Empowering the Future Health Workforce with AI : building on from Topol …

NHS
Health Education England

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Background

The Topol Review recommended:

‘the NHS should create or increase the number of clinician, scientist, technologist and knowledge specialists posts with dedicated, accredited time, with the opportunity of working in partnership with academia and/or the health tech industry to design, implement and use digital, AI and robotic technologies’.

NHS
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Digital Transformation

Business Plan 21-22:

Strategic goal:

Transform today’s workforce to work in a co-operative, flexible, multi-professional, digitally enabled system

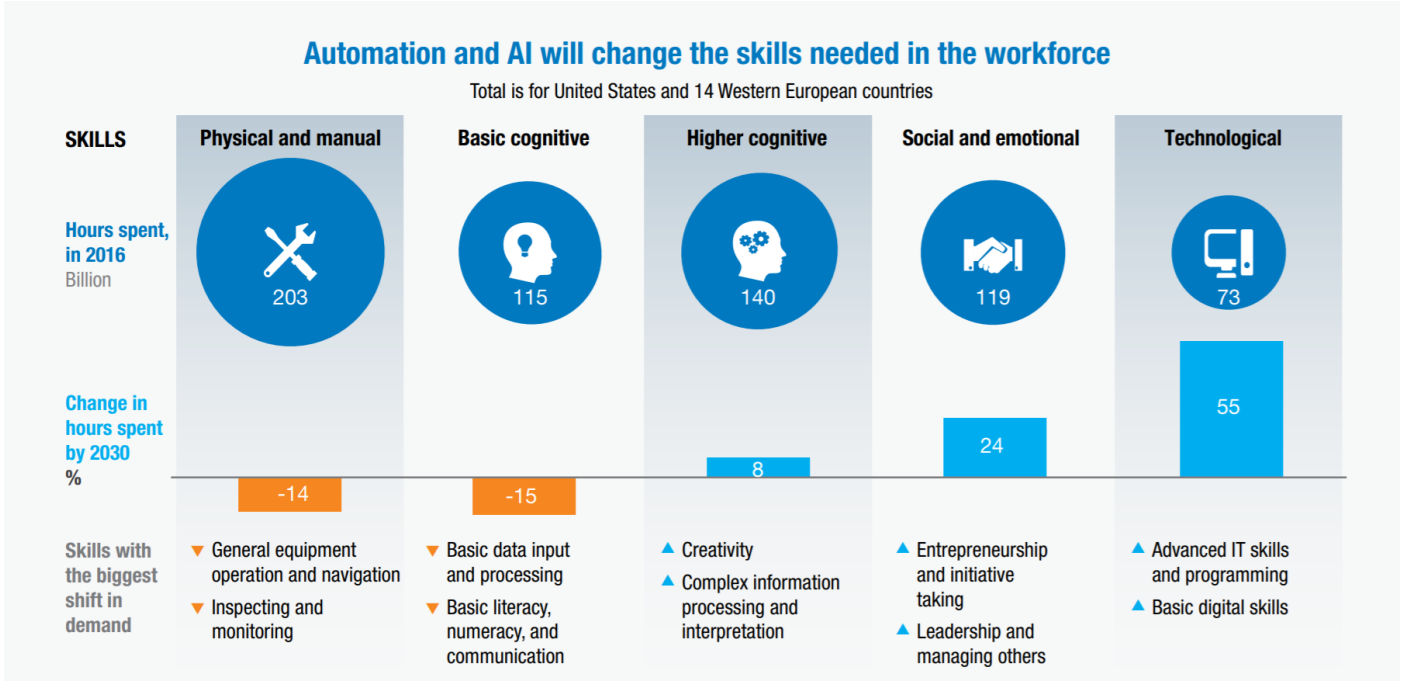
Objective:

Adapt education and training to accommodate changes in technology and support the workforce to adapt to changes in roles as a result

Figure 1: Top 10 digital healthcare technologies and their projected impact on the NHS workforce from 2020 to 2040

(Topol 2019)

The scale of change



Ref: McKinsey & Company, May 2018

Challenges & Barriers

- Technology available and working with policies for use
- Changing shape and capabilities of digital workforce
- Rate of technological change very fast, workforce very large in number and often quite disparate
- No clear career pathway or professional 'home' for most digital roles
- Importance of senior leadership understanding digital
- Uncertainty re sustainability of workforce initiatives
- No single, contextualised place for digital learning
- Big shifts in post-COVID-19 ways of working

Exploring our AI work …

Publication of the AI Roadmap, identifying 240 current UK based AI and data driven technologies in the NHS and workforce impact /educational needs. Database & report available

Horizon scanning | Digital Transformation (hee.nhs.uk)

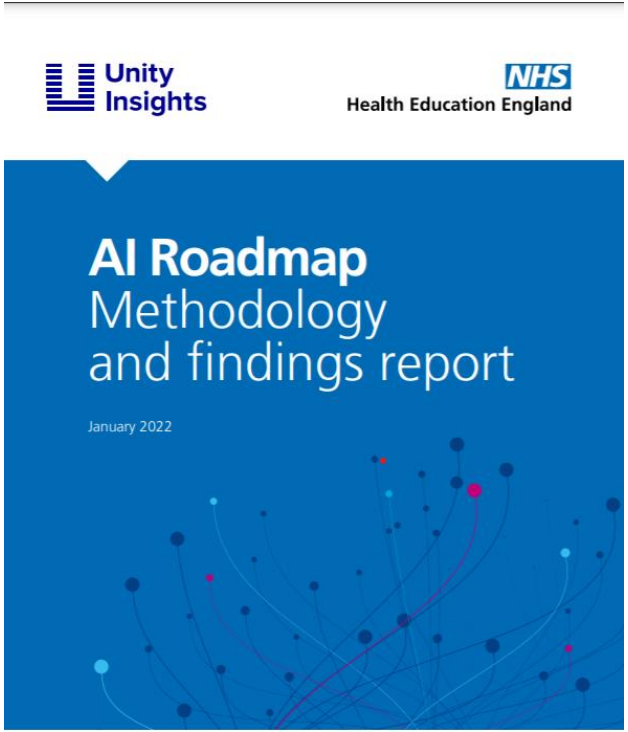
Understanding and developing healthcare workers confidence in AI in collaboration with The NHS AI Lab - 3 layers of confidence, 5 archetypes and underlying competences providing the index to assemble training and education materials Reports 1 & 2

Horizon scanning | Digital Transformation (hee.nhs.uk)

Initial content for NHS e-learning hub curated, DART-Ed Webinar series run, and launch of London AI Fellowship programme

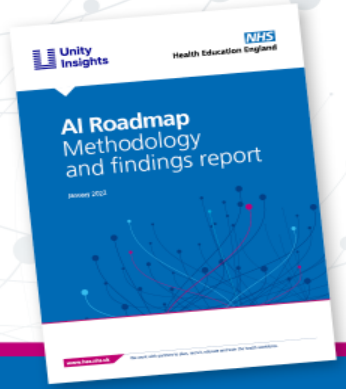
International stakeholder relationships with American Board of Artificial Intelligence in Medicine, School of AI in Healthcare Montreal, and Australian Medical Council

AI Roadmap and Dashboard



This report and associated dashboard allow us to understand the landscape of AI and data driven technologies that currently exist in healthcare; their taxonomies, spread and adoption, and the potential workforce impact of these technologies.

Distribution of AI technologies



34%
Diagnostic

29%
Automation / Service efficiency

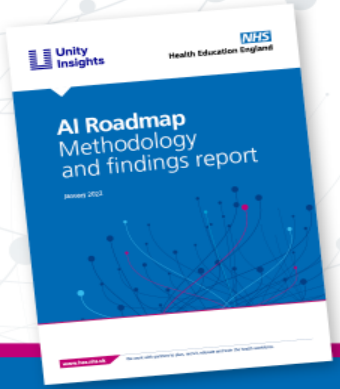
17%
P4 Medicine

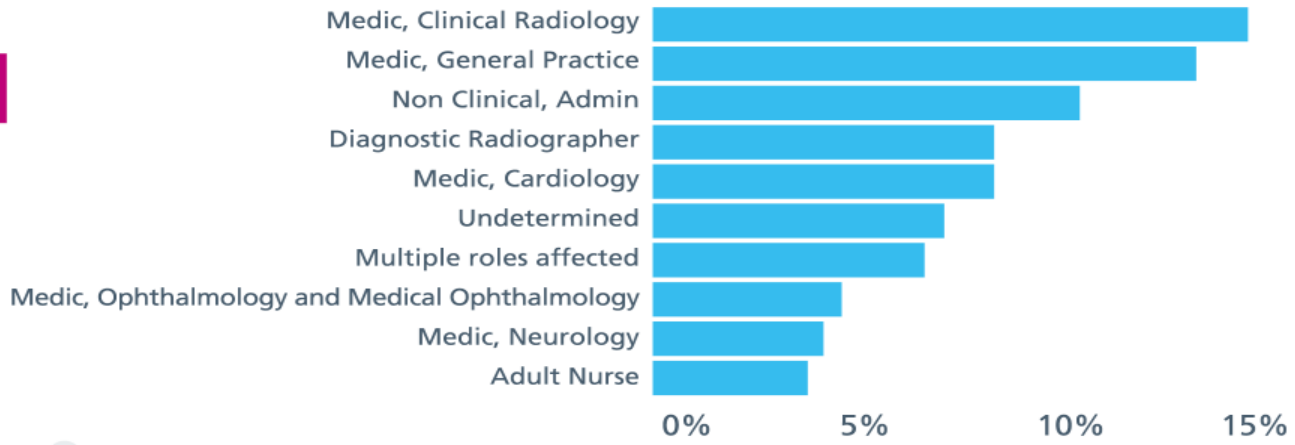
14%
Remote monitoring

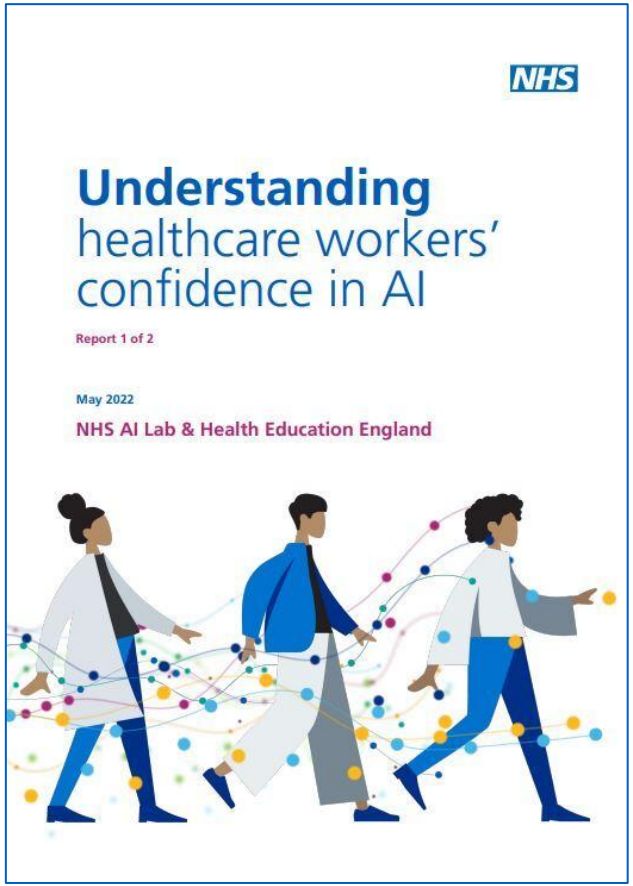
4%
Therapeutic

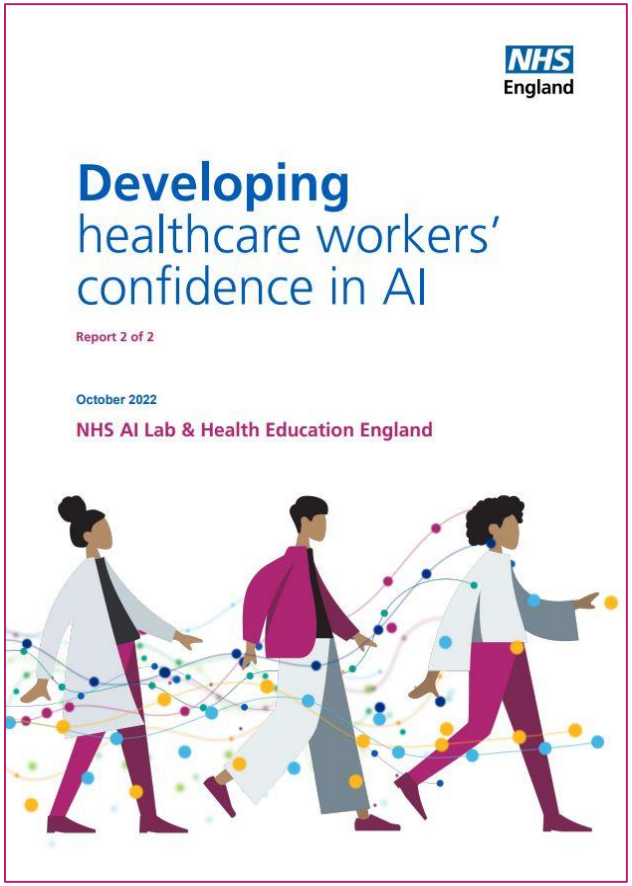
2%
Other

Workforce groups most affected by the use of AI technologies





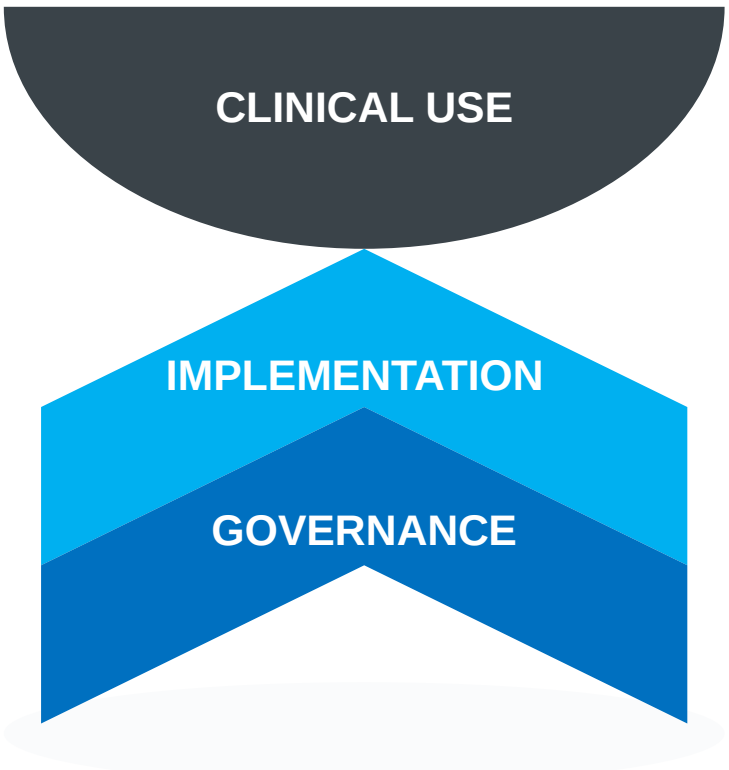

NHS
Understanding
healthcare workers' confidence in AI
Report 1 of 2
May 2022
NHS AI Lab & Health Education England


NHS England
Developing
healthcare workers' confidence in AI
Report 2 of 2
October 2022
NHS AI Lab & Health Education England

Understanding healthcare workers' confidence in AI

Assessing appropriate confidence in AI for a specific clinical decision

Increasing confidence for all AI used in healthcare



Influencing factors

- Clinician attitudes
- Clinical context
- AI model design
- Cognitive biases

- Strategy and Culture
- Technical implementation
- Local validation
- Systems impact

- Regulation and Standards
- Evaluation and validation
- Guidelines
- Liability

Workforce archetypes for AI in healthcare

Shapers	Drivers	Creators	Embedders	Users
				
Set the direction for AI policy and governance at a national level	**Champion and lead AI development and deployment at a regional/local level**	**Create AI technologies for use in healthcare settings**	**Implement, evaluate and monitor AI technologies deployed within healthcare settings**	**Use AI technologies within healthcare settings**
Example roles				
NHS leaders	Commissioners	Data scientists	Clinical scientists	Clinicians
Regulators	CCIOs	Software engineers	IT/IG teams	AHPs
ALBs	ICS leadership	Researchers	CSOs	Non-clinical staff

Education and training can then be matched under the archetypes to target competencies

Box 3: Guiding principles and enabling factors for advanced AI education

Shaper

- Educating Shapers is a priority, as their decisions will have downstream effects on all other archetypes through governance, guidance, and system transformation.
- The safe, effective and ethical use of AI in healthcare should be at the heart of Shaper education.
- Shapers across different organisations should be encouraged to work collaboratively to share knowledge, align messaging and create complimentary frameworks in relation to AI technologies.
- Awareness and appreciation of developments outside the expertise of the Shaper and their organisation is key to joined-up governance and regulation.
- Engagement of Shapers with the Creator and Embedder archetypes is vital to ensure practical frameworks that enable rather than constrain digital transformation with AI.

Driver

- Drivers need to be equipped to ask the relevant questions of an AI technology prior to procurement or commissioning (see Table A3). They should be able to critically appraise AI to make evidenced strategic commissioning decisions.
- Drivers should promote a workplace culture that embraces innovation, entrepreneurship, continuous learning and multidisciplinary working.
- Drivers should champion a culture of transparency and diversity to promote fairness and inclusivity in the development and use of AI.
- Drivers should understand the value of AI specialists and champion AI multi-disciplinary teams (MDTs).
- Educational resources for Drivers should be flexible, efficient, and accessible.

Creator

- Creators should understand both the technical and clinical aspects of the problem addressed, and the AI approach employed.
- Creators should understand and appreciate user design and workflow integration.
- Knowledge of the potential clinical consequences of using AI and the legal positions of creators, providers and users of AI technologies are essential for Creators.
- Fundamental statistical and data science literacy are crucial for Creators, enabling them to detect and mitigate risks from bias in algorithms.
- The development of diverse and inclusive AI multi-disciplinary teams (MDTs) can encourage co-creation of AI technologies and enable Creators to share their knowledge and expertise with others.
- Expansion of training for specialist data scientists and informaticians could equip more NHS professionals for Creator roles.
- Accreditation and recognition for AI co-creators and informatics specialists can professionalise this archetype and enable up-skilling.

Embedder

- Embedders can have different specialised skill sets including IT and IG specialists, data-scientists, software engineers, safety teams and specialist clinicians.
- Embedders should understand a broad range of topics at a detailed level, ranging from governance requirements and evidence evaluation to technical knowledge about AI algorithms, algorithmic biases and the importance of AI workflow integration for clinical confidence.
- Workforce transformation will be needed to equip the healthcare system with sufficient Embedders of AI technology. This will require:
  - Professionalisation of specialist embedder roles.
  - Expansion of training for DDaT data professionals and clinical informaticians
  - Upskilling of existing clinical and scientific trainees in education related to AI, with flexible training schemes and career opportunities, funded time and incentives for digital health training.

User

- Advanced education for Users should focus on the human-AI interaction and the impact of AI technologies on clinical reasoning and decision making (CRDM).
- Users should learn how to communicate with patients about AI technologies, acting as 'AI counsellors' to help guide patients in interpreting the results of AI and guiding them about issues like data security.
- Education for Users should be tailored by a professional group, guided by the clinical scenarios for AI in that area and the setting for their use (for example, emergency versus planned care).
- User education should reach clinicians in training as well as those who are fully qualified.
- AI foundational and advanced User education should be incorporated within existing undergraduate and post graduate curricula.
- Equitable access to training and support for existing clinicians will be required, at both foundational and advanced levels, including special efforts to engage and support the digitally unengaged or unconvinced.
- Support for existing trainees' education will be needed, including study leave, funding and protected time for digital and AI skills training.

HEE's e-learning platforms

NHS Learning Hub Beta

- Providing access to a wide range of resources shared and contributed by organisations and the health and care workforce
- Users can access, contribute, share & rate digital resources including video, audio, images, web links & articles
- New features are frequently being released and added to the Learning Hub in its Beta phase
- Launched on 29 May 2020

https://learninghub.nhs.uk

e-LfH e-Learning for Healthcare

- Providing e-learning programmes to educate and train the health and care workforce
- Over 300 e-learning programmes
- The e-learning programmes are developed in partnership with the NHS, third sector and professional bodies
- 2,491,670 session launches in May 2020 – the biggest month ever
- Available free of charge to all working in health and care

https://www.e-lfh.org.uk

Digital Learning Solutions

- Providing a platform that hosts national digital literacy training content and locally developed clinical systems learning
- Supports over 300 health and care organisations
- Recently developed a tool for health and care professionals to hold virtual clinical supervision sessions
- Joined the TEL team from NHS Digital in April 2020

https://www.dls.nhs.uk

Fellows in Clinical Artificial Intelligence

Bringing expertise in Clinical Artificial Intelligence to the NHS Frontline

#ClinicalAIFellows

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AI CENTRE for Value Based Healthcare

Thank You

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Suggested AI education and training approach

Continuation of efforts to:

- enable the adoption of change and innovation in healthcare settings
- advance digital skills and capabilities
- develop soft skills to support changes in patient-clinician relationships

Development of **general AI** education and training programmes to support:

- **foundational** AI knowledge and skills across the whole healthcare workforce
- **advanced** AI knowledge and skills that are specific to workforce archetypes

Provision of **specific training** for each AI technology conducted during product deployment