

Impact case study (REF3)

Institution: The University of Edinburgh		
Unit of Assessment: UoA20		
Title of case study: Identifying and addressing the challenges of NHS IT policy and practice		
Period when the underpinning research was undertaken: 2010-2020		
Details of staff conducting the underpinning research from the submitting unit:		
Name(s): Kathrin Cresswell	Role(s) (e.g. job title): Chief Scientist Office Chancellor's Fellow	Period(s) employed: 2006 – to date
Period when the claimed impact occurred: August 2013 to 2020		
Is this case study continued from a case study submitted in 2014? No		
<p>1. Summary of the impact</p> <p>Effective information technology (IT) is a critical part of current and future healthcare provision. Cresswell and the wider University of Edinburgh eHealth Research Group conducted national evaluations of health IT in hospitals, which highlighted failure to deliver promised benefits, and a critical shortage of digital skills within the NHS workforce.</p> <p>These findings contributed to a marked change of direction in England's digital health strategy, from the centralised top-down National Programme for IT (2002) towards enhancing local capacity and decision-making in 2016's review <i>Making IT Work</i>.</p> <p>Cresswell and colleagues collaborated with Imperial College London to deliver the NHS Digital Academy (NHSDA), the world's first national digital health leadership training programme, in 2017. By October 2020, over 300 NHS leaders from across the UK have gained IT leadership skills, and contributed to locally-appropriate, effective digital transformation initiatives to improve health services across the UK.</p>		
<p>2. Underpinning research</p> <p>Digitisation of health systems to improve the quality, efficiency and safety of patient care is a global policy priority (e.g. World Health Organisation Global Strategy on Digital Health 2020-2024). However, digital innovation in the NHS has been slow, and difficult. Cresswell's research within Edinburgh's cross-disciplinary eHealth Research Group has identified problems in top-down policy approaches and also helped to design and deliver solutions for more effective digitisation of the NHS. She has published almost 100 peer-reviewed articles on effective implementation, adoption and optimisation of health IT.</p> <p>As part of the eHealth Research Group, Cresswell conducted qualitative studies evaluating England's 2002 National Programme for IT (NPfIT). She coordinated and led data collection for the world's first national longitudinal evaluation of the introduction of national electronic health records (EHRs). She coordinated longitudinal qualitative case studies, comprising interviews, non-participant observations and analysis of local and national documents, of early adopter organisations over the course of three years, finding that:</p> <ul style="list-style-type: none"> centrally-procured electronic health records (EHRs) were not compatible with existing organisational practices, leading local staff to develop unsafe workarounds, often by using paper or inappropriate software (3.1) organisations found the centralised EHR system time-consuming, with limited evidence of clinical, and no evidence of direct patient benefit (3.2) frontline clinical staff made limited use of technologies (3.3) 		

Cresswell also conducted qualitative research on the introduction of electronic prescribing (ePrescribing) systems, which found that hospitals had limited understanding of the advantages and tradeoffs of different systems available for purchase, leading to problems in procurement and implementation that risked patient safety (3.4).

In 2011, Cresswell co-authored an influential systematic review (within which she was responsible for data extraction and analysis) on the overall impact of health informatics interventions on health care for the UK government. This found little robust empirical evidence to substantiate many of the policy hopes placed in health IT (3.5). This body of research indicated that a centralised procurement model was not appropriate for the UK context, risking unintended consequences for hospitals, staff and patients (3.2, 3.3), including threats to safety and patient care [3.4]. Needs for greater digital training and user engagement across the NHS were highlighted as critical to realise the potential benefits of health IT systems (3.5, 3.6).

3. References to the research

3.1 Cresswell K, Worth A, Sheikh A. (2012). Integration of a nationally procured electronic health record system into user work practices. *BMC Medical Informatics and Decision Making*, 12: 15. DOI: [10.1186/1472-6947-12-15](https://doi.org/10.1186/1472-6947-12-15)

3.2 Sheikh A, Cornford T, Barber N, Avery A, Takian A, Lichtner V, Petrakaki D, Crowe S, Marsden K, Robertson A, Morrison Z, Klecun E, Prescott R, Quinn C, Jani Y, Ficociello M, Voutsina K, Paton J, Fernando B, Jacklin A, Cresswell K. (2011). Implementation and adoption of nationwide electronic health records in secondary care in England: final qualitative results from a prospective national evaluation in "early adopter" hospitals. *BMJ*, 343:d6054. DOI: [10.1136/bmj.d6054](https://doi.org/10.1136/bmj.d6054)

3.3 Cresswell K, Morrison Z, Crowe S, Robertson A, Sheikh A. (2012). Anything but engaged: user involvement in the context of a national electronic health record implementation. *Informatics in Primary Care*, 19(4):191-206. DOI: [10.14236/jhi.v19i4.814](https://doi.org/10.14236/jhi.v19i4.814)

3.4 Cresswell KM, Mozaffar H, Lee L, Williams R, Sheikh A. (2017). Safety risks associated with the lack of integration and interfacing of hospital health information technologies: a qualitative study of hospital electronic prescribing systems in England. *BMJ Qual Saf*, 26:530-541. DOI: [10.1136/bmjqs-2015-004925](https://doi.org/10.1136/bmjqs-2015-004925)

3.5 Black AD, Car J, Pagliari C, Anandan C, Cresswell K, et al. (2011). The impact of eHealth on the quality and safety of health care: a systematic overview. *PLoS Med*, 8:e1000387. DOI: [10.1371/journal.pmed.1000387](https://doi.org/10.1371/journal.pmed.1000387)

3.6 Cresswell KM, Bates DW, Sheikh A. (2013). Ten key considerations for the successful implementation and adoption of large-scale health information technology. *J Am Med Inform Assoc.*, 20:e9-13. DOI: [10.1136/amiajnl-2013-001684](https://doi.org/10.1136/amiajnl-2013-001684)

4. Details of the impact

Cresswell and the eHealth Research Group's evaluation of the National Programme for IT (NPfIT) offered robust evidence of fundamental problems of national IT strategy (3.1-3.4), arguing the need for increased local input in decision-making (3.6) and enhanced digital skills in the workforce (3.5). This evidence influenced 2016's *Making IT Work* strategy for England (5.1), following which Cresswell and others developed and co-delivered an evidence-based solution – the NHS Digital Academy (NHSDA) – funded by NHS England. The NHSDA has built digital capability, confidence and skills across the NHS, which have proved invaluable during the COVID-19 'digital pivot'.

Policy impacts

Through the eHealth Research Group, Cresswell's research influenced the English national health IT review *Making IT work* (2016), chaired by Professor Robert Wachter (5.1). The final report makes extensive reference to Cresswell's research on the social dimensions of technological change in healthcare (5.1 p.23, p27, p30, p41, p50: Cresswell co-authored all of these referenced articles and led two as first author). Professor Wachter states: "We often drew

on [eHealth Research Group] work in our analyses and made reference to several papers from Edinburgh in our final report ... Two of the eventual recommendations of my review were directly related to research findings from the University of Edinburgh eHealth Research Group's evaluation of the introduction of electronic health records and electronic prescribing systems" (5.2).

The Westminster Government responded to the IT review with investments of at least GBP284,000,000 into digital training and engagement, including putting out a tender for the establishment of the NHS Digital Academy (NHSDA). The Edinburgh eHealth Group designed the winning bid in partnership with Imperial College London, and now co-deliver the NHSDA.

The NHS Long Term Plan (2019) specifically promises further investment in "enhancing the digital leadership of the NHS by further expanding the successful NHS Digital Academy programme." (5.3 p.95; point 5.18) and the National Audit Office describes the NHSDA as "a key element" of NHS future workforce development (5.4, p.38, para, 3.15). A 2020 review of the Digital Academy by Professor Wachter states: "Clearly, the NHS Digital Academy has filled an important void. I was... very pleased to see that the NHS Digital Academy is playing a major role in addressing the fundamental goal of building digital skills and leadership across the NHS" (5.2).

Practice impacts

The NHSDA allows clinicians and managers from UK NHS hospitals to earn a postgraduate Diploma in Digital Health Leadership (5.5). The eHealth Group lead three of the five modules on health information systems and technologies, user-centred design and decision support and actionable data analytics (5.5). The course content of the NHSDA is underpinned by eHealth Research Group outputs, which are also used as teaching materials (e.g., 3.1, 3.2, 3.4, 3.5). Cresswell leads the module 'Health information systems and technologies' and 15 of her published articles (including 3.1, 3.6) are on the list of 54 essential readings for this module.

By November 2020, the NHSDA had trained 300 clinicians and managers from NHS organisations in all four nations of the UK in IT leadership and change management skills to support the digital transformation of the NHS, to improve the safety, quality and efficiency of care. The programme has been "consistently and significantly over-subscribed" and participants report individual benefits, benefits to their NHS organisations and (while early) anticipate benefits to the wider health system (5.6). An independent scoping evaluation found that, overall, NHSDA participants had "significant impact on their confidence and digital knowledge" (5.7, p.1). One clinician explained: "[NHSDA] has resulted in a huge change to what I bring to informatics meetings. My relationship with the IT Director and senior executives, as well as my influence over the direction of travel has increased dramatically" (5.8).

The NHSDA has supported its 300+ participants to use these new digital skills and confidence in workplace projects within their NHS Trusts/Boards. One Chief Clinical Information Officer (CCIO) implemented an online consultation software in every GP practice in Devon (131 practices serving a population of 1.2 million). The project increased from 1,500 eConsults used in March 2018 (NHSDA start) to 9,500 by Dec 2018, leading to a significant reduction in GP appointments (5.9). The CCIO states: "My learning from the NHSDA has really helped Devon during the current Covid-19 pandemic as GP practices in Devon were already more advanced in their willingness to adopt and implement digital change... The NHSDA has had wide ranging impact on my ability to function as a system leader in Digital health and I literally put this into practice daily" (5.9). The Officer has since been awarded GBP500,000 through the NHS Digital Accelerator fund to extend the project, with NHSE, via the Future NHS platform, recommending this approach nationwide to rapidly respond to the Covid-19 pandemic (5.9).

A GP from London created an 'eHub' model, a virtual hub that centrally directs eConsults from 11 GP practices (5.10, 5.11). Clinicians can work flexibly from a number of locations. The GP stated: "The NHS Digital Academy learning enabled me to understand the sociotechnical

infrastructures involved, become skilled in process mapping the eHub, create a rich data source and create a continuous evaluation process to enable rapid change and evaluation” (5.10). By July 2019, the GP reported the eHub as having processed over 120,000 online consultations at a rate of over 3,000 a week (5.10). In reducing pressures for unnecessary face to face appointments, with around three-quarters of online consultations being closed off remotely (5.11), eHub freed up time for clinicians in the practices and created a route to retain GPs who would otherwise leave the NHS (5.10). The eHub model has been adopted in other areas of London (Brent and Lambeth) (5.10), with other UK Digital Accelerator sites to follow (Devon, Kent, Midlands).

5. Sources to corroborate the impact

5.1 National Advisory Group on Health Information Technology in England (2016) Making IT Work: Harnessing the Power of Health Information Technology to Improve Care in England Department of Health and Social Care: London.

https://web.archive.org/web/20210128204948/https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/550866/Wachter_Review_Accessible.pdf

5.2 Testimonial from the Chair of the National Advisory Group on Health Information Technology.

5.3 The NHS Long Term Plan, Jan 2019.

<https://web.archive.org/web/20201215223420/https://www.longtermplan.nhs.uk/wp-content/uploads/2019/08/nhs-long-term-plan-version-1.2.pdf>

5.4 National Audit Office, (2020) ‘Digital transformation in the NHS’ Department of Health & Social Care, NHS England & NHS Improvement, NHS Digital. HC317 Session 2019-2021 15 May 2020

5.5 NHS Digital Academy Application Booklet 2018/19.

<https://web.archive.org/web/20200925211200/https://www.england.nhs.uk/wp-content/uploads/2019/08/nhsda-application-booklet-v8f.pdf>

5.6 David Farrell, Harpreet Sood. (2020) The NHS Digital Academy – learning from the past to look ahead. *Future Healthcare Journal* Oct 2020, 7 (3) 185-188; DOI: 10.7861/fhj.2020-0166

5.7 NHS Digital Academy Evaluation scoping report, Institute for Employment Studies & NHS Leadership Academy, Sept 2019.

<https://web.archive.org/web/20210204100726/https://www.hee.nhs.uk/sites/default/files/documents/Evaluation%20of%20the%20Digital%20Academy%20-%20Scoping%20Report%20-%20Nov%202019.pdf>

5.8 Blog post Chief Clinical Information Officer, Poole Hospital NHS Foundation Trust, Dec 2018. <http://web.archive.org/web/20190612200823/https://digital.nhs.uk/blog/transformation-blog/2018/how-apps-and-wearables-can-support-patients-with-epilepsy>

5.9 Testimonial from Chief Clinical Information Officer, Devon Clinical Commissioning Group

5.10 Testimonial from GP who created the EHub model

5.11 Evaluation of EHub from NHS Networks. <https://www.networks.nhs.uk/nhs-networks/releasing-capacity-in-general-practice/messageboard/2-new-consultation-types/971523445/208336187/digital-first-primary-care-ehub-brent-case-study>