

August 2018

*The following submission was prepared in response to a specific request from NHS England for the Academy's input into the Research and Innovation workstream of the Long Term Plan. The Academy did not submit a separate response into NHS England's wider consultation about the Long Term Plan.*

## Summary

### **1. Increasing the pipeline of proven innovations that meet patients, citizens and staff needs**

- **A holistic plan needs to be established that supports the entire translational pathway** from bench to bedside. **AHSCs and BRCs** can support the development and translation of innovation, and **AHSNs** the dissemination and adoption of new innovations. Their success **relies on a joined up approach**.
- **Research should be incentivised in the NHS**. The value of **clinical academics** to the development of innovations should be nurtured and **protected time should be allocated to other clinicians** who want to engage with the research agenda.
- **The correct incentives and metrics** will need to be determined to ensure that the value of research is recognised from Board level through to individual job plans.
- **The NHS should become a learning health system**, where clinical evidence feeds back into the development of innovation that is relevant to and proven for use in the NHS. **Support is needed for generating appropriate evidence** along the development pathway.
- **Industry-academia-NHS partnerships are vital to delivering new innovations**. A 'team science' model of interdisciplinary working will be necessary, with appropriate mechanisms to enable mobility between sectors without increased administrative burden. **Research clusters should be better utilised** to facilitate links and collaborations across sectors.
- There is an **urgent need to better integrate and use the large volume of data held in the NHS** and make these data more easily accessible for research, within an appropriate governance framework. Engagement with patients and the public on this will be crucial.
- **Involvement with stakeholders** (including patients, the public, commissioners, regulators and clinicians) **at various points across the innovation pathway** will support the design of innovations that are needed by patients and the NHS.

### **2. Improving uptake and spread of innovations across the NHS**

- **Adoption often requires an interdisciplinary approach** that cuts across professional boundaries. Lack of money and capacity are seen as key barriers to adoption.
- **A holistic consideration of clinical value and cost effectiveness** (going beyond immediate cost savings) is required to drive uptake and adoption in the NHS.
- **AHSNs can play an important role in supporting the dissemination, scale-up and adoption of innovations across the NHS**.
- **Initiatives** such as the Accelerated Access Collaborative **need to be built on to encompass a greater number and diversity of innovations**.
- **Training is required** to ensure that all healthcare personnel can embed research findings and support innovation. In particular, **data and informatics skills will be needed** to harness the rapid advance in technologies. Training pathways should **develop a strong group of clinical academics and clinical research nurses** to lead and support research.

- The **NHS should be better utilised as a test bed for innovations.**
- A **new generation of cross-sectoral leaders capable of driving cultural and system change** to incentivise research in the NHS and adoption of innovations is needed. The Academy has launched a new leadership programme, FLIER (Future Leaders in Innovation, Enterprise and Research), to that effect.

## **Introduction**

The Academy of Medical Sciences promotes advances in medical science, and works to ensure that these are translated into healthcare benefits for society. Our elected Fellowship includes the UK's foremost medical science experts drawn from academia and industry. Our submission is informed by the expertise of our President, and of our Fellowship through our previous work, including responses to government consultations and our FORUM workshops.

We welcome the opportunity to contribute to NHS England's initial proposals for the Research and Innovation workstream of the Long Term Plan. As requested, this response will focus on providing input on the key transformative actions that the NHS could take to increase the pipeline of proven innovations that meet patients, citizens and staff needs; and improve uptake and spread of these innovations across the NHS.

### **1. Increasing the pipeline of proven innovations that meet patients, citizens and staff needs**

We are delighted to see that support for the development of innovations that will benefit patients, and meet patient, citizens and staff needs, is being considered upfront in the Long Term Plan. **A holistic plan needs to be established that supports the entire translational pathway** from bench to bedside, with equal thought given to improving the quality and utility of new innovations through enhancing the development pathway as that given to the adoption and dissemination of new innovations across the NHS. These two elements cannot, and should not, be considered in isolation as they form part of a continuum and are reliant on one another.

Organisations such as Academic Health Science Centres (AHSCs) and Biomedical Research Centres (BRCs) have a key role to play in the development and translation of innovation, and Academic Health Science Networks (AHSNs) provide valuable infrastructure to support the dissemination, scale-up and adoption of new innovations coming through the pipeline. Their **success relies on a joined up approach** across these various organisations, with a clear articulation of their respective remits, roles and responsibilities, as well as where they are best placed to lend their support within the innovation pathway.

#### ***Incentivising research in the NHS***

The UK has an international reputation for excellence in biomedical and health research, which has contributed to major advances in patient care. There is increasing evidence that **patients have better outcomes in research-active healthcare settings**, and patients would like to be offered

opportunities to be involved in trials of new medicines or treatments.<sup>1,2,3,4</sup> In addition, the public believes that the NHS should play an important role in supporting research for new treatments.<sup>5</sup>

However, recent studies report a lack of capacity (with respect to time and skilled staff) to undertake research,<sup>6,7</sup> or even to engage with the research agenda, a problem that is likely to be compounded by the UK's withdrawal from the European Union as a sizable proportion of the workforce is drawn from the European Economic Area.<sup>8</sup> There is a perception that some Commissioners and Trusts still regard research as 'nice to have', rather than a central component of its business (and one of the objectives in the Government's mandate to NHS England).

Clinical academics play a critical role in generating the evidence for new treatments and improved patient management for a wide range of medical conditions, as well as delivering front line care, often in highly specialised areas. **The value of these individuals to the development of innovations that meet patient needs should be recognised and nurtured.**

Furthermore, other clinicians who want to engage with the research agenda should be allocated protected time to do so. **Opportunities for them to work at AHSCs and BRCs, which can act as engines for innovation by supporting the translation of new advances into clinical practice, should be facilitated.**

We are encouraged by the development of new research indicators for use as part of CQC's monitoring and inspection programme, as well as the development of research strategies (such as the Department of Health and Social Care's framework for mental health)<sup>9</sup> and programmes such as the 100,000 Genomes Project that embed research within the NHS.<sup>10</sup> These initiatives send an important signal about the importance of research in the NHS. It will be vital to **determine the correct incentives and metrics to ensure that the value of research is recognised from Board level through to individual job plans** if a pro-research culture is to permeate the NHS.<sup>11</sup> This will need to be supported by evolution from a system that focuses on short-term cost savings to one that considers long-term financial gains and wider benefits.

### ***Generating evidence to support the translation of innovations into clinical practice***

Generating robust, reliable and relevant evidence is key to supporting the uptake of new innovations in the NHS. As such, **the NHS should become a learning health system**, where

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<sup>1</sup> Downing A, et al. (2016). *High hospital research participation and improved colorectal cancer survival outcomes: a population based study*. Gut **66**, 89-96.

<sup>2</sup> Ozdemir BA, et al. (2015). *Research Activity and the Association with Mortality*. PLoS One **10**, e0118253.

<sup>3</sup> Ipsos MORI (2016). *Public Support for research in the NHS*. <https://www.ipsos.com/ipsos-mori/en-uk/public-support-research-nhs>

<sup>4</sup> Cancer Research UK (2015). *Every Patient A Research Patient*. [https://www.cancerresearchuk.org/sites/default/files/cruk\\_every\\_patient\\_may2015\\_web.pdf](https://www.cancerresearchuk.org/sites/default/files/cruk_every_patient_may2015_web.pdf)

<sup>5</sup> Ipsos MORI (2016). *Public Support for research in the NHS*. <https://www.ipsos.com/ipsos-mori/en-uk/public-support-research-nhs>

<sup>6</sup> Cancer Research UK (2015). *Every Patient A Research Patient*. [https://www.cancerresearchuk.org/sites/default/files/cruk\\_every\\_patient\\_may2015\\_web.pdf](https://www.cancerresearchuk.org/sites/default/files/cruk_every_patient_may2015_web.pdf)

<sup>7</sup> Royal College of Physicians (2016). *Research For All*. <https://www.rcplondon.ac.uk/projects/outputs/research-all>

<sup>8</sup> 12.5% of NHS staff report a non-British nationality, 5.6% of NHS staff are EU nationals. See: Commons Library Briefing (2018). *NHS staff from overseas: statistics*. <https://researchbriefings.parliament.uk/ResearchBriefing/Summary/CBP-7783#fullreport>

<sup>9</sup> Department of Health (2017). *A Framework for mental health research*. [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/665576/A\\_framework\\_for\\_mental\\_health\\_research.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/665576/A_framework_for_mental_health_research.pdf)

<sup>10</sup> <https://www.genomicsengland.co.uk/the-100000-genomes-project/>

<sup>11</sup> Academy of Medical Sciences (2016). *What can research do to improve productivity in the NHS?* <https://acmedsci.ac.uk/viewFile/57d298cddb370.pdf>

clinical evidence feeds back into the development of innovations to ensure they are relevant to and proven for use within the NHS.

Those developing innovations need **better support for generating evidence, as well as better guidance on the types of evidence that are required** as innovations progress along the development pathway. Additionally, support is needed for evaluation of digital health and new technologies as they rapidly emerge to make sure that commissioning decisions can be made based on robust evidence.<sup>12</sup>

### ***Cross-sector mobility***

The modern innovation pathway is complex, with diverse stakeholders. Innovation increasingly relies on collaborative and cross-disciplinary work often at the academia-NHS-industry interface. We welcome the recognition in the Life Sciences Industrial Strategy of the important contribution that the life sciences industry makes to the UK economy and of the value of NHS-industry collaboration. In particular, we welcome the proposed fund to support convergent science activities through cross-disciplinary sabbaticals, joint appointments and cross-sectoral partnerships and exchanges across industry and the NHS. **Academia-NHS partnerships are also vital to delivering new innovations** as part of the virtuous cycle of industry-academia-NHS research.

A recent Academy FORUM event on 'Bridging the preclinical-clinical boundary' highlighted the importance of adopting a **'team science' model of interdisciplinary, cross-sector working** to reflect the breadth of skills and disciplines needed for translational research.<sup>13,14</sup> This may require different incentives and ways to reward 'success', redefining career pathways, as well as better understanding and recognition of cultural differences across sectors to maximise collaborative opportunities. **Increasing permeability across sectors** to allow exposure to different environments and development of new skills would be invaluable to achieve this aim, as would instilling a research culture into clinical training and the NHS by embedding research skills and awareness into early medical training and establishing appropriate incentives in the wider healthcare system. Looking ahead, identifying emerging and future skills gaps so that appropriate training can be put in place to address these issues will be vital.

Distinct recruitment and employment procedures within different organisations can make it particularly difficult for researchers to easily transition from one sector to another. To overcome this, **we would welcome the introduction of mechanisms to enable mobility between the sectors without an increased administrative burden.**

Open Innovation often takes place across organisational borders and can be supported by the ability of those organisations, institutions and people to work closely with one another. There are many successful examples of Open Innovation in the UK, including the Stevenage Bioscience Catalyst,<sup>15</sup> large public private partnerships like the MRC/ABPI Stratified Medicine Consortia,<sup>16</sup> co-location of research institutes such as the Francis Crick Institute,<sup>17</sup> and world-leading teaching hospitals engaged in cross-sector collaborations like the early diagnosis of lung cancer programme run by the UCLH Cancer Collaborative aimed at improving care pathways by integrating cancer

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<sup>12</sup> Academy of Medical Sciences and Cancer Research UK (2018). *Accelerating the translation of early detection and diagnosis research in cancer*. <https://acmedsci.ac.uk/file-download/87699839>

<sup>13</sup> Academy of Medical Sciences (2018). *Bridging the preclinical-clinical boundary*. <https://acmedsci.ac.uk/file-download/36971834>

<sup>14</sup> Academy of Medical Sciences (2016). *Improving recognition of team science contributions in biomedical research careers*. <https://acmedsci.ac.uk/file-download/6924621>  
<https://www.stevenagecatalyst.com/>

<sup>16</sup> <https://mrc.ukri.org/research/initiatives/stratified-medicine/research/>

<sup>17</sup> <https://www.crick.ac.uk/>

systems.<sup>18,19</sup> The UK should look to **better utilise its research clusters** that span the entirety of the UK, such as MedCity,<sup>20</sup> Life Sciences Hub Wales<sup>21</sup> and the Northern Health Science Alliance,<sup>22</sup> among others, to facilitate links and collaborations across sectors and more effectively drive medical research and innovation.<sup>23,24</sup>

### ***Realising the potential of the NHS data resources***

The wealth of data within the NHS represents a unique asset for the UK. Capitalising on their use will be paramount to delivering patient benefit and world-leading research built on real-world data and linked patient records. There is an urgent need to **better integrate and use the large volume of data held in the NHS and make these data more easily accessible for research**, within an appropriate governance framework, to ensure future access to medical innovation and support general research and innovation processes.<sup>25</sup>

The importance of NHS data and the need to improve linkages between data sets is well recognised. There is a need to develop clear and consistent requirements for access to these data sets, which balance necessary safeguards for privacy and confidentiality against facilitating data access to researchers. **Engagement with patients and the public during this process will be crucial.** The Academy is currently undertaking a project on new technologies that use patient data, collaborating with Understanding Patient Data, to help support the use of new data-driven technologies in health and social care.<sup>26</sup> It will look to establish principles for those involved in the development and deployment of new technologies that use patient data. These will be based on the expectations and needs of the public, patients and healthcare professionals, as explored through a programme of public dialogue. This clearly demonstrated the need for ongoing engagement with patients, the public and healthcare professionals on this area as it evolves. We would be delighted to share a copy of our findings with you once it has been finalised in the autumn.

### ***Stakeholder engagement***

In addition to engagement around the use of patient data, **involvement with stakeholders at various points across the innovation pathway** (including patients, the public, commissioners, regulators and clinicians) **is necessary to effectively design innovations that are needed by patients and the NHS.** Fully integrating the NHS into the research process would go a long way to improving the relevance of new innovations to meet unmet clinical need. This could be achieved through a clear articulation from the NHS on areas of need, as well as utilising the clinical infrastructure to its full potential during the innovation process.<sup>27</sup> We welcome NHS England's

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<sup>18</sup> UCLH Cancer Collaborative (2018). *UCLH Cancer Collaborative Annual Review 2017/18*.

<http://www.uclh.nhs.uk/OurServices/ServiceAZ/Cancer/NCV/Documents/UCLH%20Annual%20review%20201718.pdf>

<sup>19</sup> Academy of Medical Sciences and Cancer Research UK (2018). *Accelerating the translation of early detection and diagnosis research in cancer*. <https://acmedsci.ac.uk/file-download/87699839>

<sup>20</sup> <http://www.medcityhq.com/>

<sup>21</sup> <https://lshubwales.com/>

<sup>22</sup> <http://www.thenhsa.co.uk/>

<sup>23</sup> Academy of Medical Sciences and Wellcome Trust (2015). *Geographical clusters*.

<https://acmedsci.ac.uk/download?f=file&i=32417>

<sup>24</sup> Academy of Medical Sciences and Wellcome Trust (2017). *Geographical clusters: a vision for the future*.

<https://acmedsci.ac.uk/file-download/31821958>

<sup>25</sup> National Advisory Group on Health Information Technology in England (2016). *Making IT Work: Harnessing the Power of Health Information Technology to Improve Care in England*.

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/550866/Wachter\\_Review\\_Accessible.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/550866/Wachter_Review_Accessible.pdf)

<sup>26</sup> <https://acmedsci.ac.uk/policy/policy-projects/use-of-patient-data-in-healthcare-and-research>

<sup>27</sup> Academy of Medical Sciences (2016). *The UK drug discovery landscape*. <https://acmedsci.ac.uk/file-download/71272985>

recent announcement to achieve this as part of its twelve actions to support and apply research in the NHS.<sup>28</sup>

In a recent report, the Academy highlighted the importance of involving patients, carers and frontline clinical staff in the design and delivery research to ensure its relevance and effectiveness.<sup>29</sup> We recommend a number of actions that should be taken by stakeholders across the research landscape to increasingly involve patients, carers and members of the public more closely in the way research is done. We also encourage patients to seek and request opportunities to take part in the co-production of evidence, to ensure this addresses the issues that are most important to them. A number of our Fellows are involved in the independent technology review, chaired by Dr Eric Topol, on preparing the healthcare workforce to deliver the digital future.<sup>30</sup> We welcome the emphasis on co-creation in its interim report.

## 2. Improving uptake and spread of innovations across the NHS

### ***Barriers to adoption***

A number of Academy FORUM workshops have highlighted the delays in translation and adoption of innovation in the NHS and the need to create a demand (or 'pull') from patients and clinicians for innovation in the NHS.<sup>31,32</sup> **Adoption often requires an interdisciplinary approach that cuts across professional boundaries.** As is the case with research in the NHS, lack of money and capacity are seen as key barriers to adoption.

**A holistic consideration of clinical value and cost effectiveness** (going beyond immediate cost savings) is required that is informed by wide stakeholder engagement and is aligned to the information needs of decision-makers. Such an approach can drive uptake and adoption in the NHS. Technologies like AI are particularly challenging for the NHS as they have the potential to cause disruptive change to care pathways and it is difficult to demonstrate their value. It is important to note that research and innovation are not limited to introducing new interventions - decommissioning established ones that are proven to be ineffective is also an important outcome.

An increasingly complex landscape of healthcare provision within a resource constrained system is particularly challenging not only for the generation of evidence to support new innovations, but also in the uptake and spread of these advances. **AHSNs can play an important role in this regard and support the dissemination, scale-up and adoption of innovations across the NHS.** Regional support from AHSNs is likely to be important where fragmentation exists in the system, for example, when engaging with individual NHS Trusts.

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<sup>28</sup> NHS England (2017). *12 Actions to Support and Apply Research in the NHS*. <https://www.england.nhs.uk/wp-content/uploads/2017/11/08-pb-30-11-2017-supporting-and-applying-research.pdf>

<sup>29</sup> Academy of Medical Sciences (2017). *Enhancing the use of scientific evidence to judge the potential benefits and harms of medicines*. <https://acmedsci.ac.uk/file-download/44970096>

<sup>30</sup> Health Education England (2018). *Preparing the healthcare workforce to deliver the digital future*. [https://hee.nhs.uk/sites/default/files/documents/Topol%20Review%20interim%20report\\_0.pdf](https://hee.nhs.uk/sites/default/files/documents/Topol%20Review%20interim%20report_0.pdf)

<sup>31</sup> Academy of Medical Sciences and Cancer Research UK (2018). *Accelerating the translation of early detection and diagnosis research in cancer*. <https://acmedsci.ac.uk/file-download/87699839>

<sup>32</sup> Academy of Medical Sciences (2017). *Accelerating access to medical innovation: a research agenda for innovation science*. <https://acmedsci.ac.uk/file-download/80863587>



There have been considerable improvements to streamlining the regulation and governance of health research, such as the establishment of the Health Research Authority.<sup>33,34</sup> However, as the healthcare environment evolves it brings with it new challenges, for example the regulatory and commissioning environment for technologies such as digital health devices.

We welcome the government's investment of £86 million to support innovators and the NHS in overcoming barriers to rapid patient access to new, innovative technologies, as well as the establishment of the Accelerated Access Collaborative to develop an accelerated access pathway for quicker access of breakthrough products to market and patients. These are **important initiatives that need to be built on to encompass a greater number and diversity of innovations.**

### ***Training to embrace innovation***

There is a need for **a model for core education and continuous development that can equip all healthcare personnel with the professional judgement to evaluate, interpret, apply and embed research findings and support innovation.** We have recently highlighted the importance of healthcare professionals having an improved appreciation of research methods and statistics so that they can better judge the value of the results in informing their advice, and of them being better equipped with an understanding of the wider drivers and interventions that affect the health of the public.<sup>35,36</sup>

**Training pathways must also accommodate the need to develop and maintain a strong group of clinical academics and clinical research nurses to lead and support research,** as described above. Overall, a research trained and active workforce will facilitate the **utilisation of the NHS as a test bed for new innovations, as well as the development of the evidence base needed for their adoption.** In turn, this would result in greater awareness and earlier championing of innovations, ultimately increasing the likelihood of their effective adoption. We welcome the **NHS Test Beds programme** to test innovations in the NHS. Lessons learnt from these must be taken on board.<sup>37</sup>

**A major workforce training need is the provision of data and informatics skills to harness the rapid advance in technologies,** such as genomics, artificial intelligence and robotics, which will likely form a key part of the future NHS.

### ***Leadership and cross-sector approach***

To realise the potential of new innovations and incentivise their adoption at scale across the NHS, there is a **need for a new generation of cross-sectoral leaders capable of accelerating the translation of research into benefits for patients and society.** To this end, **the Academy has recently launched a new leadership programme,** FLIER (Future Leaders in Innovation, Enterprise and Research), focused on trans-disciplinary working. The programme aims to develop the most gifted and capable leaders of the future who can create collaborations across academia,

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<sup>33</sup> Academy of Medical Sciences (2011). *A new pathway for the regulation and governance of health research.* <https://acmedsci.ac.uk/file-download/35208-newpathw.pdf>

<sup>34</sup> Academy of Medical Sciences, Cancer Research UK and Wellcome Trust (2016). *Regulation and governance of health research: five years on.* <https://acmedsci.ac.uk/file-download/14145196>

<sup>35</sup> Academy of Medical Sciences (2017). *Enhancing the use of scientific evidence to judge the potential benefits and harms of medicines.* <https://acmedsci.ac.uk/file-download/44970096>

<sup>36</sup> Academy of Medical Sciences (2016). *Improving the health of the public by 2040.* <https://acmedsci.ac.uk/file-download/41399-5807581429f81.pdf>

<sup>37</sup> <https://www.england.nhs.uk/ourwork/innovation/test-beds/>

industry, the NHS and government, and drive innovation and its uptake and spread across the NHS.<sup>38</sup>

One of the key challenges that current and future leaders will face will be **how to drive cultural and system change to incentivise research in the NHS, as well as the uptake and adoption of new innovations**. This may require a more sophisticated understanding of the types of incentives and rewards to drive these behaviours, as well as establishing clear accountability for such change and encouraging early adopters.

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<sup>38</sup> <https://acmedsci.ac.uk/grants-and-schemes/mentoring-and-other-schemes/FLIER>