From research to reality

A vision for a research and innovation-powered NHS

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The fourth shift: from research to reality. The only way to build an NHS fit for the future is by putting research at the heart of health. To improve UK health and wealth and equalise outcomes, we need a culture of everyday innovation, testing, learning, and improvement across the health system.

From	To	Enablers
1 **Patchy patient engagement** Patients have little say in their care, rarely take part in research, and don't know what it means to do so.	**Proactive and involved citizens** People can track and manage their health, participate in health research as the norm, and are involved in co-design throughout the research process (e.g. from designing research questions and approaches to ensuring they meet their needs).	– Promote digital healthcare and home monitoring – Encourage public involvement in research as the norm – Focus on innovation in prevention
2 **Innovation-stifling culture** A cautious culture blocks new ideas and ignores needs, making research driven by supply instead of demand.	**Embedded long-term support to foster and sustain innovation** Innovation quickly meets needs flagged by health services. Long-term funding enables better planning. Staff and patients across the health system value innovation, and healthcare groups are more willing to take informed risks.	– Offer incentives for trusts supporting innovation – Ensure leadership support for innovation and role-modelling of a culture willing to take risks – Encourage better sharing of innovative practice
3 **Isolated pockets of research** Research in expert centres lacks support from wider studies across the country or in local communities.	**Research embedded in everyday care** Alongside expert centres, research is part of all health services, systems, and areas. Staff are backed and keen to lead, and patients gain from ever-better care. Patient data from across the NHS is routinely used to support research and learning.	– Trustworthy data infrastructure for secure access to patient health data – Incorporate AI as a research tool – Provide time and incentives to allow clinicians to engage in research
4 **Rigid bureaucracy** Rigid rules and systems slow research and block teamwork and use of data resources.	**Responsive, streamlined innovation model** Researchers and innovators work together in a system where different organisations can collaborate with few barriers, making it easy to develop and test ideas quickly and safely. Processes are improved and simplified based on researcher feedback.	– Introduce novel funding structures and innovation methods, such as challenge prizes – Innovate regulatory processes, such as through anticipatory regulation – Promote international and cross-sector collaboration
5 **Stuck in pilot phase** Promising ideas are tested in small trials but don't grow or spread widely.	**Widespread adoption and scaling of innovation** Innovators get funding to spread effective ideas across the health system, using its national reach. Barriers are lifted, frontline adoption is encouraged, and NHS staff and NHS teams eagerly adopt innovation to improve care.	– Provide dedicated funding for adoption of innovation – Improve purchasing and procurement processes – Identify and address structural and behavioural barriers to adoption

Foreword

Powered by research

When I first came to the UK as a physician-scientist early in my career in 1999, there were two big factors that made it the obvious destination.

One was the UK's outstanding research environment and the universities that are at its heart, and the second was the role of the NHS as a pioneering and high-quality health service.

John-Arne Røttingen
Chief Executive Officer
Wellcome

There were and are few places globally that can combine these remarkable assets.

But from my perspective today as the CEO of Wellcome, the UK's biggest non-governmental funder of research and an organisation focused on supporting science to solve urgent health challenges, it can sometimes feel that the UK's health and research systems are struggling to be greater than the sum of their parts and is not delivering on its tremendous potential.

Our opportunity

The Government's ambition to develop a 10-Year Plan for the NHS, alongside its renewal of the life sciences sector strategy, presents an important opportunity to address this, and to reflect on how we can capitalise on the huge potential of research and innovation to transform our health system and make it fit for the future.

More than ever before, research must be a core part of transformational change for the NHS, starting with the 10-Year Plan. Research is not a luxury; it is something the NHS cannot afford to live without. It must be embedded as an integral part of a learning health system.

Indeed, we cannot expect to make progress by accident. Innovations are discovered and developed through research. In a health system always operating under budgetary constraints, finding new ways to do things better, faster or most cost-effectively should be an existential mission.

The challenge however, articulated by many of those we consulted in developing this report, is that research is seen as important, but never as urgent. This needs to change in order to achieve the 3 key "shifts" in the NHS by 2035 – from analogue to digital, from hospital to community and from treatment to prevention – that have been laid out so clearly by the Secretary of State.

A long-term strategy

As this report outlines, 'From Research to Reality' is the missing fourth shift that is critical to unlocking the others. A long-term strategy for the NHS that no longer relegates research as an optional extra has the potential to deliver a health service where innovation, experimentation, and continuous improvement are seamless and widespread. This, in turn, will produce the improvements the public need, more quickly, and support the NHS workforce to embrace new solutions more effectively.

It's clear that this change won't happen overnight, but it's also clear that the NHS cannot afford more business as usual. This country's outstanding data resources and research environment provide an enormous opportunity to make it the most innovative health system in the world – and rarely has there been a better time to fully embrace it.

I hope that this report is a helpful contribution to the important conversations happening about the future of health and healthcare in the UK and offers a roadmap for the NHS to embed science as a core part of improving health for everyone.

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Executive summary

Three fundamental shifts are essential to create an NHS fit for the future: from hospital to community, from analogue to digital, and from sickness to prevention.

However, these transformations can only succeed through a fourth essential shift: from research to reality – embedding innovation and evidence at the core of healthcare delivery.

The transformative power of health research is undeniable.

Advances in vaccines, treatments, and diagnostics during the Covid-19 pandemic saved lives and restored helped to restore everyday life. Between 1960 and 2020, medical breakthroughs reduced deaths from heart disease by 70%, delivered life-changing treatments for diseases like cancer, arthritis, and HIV/AIDS, and led to an extraordinary 10-year increase in life expectancy in the UK.

Novel technologies look to continue this trajectory of improvement: early results from an AI tool for breast cancer detection identified 12% more cancer cases compared to traditional methods.[1] Yet, despite its potential, the NHS struggles to fully harness research for systematic improvement.

In September 2024, renowned surgeon and former health minister, Lord Ara Darzi released an independent investigation into the NHS in England. His report was clear on the size of the challenge and the need to reform the NHS's approach to innovation.

Health research is essential to healthcare delivery.

Health research and innovation can improve care safety, quality, and productivity; boost NHS staff job satisfaction and retention; and generate economic, academic, and societal benefits.[2] Participation in research is linked to better adherence with evidence-based practices, more effective treatment protocols, high quality care, and quicker patient access to potentially life-saving treatments. For example, the NHS Talking Therapies service enabled 90.5% of users to access evidence-based psychological therapies within 6 weeks.[3] Research-active NHS organisations tend to have lower mortality rates and higher patient confidence in healthcare professionals. Furthermore, a research-driven NHS organisation is often seen as a more attractive employer, contributing to job creation, revenue generation, and reducing staff absenteeism.

> "For the NHS, partnerships with the life science sector for research or treatment too often fall into the category of 'important but not urgent'. It is doubtful that there is an NHS leader in the country who would not recognise that research and innovation are important. It has simply not been a high enough priority. But it is innovation that can make the NHS more sustainable."
>
> **Darzi report, 2024**

Health research is also a critical driver of economic growth: for example, the UK BioIndustry Association estimates that the genomics sector could be worth £50 billion by 2040.[4]

A data-driven NHS that can maximise the benefits of its unique model to conduct research.

Effective use of health data is vital to secure faster access to new and innovative treatments in the future. The success of the globally leading RECOVERY trial of treatments during the Covid-19 pandemic showed us what research anchored in the NHS can achieve, and offers a glimpse of what could be more routine in the future. There is a significant opportunity for the NHS to be a better partner for early-stage research and clinical trials, building on the strong ethos of patient and public engagement that gives the UK an advantage in conducting research in a way that builds public trust and support for innovation.

The public recognises the critical role of health research

In a 2024 survey by the Campaign for Science and Engineering, nearly three quarters of respondents agreed that research and development have an essential or important role in the quality of the NHS. However, despite the enormous potential of health research, the NHS is yet to fully harness its potential. Research is deprioritised because it is not 'urgent'.

Over the last decade, UK life expectancy growth has slowed and healthy life expectancy has declined. NHS waiting lists continue to grow, and the number of consultant clinical academics has significantly fallen. Public participation in clinical trials is also declining, alongside participation in health behaviours such as vaccination and cancer screening.

In 2022, one study of an NHS service in Scotland found that only 27% of NHS staff were reported to have been involved in research. Innovation within the NHS remains fragmented, often stifled by systemic inefficiencies and a lack of alignment between NHS priorities and broader industrial strategies.[5]

To achieve the government's vision for health in 2035, research must be embedded as the engine of continuous improvement throughout the entire health and care system.

It must actively involve citizens, frontline staff, and communities in cocreating and scaling evidence-based solutions that meaningfully improve people's lives. It is also non-negotiable to unlock the transformative power of data to create an NHS fit for the future. Investment and political commitment are needed to make these changes, but the impact will far outweigh the cost.

What the future of health research could look like

Imagine an NHS where breakthroughs happen not in isolation, but as part of an interconnected network of innovation: where AI detects emerging health patterns and triggers immediate investigation through seamless digital infrastructure. Where patients see a more impactful digital service from the NHS, and their health apps do more than collect data, they translate it into personalised insights and actions.

Where successful solutions, such as a ward manager's efficient discharge process, can be scaled across hospitals in weeks rather than years, supported by the NHS's national structure and reinforced by new financial incentives that ensure health organisations capture the benefits.

This future is within our grasp, but it requires a transformed research system; one that makes innovation and continuous improvement an integral part of everyday practice. To unlock this progress, we need to tackle five key challenges in how we conduct health research and innovation:

1

Moving from patchy patient engagement to citizens being proactively involved in their healthcare and in health research.

By 2035, citizens should play an active role in managing their health and shaping health research from the earliest stages of design, to ensure that innovation and research deliver on what the public needs and wants from its health system.

2

Moving from a culture that stifles innovation to one that fosters and sustains it.

Over the next decade, healthcare should embrace a culture that supports innovation through evidence-based risk taking, empowering frontline staff to identify challenges and create solutions. Stable funding and long-term planning will make innovation an integral part of better care, benefiting both patients and providers.

3

Moving from isolated pockets of research to research embedded in everyday care.

By embedding research into daily practice, the healthcare system can deliver continuously improving care. A workforce incentivised to lead experimentation (e.g. by ensuring income from commercial trials is reinvested into departments leading trials[6]) will ensure that patients experience better outcomes driven by constant learning and innovation.

As one of the largest unified healthcare systems, serving a diverse population, the NHS offers a unique advantage for health research. By improving access to high-quality, well-structured data, the NHS can reap the clinical and operational benefits of innovations like AI, creating a more attractive environment for clinical trials and breakthroughs.

To realise AI's potential, we must improve data governance, access processes and infrastructure while building public trust through transparent and responsible use.[7] Fully integrated routes into research via the NHS app could improve patient engagement and give patients the option of having their health data proactively analysed by an NHS research partner to establish suitability for clinical trials.[8]

4

Moving from a system limited by rigid bureaucracy to a responsive, streamlined model of innovation.

In the years ahead, the health research system must evolve into an adaptable and streamlined model that supports rapid development and testing of ideas. Researchers and innovators should work within a connected, collaborative system with fewer barriers and processes that adapt based on their feedback. This transformation will ensure a research ecosystem designed for speed, efficiency, and continuous improvement.

5

Moving from a landscape where innovation often fails to progress past pilot testing to one which ensures widespread adoption and scaling.

In the next decade, the health research system must ensure good ideas translate into widespread practice. Effective solutions should be scaled across the NHS with dedicated funding and support, while frontline staff should be equipped and motivated to adopt proven approaches.

Streamlined processes and fewer barriers should make widespread adoption the standard, rather than the exception, delivering better care and outcomes for patients nationwide.

If we implement these changes, by 2035 the UK will have a health service where innovation, experimentation, and continuous improvement are seamless and widespread. Innovation will drive the improvements the public wants, and NHS staff will embrace new solutions with enthusiasm.

Research must be a core part of government action, starting with the 10-Year Plan. It cannot be treated as optional.

Instead, it must be a central pillar of the UK government's healthcare strategy, with greater investment, driving innovation and improvement, while leveraging our world-leading scientific heritage and scale of our national health system. The 10-Year Plan offers a crucial opportunity to elevate health research in discussions about the future of the NHS.

With clear government leadership and commitment, coupled with greater investment, we can strengthen both UK health research and NHS care delivery, ensuring our healthcare system continues to pioneer medical advances while delivering exceptional care.

A day in the research and innovation-powered NHS, 2035

Clinical Lead Nurse Sarah Chen closes her laptop with satisfaction after her weekly research feedback session. Their citizen engagement platform had flagged an emerging trend: knee replacement patients reporting unusually long recovery times when returning to work. This morning, she met with former patients and specialists to co-design a rapid research study, combining wearable sensors with patient diaries. The study will launch next week.

Across town, **Raja Malik, a local authority Public Health Officer,** reviews data from their adapted mobile screening service. Using the NHS Innovation Pipeline's adoption toolkit, his team accessed implementation guides and mentoring from successful innovators. Now their service, co-designed with local South Asian community leaders, is achieving impressive early detection rates among shift workers who previously missed screenings.

"It's completely different from my first experience with the NHS ten years ago," says **Priya Chatterjee, a patient research partner** who lives with Type 2 diabetes. Through her smartphone, she monitors her health metrics daily and contributes to three different research studies. "Now I'm not just a passive recipient of care – I'm helping shape the future of diabetes treatment!"

For **Dr. Hannah Williams, NHS Regional Commissioner**, the transformation in research and innovation has revolutionised her decision-making. "We used to struggle with patchy data and isolated pilots," she reflects, reviewing her integrated evidence dashboard. "Now I can see real-time results from innovations across the region and quickly channel resources to scale effective interventions."

At lunch, **junior doctor Dr. Joe Patel** receives a notification: his latest findings from his protected "Innovation Time" have been automatically shared across the NHS. Three hospitals have already expressed interest in adapting his protocol for regional scaling.

The old frustrations of funding gaps, bureaucracy, and the struggle to scale good ideas have been replaced by a system that nurtures improvement. From patients to clinicians, commissioners to local authority partners, everyone plays an active role in advancing healthcare knowledge and ensuring innovations reach those who need them most.

Introduction

The challenges facing the UK's healthcare system are well-documented. Tackling them requires harnessing and deploying the full potential of health research and innovation.

The transformative power of health research is undeniable.

During the pandemic, breakthroughs in vaccines, treatments, and diagnostics not only saved countless lives but also allowed societies to emerge from lockdowns and restore a sense of normalcy.

Over the longer term, innovations like antibiotics, medical imaging, and keyhole surgery revolutionised health and care. These advances contributed to an extraordinary 10-year increase in life expectancy in the UK, underscoring the profound impact of sustained investment in research.

Yet despite the enormous potential of research, we are not yet fully capitalising on its benefits.

Rises in UK life expectancy have slowed over the last decade. Healthy life expectancy has declined. NHS waiting lists continue to lengthen. Recent years have seen research productivity and medical innovation slowing. Entrenched systemic barriers such as the NHS's fragmented national and regional systems, limited ring-fenced funding for innovation, and cultural resistance to change restrict the adoption and scale of effective innovations.

The number of consultant clinical academics in the NHS has significantly declined and in 2022, one study of an NHS service in Scotland found that only 27% of NHS staff were reported to have been involved in research. Slowing engagement with health research is also seen among the public: participation in clinical trials is declining, alongside declining participation in health behaviours such as vaccination and screening for illnesses such as cervical and breast cancer.

Reforming **the UK's health and research ecosystem is critical to achieving the Government's missions**. An NHS fit for the future, along with broader health priorities of the population, can only be realised through a relentless, daily commitment to improve service delivery and health outcomes in the UK, driven through innovation.

Definitions for this report

Research: The systematic investigation of questions or problems to generate new knowledge, insights, or solutions. This includes a wide range of fields including biomedical research, clinical research, public health research, and health services research. It includes the study of human health, ill health, and healthcare.

Innovation: The process of creating new (or updating old) ideas, models of care, services, and products to improve health and healthcare. Innovation should also include the adoption of innovation, but this can be challenging in the UK context.

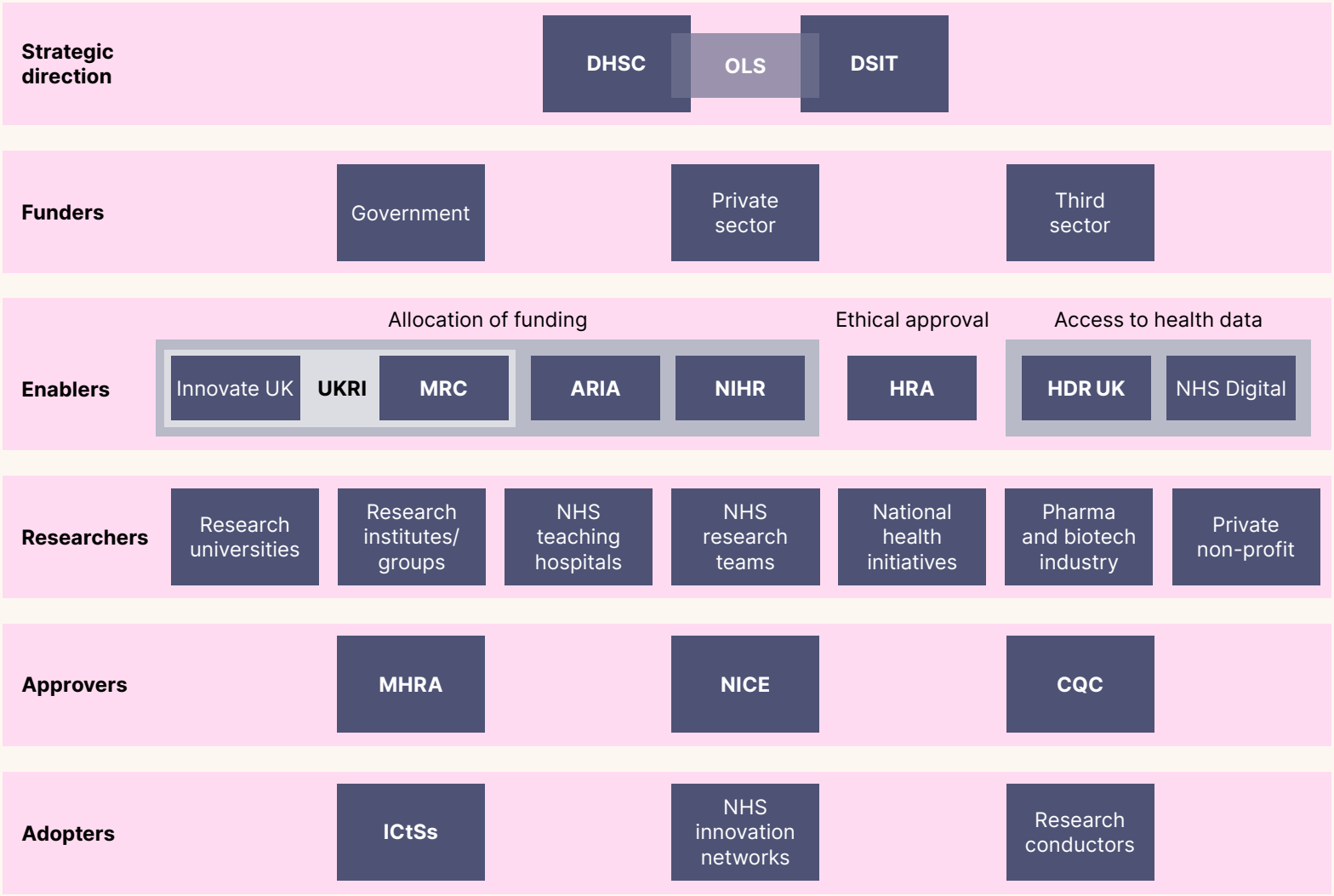
How does the health research system need to change?

The UK health research system involves the public, private, and third sectors. Figure 1 shows those involved at each stage in the flow of innovation from strategic direction setting and policy-making to adoption.

Key

DHSC: Department of Health and Social Care; OLS: Office of Life Sciences; DSIT: Department for Science, Innovation and Technology; UKRI: UK Research and Innovation; MRC: Medical Research Council; ARIA: Advanced Research and Invention Agency; NIHR: National Institute for Health and Care Research; HRA: Health Research Authority; HDR UK: Health Data Research UK; MHRA: Medicines and Healthcare Products Regulatory Agency; NICE: National Institute for Health and Care Excellence; CQC: Care Quality Commission; ICS: Integrated Care Systems

Figure 1. Overview of health research infrastructure



The UK's health science and innovation ecosystem aims to tackle health challenges and promote health equity, drive economic growth, and advance life sciences through key government priorities:

1. **NHS as an innovation partner:** Strengthen the NHS's role in healthcare innovation by linking research with care delivery, using infrastructure and data for translational research, and adopting new solutions in clinical practice.
2. **Increased life sciences R&D investment:** Boost public and private funding to solidify the UK's global leadership in biomedical innovation.
3. **Optimised NHS health data for research:** Securely expand the use of NHS data for research while safeguarding privacy and streamlining clinical trial recruitment.
4. **Improved access to finance:** Enhance funding opportunities for early-stage and scaling life sciences companies.

The government's strategy includes stable, long-term public R&D funding to attract private investment, promoting cross-sector collaboration in emerging fields (e.g. genomics, digital health), and modernising regulations to attract global investors. It also emphasises building infrastructure for ethical health data use, increasing clinical trial capacity and diversity, and providing financial support to overcome innovation challenges.

The UK's health research system has many strengths: Alignment between government departments on health, robust funding and regulatory frameworks, and a solid foundation in life sciences, world-class universities, and vast NHS patient data. NHS support provides critical information across the innovation pathway, facilitating the development, approval, and roll-out of new technologies, focusing on priority areas.

The UK healthcare system aims to translate research into practice through a structured process involving key organisations such as the Medicines and Healthcare Products Regulatory Agency (MHRA), National Institute for Health and Care Excellence (NICE), and the Care Quality Commission (CQC), which regulate, approve, and monitor innovations for safety, efficacy, and quality.

Regional Health Innovation Networks and NHS innovation hubs further support the adoption and scaling of research-backed innovations by encouraging collaboration, standardising best practices, and providing training.

However, the system also has many weaknesses. Delays and inflexibility slow the flow of ideas and innovation. Too often research focuses only on individual diseases when in reality patients can experience many conditions all at once. This traditional disease-focused approach to prioritisation also limits consideration of primary prevention. Studies mostly reflect government priorities (which is, in itself, a good thing), but rarely the needs of frontline services.

Research and funding are concentrated in a few key centres, which limits research happening in other places (particularly outside of hospitals).[9] When good innovation does occur, it often stalls. Scaling and adopting new innovation relies on already overstretched frontline staff going above and beyond, despite often lacking the time and resources to engage with research and new technologies.

Moreover, while many promising projects and initiatives exist, progress is often siloed. Cross-governmental strategic focus could increase the scale and pace of development to maximise health and economic impact.

Examples of positive initiatives supporting digital and healthtech innovation include: the NHS innovation service, which has supported the development and implementation of healthtech solutions across over 700 innovations since its launch in 2022; the Artificial Intelligence (AI) Award to speed up the testing and evaluation of AI technologies; the Medtech Funding Mandate to guide NHS commissioners towards adopting cost-effective medtech innovations; and specific funding streams for AI-related projects and solutions.

Similarly, initiatives to improve the use of patient health data (such as the National AI Strategy, aiming to make the UK a global leader in AI, particularly within healthcare; the Data Ethics Framework, guiding the ethical and transparent use of data; and the Federated Data Platform, improving data sharing across NHS systems to enable better patient outcomes) could be strengthened by using the NHS as a connector and driving force behind currently isolated programmes.

Major shifts in population health needs, disease patterns, and technological capabilities require us to think differently about healthcare delivery. While our current research system has delivered important advances, it isn't structured to fully address today's complex population health challenges. We need a transformed vision of a health economy where science and innovation work seamlessly to improve both health outcomes and economic prosperity.

Developing the vision

In light of the new government's ambitious vision for health and the upcoming NHS 10-Year Plan, Wellcome commissioned the Nesta Group to explore where research could take healthcare in the next ten years. Wellcome's goal for the work was to create a high-level vision, rather than focusing on specific policy recommendations.

With a focus on the NHS 10-Year Plan, we aimed to:

- **Rapidly understand** the current political, policy, and industry context for health and science, in order to,
- Set up a **refreshed vision** for a science and innovation powered health economy, and
- **Convene a community** of experts to contribute to the development of the vision, and help to turn it into a reality in the future.

We conducted a rapid review of academic and grey literature to explore the current policy and industry context of health science research (a full literature review accompanies this document).

Based on these findings, we created a draft vision for a research and innovation-powered NHS. Representatives from Wellcome, Nesta, and RAND Europe (also commissioned by Wellcome to work on this subject) discussed and refined the initial vision at a workshop.

External expert stakeholders reviewed and refined the updated vision further via an in-person workshop and an online survey consultation. Workshop attendees comprised representatives from government, research funders, industry, healthcare professionals, and patient experts.

The online survey consultation sought feedback on the vision from additional subject and patient experts. The final 'Vision for a research and innovation-powered NHS' incorporates comments and suggestions provided during these activities (a full External Consultation Feedback document accompanies this document).

A vision for a research and innovation-powered NHS

Three fundamental shifts are at the heart of the government's plans to create an NHS fit for the future: from hospital to community, from analogue to digital, and from sickness to prevention.

These transformations will only succeed through a fourth essential shift: from research to reality – embedding innovation and evidence at the heart of how healthcare works.

This 'fourth shift' would see the health research and innovation landscape move from a traditional research **system characterised by delays and inflexibility to one where everyday innovation and learning translates research into better care, at better cost, achieving better outcomes for patients.**

Figure 2. The fourth shift

To achieve the government's ambitious vision for health in 2035, research must be embedded as the engine of continuous improvement across the entire health and care system.

By actively involving citizens, frontline staff, and communities, we can create and scale evidence-based solutions that meaningfully improve people's lives. We need a health service where innovation and improvement are commonplace, delivering changes that matter to the public. NHS staff should be empowered to embrace these advances, ensuring patients experience consistently improving care and better health outcomes.

Five key changes will be essential to unlock progress towards the vision:

- Moving from patchy patient engagement to citizens being proactively involved in their healthcare and in health research;
- Moving from a culture that stifles innovation to one that fosters and sustains it;
- Moving from isolated pockets of research to research embedded in everyday care;
- Moving from a system limited by rigid bureaucracy to a responsive, streamlined model of innovation; and
- Moving from a landscape where innovation often fails to progress past pilot testing to one which ensures widespread adoption and scaling.

While we have presented these as discrete changes, they do overlap. In particular, meaningful involvement of the patient voice is key to delivering all of the changes. The figure on the next page summarises these changes; the following section provides further detail.

To bring these changes to life we have illustrated each of them with a vignette that shows what the consequences of them may mean for those who use and work in the NHS.

Figure 3. Vision for research and innovation-powered health system

The fourth shift: from research to reality. The only way to build an NHS fit for the future is by putting research at the heart of health. To improve UK health and wealth and equalise outcomes, we need a culture of everyday innovation, testing, learning, and improvement across the health system.

	From	To	Enablers
1	**Patchy patient engagement** Patients have little say in their care, rarely take part in research, and don't know what it means to do so.	**Proactive and involved citizens** People can track and manage their health, participate in health research as the norm, and are involved in co-design throughout the research process (e.g. from designing research questions and approaches to ensuring they meet their needs).	– Promote digital healthcare and home monitoring – Encourage public involvement in research as the norm – Focus on innovation in prevention
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5	**Stuck in pilot phase** Promising ideas are tested in small trials but don't grow or spread widely.	**Widespread adoption and scaling of innovation** Innovators get funding to spread effective ideas across the health system, using its national reach. Barriers are lifted, frontline adoption is encouraged, and NHS staff and NHS teams eagerly adopt innovation to improve care.	– Provide dedicated funding for adoption of innovation – Improve purchasing and procurement processes – Identify and address structural and behavioural barriers to adoption

1

From patchy patient engagement to citizens being proactively involved in their healthcare and in health research.

Patients and the public should be involved in all stages of research, while also taking an active role in managing their health and care. In our workshop, experts highlighted that to be able to deliver a health service that suits the needs of the public, the public needs to be involved in shaping it. This applies beyond 'patients': for example, asking clinicians how best to improve the service they work in is essential.

Figure 4. Enabling proactive, involved citizens

Patchy patient engagement

Patients have little say in their care, rarely take part in research, and don't know what it means to do so.

Proactive and involved citizens

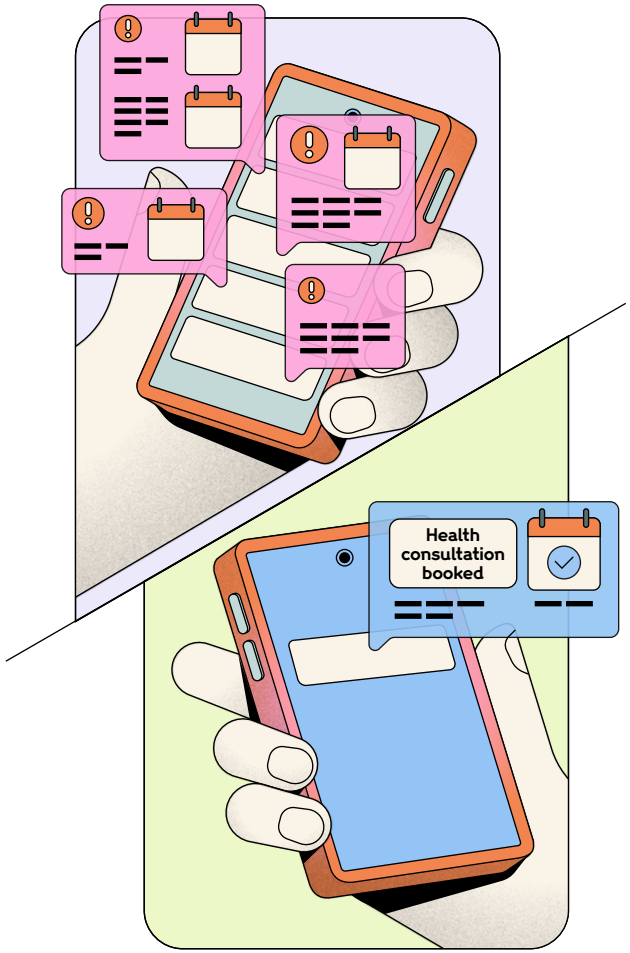
People can track and manage their health, participate in health research as the norm, and are involved in co-design throughout the research process (e.g. from designing research questions and approaches to ensuring they meet their needs).

Examples of meaningful public and professional involvement in research and innovation illustrate what this could feel like. For example, the 100-day challenge empowered both frontline practitioners and citizens to design and implement innovative solutions to complex problems such as hospital discharge delays and long-term condition management within 100 days.

A research and innovation-powered health system with actively involved citizens could feature widespread digital healthcare and home monitoring, maximising patient agency over their own public involvement in research could take the form of co-design and collective intelligence design, driving innovation in prevention and treatment.

The figure on the next page summarises two vignettes: one illustrating the current system (on the left) and the other envisioning what the system could look and feel like in 10 years time (on the right).

Figure 5. Vignettes: Proactive and involved citizens



Proactive and involved citizens

Members of the public are agents of their own health and actively involved in all stages of research

From

Linda checks her phone calendar while juggling work deadlines. Another GP appointment to squeeze in. Her pre-diabetes diagnosis means regular check-ups, but coordinating time off work, transport to the clinic, and actually getting an appointment feels like a part-time job. She recently deleted an email about joining 'Our Future Health' research programme - it sounded important, but the forms and commitments felt overwhelming. "Sometimes I wonder if the hassle of managing healthcare is worse than the condition itself" she thinks.

To

Linda glances at her health app - her continuous mitochondrial health monitor has automatically logged another week of data. When readings suggest a beneficial lifestyle change, her AI health assistant proactively schedules a virtual consultation. She's already participating in two clinical trials, matched to her profile and preferences, which her anonymised data supports. "The system works around my life now," she reflects, "not the other way around".

2

From a culture that stifles innovation to one that nurtures and sustains it.

By 2035, NHS culture must fully embrace research within the health system. The importance of cultural change was a second major insight from our expert workshop: a risk-averse culture is one of the greatest barriers to effective innovation.

A research and innovation-powered health system supporting innovation could use novel funding mechanisms to prioritise essential studies identified by patients and healthcare workers. Mechanisms like pre-procurement, where organisations compete for funding to deliver innovative services or products around particular challenges could drive innovation.

A culture of long-term change, embracing evidence-based risk across NHS innovation networks and integrated care systems, would accelerate the adoption of innovation at local and national levels. Better sharing of successful practices would enable trusts to learn from previous initiatives and improve overall outcomes.

Figure 6. Providing embedded long-term support for innovation

Innovation-stifling culture

A cautious culture blocks new ideas and ignores needs, making research driven by supply instead of demand.

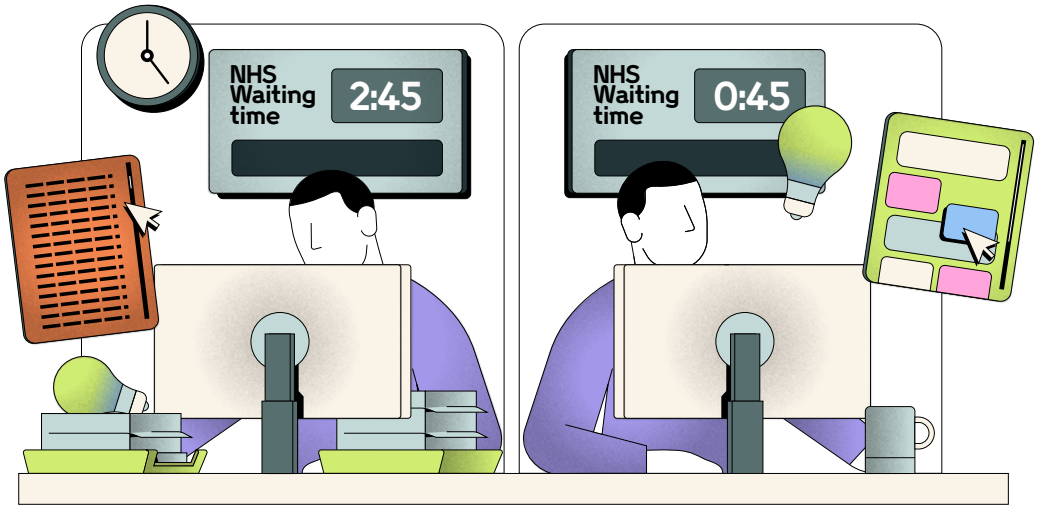
Embedded long-term support to foster and sustain innovation

Innovation quickly meets needs flagged by health services. Long-term funding enables better planning. Staff and patients across the health system value innovation, and healthcare groups are more willing to take informed risks.

There are already positive examples of embedded cultural support for innovation. For example, Innovate UK's Contracts for Innovation helps public sector organisations to solve challenges by running a competitive funding opportunity to develop and adopt new products and services.

The vignettes illustrate what this positive shift could look and feel like in practice.

Figure 7. Vignettes: Embedded long-term support for innovation



Embedded long-term support for innovation

Organisational culture change from the top down increases appetite for evidence-based risk

From

Jamie, a junior ward manager, feels defeated as another day ends with patients waiting hours to be discharged, leading to serious delays for ambulances and at A&E. He has developed a new process to speed up discharge – saving staff time and reducing delays – but this has been met with polite indifference from Trust leadership. Leadership is focused on maintaining "proven systems," with no appetite for risk or innovation. Every effort to push forward is met with resistance, leaving him questioning whether change is possible.

To

Jamie's discharge process overhaul is now live in three hospitals, thanks to the NHS's Innovation Support Framework. Identified as a critical need through strategic demand mapping, his project was fast-tracked into a pilot with funding and mentorship. A robust evaluation framework helped build the case for scaling. Jamie's solution is not only improving patient flow but also reducing staff burnout and improving productivity. For the first time, Jamie feels like his ideas are driving real change.

3

From isolated pockets of research to research embedded in everyday care.

A reinvigorated research system should break down barriers, accelerating and broadening the scope and scale of research.

A research-powered health system, where research is a part of everyday practice, should provide time and incentives for clinicians to engage in research, provide responsible access to patient data through innovative governance models like data trusts, ensure appropriate digital infrastructure, and leverage AI as a research tool.

Improved access to data will enable the NHS to more readily benefit from innovations like AI, creating a more attractive environment for clinical trials and further advancements. For AI to make a real impact on health, we need higher quality, better structured data that can be accessed more easily through improved governance and infrastructure.

Figure 8. Embedding research into everyday practice

Isolated pockets of research

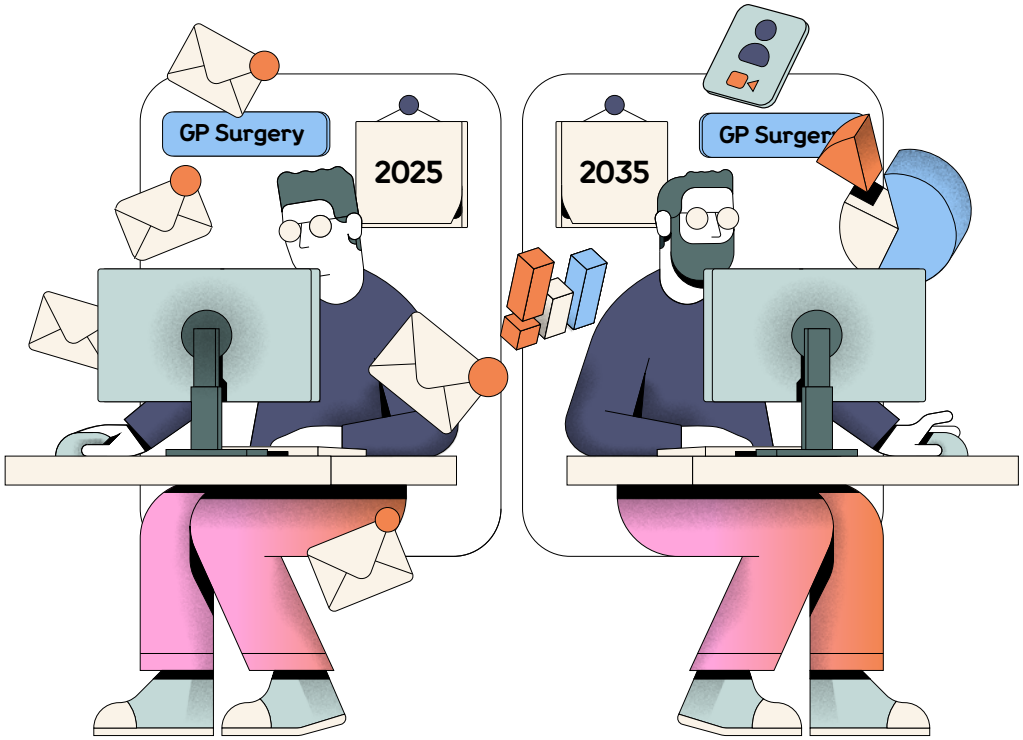
Research in expert centres lacks support from wider studies across the country or in local communities.

Research embedded in everyday care

Alongside expert centres, research is part of all health services, systems, and areas. Staff are backed and keen to lead, and patients gain from ever-better care. Patient data from across the NHS is routinely used to support research and learning.

Positive examples of this change illustrate what this could look like. Israel's centralised health system holds a large body of patient data under high security, anonymised for use in research. As records use a common format, AI systems can conduct large-scale data analysis.

Figure 9. Vignettes: Research as everyday practice



Research as everyday practice

Research saturates every part of our health system across all services and geographical regions

From

Early-career GP Dr. James Miller checks his overflowing inbox between patient appointments in his rural Yorkshire practice. Another research opportunity ignored. His mornings start at 7am with urgent cases, and evenings are consumed by admin catch-up. When he proposed flexible scheduling for research time, the practice manager dismissed it: 'That's not how we do things here.' The irony isn't lost – daily opportunities to improve primary care, but no time or support to study them. Another alert pings: three GPs called in sick. Research will wait, again.

To

In 2035, Dr. James Miller starts his day reviewing AI-synthesised research insights from his rural Yorkshire practice's patient data. Through the NHS's integrated research platform, he collaborates with GPs nationwide to improve rural healthcare. Flexible scheduling ensures protected research time, backed by incentives valuing innovation alongside care. Spotting an unusual pattern in mental health presentations, he can launch a study immediately: novel mechanisms enable funding for an unorthodox research approach, while streamlined governance brings ethical approval in days.

4

From a system limited by restrictive bureaucracy and rigidity to a responsive, streamlined model of innovation.

By 2035, the process of conducting research and developing innovation should be as streamlined and rapid as possible, encouraging wider participation. A research and innovation-powered health system should eliminate barriers to the flow of information, funding, people, and innovation.

Novel methods such as challenge prizes and venture studios could promote research in prioritised areas, while new regulatory approaches like anticipatory regulation would streamline the approval of new innovation.

Greater international collaboration, along with cross-sector, and cross-disease partnerships would improve the flow of ideas, funding, data, and expertise. Finally, a metascience approach, studying how science is conducted, would enable a dynamic, responsive health research system, capable of adapting to keep pace with change.

Figure 10. Creating a responsive streamlined innovation system

Rigid bureaucracy

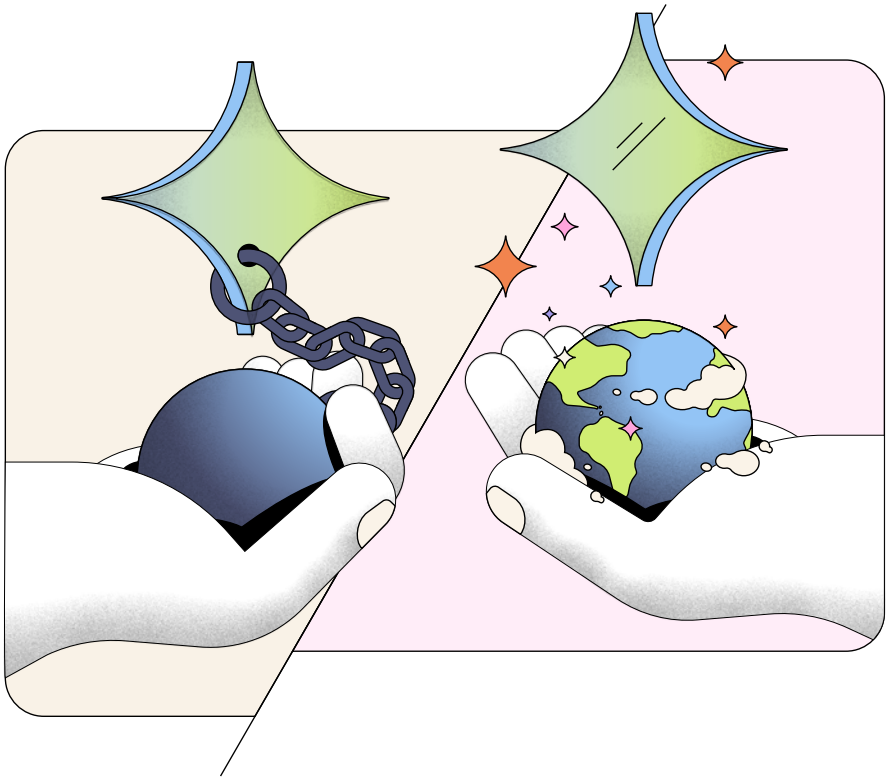
Rigid rules and systems slow research and block teamwork and use of data resources.

Responsive, streamlined innovation model

Researchers and innovators work together in a system where different organisations can collaborate with few barriers, making it easy to develop and test ideas quickly and safely. Processes are improved and simplified based on researcher feedback.

A positive example of this change in action is the MHRA 'AI-Airlock' regulatory process, which speeds up patient access to innovative AI-supported healthcare technologies by enabling developers to generate regulator-monitored evidence in NHS settings before seeking regulatory approval.

Figure 11. Vignettes: Responsive, streamlined innovation system



Agile, streamlined innovation system

A system that empowers and enables innovators, rather than slowing them down

From

Dr. Sarah Chen checks another grant rejection. Her AI tool for early sepsis detection could save countless lives, but after 18 months of navigating the NHS, she's running on fumes. Her savings are dwindling from self-funding prototypes, while colleagues warn of 'career suicide'. Every promising conversation with decision-makers dissolves into committees, procurement rules, and unclear pathways. She's caught in a loop: too early for major funding, but needing resources to generate evidence that would unlock that funding. Meanwhile, patients who could benefit continue to slip through the cracks.

To

Dr. Sarah Chen's sepsis detection AI enters the NHS Innovation Gateway's sandbox test bed, which has been created to catalyse mission-driven innovation across the health sector. She's quickly matched with pilot sites and secure patient data. Through a global research network and cross-agency funding consortium, her startup generates evidence rapidly. Within six months, her innovation runs trials internationally (digital innovation brokerage helped her work out who to collaborate with) while the NHS's agile procurement pathway enables adoption across five trusts.

5

From a landscape where innovation often fails to progress past pilot testing to one which ensures widespread adoption and scaling.

A research and innovation-powered health system in 2035 should enable the adoption and scaling of innovation. This would overcome the current pitfall where promising innovation often stalls at the pilot stage, meaning that innovation fails to lead to meaningful changes in practice and health outcomes.

A health system that promotes adoption and scaling would ensure dedicated funding, supported by updated purchasing and procurement processes, potentially redefining how health benefits are calculated. A revitalised health research system would also address the structural and behavioural barriers to the final stages of adoption. New incentives will be needed for healthcare organisations to embrace research, which might include mechanisms for capturing the benefits of change.

Figure 12. Promoting widespread adoption and scaling of innovation

Stuck in pilot phase

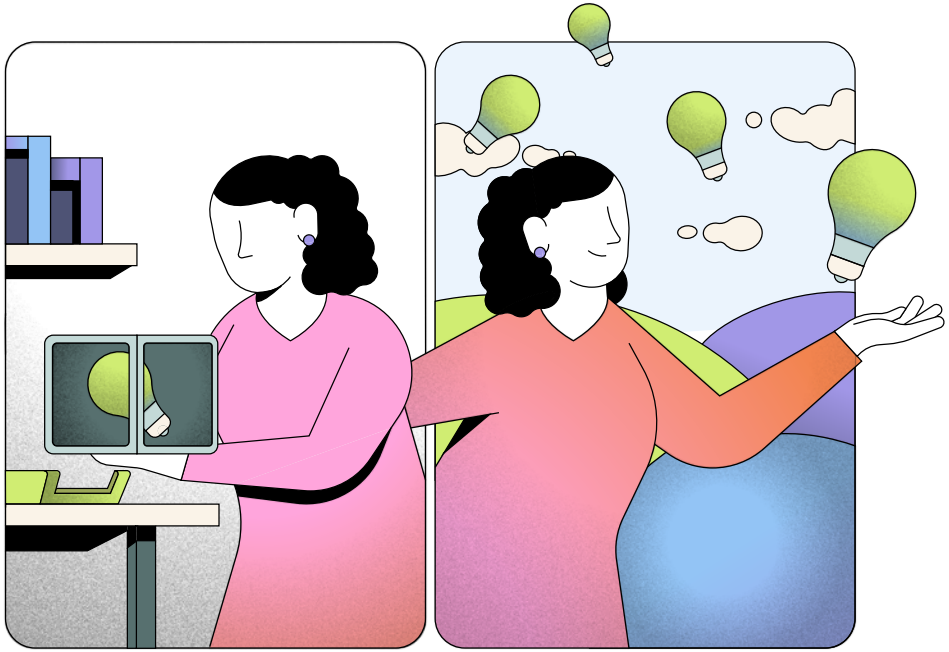
Promising ideas are tested in small trials but don't grow or spread widely.

Widespread adoption and scaling of innovation

Innovators get funding to spread effective ideas across the health system, using its national reach. Barriers are lifted, frontline adoption is encouraged, and NHS staff and NHS teams eagerly adopt innovation to improve care.

Novel approaches to support research and embed resulting innovation through public-private partnerships, such as the Government's collaboration with Lilly, illustrate the potential for widespread change to scaling and adoption of innovation. This partnership has resulted in a £279 million investment to establish a UK-based biotech hub to support early-stage life sciences businesses focused on developing new medicines.

Figure 13. Vignettes: Widespread adoption of innovation



Widespread adoption of innovation

Novel innovations are tested, funded and adopted to drive process innovation at scale

From

Emma Wright sighs at another transformation board meeting. As National Director of Transformation at NHSE, she's watching pilot projects yield promising results in Manchester and London, but wider adoption stalls. 'We've shown it works, but scaling is like pushing water uphill,' she reflects. Despite clear evidence, regional hospitals cite funding constraints and operational risks. Innovation remains confined to a few ambitious teaching hospitals with dedicated transformation teams. Meanwhile, proven solutions gather dust.

To

Emma Wright watches real-time adoption metrics climb across the country. Local health systems compete to be early adopters, incentivised by flexible funding and streamlined procurement that takes account of the wider economic and social value of interventions. When a new avatar therapy for patients who hear voices proves successful in Bristol, it's implemented across three other regions within weeks. Risk-sharing agreements and agile governance mean innovations scale rapidly. "The question is no longer if we'll adopt new solutions," she notes, "but how quickly".

Next steps

This report sets out a vision for a research and innovation-powered NHS, shaped by subject and patient experts, alongside valuable contributions from Wellcome, Nesta Group, and RAND Europe colleagues.

This transformation is essential for addressing the NHS's current challenges and will be pivotal in supporting the UK Government's key health shifts: from hospital to community, analogue to digital, and sickness to prevention.

To complement this vision, RAND Europe has developed a detailed analysis of the practical levers needed to drive change. Together, these reports provide the 'what' and 'how' of achieving a research and innovation-powered NHS.

This vision is a living document that will evolve through wider input and refinement. We hope this marks the start of an ongoing dialogue with health decision-makers and diverse stakeholders, working together to shape the future of a research and innovation-powered NHS in the UK.

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The Wellcome project team included Tom Harrison, Al Russell, Beth Thompson, Megan Challis and Beck Smith.

Endnotes

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About Wellcome

Wellcome supports science to solve the urgent health challenges facing everyone. We support discovery research into life, health and wellbeing, and we're taking on three worldwide health challenges: mental health, infectious disease, and climate and health.

About BIT

BIT is a global research and innovation consultancy which combines a deep understanding of human behaviour with evidence-led problem solving to improve people's lives. We work with all levels of government, nonprofits and the private sector, applying behavioural science expertise with robust evaluation and data to help clients achieve their goals.

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About Nesta

Nesta is the UK's innovation agency for social good. They design, test and scale solutions to society's biggest problems. Nesta's three missions are to give every child a fair start, help people live healthy lives and create a sustainable future where the economy works for both people and the planet.

For over 20 years, Nesta has worked to support, encourage and inspire innovation. They work in three roles: as an innovation partner working with frontline organisations to design and test new solutions, as a venture builder supporting new and early-stage businesses and as a system shaper creating the conditions for innovation. Harnessing the rigour of science and the creativity of design, Nesta works relentlessly to change millions of lives for the better.

Find out more at nesta.org.uk

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