The Topol Review

Preparing the healthcare workforce to deliver the digital future

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The Topol Review

The questions:

1. How are technological developments likely to change the **roles and functions of clinical staff** in all professions over the next two decades?
2. What are the implications of these changes for the **skills required**?
3. What does this mean for the **selection, curricula, education, training and development** of current and future NHS staff?

The Topol Review

Three principles :

1. **Patients included as partners** and informed about health technologies
2. **Evidence**: the **healthcare workforce** needs expertise and guidance to evaluate new technologies, on the basis of real-world evidence of clinical efficacy and cost-effectiveness
3. The **gift of time**: wherever possible the adoption of new technologies should enable staff to gain more time to care

Ethical considerations

There are important legal and ethical implications arising from the use of advanced digital and genomic technologies in healthcare

- Patient safety
- Data governance
- Respect for human dignity
- Health inequalities
- Patients and carers
- Healthcare professionals
- Health system
- Widening Digital Participation

Themes

Genomics

Artificial intelligence and robotics

Digital medicine

Organisational development

Methodology

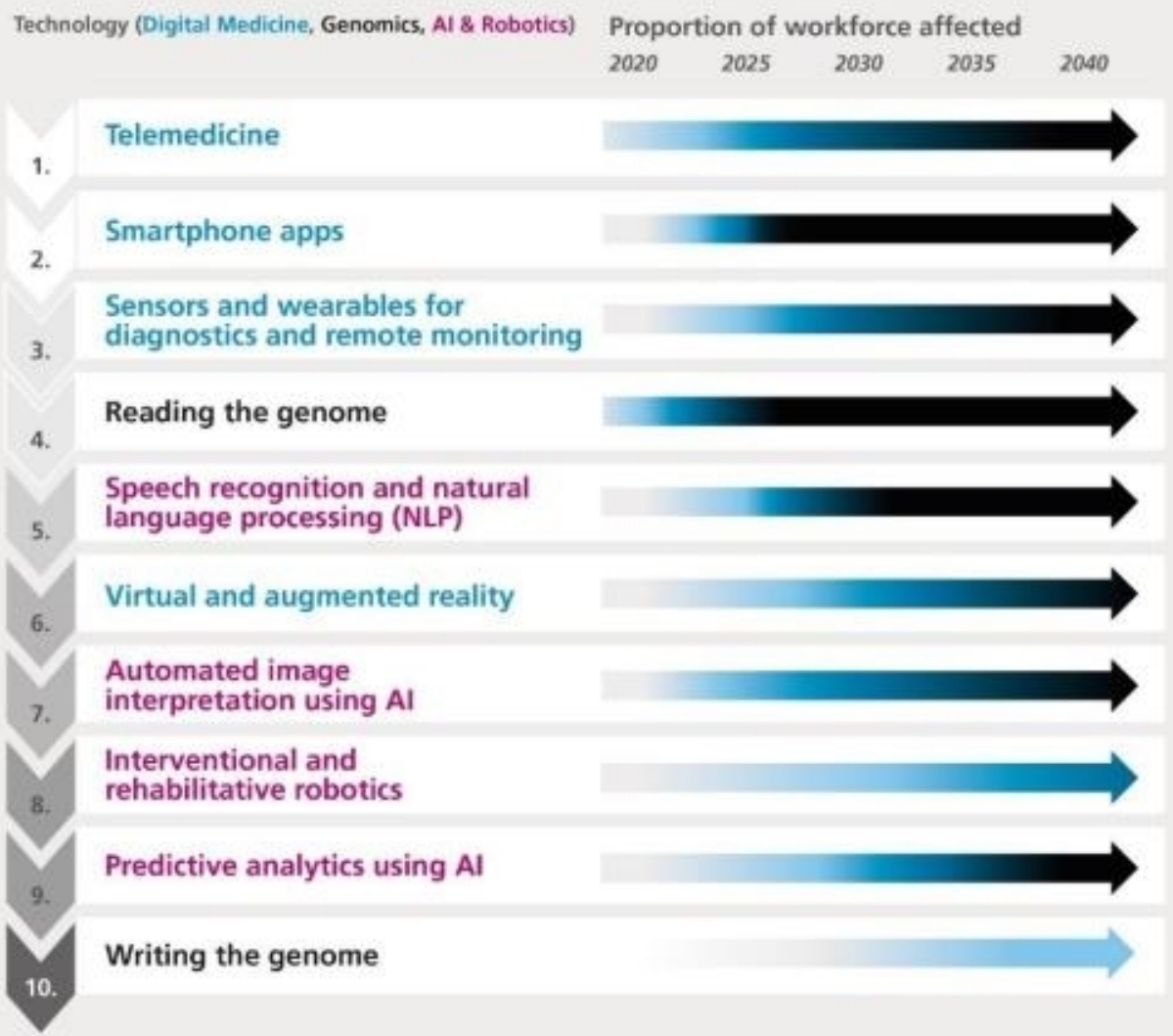
- This Review sought out expert opinion from a broad range of stakeholders.
- Panels considered evidence from a desk review of the available literature, one-to-one interviews and meetings with experts, visits and seven round-table events.
- These events, *two of which focused on mental health*, involved 275 participants, including representatives from patients and patient advocacy organisations, professional groups, industry, education, regulators and other arm's-length bodies.

The digital future of mental healthcare and its workforce

- Supplementary report
- A rapid review of the technologies that might help to transform mental healthcare over the next 20 years
- Focused engagement - interviews and focus groups held with a wide range of subject matter experts
- Sought to triangulate with the literature

https://topol.hee.nhs.uk/wp-content/uploads/HEE-Topol-Review-Mental-health-paper.pdf

Top technologies



Arrow heat map represents the perceived magnitude of impact on current models of care and, by inference, on the proportion of workforce affected.

- <20%
- 50%
- 80%
- >=80%

Use case: Smartphone apps – Computerised CBT

Case: Insomnia

First-line recommended treatment is CBT lasting longer than four weeks. Ability to provide CBT to a large population is not possible using traditional methods

Solution

Computerised CBT for insomnia treatment, as a fully automated, advanced algorithm-driven program or app

Outcome

Computerised CBT for insomnia has been shown to be an effective treatment with effects comparable to those found for face-to-face therapy

Use case: Mental health triage bot

Case: Speech recognition and natural language processing (NLP)

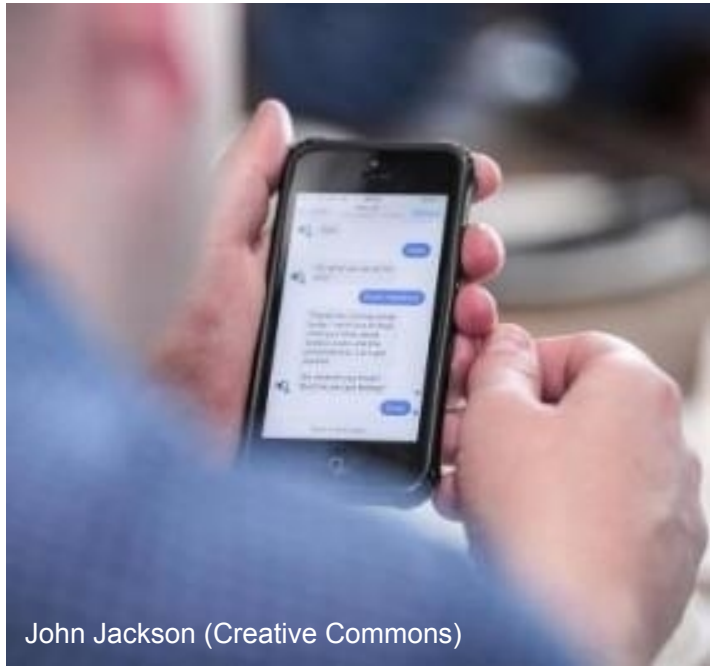
Patients with acute clinical concerns over their mental health often struggle to access services

Solution

An NLP-enabled mental health triage bot has been created, which analyses text and voice inputs for emotion and suicidal ideation and is to be built in to the GP IAPT pathway

Outcome

AI-powered bot is constantly available to patients and negates the need for travel. For clinicians, the bot saves approximately one hour of their time per patient.



John Jackson (Creative Commons)

Future scenario: Polygenic risk scores

Scenario: Genomics

By sequencing markers across the genome, specific genetic variants associated with disease can be detected.

Roles/functions change

- Blood tests could be undertaken as part of routine healthchecks, in the community, to analyse an individual's genetic risk for complex diseases.
- Test results provided in an accessible manner to GPs, nurse practitioners or hospital specialists to discuss with patients, at an appropriate time, as part of their routine care.

The Review Board Recommendations

Over 40 in total…

The citizen and the patient

- engaging and educating the public about genomics and digital healthcare technologies (P1)
- work with patient and carer organisations to support patient education (P2)
- needs-based targeted education and support through existing patient support provision (HI1)

Genomics

The citizen and the patient

- establish a clear, robust framework for healthcare professionals to use genomic data (G1)

Healthcare professionals

- healthcare professionals should receive core training in genomic literacy (G2)
- lifelong training should be available to healthcare professionals with continuing support in this field (G3)
- accredited genomic training for healthcare professionals to corporate genomic testing and genomic counselling into their practice. (G4)
- capacity built within NHS Genomic Medicine Service through support for specialist healthcare professionals (G5)

Genomics

Health system

- career pathway developed for bioinformaticians, and expansion of Higher Specialist Scientist Training for clinical bioinformaticians (G6)
- framework for genomic leadership developed across clinical specialities and primary care (G7)
- academic institutions should ensure genomics and data analytics are prominent in undergraduate curricula (G8)

Digital medicine

The citizen and the patient

- NHS online content should be a vital trusted source of health information and resourced appropriately (DM1)
- expand research and development programmes, working with patients to co-create digital technologies (DM2)

Healthcare professionals

- invest in existing workforce to develop specialist digital skills, including the assessment and commissioning of digital technologies (DM3)

Health system

- develop and commission courses to increase the number of specialists in the evaluation and regulation of digital technologies (DM5)

Digital medicine / AI and robotics

The NHS should create or increase the numbers of clinician, scientist, technologist and knowledge specialist 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 robotics technologies. (DM4/AIR5)

Artificial intelligence and robotics

The citizen and the patient

- ensure patients are involved from the beginning in the design and implementation of AI software for healthcare (AIR1)

Healthcare professionals

- educational resources should be developed to educate and train all healthcare professionals in: utilising health data; the ethics of AI; critical appraisal and interpretation of AI and robotics (AIR2)

Health system

- leverage its global reputation and integrated datasets to attract skilled experts from the global community of data scientists (AIR3)
- national programme of ‘Industry Exchange Networks’ (AIR4)

Organisational Development

The citizen and the patient

- NHS Organisations must ensure that patients, citizens and staff involved in the co-design of transformation projects, particularly in identifying how digital healthcare technologies can help to improve both patient experience and staff productivity. (OD1)

Healthcare professionals

- senior roles should be developed with responsibility to advise on the opportunities offered by digital healthcare technologies and identify local skills gaps. (OD2)
- healthcare professionals will need to access training resources and educational programmes in digital healthcare technologies to assess and build their digital readiness. (OD3)

Organisational development

Health System

- assign board-level responsibility for the safe and effective adoption of digital healthcare technologies at scale (OD4)
- NHS boards should take responsibility for knowledge management to enable staff to learn from experience: both successes and failures (OD5)
- strengthen systems to disseminate lessons from early adoption and share examples (OD6)

"An open and inclusive innovation culture, prioritising people, an agile workforce, leadership, governance and investment."

Organisational development

Health System

- frameworks to implement technological solutions and ensure staff are trained to use (OD7)
- support collaborations between NHS staff and industry aimed (OD8)
- review the regulation and compliance requirements for new digital healthcare technologies (OD9)
    - Guidance and training on cyber security, data privacy and data anonymisation.
    - Learning from international healthcare systems.

"New roles in data science, data security, ethics, human factors, implementation science, and interdisciplinary collaborations with EPSRC centres, doctoral training programmes and the Alan Turing Institute"

Dr Eric Topol

Education and training needs

Educating the future workforce

- Communicate the excitement and diversity of the future of healthcare practice
- Support high aspirations in all young people
- Articulate the knowledge, skills and professional behaviours needed

Next steps

The NHS Long Term Plan workforce implementation group.

- The technology skills and enablement group has been chaired by Sir David Behan, Chair of HEE.
- Sir David has been leading work to map the Topol Review recommendations and other technology requirements from other ALBs
- A high level work plan for 2019/20.

Next steps: 3 Lenses

CAPACITY

The skills required to navigate a data rich and digitally progressive health environment are much sought after.

We will need to increase capacity by attracting he best technologists, informaticians, data scientists to the NHS.

Planning
Recruitment
Retention

BUILDING THE RIGHT ENVIRONMENT

We must enable a culture, with our leaders at our forefront , which values technology that makes the lives easier for those who provide services and those who use services

Digital Journey
Culture Shift
Professional and Regulatory Landscape

CAPABILITY

For technology to be of maximum benefit to the NHS , the entire workforce will be offered the opportunity to develop a broad scope of digital and specialist technology literacy.

Capability assessment
Digital Skills Development
Knowledge Management

Three areas which are required:

1. Are all Boards aware of the potential that digital technology will have to transform the way that healthcare services will be provided?

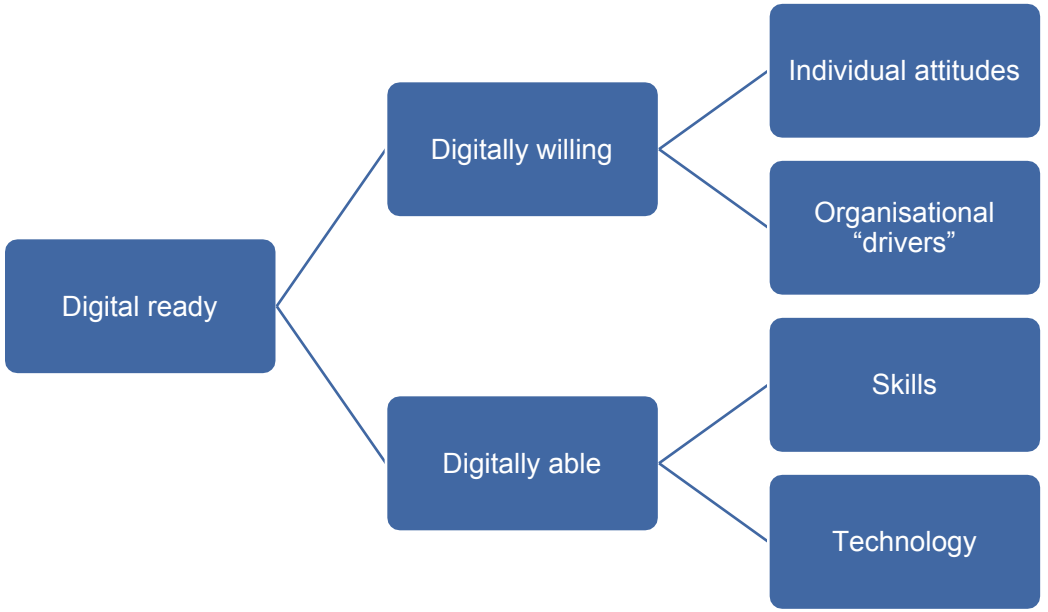
2. How can we create a movement of clinicians who work using technology alongside their clinical skills?

3. 95% of all jobs in the economy are going to require some digital component over the next few years. How do we ensure that everyone who works in health and care has the appropriate awareness so that those technological changes can be embraced by all of us into the future?

The New NHS Educational Challenge

- 1.4M staff
- New professional roles
- Personalised learning
- Comprehensive learner profile
- Enable and support returners
- Make learning fun, exciting and (even) addictive

Adaptability = digital readiness



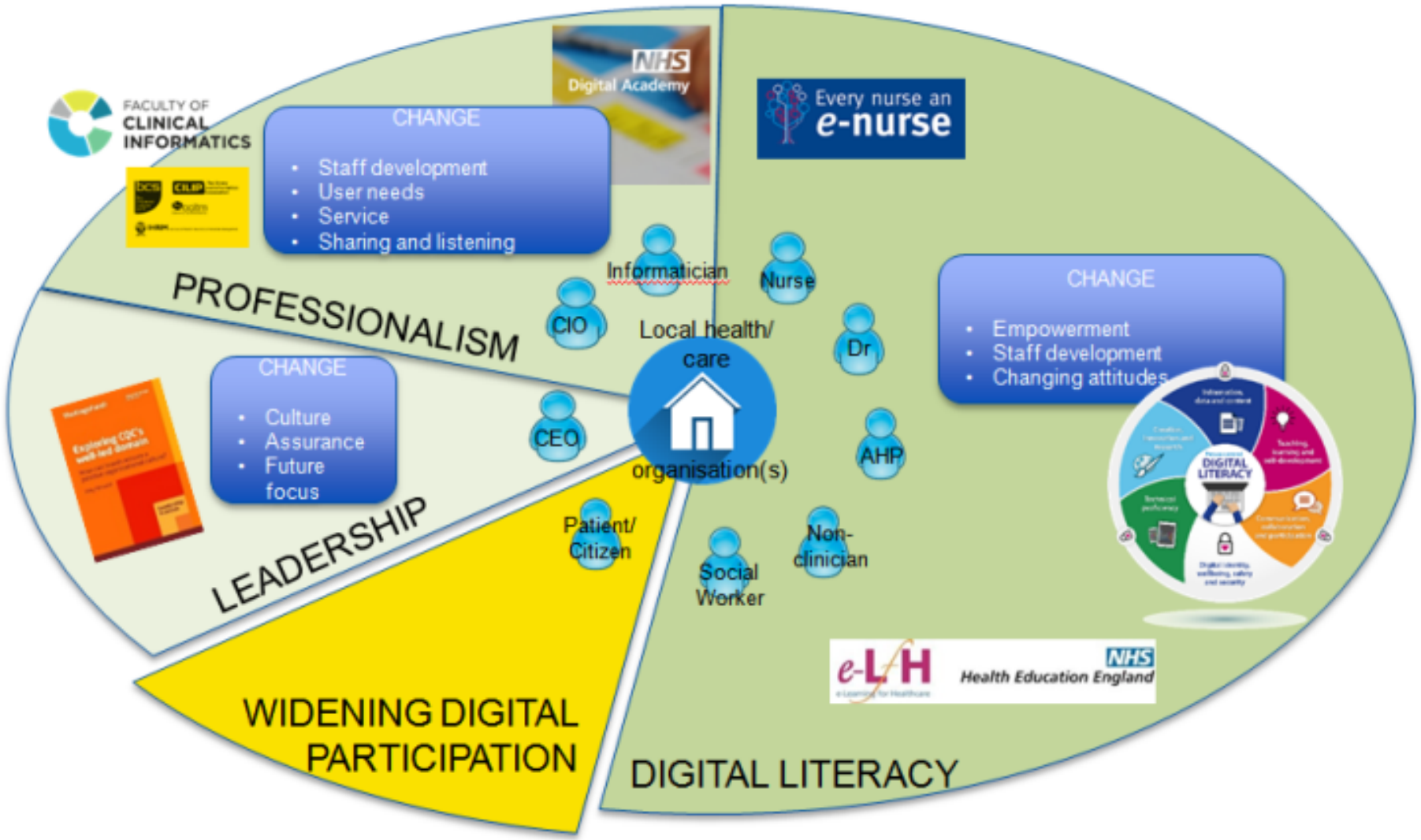
Everyone

Organisation leaders

Everyone

Informaticians

BDRW on a slide



@NHS_HealthEdEng @jamesfreed5 #DigitalReady

Building digital and technological skills

Immediate 2019/20 actions	Actions to develop full People Plan	Other commitments
1. Develop a library of education, learning, knowledge and best practice resources to expand the digital skills in current workforce 2. Set out plans for an expanded NHS Digital Academy to develop digital leadership capability 3. Establish the Topol Programme for Digital Fellowships in Healthcare	1. Deliver intensive training for boards and senior leaders to build tech and data awareness and capability 2. Provide an accreditation/ credentialing framework for digital leaders at regional, system and local levels 3. Start to develop and integrate digital education and learning resources into academic and professional curricula 4. Undertake a technology skills audit to assess and plan for future digital roles and skills required 5. Develop flexible career pathways and establish early pathway initiatives for the future digital talent	1. Significantly increase flexible working through technology 2. Work with professional regulators to help them understand the implications of digital technology for our workforce

HEE Star


Supply
Primary care
Up-skilling
Cancer
New roles
Mental health
In hospital
Maternity
New ways of working
Prevention
Leadership
Community based care
Reducing the per capita cost of healthcare
Improving population health outcomes
Improving individual experience of care
Improving experience of providing care

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Thank you

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Weekly bulletin on the Tech: KnowledgeManagement@hee.nhs.uk