

► An economic analysis of the national shared emergency care summary in Scotland

Tom Jones*, Alexander Dobrev†, Jonathan Cameron‡, Libby Morris§, Karl A Stroetmann† and Veli N Stroetmann†

*Tanjent Consultancy, Hereford, UK; †Empirica Communication & Technology Research, Bonn, Germany; ‡National Information Services Group, National Services Scotland, Edinburgh, UK; §Scottish Clinical Information Management in Primary Care, Edinburgh, UK

Summary

The Emergency Care Summary (ECS) in Scotland provides essential clinical and demographic information about patients needing unscheduled or emergency care. Information about patients' medications, adverse drug reactions and allergies is transferred twice every day from GP systems to the ECS. Access is then available to authorised health-care professionals at the national help line, at out-of-hours services and in accident and emergency departments. An economic analysis of the ECS implementation showed that annual benefits exceeded annual costs after about seven years. Approximately 77% of the benefits were non-financial and 23% from redeployed finance. No cash savings were planned and none were realised. As ECS utilisation increased from 2006, the net benefits became positive. This relationship between utilisation and net benefits is a common feature of successful e-health investment.

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. Information about patients' medications, adverse drug reactions and allergies is transferred twice every day from GP systems to the ECS. The information is then available to authorised health-care professionals at the national help line (NHS24), out-of-hours (OOH) services and accident and emergency (A&E) departments.

Development of the ECS started in 2002. Initial pilot trials in 2004 preceded the rollout across Scotland which started with OOH centres, and then NHS24 and A&E departments during 2006 and 2007. The main impact of the ECS was from 2007, when large-scale access to NHS24 became available. NHS24 is the biggest user, responsible for approximately 70% of all ECS accesses.¹

Clinical information from the ECS enables better and safer services for patients who use NHS24, OOH and A&E services, 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 the ECS.

The ECS depends on interoperability between GP systems and the systems at NHS24, OOH services and several A&E

departments in hospitals throughout Scotland. This interoperability was a key factor in the development of the ECS. Codes are not particularly important for ECS and most of the data is in the form of free text. The ECS displays data from the GP systems exactly as extracted.

The ECS depends on existing tools and systems across NHS Scotland, such as:

- The CHI number (Community Health Index), a unique patient identifier;
- SCI Store software which was used to develop the ECS Store;
- Data transport software, eLinks, to collect ECS files from GP systems;
- GP practice systems to generate and maintain files of patient ECS information using the Scottish Enhanced Functionality (SEF) framework.

The ECS is a Microsoft SQL Server database with several plug-ins developed as web applications using Active Server Pages and Visual Basic scripts. This allows integration with software used by NHS24, integration with A&E systems and web access for audit and system administration.

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

- An explicit opt out option for patients at any time;
- Explicit patient authorisation for ECS users to access patient records;

Correspondence: Tom Jones, 10 Gruneisen Street, Hereford, HR4 0DX, UK (Fax: +44 1432 268 100; Email: tomjones@tanjent.co.uk)

- Regular review 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 in the ECS;
- Use of the NHS secure network to transport data files;
- Generation and maintenance of patient information using the SEF framework;
- Certification and authentication protocols to facilitate security and confidentiality.

In August and September 2006, every household in Scotland received a leaflet describing the ECS² explaining that patients have to give permission before any clinician can view their data in the ECS and that anyone has the right to opt out of the ECS at any time by notifying their GP. In practice, the opt-out rate has been very low, at about 0.02%.

The GPs agreed that clinical information in the ECS would be accessible only by clinicians who were providing NHS24, OOH or A&E services. This assured GPs, the public and health-care professionals generally that the design and operation of the system complied with appropriate ethical and legal requirements.

Methods

An evaluation of the ECS was part of the European Commission’s EHR Interoperability (EHRI) study.³ Costs and benefits were identified, and measured or estimated for each type of stakeholder. All values were at 2008 prices in UK sterling and adjusted to a present value.

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

The main benefits of the ECS were improved patient safety, which was the main strategic objective, and reduced exposure to risk. There were also time-savings. The EHRI study³ estimated that the first net benefit (i.e. the annual benefit exceeded the annual cost) occurred after about seven years (Figure 1). The high spending in 2006 was due to the cost of writing to each household to explain the ECS

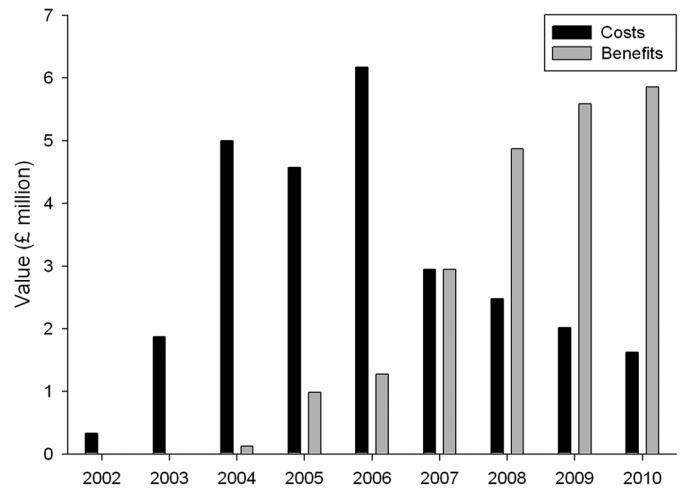


Figure 1 Estimated annual costs and benefits

proposals. The increasing benefits reflect the step-by-step implementation needed for effective engagement with health-care professionals.

In terms of the cumulative effect, the cumulative benefits of the ECS will have outweighed the cumulative costs by 2010 (see Figure 2). The net benefits follow the utilisation curve closely (Figure 3). As ECS utilisation increased from 2006, the net benefits became positive. This relationship between utilisation and net benefits is a common feature of successful e-health investment.³

The main beneficiaries of the ECS are the Scottish population and the NHS Health Boards, in roughly similar proportions of approximately 40% each; the remainder of the benefit accrues to health-care professionals. The benefits to the population stem from improved performance of NHS24 and OOH services established before ECS was available. Improved patient safety was a planned benefit. It represents about one-third of all estimated benefits.

The ECS has been an undoubted success and health-care professionals want similar information for other services. The latest NHS Scotland e-health strategy⁴ reflects this, with

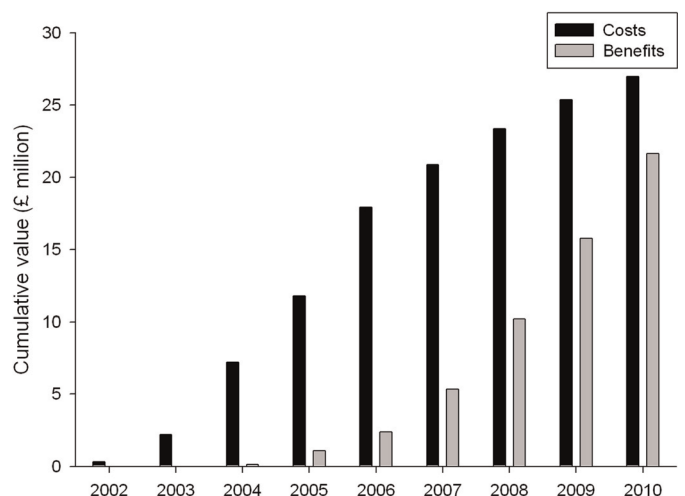


Figure 2 Cumulative costs and benefits

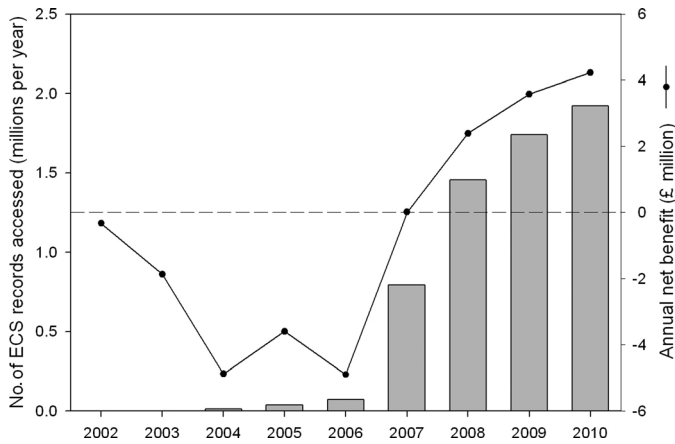


Figure 3 ECS utilisation and net annual benefits

plans for a national electronic health record which would be built on the success of the ECS using existing technology.

The ECS needed extra finance for about 21% of its total costs.

Discussion

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Taking seven years to realise a cumulative benefit from the ECS is consistent with the complex engagement needed

with health-care 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, it is the social net benefits which justify investment in the ECS.

The sustainability of the ECS is evident from the rising, positive gap between annual benefits and costs since 2008. The step by-step implementation may have extended the time required to realise net benefits, but it helped to reduce the enormous risks of e-health. It also assisted with effective engagement of health-care professionals. Both helped to achieve an intimate knowledge of users' and organisations' needs, clarity about functionality, usability and links to benefits, and a viable business case for all stakeholders. These were essential to realising the full benefits of the ECS.

References

- 1 Empirica. *Study on Economic Impact of e-Health*. See <http://www.ehealth-impact.org/> (last checked 3 January 2009)
- 2 Scottish Executive. *Your Emergency Care Summary: What does it Mean for You?* See: <http://www.scotland.gov.uk/Publications/2006/08/16152132/0> (last checked 3 January 2009)
- 3 Empirica GmbH. EHR Impact. *Study on the Economic Impact of Interoperable Electronic Health Records and ePrescription in Europe*. See <http://www.ehr-impact.eu> (last checked 3 January 2009)
- 4 NHS Scotland. *eHealth Strategy 2008–2011*. See <http://www.show.scot.nhs.uk/eHealth%20Strategy%202008-11%20final.pdf> (last checked 3 January 2009)