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RE28: Optimising emergency and out-of-hours services - the
impact of the nationally shared emergency care summary in
Scotland

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Introduction

NHS Scotland's Emergency Care Summary (ECS) provides essential clinical and demographic information for patients who need care in unscheduled or emergency care situations. Data about patients' medications, adverse drug reactions and allergies are transferred securely twice everyday from GP systems to ECS. It is then available to authorised healthcare professionals at NHS24, Out of Hours (OOH) services and accident and emergency (A&E) departments.

Engagement and consultations on ECS development started in 2002. Initial pilots launched in 2004 preceded an incremental rollout across Scotland that started with OOH centres, and then NHS24 and A&E departments during 2006 and 2007. The main impact of ECS is from 2007, when large-scale access to NHS24 became available. NHS24 is the biggest user, at about 70% of all ECS accesses.

Clinical information from ECS enables better and safer services for patients who use NHS24, OOH and A&E, especially if they are ill, confused, or cannot remember their clinical details. About 5.1 million people live in Scotland, and about 1.3 million, approximately 25%, have live medication information in ECS.

Interoperability standards reflect the nature and context of the ICT applications; agreements among users and industry; clarity on the results needed; testing and certification; and legal and regulatory compliance. Effective stakeholder engagement and confirmations gained from Information Governance leads and the Information Commissioner for Scotland were essential to set standards for ECS. The Data Protection Act provides the main legal requirement for access to Health Records in Scotland

ECS uses effective interoperability between GP systems and the systems at NHS24, OOH and several A&E departments in hospitals throughout Scotland. The interoperability of ECS with user systems is a key factor in the successful uptake and use of the system. Information transfer uses the secure national NHS N3 Broadband network to enable fast, secure access to ECS.

Codes are not particularly important for ECS. Most of the data is mainly a structured free text view at the interfaces with the GP systems. ECS synchronises with these but does not check or change information transferred; it displays the data from the GP system exactly as extracted.

ECS achieves interoperability across Scotland through policy and implementation activities at four generic levels; the health care setting; organisation of healthcare providers; semantics; and technical and functional aspects. It maximises existing technology tools and systems across NHS Scotland, such as:

- The CHI number (Community Health Index) as a unique patient identifier

- Existing SCI Store software develop the central national ECS store
- Existing data transport software, eLinks, to collect ECS files from GP systems and transport them to the central system
- GP practice systems to generate and maintain files of patient ECS information using the Scottish Enhanced Functionality (SEF) framework.

ECS is a Microsoft SQL Server database with several plug-ins developed as Web applications using Active Server Pages and Visual Basic scripts. Features include:

- System-to-system integration for Adastra and Taycare at OOH and the patient relationship management (PRM) software used by NHS24
- Integration with A&E systems
- Web access for audit at A&E, OOH and health boards' system administration.

In response to public and clinician concerns about security and confidentiality, ECS ensures that there is:

- An explicit opt out option for patients at any time
- Explicit patient authorisation for ECS users to access patient records
- Regular reviews of users and access by GP practices, health boards and the national ECS team
- Authorisation protocols when validated patient carers, such as parents or descendants, are involved in telephone calls
- Strict user access protocols, authorisation, password control and reporting
- Read only access to patient information on ECS
- Use of the NHS N3 secure broadband and encrypted eLinks to transport data files
- GP practice systems developed to generate and update patient information in ECS using the SEF framework
- Web Services technology facilitates security and confidentiality by using certification and authentication protocols.

NHS24, OOH and A&E staff must have explicit patient consent before accessing patient information. This is in addition to the implicit, informed consent patients provide to transfer their information from their GP to ECS. These consents reflect different ethical and operational requirements compared to paper-based systems where patients can face the same questions several times.

In August and September 2006, every household received a leaflet describing ECS¹ explaining that patients have to give permission before any clinician can view their data in ECS and that citizens have the right to opt out of ECS at any time by notifying their GP. The opt-out rate is very low; about 0.02%.

GPs agreed that clinical information in ECS is accessible only by clinicians providing NHS24, OOH or A&E services. This assures GPs, the public and healthcare professionals generally that the design and operation of the informatics, interoperability and information management complies with ethical and legal requirements.

Methodology

¹ www.scotland.gov.uk/Publications/2006/08/16152132/0

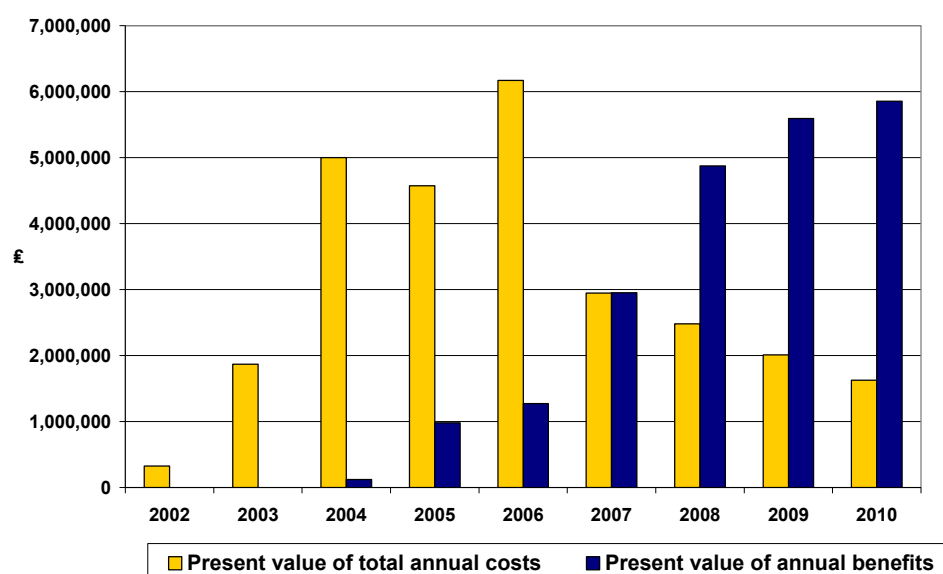
ECS evaluation is part of the European Commission's EHR Interoperability (EHRI) study². The methodology identifies, measures and estimates values of costs and benefits for each type of stakeholder. All values are at estimated 2008 prices in UK sterling and adjusted to a present value, giving the total estimated value of costs and benefits, and so net benefits, over an estimated ECS life-cycle.

Economic costs and benefits have three financial characteristics: extra finance, finance redeployed or non-financial. Assigning each cost and benefit to one of these categories provides a financial perspective, especially a net financial impact over time. Economic and financial analyses have different distributions between the types of stakeholders. These help to identify challenges and barriers for sustainable benefits.

Results

Chart 1 shows that the EHRI study³ identified the first net benefit realised after about seven years.

Chart 1 – NHS Scotland Emergency Care Summary – Estimated Annual Socio-economic Impact



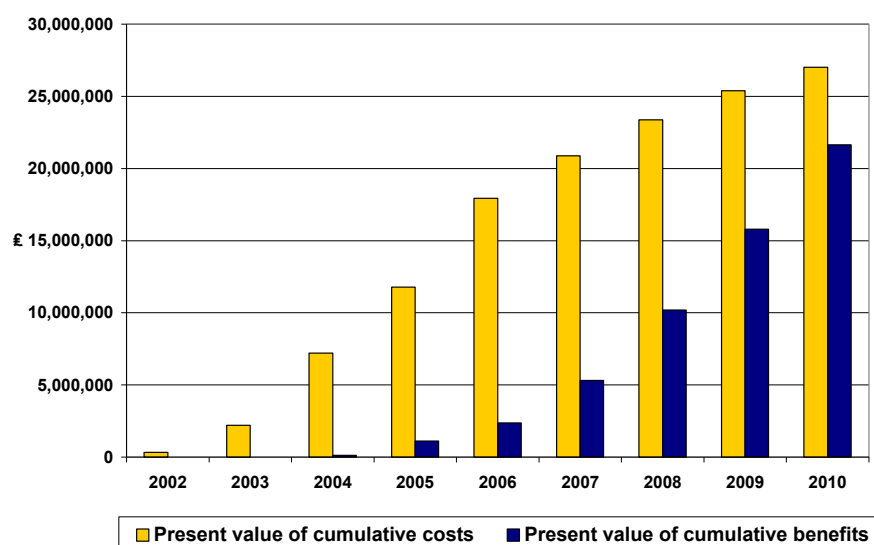
The timescale was determined by the time needed for effective engagement. High spending in 2006 was due to the cost of writing to each household to explain the ECS changes. Increasing benefits reflect the step-by-step implementation and the investment timescales needed for effective engagement with healthcare professionals.

Chart 2 shows the cumulative effect. By 2010, after nine years, the ECS is heading towards a net benefit, and expected by 2012; consistent with three years of large, stable estimated annual net benefits from 2008 to 2010 as ECS utilisation approaches its peak.

² Study on the economic impact of interoperable electronic health records and ePrescription in Europe
Directorate General Information Society and Media European Commission 2008 www.ehr-impact.eu

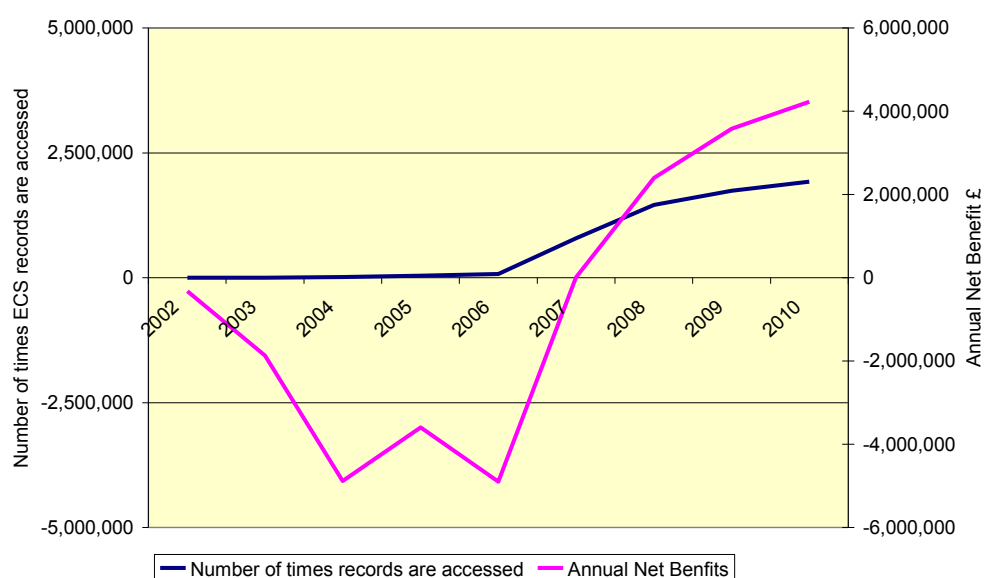
³ Study on the economic impact of interoperable electronic health records and ePrescription in Europe
Directorate General Information Society and Media European Commission 2008 www.ehr-impact.eu

Chart 2 – NHS Scotland Emergency Care Summary – Estimated Cumulative Socio-economic Impact



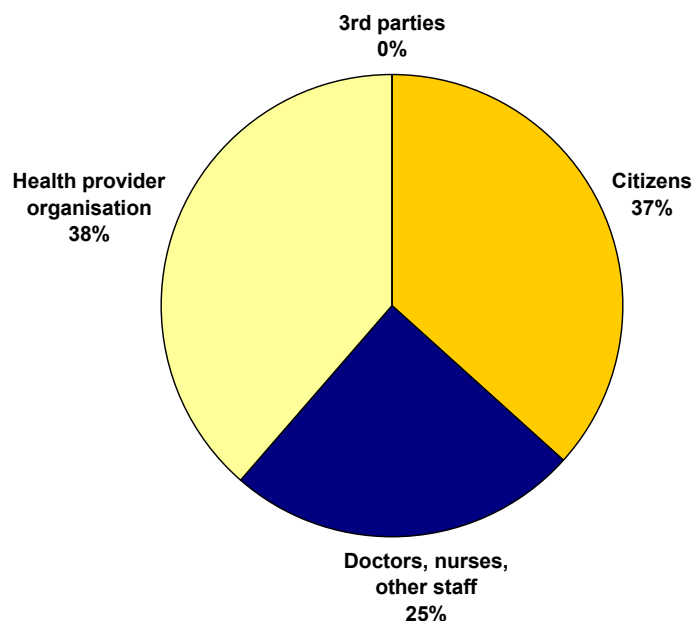
The net benefits slope follows the utilisation curve closely, as shown in Chart 3. As ECS implementation and utilisation expand from 2006, estimated cumulative net benefits rise from the negative side of the X-axis to the positive. This direct, leading relationship of utilisation with net benefits is a common feature of successful eHealth investment.

Chart 3 – NHS Scotland Emergency Care Summary – Comparison of Estimated Cumulative Net Benefits and ECS Utilisation



Citizens and the health boards are the main ECS beneficiaries, roughly in similar proportions approaching 40% each. Healthcare professionals have about 25%. Citizen benefits are from improved performances of NHS24 and OOH services established before ECS was available. Chart 4 shows the position.

Chart 4 – NHS Scotland Emergency Care Summary – Estimated Distribution of Socio-economic Benefits



Improved patient safety was a planned benefit. It is about one third of all estimated benefits. NHS24 and OOH arrangements were in place before ECS implementation, so benefits derive from supporting the NHS24 and OOH services, not enabling them.

Healthcare professionals want similar information for other services. The latest NHS Scotland eHealth strategy for 2008 to 2011⁴ reflects this with a national electronic health record by building from the ECS successes in using existing technology, engagement, interoperability, implementation and benefits realisation.

Chart 5 shows that the ECS needed extra finance for about 21% of its total costs. Chart 6 shows that ECS does not generate extra finance. The net result shows that ECS needs extra cash to invest in patient safety and effectiveness, not in liberating cash.

Chart 5 – NHS Scotland Emergency Care Summary – Estimated Distribution of Financial Costs

⁴ *eHealth Strategy 2008 – 2011 NHS Scotland 2008*

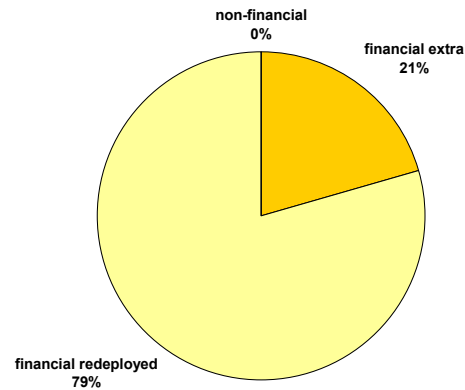
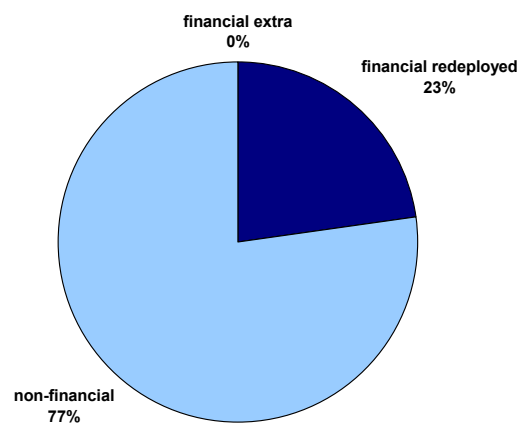


Chart 6 – NHS Scotland Emergency Care Summary – Estimated Distribution of Financial Benefits



Discussion

Taking seven years to realise annual net benefits from ECS is consistent with the need to complete successfully the complex engagement needed with healthcare professionals. The sustained build-up of utilisation from year five of the system reflects the step-by-step implementation policy.

Benefits are realised from quality gains, such as patient safety and more effective health care, not from extra income. Consequently, social net benefits justify ECS investment.

Conclusions

ECS sustainability is evident from the rising, positive gap between annual benefits and costs since 2008. The main challenge was setting ECS into patients'

consultations with NHS24, OOH and A&E services. Step by-step implementation may seem to extend the time needed to realise net benefits, but it helps to reduce the enormous risks of eHealth. It is also true for effective engagement with healthcare professionals. Both helped to achieve an intimate knowledge of users' and organisations' needs; clarity about functionality, usability and links to benefits; and a viable, financed business case for all stakeholders. These are essential to realise the benefits from ECS.