, and with protected time and funding to enhance their research skills and experience. (see Case Study 8).
- **FRAP**³²⁰ – (see page 25).

Patient and Public Involvement

The mechanisms for PPI in research explored in Chapters One and Three are critical for research taking place in healthcare settings. The steps we proposed in these earlier chapters to ensure a research culture that values and rewards patient and public involvement in research are critical to maximise the research potential of the NHS, and broader healthcare settings.

Public health

As noted in Chapter Two (Solution 6), a key driver of improved relationships in public health research will be enhanced opportunities for joint appointments and secondments between academia and other settings in Government agencies such as UKHSA, OHID, Public Health Scotland, Public Health Wales and HSC Public Health Agency in Northern Ireland.

Patient data

Finally, the potential of patient data as a research resource remains unfulfilled and will rely on actions including those proposed in the Government's *Life Sciences Vision, Data Saves Lives* report, and the *Goldacre Review*. We continue to believe that in order to maximise the potential of health data, it must embed the principles set out in Academy's 2018 report, *Our data-driven future in healthcare*.^{321,322,323,324}

We also recognise that there are significant differences in data infrastructure between the four nations. HDRUK currently coordinates six collaborative sites across the UK, based in Wales & Northern Ireland, the Midlands, the North, the Southwest, Cambridge, Oxford, London, and Scotland. Sharing learnings and best practice between these sites (particularly Scotland, where linkages to other national datasets such as the electronic Data Research and Innovation Service (eDRIS), will be vital to maximising the power of health data to improve lives).³²⁵

Solution 13: To truly maximise the research potential of the healthcare system, we must facilitate the use of patient data as a research resource for the good of all. This must be done in a way that:

- a. Learns from best practice across the four nations.
- b. Respects and protects the privacy, rights, and choices of patients and the public.
- c. Includes patients and the public as active and meaningful partners in decisions about their data.
- d. Maintains trustworthiness in the responsible and effective stewardship of patient data within the NHS.

Toolkit includes:

- **Understanding Patient Data**³²⁶ – programme that works with patient groups, charities, NHS organisations, and policymakers to bring transparency, accountability and public involvement to the way patient data is used.
- **Data saves lives: reshaping health and social care with data**³²⁷ – Department of Health and Social Care strategy for use of data to drive healthcare innovation, launched in 2022.
- **HM Government's Life Sciences Vision**³²⁸ – strategy that outlines government and the life science sector's ambitions for the sector over the next decade, published in 2021.
- **Better, broader, safer: using health data for research and analysis (Goldacre Review)**³²⁹ – government-commissioned review on how to improve safety and security in the use of health data for research and analysis, published in 2022.
- **Health Data Research UK**³³⁰ – the UK national institute for health data science.

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Whether through existing coordination bodies or through the creation of new ones, we believe that good coordination requires clear accountability, representation of all stakeholders, and access to both data and resource.

Conclusion: The need for coordination

Throughout our evidence gathering we heard from funders, industry, researchers, patients, carers, and the public about the importance of coordination. Funders identified the need for coordination within a diversified system to minimise inefficiencies and duplication. Researchers described the need for coordination to both minimise gaps between the funding offer as well as to make a diverse system easier to navigate. Lived experience researchers described the need to coordinate in order to make best use of available funds, particularly where these are derived from public sources – specifically tax revenues and public donations.

This need for coordination has been described before and, in 2007, led to the formation of the Office for Strategic Coordination of Health Research (OSCHR). OSCHR's stated role is to 'facilitate more efficient translation of health research into health and economic benefits in the UK through better coordination of health research and more coherent funding arrangements to support translation'. The UK Clinical Research Collaboration (UKCRC) has also played an important role in data collection and coordination in clinical research.³³¹

Many of the issues we describe throughout this report, whether it is support for health researchers, embedding PPI, improving cross-sector mobility, paying the full cost of research or instilling a sustainable research culture in healthcare, need both better data and coordination across the sector. Achieving this will require the full range of stakeholders across public and charitable funders, HEIs, industry, patients, carers and the public, and NHS leaders. Whether through existing coordination bodies or through the creation of new ones, we believe that good coordination requires clear accountability, representation of all stakeholders, and access to both data and resource. Here we set out our principles for coordination.

To provide the coordinated approach required to address many of the issues identified throughout this report, we recommend the following principles for coordination:

- Clear accountability for coordinating bodies including lines of reporting between different bodies.
- Representation of all key health research stakeholders, including; public and charitable funders, HEIs, industry, patients, carers and the public, NHS, and public health leaders.
- Access to appropriate resource and data to perform necessary functions.

To address this overarching challenge, the Academy of Medical Sciences will therefore commit to mapping existing coordinating functions in health research, before convening key stakeholders from across the sector, including existing coordinating bodies, to consider:

- Strengths, challenges and gaps in existing coordination.
- How the principles above can support enhanced coordination in health research.

We will convene this group within six months of publication of the report.

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Annex I. Glossary

- ABPI:** Association for British Pharmaceutical Industry
- AI:** Artificial intelligence
- AMRC:** Association for Medical Research Charities
- ARCs:** Applied Research Collaborations
- BBSRC:** Biotechnology and Biological Sciences Research Council
- BEIS:** Department for Business, Energy and Industry Strategy
- BIA:** BioIndustry Association
- BRCs:** Biomedical Research Centres
- CARIN:** Clinical Academic Roles Implementation Network
- CARP:** Clinical Academic Research Partnerships
- CCT:** Certificate of Completion of Training
- CESR:** Certificate of Eligibility for Specialist Registration
- Clinical academic:** Any clinically qualified healthcare professional who also pursues a career in research (inclusive of doctors, dentists, nurses, midwives, allied health professionals, registered public health practitioners).
- CRFs:** Clinical Research Facilities
- CRN:** Clinical Research Network
- Cross-sector mobility:** When an individual performs health research in multiple sectors over the course of their career. Movement between sectors can be gained via permanent jobs, secondments (or similar placements) or joint appointments.
- CRSF:** Charity Research Support Fund
- DSIT:** Department for Science, Innovation and Technology
- EDI:** Equity, diversity and inclusion
- eDRIS:** Electronic Data Research and Innovation Service
- EPSRC:** Engineering and Physical Sciences Research Council
- ESRC:** Economic and Social Research Council
- EU:** European Union
- FEC:** Full economic costs
- FLIER:** Future Leaders in Innovation, Entrepreneurship and Research
- FRAP:** Future Research Assessment Programme
- FTE:** Full-time equivalent
- GMC:** General Medical Council
- GTV:** Global talent visa
- GVA:** Gross value added
- HDRUK:** Health Data Research UK
- Health research:** All research-related activity that contributes to better health outcomes.
- HEFCs:** Higher Education Funding Councils
- HEI:** Higher Education institution
- HESA:** Higher Education Statistics Agency
- Hypothecated funding:** Restricted funds for specific projects or uses (also called response mode funding)
- ICB:** Integrated Care Board
- ICS:** Integrated Care System
- IRO:** Independent Research Organisation
- Lived experience researchers:** Members of the public, people with lived experience of a health condition, patients, people with caring responsibilities and/or family members who conduct, lead, are involved in or otherwise contribute to health research. This does not include participation in research studies. There is no single agreed term for people involved in research and whilst lived experience researcher is our preferred term for this report, this involvement can also be referred to by terms such as *peer researcher*, *public contributor*, *patient researcher*, *community researcher*.
- LMB:** Laboratory of Molecular Biology
- MRC:** Medical Research Council
- NICRN:** Northern Ireland Clinical Research Network
- NIHR:** National Institute for Health and Care Research (known as the National Institute for Health Research until 2022).
- NMAHPs:** Nurses, midwives and other allied health professionals
- OSCHR:** Office for Strategic Coordination of Health Research
- PIPS:** Professional Internships for PhD Students

Patient and Public Involvement (PPI): The practice of involving members of the public, people with lived experience of a health condition, patients, people with caring responsibilities and/or families at any stage of the health research cycle or its governance processes.

PSREs: Public sector research establishments

QR: Quality-related funding

QR/REG: Quality-related/Research Excellence Grant funding

R&D: Research and development

R&I: Research and innovation

RCP: Royal College of Physicians

REF: Research Excellence Framework

SMEs: Small and medium-sized enterprises

STEM: Science, technology, engineering, and mathematics

STFC: Science and Technology Funding Council

Team science: Any team-based research involving two or more research groups (even if they are all within the same institution) that aims to result in an academic publication or other research output.

TRAC: Transparent Approach to Costing

UCEA: University and Colleges Employers Association

UCU: University and College Union

UKCRC: UK Clinical Research Collaboration

UKRI: UK Research and Innovation

Unhypothecated funding: Unrestricted funds for strategic use

UUK: Universities UK

Annex II. Terms of reference

This project will set out to produce a short vision document on the future sustainability of the health research ecosystem and pipeline for talent in the UK. The vision will consider the factors that constitute a sustainable health research ecosystem and explore the intersection between different actors including Government funders; Higher Education Institutions (HEIs); medical research charities; Independent Research Organisations (IROs); industry and the NHS.

It will be informed by evidence collected from a range of sources, which may include a call for written evidence, oral evidence sessions, evidence gathering workshops, commissioned research and previous Academy activities and recommendations.

The vision will include recommendations for relevant stakeholders pertaining to:

- The financial sustainability of health research in HEIs, IROs and the NHS.
- The sustainability of the pipeline for health research talent (encompassing training, career development and cross-sectoral mobility).
- Cross-sectoral collaboration as a model for sustainable health research.
- The role of a sustainable health research ecosystem in preserving the future economic and health security of the UK.

This project will be inclusive of the wide range of disciplines encompassed within health research and will take a four-nations approach to develop recommendations relevant to the whole of the UK.

Annex III. Membership of Steering Group, Patient and Carer Reference Group, Review Group and Secretariat

Working Group

Co-chairs

- **Professor Dame Julia Goodfellow FMedSci**, Independent
- **Professor Sir Peter Mathieson FMedSci**, Principal and Vice-Chancellor, University of Edinburgh

Members

- **Dr Rasha Al Lamee**, Clinical Senior Lecturer, National Heart and Lung Institute, Imperial College London
- **Gilly Anglin-Jarrett**, Lived Experience Expert
- **Professor Frances Brodsky FMedSci**, Professor of Cell Biology, UCL
- **Professor Dame Nicky Cullum FMedSci**, Professor of Nursing, University of Manchester
- **Professor Alastair Denniston**, Consultant Ophthalmologist and Honorary Professor, University Hospitals Birmingham NHS Foundation Trust/University of Birmingham
- **Professor Tim Eisen FMedSci**, Global GU Oncology Franchise Head, Roche
- **Professor Ian Greer FMedSci**, President and Vice Chancellor, Queen's University Belfast
- **Professor Jackie Hunter FMedSci**, Chair, BenevolentBio
- **Dr Harren Jhoti OBE FMedSci**, Chief Executive Officer, Astex Pharmaceuticals
- **Professor David Lomas FMedSci**, Vice-Provost Health, University College London
- **Dr Maria Palmer**, Director, NHS R&D Forum
- **Sir Mene Pangalos FRS FMedSci**, Executive Vice President, BioPharmaceuticals R&D, AstraZeneca
- **Professor Ruth Plummer MBE FMedSci**, Professor of Experimental Cancer Medicine, University of Newcastle
- **Sarah Rae**, Lived Experience Expert
- **Professor Caetano Reis e Sousa FRS FMedSci**, Principal Group Leader and Assistant Research Director, Francis Crick Institute
- **Professor Sir Nilesh Samani FMedSci**, Medical Director, British Heart Foundation (BHF)
- **Professor Irene Tracey FMedSci**, Vice Chancellor, University of Oxford
- **Professor Julie Williams FMedSci**, Director, Dementia Research Institute, Cardiff University
- **Professor Ele Zeggini FMedSci**, Director, Institute of Translational Genomics, Helmholtz Zentrum München

Patient and Carer Reference Group

Co-chairs

- **Gilly Anglin-Jarrett**, Lived Experience Expert
- **Sarah Rae**, Lived Experience Expert

Members

- **John Cassidy**
- **Leroy Decosta Simpson**
- **Sophie Evans**
- **Lynn Laidlaw**
- **Candice McKenzie**
- **Nanik Pursani**
- **Mandy (Amanda) Rudczenko**
- **Karen Swaffield**
- Additional members who prefer not to be named for personal reasons

Review Group

- **Chair: Professor Mike Malim FRS FMedSci**, Professor of Infectious Diseases, Head of School, School of Immunology & Microbial Sciences, KCL; Vice-President non-clinical, Academy of Medical Sciences
- **Dr Niharika Duggal**, Lecturer in Immunity and Ageing, University of Birmingham
- **Professor Sir Michael Ferguson CBE FRS FRSE FMedSci**, Academic Lead for Research Strategy, University of Dundee
- **Dr Neha Issar-Brown**, Director of Research, Versus Arthritis
- **Dr Fiona Marshall FRS FMedSci**, President of the Novartis Institutes for BioMedical Research (NIBR)
- **Professor Jane Norman FMedSci**, Provost and Deputy Vice-Chancellor (DVC) for the University of Nottingham
- **John Turner**, Patient
- **Richard Watson**, Deputy Chief Executive and Director of Strategy and Transformation, Suffolk and North East Essex Integrated Care Board
- **The Rt Hon Lord David Willetts FRS FMedSci**, Member of House of Lords, former Science and Universities Minister

Secretariat

- Dr Tom Livermore, Head of Science Base and Careers Policy
- Holly McIntyre, Careers Policy Officer
- Harry Chambers, Policy Officer
- Monica Dahiya, Policy Manager
- Dr Rachel Quinn, Director of Medical Science Policy
- Holly Rogers, Head of Engagement
- Melissa Bovis, Public Engagement Manager
- Rachel Bonnington, Public Engagement Officer
- Joseph Ewing, Policy Manager, September 2021-September 2022
- Dr Teteh Champion, Policy Officer, January 2022-April 2022
- George Phillips, Policy Officer, September 2021-December 2022

Annex IV. Sources of input and contributors to the project

Written submissions

A call for written input was launched in October 2021 to identify key areas of focus for the project. The call closed in November, with over 45 completed responses from a range of individuals and organisations.

Three overlapping themes emerged most frequently from the consultation. These were:

- investment and financial sustainability
- attracting and retaining talent
- research in the NHS

Roundtable discussions and workshops

We hosted a total of five roundtable discussions and workshops:

- Health research sustainability PPI roundtable discussion (25 November 2021).

A small group of patient and carer representatives were convened to explore priorities for sustainability of health research from the perspective of patients, carers and service users.

- Workshop: Maximising the benefits of a diverse health research ecosystem for financial sustainability (1 April 2022).

This workshop was attended by public, charitable, and private funders of research, as well as universities and research institutes. The workshop explored how diversity in the research funding system can promote financial sustainability of health research.

- Workshop: Early and mid-career researcher priorities for sustainable research careers (4 May 2022).

This workshop was attended by 29 biomedical, clinical, health and lived-experience researchers ranging from late PhD to recently appointed research group leaders. Attendees were asked to define their vision for sustainable health research careers, the barriers to this, and the possible interventions that could help us support long-term sustainability.

- Workshop: FORUM workshop on the contribution of cross-sector mobility to the sustainability of health research in the UK (17 June 2022).

This workshop was run as part of the Academy's FORUM programme and was attended by 21 individuals from across academia, the NHS, industry, charities, lived experience experts and more. Discussion focussed on the contribution of cross-sector mobility to the sustainability of health research in the UK, covering the definition, benefits of, barriers to, and possible interventions to support, the movement of health researchers between sectors.

- The NHS and the Long-Term Sustainability of Health Research roundtable discussion (17 September 2022).

This roundtable discussion brought together 12 research leaders in the health service across the UK, drawn from academia, industry and NHS. Attendees considered the role of the NHS in contributing to the sustainability of health research in the UK; current challenges and opportunities to research in NHS; and areas for possible recommendations.

Public dialogue workstream

The Academy commissioned Ipsos to conduct a series of public dialogue sessions. These sessions were conducted on three consecutive nights in the week of 30 May 2022. In total, 44 members of the public participated in structured three-hour discussion sessions.

Attendees were provided with relevant background in the form of a pre-recorded presentation exploring:

- what health research is
- examples of outcomes of health research
- some of the challenges which this project seeks to address

Attendees then engaged in a series of facilitated discussions in small groups of 4-5 members of the public to explore their:

- support for health research in the UK (and its long-term sustainability)
- relative prioritisation of health research
- views on who should fund research
- views on the research workforce, who is represented within this and how they are supported



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