Introducing a nationally shared electronic patient record: Case study comparison of Scotland, England, Wales and Northern Ireland

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A B S T R A C T
Aim: To compare the experience of the four UK countries in introducing nationally accessible electronic summaries of patients’ key medical details, intended for use in emergency and unscheduled care episodes, and generate transferable lessons for other countries.
Method: Secondary analysis of data collected previously on all four schemes; cross-case comparison using a framework derived from diffusion of innovations theory.
Main findings: Whilst all four programmes shared a similar vision, they differed widely in their strategy, budget, implementation plan, approach to clinical and public engagement and approach to evaluation and learning. They also differed, for various reasons, in stakeholder alignments, the nature and extent of resistance to the programme and the rate at which records were created. A nationally shared, widely accessible electronic record has powerful symbolic meaning; it may or may not be perceived as improving the quality and safety of care or (alternatively) as threatening patient confidentiality or the traditional role of the doctor or nurse. ‘Hard’ project management oriented to achieving specific milestones and deadlines sometimes appeared counterproductive when it cut across the ‘softer’ aspects of the programmes.
Conclusion: When designing and implementing complex technologies with pervasive implications, policymakers must consider not only technical issues but also the personal, social and organisational aspects of the programme. A judicious blend of ‘hard’ and ‘soft’ management appears key to managing such programmes.

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1. Background

Most citizens, and clinicians, are positive about the idea of a secure summary of key medical details, accessible from wherever the patient seeks care [1–3]. Many European countries, and others such as Australia, USA and Canada, are currently seeking to establish such a summary [4–6]. The potential benefits of a nationally-accessible electronic record (known in the USA as health information exchange), assuming such a system to be fully secure, perfectly accurate and universally accessible, are often assumed to be self-evident [7]. Despite this, attempts to implement nationally shared summary records have often met with troubled fortunes. The United Kingdom is a unitary state containing four separate countries: England, Scotland, Wales and Northern Ireland. Between 2004 and 2008, each of these countries started to introduce their own national, centrally stored electronic summary record. There was much in common between these four schemes (for example, all were based on an extract from the record held by the patient’s National Health Service (NHS) general practitioner and accessible by authorised staff via a secure connection). But there were also significant differences between them. Of particular note is the difference in population of the four countries, which ranged from 51 million in England to 1.8 million in Northern Ireland (see Box 1).

All authors of this paper were involved in at least one of the four individual programmes (English programme – TG and JW; Scottish – LM and JW; Welsh programme – GH; Northern Irish – KG and LM); various papers have been published on these individual programmes [2,8–10,29]. This paper reports the results of a reflective reanalysis and cross-case comparison of the data collected for each individual programme. We summarise key differences and reflect on lessons learnt across the four schemes with a view to informing implementation of these and related developments in other countries. Because of differences in the level of (and budget for) research on these programmes in each of the four countries, the findings presented here are a mix of formal research findings, routinely collected data and our own reflections as people who were closely involved in implementing the programmes; they should be interpreted accordingly.

In this paper we first describe features of each of the four programmes. Regrettably but inevitably, the different contexts and priorities of the different programmes led to different types and levels of data being available on each of them, so whilst we have made every effort to compare like with like, this has not been possible in all aspects of the programmes. Second, we describe a methodology for the cross-case comparison of these programmes. Third, we present the findings of this analysis under the headings of scoping and set-up; system design; ‘hard’ and ‘soft’ aspects of implementation; approach to data quality; and approach to evaluation, monitoring and learning. Finally, we conclude that many important lessons have been learned from this exercise and recommend that those embarking on comparable programmes should take time to study the lessons reported here.

Box 1: Implementation challenges for programmes introducing a shared electronic summary record

1. Scoping and set-up:
   a. Naming and framing the programme
   b. Defining the stake holders
   c. Defining the scope and purpose of the shared record
   d. Assigning leadership roles and domains of responsibility
   e. Setting strategic direction

2. Designing the system:
   a. Deciding who will do what (including who will set the standards, build the technology, undertake testing, etc.)
   b. Defining the use case(s) and core clinical content – including what the record will be used for, what data it will contain, where it will be available, and who may access it under what circumstances
   c. Designing the underlying record architecture (e.g. coding structure) including security features and access controls
   d. Developing and testing software
   e. Designing the consent model

3. ‘Hard’ aspects of implementation, including:
   a. Project management, e.g. liaising across organisations and sectors; managing and prioritising the various interacting tasks and sub-projects
   b. Mobilising funding streams for the different sub-projects
   c. Improving and maintaining data quality in the records from which the summary will be drawn
   d. Accommodating the competing interests, priorities, values and practical constraints (e.g. budgets) of different stakeholders

4. ‘Soft’ aspects of implementation (promoting acceptance and use), including:
   a. Informing patients and answering questions from the public
   b. Engaging clinicians and encouraging active use of the record
   c. Managing concerns about privacy and data protection e.g. civil liberties lobby, professional groups

5. Evaluating, monitoring and learning
   a. Defining and measuring “success”
   b. Monitoring uptake and use
   c. Demonstrating clinical and other benefits
   d. Maintaining an over-arching narrative of coherence and progress (and in some cases, countering narratives of “failure” generated by the press or other stakeholders)
   e. Generating and incorporating organisational and system learning
2. Brief description of the four schemes

2.1. Scotland

The basic version of Scotland’s Emergency Care Summary (ECS) lists current and discontinued medication and adverse reactions. It was piloted in two Health Boards in 2004 and rolled out across Scotland by 2006. By 2011, it was connected in 100% of general practices across Scotland. A new national data store was built to host the records and pre-existing electronic links (‘e-links’) with practices were used to connect with this. Patients’ medical and demographic details are automatically updated from GP record systems twice each day. As each locality became involved, practices and patients were informed about the new system via local and national publicity campaigns, and patients were informed of their right to opt out and how to do so (by notifying their practice). Only around 2000 people (0.03% of the adult population) chose to opt out in the early months of the programme, and this proportion has not changed subsequently, despite widespread use of the system.

Scotland’s Emergency Care Summary can be accessed by staff in NHS24 (Scotland’s national telephone triage system) as well as those in Accident and Emergency Departments, Acute Receiving Units, and Out of Hours Centres. In 2011, it was made available to paramedics in Emergency Ambulances. All patients using these services are routinely asked whether the clinician may view their ECS record. More than 96% of Emergency Care Summary accesses are via secure integrated access from the user’s clinical system. Clinicians are permitted to ‘break the glass’ and access the summary record without consent if the patient is too ill or unable to consent; all emergency accesses are audited.

In Scotland, there are currently 230,000 accesses to the Emergency Care Summary every month and this number is steadily rising as new users are added, e.g. prison service, hospices, and other emergency admission units. Audit logs of all accesses are available to practices and to every user on request; these logs are also checked regularly for fraudulent accesses. Surveys suggest that clinicians working in emergency situations value the Emergency Care Summary and regard it as a key data source. It is perceived to be especially useful in the medicines reconciliation process when patients are admitted to hospital. For example, 34% of 118 clinicians in a survey of NHS24 users said that it had changed a clinical decision and at the time of submission no episodes of harm directly linked to use of the Emergency Care Summary had been reported (unpublished data). It is currently being piloted by ambulance services and emergency dental departments, and proposals have been drawn up for its use in planned clinical care such as outpatient appointments. New developments include additions of a Key Information Summary and an interface for patient access to their record.

The Emergency Care Summary programme was clinically led from the outset. The first year of the programme mainly consisted of meetings and workshops within clinical groups to build consensus about the format and clinical content. A series of patient focus groups was undertaken by the Scottish Consumer Council and their views helped inform strategic decisions. There was close liaison with the Information Commissioner, General Medical Council and professional defence societies, and each stage of work started once all were in agreement. This approach appeared to build strong clinical support for the project at all stages, and this support has persisted since. The various new developments in the programme all originated within the clinical community and had strong backing from the Scottish General Practitioners’ committee of the British Medical Association.

2.2. Northern Ireland

Northern Ireland began to introduce a very similar Emergency Care Summary to Scotland in April 2008, using an identical technology and near-identical information sources for both clinicians and the lay public. It was initially piloted in one NHS trust; Southern HSC Trust, with information being available from 50 local GP Practices and accessed by one Out of Hours Department and one Accident and Emergency Department. As in Scotland, the programme was clinically led and there was close (and largely informal) liaison with the Scottish group who had developed it. Much of the success of the programme has been attributed to the fact that the solution being adopted was already implemented nationally in Scotland and had already won the support of clinicians. The dataset in Northern Ireland was similarly restricted to demographic details, medications and allergies. Following the successful completion of the pilot, the HSC ICT Programme Board recommended that the programme be rolled out across the region. The programme is now on target for completion by end 2012 which will see data being extracted daily from all 365 GP Practices and being available for access by appropriate staff in all five Northern Ireland Out of Hours Centres, all ten Accident and Emergency Departments and at hospital pharmacy departments. The project board is also considering the possible extension of use to other professionals e.g. Ambulance Service.

2.3. England

England’s shared electronic record, the Summary Care Record (SCR), was introduced as part of the National Programme for IT (NPfIT) via a Programme Board within Connecting for Health (the IT arm of the Department of Health); a full evaluation of the early roll out phase has been published \[8,9\]. There was a detailed national implementation plan within the Department of Health and a centrally coordinated monitoring scheme. Summary Care Records were introduced in two localities (Bolton and Bury) known as ‘early adopters’ from 2007. National roll-out of the programme began in 2009. A large-scale public information programme sought to inform people about the SCR and their right to opt out. It comprised individual letters, local mass media and talks to third sector groups. This programme was locally led but had extensive input and ‘branding’ from Connecting for Health; its success in raising awareness of the Summary Care Record was limited \[10\]. Participating NHS primary care trusts were required to produce a Project Initiation Document with milestones; named staff allocated to key tasks; and a ‘benefits realisation plan’. Individual general practices were encouraged to work with the supplier
of their practice software to upload selected data fields from their surgery-based system to the central N3 Spine. England has a number of different suppliers of general practice software, only some of whom were able to develop functionality to create Summary Care Records. Some general practitioners considered the programme unethical because personal medical data were to be shared without the patient’s explicit consent, hence they refused to participate, though resistance from clinicians appeared gradually to lessen as more and more practices joined the scheme.

Use of Summary Care Records by clinicians was low in most though not all emergency and unscheduled care settings for a variety of reasons, including non-availability of records (“low hit rate”), technical glitches (e.g. slowdowns, ‘bugs’ leading to partial or complete incompatibility between software packages, temporary loss of access to Spine), low levels of training and motivation, information governance issues (such as forgotten passwords or lost clinician identity smart cards) and fear of surveillance by staff (especially junior nurses and pharmacists). Resistance from civil liberties groups and negative press coverage exacerbated the programme’s political sensitivity, which was associated in the minds of many citizens with a wider ‘surveillance state’ (e.g. it was linked to the contemporaneous but separate debate about universal ID cards [11]). Our independent evaluation report in June 2010 raised a number of concerns, including the high complexity of the programme, slow overall pace of progress, scope creep, persistent technical challenges, greater than anticipated workload for front-line staff, and whether the ambitious information governance plans were workable and sustainable [12]. By the end of August 2012, approximately 40 million of England’s 51 million population had been sent a letter about the Summary Care Record and over 18 million records had been created, with 250,000 new records created per week. While this was considerably slower than the pace of progress originally anticipated by policymakers, the programme appears to have become less politically contentious over time and the low opt-out rate (1.3%) appears to reflect higher than expected public confidence in the technology and the programme.

Whilst the National Programme for IT was formally withdrawn in late 2011 in favour of locally-developed electronic record systems, at the time of writing the SCR remains national policy and efforts continue to create one for every consenting NHS-registered citizen. However, a previously linked programme to create a patient portal (HealthSpace) for the SCR was abandoned in 2012 because of very low uptake.

2.4 Wales

The Welsh Individual Health Record (IHR) was developed with a dual vision – to merge the best of the NHS with the best that commercial systems can provide. Intentionally, there were no large procurements and the modest initial budget for the project (£4.7 million) was – again, intentionally – paid for from existing funding streams within the healthcare infrastructure. From the outset, the Individual Health Record was conceptualised as one component of a much wider work programme comprising new clinical and business processes along with new technological infrastructure and tools. The main technological elements were:

(a) a public sector broadband network whose purpose was to link organisations so as to share information securely,
(b) an email address and unique identifier for all NHS staff (this was later extended to local government),
(c) a Clinical Communications Gateway for referrals and discharges (“any to any”),
(d) the Individual Health Record described above, and
(e) a patient portal for appointment booking, prescription requests and self-management (‘My Health Online’).

The first Individual Health Records were created in May 2007 in Gwent. Progress in the early months was rapid – the prototype covering 400,000 records was delivered in six months and the consent model was broadly accepted by all key stakeholders over a similar time period. A setback occurred in November 2008 when the commercial supplier which had been contracted to deliver to two further regions in Wales and deliver the national roll out went into administration. A revised strategy was quickly developed in response to this setback, based on direct involvement of the different GP system suppliers to supply software for creating Individual Health Records directly to their GP clients. By summer 2012 nearly 65% of GP practices had gone live with the Individual Health Record – providing the IHR for over 2 million patients. Roll out to the remaining practices is continuing as part of the new GP systems framework contract which will upgrade GP practice computer systems in Wales and support centrally hosted services.

3. Method

This study was a secondary, reflective analysis of data collected by us in our roles as participants in and/or evaluators of the national shared record programmes. The dataset consisted of both quantitative data (letters sent, records uploaded, records accessed and similar metrics) and qualitative data (documents such as strategies, business plans, minutes of meetings and so on; interviews with clinicians, project managers, commercial software suppliers and service users; press articles and other material from the public sphere; academic papers and commentaries; and ethnographic field notes). These sources have been described in detail in previous papers [2,8–10].

The secondary analysis consisted of four phases. In phase one, we discussed informally our separate interpretations of the different programmes and compared and contrasted our own roles in them. In phase two, we developed the analytic framework shown in Table 1, by considering the different dimensions of the programmes and in which key aspects they were similar (or dissimilar). This phase was helped by adapting a previously developed multi-level theoretical model for considering the diffusion of complex service innovations [13]. In phase three (overlapping with phase two), we returned to the original data sources and extracted data to populate the table; these data sources were a mixture of formally collected research data and routinely collected data on various aspects
Table 1 – Comparison of the implementation of four national shared electronic record schemes in UK (reproduced with permission from MSc course materials for Global Health MSc Programme at QMUL).

<table>
<thead>
<tr>
<th>Broad aspect</th>
<th>Specific factor</th>
<th>Scotland Emergency Care Summary</th>
<th>England Summary Care Record</th>
<th>Wales Individual Health Record</th>
<th>N. Ireland Emergency Care Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>National context</td>
<td>Population ONS 2007 (% of UK)</td>
<td>5.1 million (8%)</td>
<td>51.1 million (84%)</td>
<td>3.0 million (5%)</td>
<td>1.8 million (3%)</td>
</tr>
<tr>
<td>Key geographic and demographic features</td>
<td>Some geographically remote areas. Very large public sector. High public trust in clinicians and the NHS</td>
<td>High population mobility. Mixed health economy with complex local arrangements. Low levels of public trust in government. Strong civil liberties lobby.</td>
<td></td>
<td></td>
<td>Small and geographically contained area covered by (e.g. only 5 GP out of hours centres and 11 A&amp;E departments)</td>
</tr>
<tr>
<td>Scoping and set-up</td>
<td>Scheme initiated by Clinicians</td>
<td>Government and IT industry</td>
<td>Collaboration (&quot;Team Wales&quot;)</td>
<td>Scheme initiated collaboratively Predominantly clinically led Adopt a tried and tested low-tech solution from Scotland</td>
<td></td>
</tr>
<tr>
<td>Designated leader</td>
<td>General practitioner</td>
<td>Senior civil servant</td>
<td>General Practitioner/Professional Informatician</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Programme philosophy</td>
<td>Thrifty and restrained approach, maximising use of existing systems and materials. Emphasis on simplicity and fitness for purpose.</td>
<td>Large, up-front investment to create an integrated national IT system. Emphasis on due process, formal contracts, highest security standards.</td>
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</tr>
<tr>
<td>Set-up budget Scope and purpose of shared record</td>
<td>£0.5 million Initially, emergency and non-negotiable clinical use case: emergency care</td>
<td>£200 million Initially, emergency and unscheduled care. Later, broadened to include community based services and end of life care.</td>
<td>£4.7 million Improve quality, safety and convenience of emergency care and out of hours care.</td>
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</tr>
<tr>
<td>System design issues Approach to requirements definition</td>
<td>Predominantly clinical, wide consultation focused on &quot;getting everyone on board&quot;, including early patient consultation</td>
<td>Technical expert-led 'engineering' model, includes seeking ideas and feedback from defined stakeholder groups</td>
<td>Socio-technical. Technology design should, first and foremost, enable and support front-line clinical work</td>
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</tr>
<tr>
<td>Key design principles Emergency and intuitive &quot;keep it simple and practical&quot;. Ambiguity tolerated and/or addressed in a pragmatic, common-sense way.</td>
<td>Centrally modelled based on assumption that all problems should be &quot;fixed&quot; (hence multiple committees working on solutions and producing guidance)</td>
<td>Grow a locally-relevant system within a national architecture. Create the potential for any NHS clinician to see the medical record wherever the patient is seen.</td>
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</tr>
<tr>
<td>Approach to privacy and consent</td>
<td>Seen as a pragmatic trade-off against access to data</td>
<td>Seen in absolute, technical and legal terms hence initial model was complex and confusing</td>
<td>National database rejected because of patient, clinician and public concerns about security and privacy. Pragmatic consent model similar to Scotland</td>
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</tr>
<tr>
<td>Implementation process</td>
<td>Stakeholder alignment</td>
<td>Co-evolved from the outset</td>
<td>Multiple interest groups</td>
<td>Co-evolved from outset</td>
<td>As Scotland</td>
</tr>
<tr>
<td>Change model/intended pace of progress</td>
<td>Stakeholder alignment</td>
<td>Organic, with strong emphasis on going at the pace at which stakeholders were comfortable</td>
<td>Managerial, civil service driven (&quot;PRINCE 2&quot;: tightly managed via Gantt charts with a view to &quot;realising benefits&quot;)</td>
<td>Socio-technical and responsive to contingencies e.g. procurement model was changed when one IT supplier went into administration</td>
<td>As Scotland</td>
</tr>
<tr>
<td>Approach to ensuring baseline data quality of GP record</td>
<td>Data quality of practice records was high but technical and operational challenges were encountered when practices went live with the ICS. Practices are encouraged to add medications prescribed 'elsewhere' but this aspect remains a challenge.</td>
<td>Baseline data quality was variable. Initially LES (locally enhanced service) - financial incentive and facilitation but funding for this was withdrawn in mid 2009. Smart card requirement (but low actual use of smart cards) led to inaccuracies in data quality</td>
<td>Data quality of GP records was variable but improving, driven by QOF and professional pressure. A Data Quality System (DQS, similar to LES in England) was introduced in 2007 with the aim of improving quality for electronic record initiatives referral and discharge and medicines management and the HR</td>
<td>Demographic data on GP clinical systems was considered good following implementation of unique identifiers (Health and Care numbers) to all records and Data Quality Initiative in 2004–2006.</td>
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</tr>
<tr>
<td>Actual pace of progress</td>
<td>Stakeholder alignment</td>
<td>Steady</td>
<td>Steady to begin with then static following a setback in 2008; more recently steady progress resumed</td>
<td>Steady to begin with then static following a setback in 2008; more recently steady progress resumed</td>
<td>Slow during pilot implementation and evaluation and early roll out – full roll out on target for completion by end 2012</td>
</tr>
<tr>
<td>Promoting acceptance and use</td>
<td>Approach to patient and public engagement</td>
<td>Clinicians wrote letters and led information campaigns</td>
<td>Communications Department of Connecting for Health set ‘house style’ and supported information campaign</td>
<td>Widespread clinical and public consultation. Website and leaflet give information and FAQs</td>
<td>Active communications group established led by clinicians with representation from GPs, Patient Client Council, Out of Hours staff and Trust communications staff As Scotland</td>
</tr>
<tr>
<td>Approach to clinical engagement</td>
<td>Clinicians seen as central driver</td>
<td>Clinicians seen as a hurdle to overcome</td>
<td>Clinicians were a key stakeholder group in a wider partnership</td>
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</tr>
<tr>
<td>Approach to ensuring on-going data quality of the summary record</td>
<td>Feedback to practices to encourage them to add medications prescribed ‘elsewhere’ to the ECS but this remains a challenge.</td>
<td>Technical solution: whenever someone uses a smart card, all data in relevant fields added to the record since previous upload would be added to SCR</td>
<td>Audit incentives plus training programme and engagement of clinical and professional leaders to prioritise issue of data quality</td>
<td>Some issues with accuracy of medications on ECS identified. Full regional review conducted of how medication is recorded and standards agreed. Changes to clinical systems being agreed.</td>
<td></td>
</tr>
<tr>
<td>Evaluating, monitoring and learning</td>
<td>&quot;Success&quot; defined in terms of</td>
<td>Everyone on board, accessing shared records is part of business-as-usual of unscheduled care</td>
<td>Records created; records accessed; benefits realised</td>
<td>Effective, efficient and safe system; widespread confidence in the IT; high staff morale and productivity</td>
<td>As Scotland</td>
</tr>
<tr>
<td>Official evaluation by</td>
<td></td>
<td>In-house team</td>
<td>Academics under contract</td>
<td>Local teams as part of ongoing audit</td>
<td>In house team as per ICT Programme governance arrangements</td>
</tr>
<tr>
<td>Approach to organisational/team learning</td>
<td></td>
<td>Much learning was tacit, often shared informally amongst key players identify clinical success stories and critical incidents; produce pragmatic audits which gave an overview of key indicators</td>
<td>Knowledge seen as codified facts; documented on &quot;lessons learnt&quot; spread sheets; Internal implement a &quot;benefits realisation strategy&quot; and collect examples of benefits External: commission an independent academic team to produce a report to demonstrate transparency</td>
<td>Explicit focus on a learning community and &quot;progress through partnership&quot; from the outset External international advisory group undertook public peer review on annual basis Benefits Realisation strategy and compilation of a benefits register</td>
<td>As Scotland</td>
</tr>
</tbody>
</table>

Table 1 (Continued)
of the schemes’ performance. In phase four, we discussed similarities and differences across cases so as to generate higher-order insights. The essential analytic method was cross-case comparison from an interpretivist social practice perspective (i.e. explicitly considering the personal, social and political context as well as the material properties and functionality of the technologies under scrutiny) [14].

4. Main findings

The contrasting characteristics and fortunes of the four programmes are summarised in Table 1. Whilst there were many differences between them, it is clear that – whatever the setting and the particulars of the programme – implementation of a nationally shared electronic summary record is a highly complex challenge which requires multiple overlapping tasks (Box 1). These implementation challenges were common to all four programmes, but they played out very differently because of significant differences in contextual variables. We consider each of the main tasks and relevant contextual issues in turn below.

4.1. Scoping and set-up

‘Naming and framing’ is key to implementing a technology programme with social or political significance [15,16]. People make sense of technology programmes by generating and exchanging stories about them. Through these stories, the technology acquires a shared social meaning (or, in some cases, how a truce about its contested social meaning is negotiated). In the Scottish programme, a small number of enthusiastic clinicians led the programme from the outset with minimal input from government. Early and continuing consultation with groups representing service users created a master narrative of ‘improving clinical care and assuring quality and safety’ with which the name “Emergency Care Summary” quickly became associated, and within which additions to the programme (e.g. the Palliative Care Summary, introduced later) were contextualised and worked towards. Managerial and technical expertise was supplied by key organisations holding national contracts.

In Northern Ireland a similar approach has been taken for both the technology design and adoption. The implementation was led by clinicians familiar with the programme in Scotland. The implementation and initial pilot phase also allowed time for the system to be introduced and accepted. The Minister for Health officially launched the programme in 2008. The programme was also keen to ensure that the dataset would be kept restricted (to demographics, medications and allergies) and not to be seen as introducing a full electronic care record ‘by the back door’. A very active communications group with representation from GPs, consultants, Out of Hours staff and the Northern Ireland Patient Council was established and this multi-stakeholder group developed and led the delivery of material to all stakeholders. The summary is now available in secondary care for medicines reconciliation in planned admissions.

In England, the technology was not so very different, but the ‘naming and framing’ unfolded very differently [17]. The idea of the Summary Care Record was announced in 1998 by the newly-elected Prime Minister with these words (which subsequently became widely-quoted and ridiculed by critics), “If I live in Bradford and fall ill in Birmingham then I want the doctor treating me to have access to the information he needs to treat me.” [17]. That the technology and associated vision was announced by a top politician as part of a ‘regime of hope’ [18] reflected its positioning as a component of an ambitious, government-led IT programme of unprecedented scale, involving financially costly and inflexible contracts with a handful of IT suppliers. It became associated in the minds of press and citizens with other aspects of the ‘Database state’ (notably the Blair government’s contemporaneous attempt to introduce a national ID card) [2,11]. It is perhaps for this reason that civil liberties protests were especially vocal in England. Many commentators viewed New Labour’s focus on “big IT” as a mechanism to bring about public sector reform, partly due to technology’s potential to challenge organisational inertia and prompt transformational change. For example, the Choose and Book programme for booking hospital appointments was described by Department of Health sources “as easy as booking a plane journey”.

In Wales, the ‘Informing Healthcare’ strategy had been written in 2002 by a consortium comprising clinicians and managers from NHS Wales. It was launched by the then Minister for Health so there was both a high degree of local ownership and a high degree of national political commitment. The introduction of the Individual Health Record was the first major step in the implementation of the wider Informing Healthcare strategy (in other words, the programme was a change programme underpinned by technology, not a technology programme). It was led by highly experienced clinicians and managers who also had extensive technical knowledge, leadership experience and political connections. For example, several had previously worked on the English National Programme for IT and had made a personal choice to move to devote their energies to delivering a national strategy for electronic patient records that was informed by lessons learned from both the successes and disappointments of previous initiatives. Partly as a result of their earlier experiences in England, they saw inherent risks in a strongly top-down and milestone-heavy approach which was wholly or largely procurement driven.

Despite their reservations on how the programme was implemented, the leaders of the Welsh programme were committed to the principle of clinical information being available wherever an NHS patient was being treated, and of ensuring national-level interoperability and integration as far as was technically possible. To this end, they worked to establish a broad-based partnership under the banner of ‘Informing Healthcare’ which included Welsh Government, national and local-level NHS, local authority, and the IT industry. The main strengths and distinguishing features of the Informing Health care Programme in Wales are: (a) strong national leadership; (b) extensive stakeholder involvement and engagement; (c) technical governance (via the National Architecture Design Board, NADB); (d) explicit acknowledgement of the tension between technical design and clinical need (e.g. NADB is chaired by a clinician and has equal membership of technical and clinical staff); (e) a mixed economy of technical
systems; (f) incremental development and deployment; and (g) the principle of being user-led and benefits-driven, so as to provide clinicians with something better than they already have (relative advantage). These aspects of the Welsh system are described in more detail in other sections below.

4.2. System design process

The four programmes differed strikingly in their overall approach to system design. As Table 1 shows, the Scottish team viewed the programme primarily in social terms and defined the key preliminary task in terms of “getting everyone on board”. The programme’s leaders did little else in the first year apart from building dialogue, negotiating with patient and clinician groups, and consulting with formal bodies such as the Information Commissioner and professional defence societies. Issues such as security and privacy were discussed at length, and qualitative research studies of the patient perspective were commissioned, but the solutions that emerged were pragmatic and relatively light-touch (with scope for individual judgements accommodated and based on clinical need), rather than weighed down by rigid information governance procedures.

The Emergency Care Summary programme in Northern Ireland was very similar to Scotland. Given the decision to implement the same solution as in Scotland (which was provided under Crown Copyright) much of the efforts were spent in agreeing the previously-developed patient consent model and what data would be shared. Early discussions with British Medical Association, Local Medical Committees, patient representative bodies and the Information Commissioner, whilst time consuming in the early stages, were considered to be critical to success and helped to ensure that the regional implementation was accepted.

The Summary Care Record programme in England also included early discussions with patients, clinicians and professional bodies. However here, the overall emphasis was on establishing an infrastructure within the civil service in which a series of committees and working groups were allocated particular tasks, each of which was charged with ‘fixing’ one of the programme’s numerous problems and challenges. Perhaps because of dominance of the ‘civil service logic’, issues such as security and privacy were constructed in absolute and predominantly legalistic terms. Solutions were correspondingly technology- and procedure-focused and perceived by many of the programme’s participants as bureaucratic. Under the Labour administration which lasted from 1997 to 2010, there was a strong belief in the positive benefits of management consultancy [19]. The civil service sought to commission management consultants to help implement change, and the NPfIT in England aligned with this strategy by procuring short-term consultancy to help develop the Summary Care Record programme. These management consultants typically brought generic project management skills but had little or no previous experience in the NHS.

In Wales, the idea of a centrally-held summary (stored on the Spine) was rejected at an early stage on design grounds. The Individual Health Record technology therefore differs from other shared electronic record systems in the UK in that it is not a summary at all. Rather, it is a full extract from

the patient’s GP-held record with certain “sensitive” fields (notably for sexual health and some mental health) obscured. The core design principle for this technology was to create a mixed economy of ICT systems that made the best use of existing NHS systems and the skills of established NHS staff, and combining this with the “best of breed” from the commercial sector. The challenge of interoperability would be addressed by stipulating compliance with the national architecture and standards. Another key difference was how the consent model for access to a patient’s record was developed. This model was based on the following principles: (a) The key task was seen as solving real world problems in a specific care setting (rather than, for example, becoming tangled up in a philosophical debate about privacy); (b) clinicians were seen as professional people who, if they could be trusted to provide patient care, could also be trusted to share information responsibly; (c) the key policies and principles that were needed to deal with professional conduct around information sharing were seen as already existing (for example, in professional codes of practice) rather than needing to be developed de novo; (d) a complicated role-based access and control model built into the software was seen as unnecessary; (e) it was acknowledged that human error or malice was likely to occur somewhere in the system, so strong audit processes would be put in place to identify those who had accessed patient records and provide this information to patients if requested; and (f) the principles of the consent model were seen as being developed and owned by the professional bodies (British Medical Association, Royal College of Nursing), practising clinicians, patient representatives (Community Health Councils) and the Information Commissioner, rather than by technologists and managers.

4.3. ‘Hard’ aspects of implementation

Electronic records, especially when introduced nationwide, have multiple stakeholders including policymakers, clinicians, patients, commercial IT companies, potential users of secondary data and civil liberties groups [14]. Each stakeholder brings different interests, goals and values to the negotiating table, and people often feel strongly about particular issues either individually or on behalf of the organisation or social group they represent. For this reason, ‘implementation’ is not a politically neutral project management exercise but is steeped in contested meanings and conflicting narratives of power and control [9]. One way of conceptualising the complexities of such programmes is to consider the extent to which the various people (clinicians, project managers, service users, civil servants technical suppliers, civil liberties protesters, press and so on) and technologies (nationally shared record, local record, supporting infrastructure, availability of local terminals and so on) involved are aligned in a more-or-less stable socio-technical network [20]. This network may be destabilised if, for example, a major supplier pulls out of a contract, a security breach story emerges in the press or a new regulatory ruling (e.g. by the Information Commissioner) is made, since these events have knock-on effects on the wider network.

In Scotland, one of the major primary care system suppliers was part-owned by the Scottish Government and deployed
in 80% of practices. This somewhat circumstantial alignment of interests meant that development for this system was prioritised and proceeded rapidly. Other suppliers working in Scotland had to fall in with the requirements for Scottish Enhanced Functionality, which included the ability to export data to the Emergency Care Summary. At the time, the informatics community had strong links with the Scottish General Practitioners Committee of the British Medical Association, the Royal College of General Practitioners, nursing networks and patient groups. The atmosphere was one of cooperation and improvements to patient care. Another largely circumstantial realignment which helped create a supportive context for the Emergency Care Summary implementation was the new GP contract, which devolved responsibility for out of hours care to Health Boards and away from individual GP practices.

Northern Ireland’s implementation of the Emergency Care Summary required the development of an interface with the clinical systems in use in general practices. Unfortunately Northern Ireland did not use the system used by the majority of practices in Scotland and was in a weaker negotiating position with commercial suppliers because of its smaller size. Northern Ireland did replace existing contracts with its four primary care system suppliers in 2009, making the requirements for the Emergency Care Summary system mandatory. Northern Ireland used the same out of hours computer system as Scotland, so was able to benefit from this development.

In England, the key socio-technical alignments required for smooth implementation were very different and, many would argue, unstable or non-existent. For example, Connecting for Health was tied into very large, legally binding contracts with major IT suppliers, in which small changes to specification came with large price tags, making the programme cumbersome and inflexible. Professional bodies such as the various Royal Colleges and the British Medical Association aligned rather awkwardly with these players, perhaps because they struggled with the trade-off between risks and benefits of nationally shared records. Clinical engagement and fit to NHS requirements and workflow at the outset was considered by many to be poor, because of a strong technology focus. Whilst these improved somewhat as the programme unfolded, this occurred too late in its life cycle to influence pre-existing contracts. The government was unpopular and a general election was looming.

In Wales, the national agency Informing Healthcare made an early strategic decision to build the single electronic record incrementally via what was described as a “national programme for local implementation”. The strategy was to work with local NHS organisations on a region by region basis, seeking to avoid disruptive, unaffordable and (they felt) unnecessary ‘rip and replace’ approaches; and learning lessons at each stage. The strategy was introduced with what the chief executive of Informing Healthcare described as “no arbitrarily dictated timescales” so that progress could follow the pace of technical development and clinical and public engagement. Importantly, ‘incremental’ in this context was defined as ‘small’ rather than ‘slow’: the aim was to take tightly-scoped but rapid steps, with the initial Individual Health Record prototype being delivered locally in 6 months at a cost of under £1 per patient.

4.4. ‘Soft’ aspects of implementation

Research on diffusion of technology-based innovations shows that their uptake depends to a large extent on their attributes – such as whether potential adopters perceive them as useful and easy to use; whether benefits are rapidly seen; whether they can be implemented with minimal infrastructure; whether they can be tried out with minimum investment; whether the mechanisms that generates benefits are clear to users; and whether they are customisable to local circumstances (‘potential for reinvention’) [21,22]. Even the simplest nationally shared electronic record is in reality technically very complex (the more so as more functions and security features are added). In addition, such records inevitably come with, or presuppose, a complex supporting infrastructure – including the ‘locked down’ computing environments of the typical NHS organisation. The impacts of shared electronic records typically occur at some distance in time and place from the people who undertake the initial implementation work [23,24]. One computer science academic observed that in relation to IT programmes, “One can (with difficulty) achieve any two of (a) high security, (b) sophisticated functionality, and (c) great scale – but achieving all three is currently (and may well remain) beyond the state of the art.” (page 230) [25]. Scotland’s experience with the modest functionality of the early Emergency Care Summary suggests that clinicians may be happy to compromise on these competing ideals if there is significant benefit to patient care, service delivery or more efficient use of time.

The vast scale of the Summary Care Record programme in England created multiple interdependencies and logistical challenges. Some stakeholders perceived substantial scope creep as central committees chose to add new functionality and potential use cases, partly in an attempt to increase use of the technology and demonstrate its benefits. Initial plans for the consent model were complicated and unwieldy. The British Medical Association came out in strong opposition to the ‘implied consent’ model.

In contrast, Scotland’s Emergency Care Summary team adopted a highly pragmatic approach of “keep it simple”: they resisted efforts by stakeholders to extend the content and scope of the new technology; all stakeholders (clinicians, patients, technical designers, policymakers) agreed in broad terms what the record was for (emergency care), what it would contain (drugs and allergies) and who would use it (clinicians delivering emergency and unscheduled care). A two-stage consent model (initial implied consent for data upload, followed by explicit consent to view) was proposed and gained the support of all key stakeholders. Consent to view at the point of care has been perceived by staff as simple and easy to administer and been incorporated into their workflow with no major problems. Initial concerns from secondary care clinicians that this consent model would be unworkable proved unfounded. Indeed, the question “Are you happy to give permission to all clinicians looking after you to have access to your GP records?” appears to have driven a change in culture by encouraging clinicians to involve patients in decisions about who may access their record, and to respect their views on this issue.
Northern Ireland adopted the same approach as in Scotland with a view “If it is already working; why change it?”. The dataset remains restricted and it is noteworthy that participating GPs insisted from the outset that there would be no extension of the minimal dataset (which is seen as providing sufficient information in almost all cases) without a full consultation. Perhaps because of this clear containment of scope, Northern Irish general practitioners have been very supportive of the initiative. The consent model from Scotland was also shared with all stakeholders and was agreed. Northern Ireland is exploring the possibility of taking up Scotland’s Palliative Care Summary when implementation of ECS is completed.

In Wales, the leaders of the programme began with a conviction that the complexities of implementing ICT at scale cannot be managed centrally. They felt that creating the necessary “social architecture” at both local and national level was just as important as developing the technical architecture. For example, the difficulties that England had faced in gaining and maintaining the trust of patients, the public and clinicians led the leaders of the Welsh programme to reject the idea of a single large database (the Spine) containing all patient records. Development of the consent model in Wales was seen as an essentially social challenge, not a technological one; this work package had a high degree of professional and patient involvement and ownership and also benefitted from studying what could be learned from Scotland’s success.

4.5. Data quality

A key feature of any electronic record is the quality and completeness of data it holds. This is important both from an absolute perspective (a missed penicillin allergy or out-of-date medication list might have life-threatening implications) but also because if the records are widely perceived to contain inaccurate or unreliable data, clinicians will be reluctant to access them or act on the information they provide. There is a tendency for greater reliance to be placed on computer-held data (such as medication lists) rather than equivalent data in manual form (e.g. a handwritten letter or plastic bag of medication), particularly by junior staff who may lack experience in questioning the provenance and accuracy of medical records. This tendency is called automation bias [26].

A warning screen on the initial page of Scotland’s Emergency Care Summary advises caution when interpreting the medication list, as it may not include drugs prescribed in the last few hours, prescriptions which were handwritten on home visits or prescribed elsewhere (e.g. in a hospital, drug clinic or mental health clinic). Early feedback from users of the Emergency Care Summary identified ‘medication prescribed elsewhere’ as a significant problem, so GP practices were encouraged routinely to add such medications manually so they would be uploaded onto the central summary. General practice electronic record systems are all able to record a field ‘medications prescribed elsewhere’ but this is time consuming and can add significant workload; particularly when patients are discharged from hospital on multiple medications, hence a change in culture was needed. Recent evaluations of the Emergency Care Summary show that this issue remains significant and has only partly been addressed (unpublished data).

Whereas Scotland’s and Northern Ireland’s Emergency Care Summary is automatically updated twice daily, England’s Summary Care Record is updated only when the general practice clinician inserts their identifying smart card. If the clinician logs on without his or her smart card, the record is not updated with the latest medication or other data. This means that significant medication changes can sometimes fail to be uploaded to the Summary Care Record, for example when lucums (who may not have a smart card) prescribe medication, or when a regular clinician’s card is forgotten or fails to “work”.

In the Welsh system, the quality of GP record data was variable but improving, driven by the Quality and Outcomes Framework (QOF – a national financial incentive to record certain key data in agreed fields) and peer pressure among professionals. A financial incentive scheme, the Data Quality System (DQS, similar to the locally enhanced service or LES in England) was introduced in 2007 with the aim of improving data quality on electronic records; referral and discharge; medicines management and the Individual Health Record.

4.6. Evaluating, monitoring and learning

The approach to evaluation and monitoring differed substantially across the four programmes. In England, there was political pressure on Primary Care Trusts and Strategic Health Authorities to demonstrate “benefits realisation”. When benefits were not as evident as policymakers had anticipated, enthusiasm waned significantly. This illustrates the perils of a ‘technological determinism’ approach (assuming that the technology itself will cause the benefits), since when any system implementation is linked to a required “benefits realisation” strategy, participants may tend to look for these benefits once the technology goes live rather than taking active steps to achieve them (e.g. by actively trying to promote and support use of the technology). Our cautious approach to ‘benefits realisation’ is not to deny the need for an evaluation plan to help ensure that the system is accepted, actually used and that usage has the desired impact [27].

Somewhat negative press coverage tended to portray the NPfIT on the whole as inefficient and monolithic, and the Summary Care Record programme as ill-conceived and unethical, because civil liberties campaigners had contested the ‘implied consent’ model. The Communications Department of Connecting for Health managed press releases about the NPfIT and monitored and responded promptly to all press coverage. The Summary Care Record programme was the subject of a formal, independent evaluation which was commissioned by competitive tender at a cost of almost £1 million; the 235-page academic report was “welcomed” by Connecting for Health but its key message, that the SCR programme was characterised by unwieldy political and technical complexities which stacked the odds against its smooth implementation, was not easily actioned. The official evaluation report was submitted just before the 2010 general election; the new Conservative government quickly commissioned two smaller inquiries into the consent model and the clinical content of the SCR. On the basis of these, the Department of Health stipulated a more limited clinical content similar to the Emergency Care Summary in Scotland and a modified consent procedure. This
change, whose impact on uptake rates appeared to be showing an upward trend as this paper was submitted, appeared to result in a more acceptable technology with a simplified content and consent model and to have reduced the controversies surrounding it sufficiently to allow slow but steady uptake, though no information on its actual use was available to us.

In Scotland, there was no official independent evaluation (no budget had been allocated) – partly because the programme was less politicised and civil liberties protests less prominent, so neither politicians nor the public were asking for one. Feedback from users of the Emergency Care Summary was gathered as part of a small-scale in-house evaluation; it was apparent from this that the system had quickly become part of ‘business as usual’ and a proposal for a randomised trial (in which some localities would have access to the Emergency Care Summary but others would not) was deemed unethical. Ongoing collection of staff reports has produced many anecdotal stories of improvements in patient care and perceived time saving, but because of the pragmatic study design it is difficult to attribute these perceived improvements solely to the use of the Emergency Care Summary. Feedback from pharmacists who use the Emergency Care Summary for medicines reconciliation in unscheduled admissions has been positive (unpublished data). Press coverage of the introduction of the Emergency Care Summary was limited, but in one incident widely reported in the national news, a hospital doctor looked at records of celebrities and colleagues, a breach which was rapidly picked up via routine audit procedures. A decision was made not to respond formally to the press stories on this incident, on the grounds that there was no control over what would be printed. As it turned out, publicity from this incident raised public awareness in a positive way by highlighting how rapidly the breach was detected.

In Northern Ireland an in-house evaluation of the pilot implementation in the Southern Trust was completed in 2009, in line with programme governance arrangements. This concluded that the system had met the objectives of collating and making available medications and allergy information to staff with appropriate access controls, although there were concerns about the low usage of the application. Much of this was based on the fact that with only some general practices participating in the pilot, the hit rate was low and it was time consuming for clinicians to check whether the record was available. The HSC ICT Programme endorsed the regional implementation of the programme but asked for monitoring of the usage of the system. There are currently approximately 1100 accesses to the ECS per week by staff at Out of Hours Departments, Accident and Emergency Departments and hospital pharmacy. The project board are content with the steady increase and has allowed the system to be embedded to existing work practices and used where necessary without stipulating the nature of this use.

In Wales, the programme’s organisers emphasised recognising and responding to the inherent conflicts between professionals, organisations, priorities and political reality for delivering a major IT programme when financial resources are limited. Attention was paid to communication and stakeholder engagement – e.g. via regular meetings with local leaders and presentations to chief executives and their boards.

Nationally funded but locally based Informing Healthcare (IHC) project managers were appointed and trained as ambassadors and facilitators for the scheme. Significant stakeholder commitment was built by running problem-solving, topic-based events (the first and longest lasted five days) involving a range of stakeholders including clinicians, ICT professionals, chief executives, Ministers, government officials and patient representatives in real-time decision-making about requirements and technical design that the Informing Healthcare programme would commit to acting on. This created a sense of common purpose, credibility and trust: the national ICT Programme was perceived to be genuinely owned and driven by its key stakeholders.

Whilst a formal independent evaluation of the Welsh programme was not commissioned, the Informing Healthcare International Advisory Group (whose members were drawn from USA, Canada, New Zealand, Denmark, Finland, Netherlands, Republic of Ireland, Scotland and England) met annually to undertake a public peer review of the programme. This peer review was held in a culture of openness: ICT suppliers and the national and local media were invited to participate. This had a number of benefits (a) it provided independent external benchmarking of the programme’s progress; (b) it identified areas where Wales was at the forefront of international developments; (c) it also identified lessons that Wales could learn from the experience of others; (d) its recommendations were implemented via agreed action plans which were publicly reported and reviewed by subsequent advisory group conferences; and (e) it placed the Welsh ICT programme in an international context rather than simply comparing it with the English equivalent. This last feature helped considerably to counter the bad press about the perceived failure of England’s NPfIT (and also the implied adverse implications of this ‘failure’ for the credibility all national ICT programmes). This positioning was extremely important and valuable in maintaining the strong and consistent Ministerial support of the Welsh Government, working NHS clinicians and technical and managerial staff.

5. Conclusions

This secondary data analysis has demonstrated the added value of reflecting collectively on the successes and disappointments across the shared electronic record programmes in the four UK countries. We hope that the lessons described above will also resonate outside the UK to countries such as the USA, which are just beginning to implement regional and national electronic records [28].

The very different fortunes of the four programmes were only partly explained by differences in the technologies. At least as significant were the widely differing histories of the programmes, their different stakeholder alignments, the order of magnitude difference in scale (making logistics and stakeholder engagement considerably easier in some countries than others) and the different logics that drove decision-making and collective action. The findings have underlined the need to take a socio-technical perspective when considering how and to what extent a national eHealth programme has been a “success” [14].

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Summary points

What is already known about this topic

- Technology programmes have personal, organisational and social dimensions
- Many countries are in the process of introducing a nationally shared electronic record or summary record; few have yet achieved this goal.
- England, Scotland, Wales and Northern Ireland each began a programme to introduce such a record between 2004 and 2008.

What this study adds

- Efforts to introduce a similar (but not identical) shared record technologies met with very different fortunes in the four UK countries.
- Many of the differences were explained by personal, organisational and socio-political factors and the interplay of these factors.
- The most evident disappointments appeared to be explained by a ‘techno-bureaucratic’ approach in which ‘hard’ aspects of the programme (technology and project milestones) were privileged over ‘soft’ aspects (buy-in, stakeholder consensus, the symbolic significance of the new technology and concerns about ethics or civil liberties).

Author contributions

All authors contributed to analysing the data, drafting the manuscript and checking the final version of the paper.

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Competing interests

The authors’ interests in the different technologies and programmes are set out in the paper. In brief, TG evaluated the English programme; LM was involved in delivering the Scottish and Northern Irish programmes; JW was involved in delivering the Scottish programme and GT was involved in delivering the Welsh programme. No authors have personal financial interests in the technologies described.

REFERENCES