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Finally, the NHS goes digital.Or does it?

The NHS is 20 years behind the private sector in its use of technology, and a long way behind many of its doctors and patients. Will plans for a dramatic catch up work? **Stephen Armstrong** reports

The NHS, the government hopes, will be an entirely digital organisation in five years' time—from patient records to specialist appointments, online general practitioner consultations, and rigorous data trawling to predict and prevent unnecessary deaths. It's a bold vision—as outlined in the National Information Board's complex Personalised Health and Care 2020 framework, published in November 2014.[1] The problem is no one seems entirely clear how it will work, when it will work, and if it will achieve the benefits that the information board predicts.

Delegates at the King's Fund digital health and care congress last month heard a series of optimistic positioning statements from NHS England.[2] Tim Kelsey, national director for patients and information, outlined plans for free wi-fi across the NHS and for patients to be able to view and control their full health records online and access increasing numbers of digital health services. He also planned to extend the provision of remote care through online platforms and enable doctors and nurses to access "the most up-to-date lifesaving information wherever they are in England by 2018 for primary, urgent and emergency care services and by 2020 for all other NHS funded services."

With administration taking up roughly 70% of a junior doctor's time, Kelsey argued, on the spot wi-fi will free up more time with patients, make it easier to track down patients' records, and allow wearable wi-fi connected monitoring devices to be used in hospitals. He cited the 20% of patients with diabetes who have experienced a largely avoidable hypoglycaemic episode while on the ward and suggested skin strip glucose monitoring systems could help patients and their doctors identify problems early.

Beverly Bryant, NHS England's director of digital technology, said surveys proved patients were already on board—"the population is using iPads to book their holidays and travel arrangements," she argued. "The 2015 customer service satisfaction index for England showed that the way people are interacting with other digital services—banking, shopping—it would be really nice if they could interact with NHS services in that way."

And Huw Evans, clinical informatics lead for the primary care patient safety research group, suggested data crunching incident reports would save the NHS millions of pounds and thousands of lives every year. "In our analysis of 270 000 incident reports we found 99 cases of babies receiving a tuberculosis vaccination when it was not safe for them to do so," he explained. "We can create algorithms to look for those cases that we need to focus on, to pass on to my clinician colleagues sooner, and to find those 99 babies."

For many NHS staff, going digital is long overdue. "For many of my members their working experience is already pretty much paperless," explains Maureen Baker, chair of the Royal College of GPs. "Our frustration is the lack of interoperability—the fact that we need to send faxes to hospitals and pharmacies because we can't send something electronically beggars belief."

Delegates, however, seemed baffled by and slightly uneasy with progress so far. "The NHS is 20 years behind the non-healthcare private sector at the moment," said John Farenden, director of Ernst and Young's new digital health innovation programme. "The rate of change is slow–it's taken NHS England some time to publish details of its plans and timescale for approving health apps. The benefits of technology–helping moving care out of hospitals into community, for instance–are clear. What isn't clear is if these targets will be hit."

Tim Kelsey
Doctors to access "the most up to date lifesaving information by 2018"

Beverly Bryant
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Maureen Baker
"The fact we need to send faxes to hospitals because we can't send electronically beggars belief"

Martina Kane
"There's a great danger that casual introduction of the wrong technology can cause more harm than good"

Oliver Johnson
"People don't have broadband because of cost. There is a long tail of digitally deprived people"

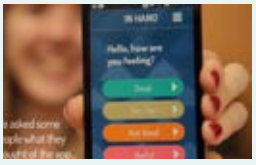
Doctors and patients get on with the technology revolution

For years efforts to computerise the NHS ignored two crucial groups—clinicians and patients—and focused on data, administration, and communications. As a result the direct healthcare benefits of technology have proved elusive. Across the course of the digital health and care congress, however, pilot studies and rolled out programmes suggested that innovative use of simple technology could measurably improve patient care.

Pain management

Frances Cole, part time GP and pain rehabilitation specialist working in West Yorkshire, demonstrated PainSense—a cognitive behavioural therapy based app for self management of persistent pain. It includes a range of features from tension alerts to relaxation resources, medication tracking, and the use of games to support engagement, goal setting, and adherence.

"The UK is following the US in prescribing highly expensive, strong opiates leading to long term harm and addiction," Cole argued. She highlighted results from pilot programmes with the app showing reductions in pain related medication, GP consultations, and onward referrals to pain or orthopaedic services.



Mental health

The In Hand app—designed by FACT, an arts and technology organisation working in collaboration with Mersey Care Mental Health Trust—is aimed at young people and offers a combination of techniques to relieve stress or low mood.

Lucy Simmons, from Nottingham's MindTech—a healthcare cooperative focusing on the development and evaluation of new technologies for mental healthcare and dementia—explained, "Once the app knows how you are feeling it will take you through simple steps to help you be yourself. These activities include talking to someone, reading inspirational quotes, and taking pictures. There were around 5000 new users downloading the app in our first six months, 75% of people used it more than once and 50% said that In Hand had helped them either a little bit or a lot."

Older people

Leeds City Council's mobile health pilot—now in its sixth month—focused on older people's moods. Potentially, over 15 000 people over 75 years old feel lonely in Leeds, explained Janet Jadavji, chief executive at Yecco, which designed an app to help people stay in touch with friends and family as well as monitor their blood pressure, weight, and pulse rate. The council funded and distributed tablets loaded with the app for the pilot.

"Of the ten people on the pilot, six people have now gone to their GPs with some readings and have sought early treatment and advice," Jadavji explained. "One of our participants called 111 in the middle of the night and—because of the readings and the ability to share this information on the tablet—he was admitted for two days, instead of five. So there was a reduction there in his stay and cost of treatment."

Hypertension

Proving that technology needn't be state of the art, Liverpool health trainer Stephen Park outlined the city's Florence telehealth programme. Patients register with Florence if they are at risk of developing hypertension. All the patient needs is a basic mobile phone.

"It's completely free to use so you don't have to pay for texts," Park explained. "We set them up on the system, give them a blood pressure monitor, run them through how to use it at home, and give them a management plan. Every time they take a reading they text that into Florence, which will collate that data and report to the patient whether or not they need to take any action—or if they meet a critical breach get in touch with the clinician."

Park found that of the 300 Florence users he had interviewed since the project began, 80% were more aware of their blood pressure and more motivated to improve their health. Of course that might not prove to be the long term result.

Drinking

John Larsen, director of evidence and impact at the alcohol industry's responsible drinking charity Drinkaware, showed how users' responsiveness to novel technology could diminish over time. The Drinkaware app, introduced last August, allows users to track alcohol consumption in units and calories, set personal goals, and have achievements recognised. In the first six months 50 000 people downloaded the app, when they reported consuming an average of around 22 drinks a week. This fell sharply in the first week to just over 16 but rose again after four weeks until it levelled out at around 20. "This suggests that people have an initial excitement effect and then return to just under their previous drinking levels," he explained.

Risks for vulnerable patients

Patient groups are concerned less by the pace of change and more by the way care of some patients will suffer. "There's an enormous opportunity with the move to digital for patients with dementia, but there's also great risks and it's not clear that's being addressed," argued Martina Kane, senior policy officer at the Alzheimer's Society. "Although using iPads in healthcare is popular with dementia patients as it makes you stand out less—your kids are probably using one—adapting to new devices isn't easy. Some people with dementia find it increasingly hard to use the telephone so the internet will be equally tricky."

When a member of the society asked Bryant about this, she seemed uneasy. "We've got quite a lot of work going on with groups with

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learning disabilities," she explained. "I'll be honest, we've probably focused more on that area than we have on dementia so it might be a gap. I'll go and have a look and make sure." (*The BMJ* approached NHS England to follow up on Bryant's answer but it didn't reply.)

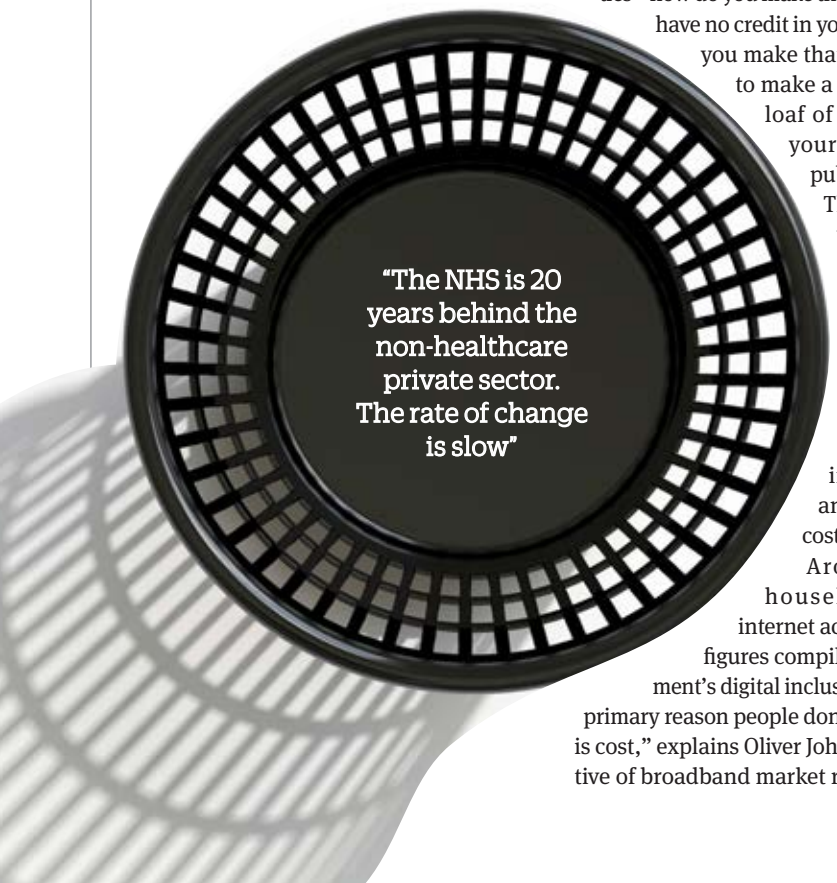
Getting it right

The Alzheimer's Society has, however, observed that dementia friendly technology has huge potential. Ali Rogan, external affairs director for Tunstall Healthcare and chair of the Alzheimer's Society dementia friendly technology "task and finish" group, gave one example of a patient who often wandered from her flat in the night and became disoriented, knocking on neighbours' doors. The patient, she explained, agreed to have a bed sensor and door sensor fitted in her flat. The sensor on the door sends an alert to Hull City Council's out of hours care team if the patient leaves her flat between 10 pm and 7 am and doesn't return within five minutes. Within the same hours, if she leaves her bed and doesn't return within 15 minutes, which may indicate a fall, an alert is sent. After four months, the team had been called out seven times—preventing her from disturbing her neighbours and getting into danger and saving her from being placed in 24 hour care.

"One in four hospital beds are occupied by people with dementia—there are 850 000 people with dementia in the UK, and three quarters of them have a comorbidity," according to Kane. "There's a huge opportunity for technology to help and relieve burdens on the NHS, but there's also a great danger that casual introduction of the wrong technology can cause more harm than good."

Disability inclusion and access consultant Jonathan Kaye also pointed out the absence of plans to pool health and social care data in the framework. "I have cerebral palsy, so I'm disabled but otherwise I'm very healthy," he explains. "All of my care as an adult has been handled by the local authority, not the NHS. There's no provision for the sharing of information so if I arrive on an NHS ward there's no records of my previous care."

There's also concern that poorer patients may receive worse care under an entirely digital system. "A lot of local GP surgeries now require you to phone in at 8.30 am to secure an appointment," explains Sharon McAulay, who runs the Star Project community centre in Paisley, Glasgow. "But for some of the more disadvantaged members of our communities—how do you make that phone call if you have no credit in your phone? How do you make that call if you've got to make a choice between a loaf of bread and using your last £1 to use a public telephone? . . . That's going to get worse with online booking; few of our clients have broadband. They'll inevitably end up using emergency departments instead of the GP and what's the true cost of this?"



Around a fifth of households have no internet access, according to figures compiled for the government's digital inclusion strategy.[3] "The primary reason people don't have broadband is cost," explains Oliver Johnson, chief executive of broadband market research company Point Topic. "It's still expensive to buy all the kit you need, let alone the monthly subscription. Ironically, the cheapest rail fares and the cheapest goods are online so poorer people suffer twice over. The numbers are getting better but nowhere near as fast as people thought or hoped. What's left is a very long tail of digitally deprived people."

Nonetheless, online services are expected to become the NHS's new frontline. NHS Choices will allow citizens to register for a GP, order prescriptions, access apps and digital tools, speak to their doctor online or by video link, and view and take control of their full health record through a single online portal. As the NHS moves online, these one in five digitally deprived households will be unable to access those services in the privacy of their own homes.

Technology for all

Bryant hinted at this without offering solutions. "How do we make sure the technology enabled middle classes don't snap up all the appointments?" she asked delegates. "We have to be mindful of digital inclusion. We will always make it possible for people to meet clinicians face to face or talk over the phone, but we will also make it possible to signpost information, building on NHS Choices. Many GP appointments are for minor ailments—if patients could find information online they wouldn't go to their GP, freeing up GP time. When you improve convenience, it costs less. Having a multidisciplinary team working on a Skype consultation or video or teleconference with team, carer, and patient stops people having to go in for an appointment and saves money."

This, according to Baker, isn't necessarily so. "Many practices already use email and Skype consultations—it's convenient for patients but it doesn't really save work in the practice," she argues. "In fact if during a Skype consultation you realise you actually need to examine the person you'll need to bring them in and duplicate your time with them. I'm not saying we shouldn't do it, but arguments around this claim that it will save us loads of time in general practice. We're saying, 'it won't save loads of time.' Although, as the college has no representation on the National Information Board, it's hard to make ourselves heard."

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