



EDITORIALS

New AI laboratory for the NHS

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The public must be engaged in AI innovations to ensure real benefits for health

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In August 2019 the UK government announced a welcome boost for artificial intelligence (AI) in healthcare, with £250m (€280m; \$310m) for a national laboratory in England.¹ Public imagination is captivated by robots, but the new lab will prioritise technologies more likely to benefit the health system and patients in the short term, including algorithms to predict demand for hospital beds and tools that identify signs of disease from diagnostic images, all underpinned by a focus on ethical and fair AI.²

Clear priorities

Many healthcare professionals rely on paper records and outdated technology, and struggle to access basic information at the point of care. Investment is needed, but this must be matched with a credible national strategy for AI and data analytics that focuses on the needs of patients and the health system rather than technology for technology's sake. The priorities of NHSX, the national agency for digital transformation in healthcare that will host the AI lab,³ include reducing clinicians' workloads, giving patients tools to access services directly, ensuring clinical information can be accessed safely where needed, enhancing patient safety, and improving productivity. These welcome priorities must be accompanied by a needs driven approach throughout the technology development process.

A clearer focus on improving health inequalities is also required. The history of AI's effect on marginalised communities is sobering⁴ and shows that we must go beyond widening internet access to ensuring that new technology is developed together with underserved communities and that the new AI lab has a diverse workforce. This is an opportunity to direct investment towards patients and communities where health inequalities remain stubbornly entrenched.

New technologies must be evaluated in real world settings to give patients, the public, and healthcare teams confidence that implementation is safe and will improve care. Yet, although the National Institute for Health and Care Excellence (NICE) has developed evidence standards frameworks for digital health

technologies,⁵ consensus about evaluation methods is limited, and questions persist about whether evaluators will be able to gather the data that they need at the pace required. Questions also remain about how regulatory frameworks will evolve to deal with fast changing technologies, such as algorithms that are dynamically updated.

Data scientists, technology incubators

Many of the major innovations in data analytics from the past two decades have happened only with close NHS involvement.⁶ The AI lab will therefore need to support data science in the public sector as well as the private sector. The NHS has not invested sufficiently in its 10 000 or so data analysts,⁷ but they are critical to solving healthcare problems and can also act as valuable bridges between clinicians, managers, and data scientists in industry.

We may also need to invest in more "technology incubators"—environments that bring together multidisciplinary teams (including patients) to develop AI solutions to healthcare problems. Developments such as DRIVE, a unit at Great Ormond Street Hospital to develop technologies for better care, have made a start, but more such units at greater scale will be needed to match the government's ambitious innovation agenda.⁸

AI is powered by data. Although the NHS potentially has the best health data in the world, local systems rarely communicate with each other, and the process of accessing and organising data for research is slow and costly. Harmonisation is a priority, but strategic questions remain—for example, how much health data should be stored in national databases and how much held locally and processed according to national standards.

Fair value

Another challenge lies in how health systems can obtain fair value when sharing data with private companies. NHS boards have been warned not to give data away too cheaply to private operators,⁹ but there is still too little transparency about how health data are being shared with the private sector,¹⁰ and

ambiguity exists about how intellectual property should be managed. NHSX will host a new centre of expertise to tackle these questions and will need to make rapid progress.

Crucially, the public must be fully informed and proactively engaged in shaping decisions about how data are used and privacy protected. Commercial access to data remains a red line for some.¹¹

Supporting adoption

Identifying a technological solution that works in one place is only half the battle; the bigger challenge is to get these solutions working well everywhere. Promising tools are being developed to help this process,¹² but we need more investment in knowledge sharing infrastructure and better support for those adapting innovations for local use.¹³ Redesigning clinical workflows and patient pathways around technological innovation will take time and people, yet the NHS has a shortfall of 100 000 staff.¹⁴ Unless these challenges are tackled through a clear national strategy, the potential of new technologies will not be fulfilled.

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