

The Topol review – preparing the healthcare workforce to deliver the digital future

The **final report** of the review into the future of technology in the NHS, commissioned by the Secretary of State for health and social care and led by Dr Eric Topol, has been published. It explores the implications of digital developments in the NHS, including how to prepare and train the healthcare workforce to transform the way they care for patients, diagnose and treat diseases, and prevent illness from developing. If you have any questions about this briefing or our work in this area please contact Leanora.Volpe@nhsproviders.org.

Summary of key recommendations

The NHS long term plan identifies a need for the NHS to adopt a responsive and innovative approach to using technology in the workplace to reduce workload, improve and personalise patient care, and make the best of digital developments into the future. This review makes recommendations to the NHS about how to enable staff to make the best use of technologies such as genomics, digital medicine, artificial intelligence and robotics to improve services, supporting the NHS long term plan, and the upcoming workforce implementation plan.

Key recommendations include:

- The NHS must focus on building a digitally ready workforce that is fully engaged and has the skills and confidence to adopt new technologies and deploy them in the delivery of day to day care across the health system. This will be achieved through training programmes, continued professional development (CPD), sabbaticals and secondments, as well as top-down cultural change to create a culture of learning and development.
- Digital medicine will require leadership to direct the agenda, including board level roles and senior roles to advise boards on digital technology. Board level skills in data provenance, curation and governance will be necessary to support organisations to safely and effectively build digital capability, and make informed investment decisions.
- The NHS will need to build specialist capacity to commission and evaluate health technologies and make informed investment decisions. It should collaborate with academia and industry to create a pipeline of specialist staff including robotics engineers, data scientists and artificial intelligence (AI) specialists moving into the NHS.
- Regulators, academic institutions and professional bodies will be encouraged to identify the skills, behaviours and values required to build a digitally enabled workforce, and to develop curricula and training programmes accordingly.

Implications for members

Many of the developments outlined in this review focus on the increasing use of technology not just in specialist hospital settings, but encompassing the whole health system. This ambitious review of the potential for technology in the NHS has some key implications for trusts, many of which will be impacted by increasing use of technology across the services they provide.

A primary consideration for trusts will be the need to upskill their workforce to ensure that all staff have an appropriate level of digital literacy to implement technology in their day to day roles and enhance patient care. This includes prescribing and analysing data from wearable technology and monitoring equipment, using genomic data to make informed decisions about patient care, and using predictive analysis to identify at risk populations and manage them accordingly.

The ambition for all NHS staff to develop digital literacy and capability in understanding and evaluating health data will have a significant impact on staff training, both internally and in terms of CPD time. Trusts may wish to consider this in forward planning. Training budgets and workforce pipeline for specialist staff are key interdependencies for trusts seeking to increase the knowledge and skills of their workforce. In addition, trusts may be asked to build digital literacy at their board level to enable organisation-wide cultural change and support staff at all levels to take up digital technology in their daily practice.

Engagement with patients and carers when developing the use of technology in their services, will also be key when ensuring that digital solutions reflect local needs and meets the needs of patients using the service. There will also be a need to ensure that the implementation of digital healthcare complements work being done in local systems to integrate care and services to streamline patient pathways, including the joining up of health and care records.

Detailed summary of recommendations

The review explores how technology used in healthcare will impact the roles and functions of healthcare staff over the next two decades, and sets out a series of recommendations for the NHS and other relevant bodies, including Health Education England (HEE) and regulators, to ensure that the uptake of technology in the NHS is evidence-based, supported by engaged and capable staff, and supports improvements in patient care.

The review addresses opportunities to scale up the use of innovative technology in the NHS while acknowledging the need for any large-scale change to the delivery of care to be underpinned by robust frameworks for data governance, cyber security, ethics and a commitment to maintain personalised care. While the review identifies that all staff in the NHS will need to have digital literacy in the next 20 years, it emphasises that the role of technology is not to replace staff, but to augment their roles and enable them to gain more time to care for patients.

Transformation of digital technology in the NHS

Digital transformation in the NHS is gathering pace. The review identifies a series of digital and technological developments which are likely to take place in the NHS over next 20 years. These include the use of telemedicine, smartphone apps for patients to monitor their health, speech recognition, genomics including genome writing, interventional and rehabilitative robotics, and the use of predictive analytics to anticipate and prevent ill health in patients. However, these developments in the use of technology in the NHS build on an already growing breadth of services using technology to support patient care, such as telemedicine and online appointment booking, as well as increasing use of genomics in healthcare.

The impact on patients and carers is central to the review with an emphasis on ensuring that care is shifted closer to home. Care is envisaged to become less paternalistic, sped up by the use of technology to empower and inform individuals. The review has identified that while the majority of the population has access to the internet, less than a quarter have registered for online GP services, illustrating the need to work with patients to co-create digital applications that meet their needs. In addition, the review emphasises the need to ensure any use of technology in healthcare is able to redress health inequalities, rather than enforcing them.

The review sets out three principles essential to the spread of technology in the health system:

- Patients need to be included as partners and informed about health technologies, with a focus on marginalised and vulnerable groups, to ensure use of technology is equitable and does not reinforce inequalities present in society.
- The healthcare workforce needs expertise and guidance to evaluate new technologies
- The adoption of new technologies should enable staff to gain more time to care, promoting deeper interaction with patients.

The review makes recommendations around the development of clear frameworks to safeguard confidentiality, and inspire the confidence of citizens, as well as identifying a need to make sure that programmes are developed to engage and educate the public about digital healthcare technologies and genomics, including local arrangements to provide needs-based targeted education and support. Such programmes should be developed closely with patients.

Other enablers of effective digital transformation in the NHS include the completion of digitisation and integration of health and care records to avoid inadvertently introducing further fragmentation and duplication into the patient pathway, and the resolution of uneven NHS data quality with gaps in information governance, to enable smooth uptake of technology across the NHS.

Evolving and developing the health workforce

The rollout of genomics will have significant implications for the NHS workforce, and while pace of change may vary depending on specialty, ultimately the increasing use of technology in the NHS will impact on all professionals. For example some aspects of care and management of rare diseases will remain largely in

the domain of specialised colleagues but risk prediction for common diseases and pharmacogenetics will become mainstream.

In light of this, the review is clear that in order for healthcare to make effective use of the new technologies available, the entire health workforce will need to evolve, and develop digital literacy so that they can confidently provide care informed by digital technology and data. The review sets out a number of recommendations to support this transformation of the workforce.

Training and education

Education and training are key to the scaling up of technology in the NHS and the ability of staff at all levels to carry change into their day-to-day roles, and the review makes a series of recommendations to the NHS, educators and professional bodies to support the building of capability in the NHS workforce, including:

- Healthcare professionals **should receive training in genomic literacy** to help them understand the basis, benefits and ethical considerations of genomics in healthcare. Resources should be developed to educate and train all healthcare professionals in health data provenance, curation, integration, ethics and critical appraisal of health technologies and data.
- **Academic institutions should ensure genomics and data analytics are prominent in undergraduate curricula**, and should ensure the expansion of undergraduate capacity in genomics, bioinformatics and data science, to support an increased supply of specialist staff entering the NHS.
- The NHS should **foster a culture of learning**, with strong workplace learning infrastructure, reputation for training and support, and dedicated staff time for development and reflection, supported by the training of a cadre of educators and trainers who are able to lead the timely upskilling of the NHS workforce.
- **Lifelong training** should be made available for healthcare professionals to maintain up-to-date capability in a rapidly evolving field, including 'just-in-time' digital updates and CPD.
- The NHS **should invest in its existing workforce to develop digital skills** including assessment, evaluation and commissioning of digital technologies through the digital academy, CPD, secondments with links to the technology industry, and secondments.
- HEE should establish a digital education programme, to implement the digital education strategy and complement the genomics education programme.

Specialist and technical roles

While building capability in the wider clinical workforce is essential to making sure the use of technology to improve care reaches patients, the NHS will also have a need to build capacity in specialist roles, including bioinformaticians, artificial intelligence specialists, genomic counsellors, clinical scientists and specialists in genomic medicine. The review's recommendations around building specialist technological capability in the NHS include:

- The NHS **should train a cadre of specialists in the regulation and assessment of digital technologies**.

- The NHS should **collaborate with academic industry and technology industries** through new apprenticeships and masters' schemes, including the NHS Digital Academy, to develop a pipeline of robotics engineers, data scientists, and then attract them to work in the NHS.
- **Capacity in the NHS genomic medicine service should be built**, including increasing capacity for genomic counsellors, clinical scientists and specialists in genomic medicine, to support the widespread increase in the use of genomics to support healthcare across the system.
- An **attractive career pathway should be developed for bioinformaticians**, with an expansion of higher specialist training for clinical bioinformaticians and specialist posts with dedicated time to work in partnership with academia or the health technology industry.
- To manage the national shortage of AI specialists, a **national programme of industry exchange networks** should be created to benefit the NHS, and the NHS should leverage its global reputation to attract skilled data scientists from around the world.
- The NHS should commission flexible and responsive training for specialist roles, and work with PSRBs to introduce and strengthen accreditation of newer specialist groups.

Supportive leadership to enable change

Digital medicine will require leadership to direct the agenda, including board level roles and senior roles to advise boards on digital technology. Skills in data provenance, curation and governance will be needed within the leadership of NHS organisations to foster a learning culture where staff are supported to develop capability in digital healthcare technologies. The review recommends the following measures are taken at the level of NHS leadership to enable progress:

- Organisations should **assign board-level responsibility for the safe and effective adoption of digital health technologies**, with a focus on clinical outcomes and promoting effective and consistent staff engagement.
- Boards should take responsibility for **effective knowledge management** to enable staff to learn from experience and build and share knowledge.
- Organisations employing and training staff should ensure **current and new staff are supported to reach an appropriate level of digital literacy**.
- Systems should be strengthened to **disseminate lessons from early adoption**, and share examples of effective, evidence based technological change programmes.

NHS Providers view

The Topol Review sets out an ambitious vision for digital transformation across the NHS workforce. Trusts will welcome this vision given the rapid advancement of technology available to providers and an increasing demand from patients to use digital platforms to better manage their health and care needs.

We particularly welcome the completion of this proactive review as a valuable part of a wider strategy to upskill the NHS workforce. The work of Dr Topol's team needs to be supported by the development of a series of well-defined and implementable measures to ensure both current and future generations of NHS staff are better equipped to get the most out of technology.

Enhanced digital literacy will require significant investment. While the review does not make specific recommendations around the funding of genomics training, AI and robotics, patient data analysis and many other strands of the prescribed technological education, it is clear to providers that the national training budget will need to be significantly increased to meet the ambitions outlined therein.

Furthermore, the 2019 comprehensive spending review will need to address these requirements alongside a series of complementary education and training initiatives for NHS staff to be detailed through the national workforce implementation strategy within the coming months. These initiatives must be clearly costed and genuinely deliverable if we are to tackle the significant challenges faced by the NHS workforce in the short and long-term.

NHS trusts see the potential for technological transformation to make a tangible difference to the NHS, consistently rating it as a key factor to improve workforce productivity. We look forward to engaging further with HEE and other national policy-makers to support boards to build their strategic capacity in this space, share good practice and develop the next steps needed to realise the ambitions of this review.