THE LANCET

Evidence for LSE-Lancet Commission 'The Future of the NHS'

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Role organisation plays within the NHS?

The Academy of Medical Sciences is the independent body in the UK representing the diversity of medical science. Since its creation, almost 20 years ago, the Academy has argued that research and innovation must sit at the heart of the NHS to improve patient care, deliver cost-effective healthcare and facilitate the growth of a strong commercial life sciences sector. Our mission is to advance biomedical and health research and its translation into benefits for society. To support this mission, the Academy nurtures the next generation of clinical and non-clinical researchers; convenes the best experts to address key policy issues; engages patients and the public; and facilitates strong and equitable partnerships between academia, industry and the NHS (particularly through its FORUM workshops).[1,2] The Academy's Fellows are central to all that we do and we welcome the fact that a number of them are members of this Commission.

[Refs: 1. Academy of Medical Sciences. https://acmedsci.ac.uk/, 2. FORUM. https://acmedsci.ac.uk/policy/forum]

From your organisation's perspective what are the biggest challenges facing the NHS in the immediate future and also looking forward over the next 20 years?

Challenge 1: Incentivising research in the NHS

There is increasing evidence that patients have better outcomes in research-active healthcare settings.[3,4] The public believe that the NHS should play an important role in supporting research for new treatments, and patients would like to be offered opportunities to be involved in trials of new medicines or treatments.[5,6] The NHS is crucial to the success of the life sciences industrial strategy, and research in the NHS can play an important role in meeting the Government's commitment to boost spending on R&D in the UK to 2.4% of GDP by 2027. Set against this, recent studies carried out by bodies including CRUK and the Royal College of Physicians report a lack of capacity (with respect to time and skilled staff) to undertake research and this is likely to be compounded by the UK's withdrawal from the European Union. In addition there is a perception that some Commissioners and Trusts still regard research as 'nice to have', rather than its core business (and one of the objectives in the Government's mandate to NHS England).

The fact that new research indicators are being developed for use as part of CQC's monitoring and inspection programme sends an important signal about the importance of research in the NHS. Finding the correct incentives and metrics to ensure that the value of research is recognised from Board level through to individual job plans is necessary if a pro-research culture is to permeate the NHS. 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.

[Refs: 3. Downing A, et al. (2016). *High hospital research participation and improved colorectal cancer survival outcomes: a population-based study Gut* 0:1–8. *doi:10.1136/gutjnl-2015-31130,* 4. Baris A*, et al.* (2015). *Research active Trusts had lower risk-adjusted mortality for acute admissions, which persisted after adjustment for staffing and other structural factors* PLoS One. 2015; 10(2): e0118253.doi: 10.1371/journal.pone.0118253, 5. Ipsos MORI (2016). *Public Support for research in the NHS.* https://www.ipsos.com/ipsos-mori/en-uk/public-support-research-nhs, 6. Cancer Research UK (2015). *Every Patient A Research Patient. https://www.cancerresearchuk.org/sites/default/files/cruk_every_patient_may2015_web.pdf,*
7. Royal College of Physicians (2016). *Research For All. https://www.rcplondon.ac.uk/projects/outputs/research-all*]

(Continued) *From your organisation's perspective what are the biggest challenges facing the NHS in the immediate future and also looking forward over the next 20 years?*

Challenge 2: An ageing and multi-morbid population
The UK has an ageing and increasingly multimorbid population. There is evidence that patients with multimorbidity account for a disproportionately higher share of the healthcare workload and healthcare costs than would be expected from the individual component conditions. More research is needed to understand the burden, determinants, prevention and treatment of multimorbidity[8]. Integration of services and delivery of care will be needed to support these patients and, when treating the health condition of primary concern at any given time, due attention will also need to be paid to the management of co-existing conditions.

The importance of mental health conditions as a component of multi-morbidity was emphasised repeatedly in our recent study on this issue and there is increasing research into the processes like inflammation that might underpin the mind-body interface. It is clear that we will need 'amphibious' healthcare professionals who bridge the mental-physical interface, and new care pathways that integrate mental and physical care.

Challenge 3: Harnessing the opportunities of scientific developments and research outcomes
A recent horizon scanning exercise carried out by the Academy identified Genomics and related fields and Artificial intelligence (AI) and data as two of the areas likely to be the most transformative for the health of society by 2048. Both can be harnessed to provide increasingly personalised prevention, diagnostics and treatments in the NHS. There are significant opportunities for research and healthcare delivery that could be realised by increasing capabilities in the collection, linkage and analysis of health care data and this is a key strand of the life sciences industrial strategy. However, a recent meeting at the Academy highlighted the requirement at a local level for data skills capacity building, robust data management structures and governance, and interoperability between platforms in different regions, alongside cultural change to recognise and promote the benefits of digital maturity in the NHS.[9]

A number of our 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.[10,11] Adoption often requires an interdisciplinary approach that cuts across professional boundaries and may even cause the superseding of some specialisms. As is the case with research in the NHS, lack of money and capacity are seen as key barriers. It is clear that an early consideration of the context in which the innovation will be delivered and of patient need is required by researchers and developers. 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. 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.

Research and innovation are not limited to introducing new interventions - decommissioning established ones that are proven to be ineffective is also an important outcome.

[Refs 8: Academy of Medical Sciences (2018). *Multimorbidity: a priority for global health research*. https://acmedsci.ac.uk/file-download/82222577, 9: Academy of Medical Sciences (2017). *Digital maturity of health and social care systems.* https://acmedsci.ac.uk/more/news/digital-maturity-of-health-and-social-care, 10. Academy of Medical Sciences (2018). *Early detection and diagnosis research in cancer.* https://acmedsci.ac.uk/more/events/early-detection-and-diagnosis-research, 11.Academy of Medical Sciences (2018). *Accelerating access to medical innovation.* https://acmedsci.ac.uk/more/news/accelerating-access-to-medical-innovationl]

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Challenge 4: Ensuring a research-aware and research-active workforce
The previous three challenges reinforce the 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.[12, 13]

Training pathways must accommodate the need to develop and maintain a strong group of clinical academics and clinical research nurses to lead and support research. They deliver front line care, often in highly specialised areas, and also play a critical role in generating the evidence for new treatments and improved patient management for a wide range of medical conditions. Ensuring that appropriate flexible working can be adopted by clinical academics in any new workforce models will be essential, as will ensuring that attractive research opportunities are available within both specialist and generalist training routes.

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. A number of our Fellows are involved in the independent technology review, chaired by Dr Eric Topol, which will identify how to prepare the NHS workforce for these technological developments.

[Refs: 12: Academy of Medical Sciences (2017). *How can we all best use evidence?* https://acmedsci.ac.uk/policy/policy-projects/how-can-we-all-best-use-evidence , 13: Academy of Medical Sciences (2016). Improving the health of the public by 2040. https://acmedsci.ac.uk/file-download/41399-5807581429f81.pdf]