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The digitisation of medical records is getting closer

DREW GREENBLATT is baffled by the technical backwardness of America's costly health system. He owns Marlin Steel Wire Products, a small firm based in Baltimore that makes components for Toyota, Roche and other multinationals. He offers good health coverage for his employees, but his health costs have nearly doubled since 2000. Last September he went to Congress to plead for legislation that would modernise the information technology used by America's medical system. "My receptionist, my shipping clerk and even the industrial robots on my factory floor use e-mail," he says, "so why can't I e-mail my doctor?"

It is a reasonable question. After all, America spends some 16% of its GDP on health care, the largest share of any big country. A man from Mars would certainly expect doctors in the world's most technologically advanced country to have ready access to e-mail, and probably also to sophisticated health information technologies (HIT) such as electronic health records (EHRs). Put simply, EHRs are digitised versions of all the bits of paper usually kept in files by all the doctors a patient sees regularly. HIT describes all the hardware, software and other kit needed to make sense of the data and to give remote access to them. Yet although most health-care providers have installed computer systems to deal with back-office tasks such as billing, shockingly few have modernised the bits of their business that patients like Mr Greenblatt encounter.

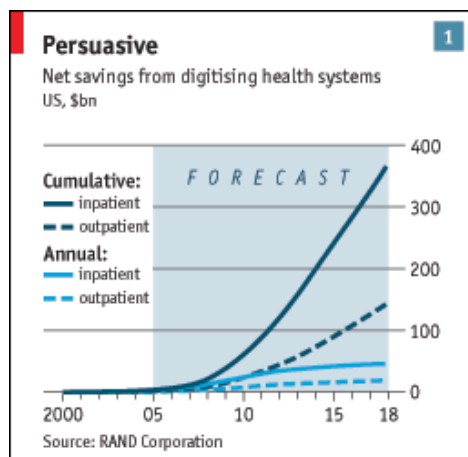
Pass the papyrus scroll

Recent studies suggest that fewer than one-fifth of the doctors' offices in America offer EHRs. Many other rich countries are doing better. Denmark has an electronic health (e-health) system to which nearly everyone is connected, and a way to track which drugs have been prescribed to whom, by whom and when. Other continental European countries are building HIT grids.

More impressively, parts of the developing world are leapfrogging the richer countries' technologies. India's Apollo hospital chain has for years been using an advanced EHRs system, built locally, that integrates back-office functions with the sort of data on patients doctors need to see. Apollo Health Street, a successful offshoot, sells HIT software and services to American hospitals. Prathap Reddy, Apollo's founder, wants to build an open-source "health superhighway" in India from which everyone can benefit, not just the better-off who use his hospitals.

Another developing-country pioneer is a Thai company, Bumrungrad. Foreign visitors to its hospital in Bangkok are often surprised by its gleaming new facilities, complete with a Starbucks coffee shop in the lobby, and by its superb customer service. Those visible signs of modernity, along with its high-quality, low-cost medical offerings, have helped to make it a popular destination for many medical tourists from the rich world. Bumrungrad makes innovative use of HIT. In the absence of suitable offerings from Western software vendors, the company also built its hospital-management system from scratch. When Microsoft decided to enter this industry a few years ago, it was so impressed that it bought the Thai firm's software division outright.

If health providers were to switch to EHRs integrated into a "smart grid" of information technologies, the future of medicine could look a lot brighter. Herbert Pardes, the head of New York-Presbyterian Hospital, believes that if used properly this bundle of technologies could give more power to patients, transform the daily practice of medicine and assist research into new pharmaceuticals.



The RAND Corporation, an American think-tank, examined the potential benefits of digitising health systems in a 2005 report. It estimated that, if 90% of hospitals and doctors in America were to adopt HIT over 15 years, the health system could save some \$77 billion a year from efficiency gains (see chart 1). If health-and-safety benefits are taken into account, the gains could double, saving about 6% of the \$2.6 trillion that will be spent on health care in America this year.

HIT sceptics, including some leading doctors, have pointed out that the RAND forecast is merely a theoretical calculation, but real-world experience now supports its conclusions.

A study published in the *Archives of Internal Medicine* in January compared a group of hospitals in Texas that has adopted advanced HIT systems with a group that has not. It found that the first group suffered 15% fewer deaths and 16% fewer complications, as well as enjoying lower costs.

Even stronger evidence comes from Kaiser Permanente, an unusual American health-care chain whose 8.6m patients receive fully integrated care, rather as they would from a government-run service such as Britain's National Health Service (NHS). That made it much easier to implement an ambitious HIT system costing over \$4 billion. It says it now has "100% compliance" from doctors.

In March Kaiser Permanente published evidence in *Health Affairs* showing that its digital efforts have cut visits per patient by an average of 26%, thanks to more e-mail and telephone consultations. That saves money and increases efficiency, but patients seem to like it too.

So America has at last decided to get serious about digital medicine. The giant fiscal-stimulus package passed earlier this year by Congress includes nearly \$20 billion to create a national health-information network, including incentives for hospitals and doctors to adopt EHRs. But various obstacles could yet get in the way.

Back in the early 1960s Morris Collen of Kaiser Permanente attended the first global conference on "medical electronics" and became convinced that this was the future—only to see one effort after another fail over the next 40 years. Eve Kurtin of Vantage Point, an American venture-capital fund, says her company has also tried and failed repeatedly over the past 20 years. Even Google seems uncharacteristically cautious. The head of its EHRs effort concedes that "health is hard."

One stumbling block has been privacy, but the technical tools to safeguard it, such as encryption software, have improved so much that this should no longer be a problem. Recent legal changes also help. A law passed in America last year stops insurers or employers from using genetic information as a basis for discrimination. Lorenzo Valeri of RAND's European division points to a web of EU-wide and national regulations that provide strong safeguards.

A bigger obstacle has been resistance from doctors, some of which stems from failed previous efforts to introduce HIT. Doctors and nurses have too often been required to learn how to use new software but have rarely been compensated for their time or seen tangible medical benefits. That is why much of the health money in the American stimulus package will go on providing financial incentives to encourage doctors to go digital.

But fancy kit and pots of money alone are not enough, as Britain has discovered to its cost. Under a scheme known as Connecting for Health, the NHS is spending nearly £13 billion digitising England's health system. It may succeed in the end, but the process has been agonising. The reformers drove ruthless bargains with the HIT vendors involved,

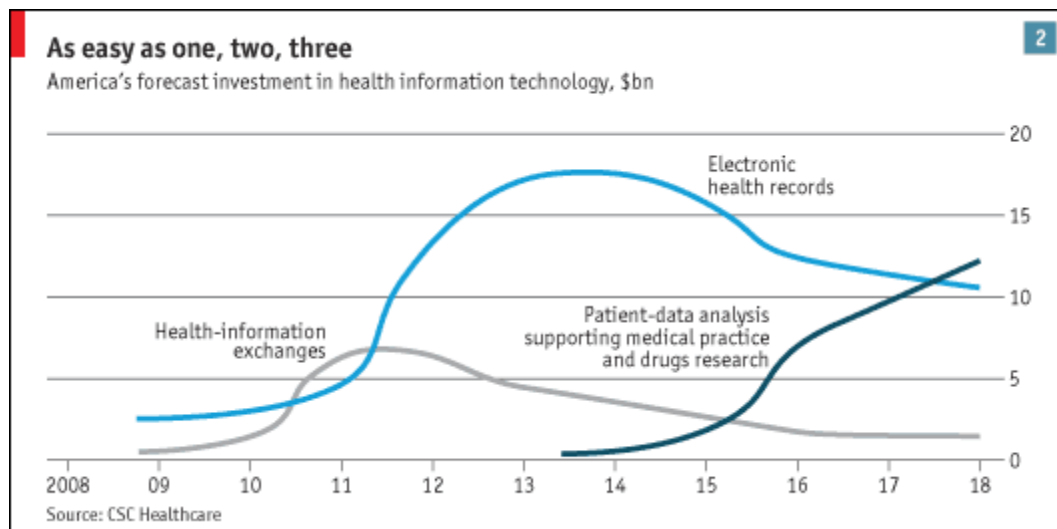
but that policy backfired, says James Barlow of Imperial College’s business school. Two big vendors, Accenture and Fujitsu, were squeezed out. In January a parliamentary report concluded that the project was at least four years behind schedule and that the final cost might yet soar.

An even bigger flaw was that the project was too top-down. Doctors and hospitals grouched that their concerns were not reflected in its design. John Halamka, the chief information officer at Harvard Medical School, thinks that reformers need to take a bottom-up approach and listen to both doctors and patients. He has shared EHRs with patients at Boston’s Beth Israel Deaconess Medical Centre for years and is convinced patient control works better.

Top-down or bottom-up?

Simon Eccles, the medical director at Connecting for Health, counters that “sometimes centralisation is good.” A top-down approach, he says, makes it easier to set common security standards and data-sharing protocols, for example. That may well be true for small countries. Denmark, for example, has done well with a modest top-down HIT system. But it will probably work less well in a large and heterogeneous system like the NHS. Dr Eccles concedes that his system could have provided more choice to local hospitals.

Kaiser Permanente’s Dr Collen, now in his 90s, thinks that technology has at last become robust and reliable enough to implement the vision he had over four decades ago. But the father of HIT insists that digitisation will succeed only if coupled with empowerment: “The patient has lived with his medical problem and often knows it better than the doctor.”



The American HIT reforms will unfold in three phases (see chart 2). The first will involve health-information exchanges to make sure that systems work together. The next phase—which may run concurrently with the first—will be the adoption of EHRs. The

final phase will involve the analysis of patient data to improve medical practice and drugs research.

One concern is that big software vendors or health providers with expensive legacy systems may try to slow things down so that they can milk their existing businesses. Peter Neupert, who heads Microsoft's HIT effort, fears that a debate about standards could turn into an excuse for inaction: "Let's remember HIT is not like railways, where the gauges had to match perfectly for interoperability."

America's respected Institute of Medicine has expressed similar concerns. In a recent report it pointed to the dangers of too "monolithic" an approach and said that medical information must be free to move about on rival software systems.

The best way to ensure that the first phase does not get captured by interest groups may be to push ahead with phase two at the same time by putting EHRs in the hands of patients. But this is controversial. Thomas Lee, the boss of Partners Community Healthcare, a large health provider in Boston, and a medical doctor himself, acknowledges that the days of the all-knowing doctor are gone. "I openly Google things I don't know in front of my patients," he says. But nor does he think patients should be given a free hand: "I want the provider to control records behind a firewall, and to let patients peep into them as necessary."

That view is squarely opposed by Aurelia Boyer, the chief information officer for New York-Presbyterian Hospital and a former nurse. She thinks that health care is "paternalistic by nature." Rather than wait for HIT integration among lumbering health-care giants, she wants to give patients access to their data immediately, in the hope of linking up the disconnected bits of the health system more speedily.

Her hospital has just launched a pilot EHRs scheme using Microsoft's Health Vault software that gives full control of data to individuals. Patients can now decide which bits of their records they wish to share with whom: all of them with their emergency medical doctor, most with their insurers, some with their dermatologist, and so on. Some doctors worry that patients may not always make the right decisions, but at least an electronic system will eliminate the mix-ups that happen in today's paper-based system.

A recent investigation of the NHS by the *Health Service Journal* found that many paper-based records are lost or misplaced. It calculated that perhaps 1.2m British patients are being treated each year by doctors without proper notes to hand. Ian Gallifant of Zaptag, a brash British firm that is trying to prise control of medical records away from doctors, puts it this way: "Records have to be owned by someone and the trials in Britain are perhaps indicating that the NHS is not the entity to have that responsibility. Why not the individual, who has the most to gain?"

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