Electronic Clinical Communications Implementation (ECCI) in Scotland: a mixed-methods programme evaluation

Claudia Pagliari PhD,1 Mhairi Gilmour MSc2 and Frank Sullivan PhD FRCGP FRCP3
1Senior Lecturer (R&D), Department of General Practice, University of Dundee, Dundee, UK
2Research Fellow, Department of General Practice, University of Dundee, Dundee, UK
3Professor of Primary Care, Department of General Practice, University of Dundee, Dundee, UK

Abstract

Aims The Electronic Clinical Communications Implementation programme aims to facilitate implementation of electronic systems for primary-secondary care communication, focusing on laboratory results reporting, outpatient appointment booking, referral, discharge and clinic correspondence, and clinical e-mail. This independent programme evaluation explored the processes and outcomes of implementation, barriers and facilitators to system adoption, and benefits and drawbacks for professional users. Methods The mixed methods approach incorporated document review, surveys, stakeholder interviews, consensus exercises, and monthly recording of quantitative process and outcome variables. Results Qualitative and survey work highlighted wide variation in the technologies and implementation approaches adopted. A consensus process was used to instigate a national minimum dataset. To date, implementation of laboratory results reporting has demonstrated the greatest success and electronic outpatient booking the least. A mixed-format survey of users in clinical practice revealed a more detailed picture of behaviour and attitudes demonstrating that where systems are available and accepted they are utilized, while product usability, process complexity and user-engagement methods influence uptake. Conclusions The evaluation has demonstrated the difficulties faced when attempting to implement a multifaceted technological and behavioural change intervention on a national scale, but has also revealed unexpected benefits, including general improvements in Information Management & Technology capability across the Scottish health service.

Introduction

The Electronic Clinical Communications Implementation Programme (ECCI) is a Scottish government initiative to facilitate electronic information exchange between primary and secondary care (NHSScotland 2003a). Its primary objective has been to update ways of working by replacing paper-based systems.

The programme was initiated in 2000 and is part of the Scottish National Health Service (NHSScotland) Information Management & Technology (IM&T) strategy, which includes a commitment to implementing the universal patient identifier, enabling record linkage, by 2003 (NHSScotland 2000). ECCI targets six electronic deliverables relating to direct hospital outpatient appointment booking from primary care, referral from primary to secondary care, results
reporting from secondary care laboratories to primary care, transfer of hospital discharge and clinic letters to primary care and clinical e-mail (e.g. second opinion correspondence).

Although the planned end date for ECCI was March 2003, challenges with implementation stimulated an extension of the programme by a further year.

A 2-year evaluation project was initiated in November 2001 with the broad aim of assessing the effectiveness of the methods used to implement ECCI across 16 Scottish Health Board areas. One of the goals of this commissioned research was to provide constructive feedback and recommendations for government implementation personnel and policy makers as a means of informing current and future programmes. The research described here focused on the processes and outcomes of implementation, barriers and facilitators to system adoption, and benefits and drawbacks for professionals.

Broad research questions

- How have regional project teams interpreted and approached the objectives of ECCI?
- What factors have positively or negatively influenced the effectiveness of ECCI projects?
- To what extent has ECCI achieved its objectives?
- What benefits and drawbacks of ECCI deliverables are perceived by professional users of the systems?

Methods

A broad programme evaluation approach was adopted involving mixed qualitative and quantitative methods. This takes account of the complexity of the intervention and the range of perspectives necessary to achieve a comprehensive overview (Friedman & Wyatt 1997; Heathfield et al. 1998). ‘To generate information that is useful to decision makers, evaluations of [clinical] information systems need to be multidimensional, covering many aspects beyond technical functionality’ (Kaplan 1988, p. 10).

The following core methods were used:

1. Survey of ECCI project managers;
2. In-depth studies of regional projects involving document review and team member interviews;
3. Development, consensus assessment and implementation of a minimum dataset, and
4. Survey of primary and secondary care ECCI users.

Methods 1 and 3 have a national focus and involve all 16 health board areas, while 2 and 4 involve in-depth studies of seven regional sites, chosen to represent the others in terms of geographic and demographic spread and initial IM&T maturity.

1. The survey of regional project managers, conducted in the first quarter of the project, sought information on software solutions chosen to achieve ECCI deliverables, project organization and team structure, project management methods, resource distribution, internal and external communication, regional IM&T infrastructure, perceived facilitators and barriers to implementation, and existing evaluation activities.

2. Site visits were preceded by a thorough review of local project documentation in order to assess background characteristics and to inform the development of interview protocols and respondent selection. In-depth, semi-structured interviews were then carried out with key members of the regional ECCI project team (e.g. project manager, organizational development facilitator, project doctor). Appropriateness of interviewees was determined in consultation with the local project manager. The aim of the interviews was to establish how each site had tackled the ECCI programme and why this route had been chosen (e.g. technologies adopted, organizational structure, team roles, stakeholder involvement, resourcing). Interviews also gave participants the opportunity to reflect on successes of ECCI in their area and to describe facilitators and barriers to implementation. Narrative and reflective notes and audio recordings were taken during interviews, after which a summary was prepared and fed back to the interviewee for respondent validation. Broad content analysis was then carried out on the interview summaries and the results converged with those of the document review and observer reflections to produce a holistic site summary, copies of which were distributed to the relevant project managers for information and confirmation. Content domains were analysed across and within sites in order to
identify broad variables influencing ECCI implementation and specific issues for individual project teams.

3 This exercise aimed to generate and implement a minimum dataset for ECCI. An extensive draft was initially prepared containing multiple indicators for each of the ECCI deliverables. These related to readiness (systems installed, users trained), use (system utilization, numbers of e-communications), quality (e.g. presence of an accurate patient identification code) and impact (e.g. clinical process turnaround times, readmissions following discharge). After negotiation with a steering group including central and regional ECCI personnel, indicators of impact were removed, because stakeholders regarded these as unfeasible to collect within existing project resources. The remaining indicators were then presented to regional project managers, who were asked to rate their appropriateness and feasibility. Responses were aggregated and items receiving disagreement from two-thirds or more of respondents, or variable ratings, were fed back for discussion and re-rating. Only indicators receiving consensus agreement (agreement from two-thirds or more) after the second round were retained. All indicators were rated as appropriate, but this process eliminated the quality indicators, which were thought to be unfeasible. The remaining 39 indicators of readiness and use form the basis of the monthly dataset being collected for ECCI.

4 The survey of professional users of ECCI technologies aimed to explore behaviour, experiences and attitudes. In addition to descriptive data on specific technologies employed and frequency and duration of use, it sought information on how users came to be aware of ECCI and their perceptions about the benefits and drawbacks of the systems they were employing and the barriers and facilitators to adoption and use. The ECCI Programme Board had recently refocused on four key deliverables relating to results, referrals, discharge and booking, hence the survey targeted these only. One of the aims of the survey was to gather data on individual primary care practices and hospital clinics or wards using particular ECCI deliverables, so as to inform a sampling strategy for a future interview study of informed users and their patients. For this reason, sites known to have had one or more ECCI deliverables rolled out to them were targeted with the aid of regional project managers. The latter were able to provide named contacts for the majority of relevant primary care sites, however, only clinic/ward names were available for most secondary care sites. Most nominated primary care contacts were practice managers. In secondary care, questionnaires were addressed to the clinic or ward manager. Where no named contact was provided, the covering letter asked the recipient to pass the questionnaire to their most appropriate colleague if they were unable to complete it. Where an e-mail address was available, the questionnaire was initially sent electronically, followed by an electronic reminder to non-respondents, followed by a paper-based questionnaire and covering letter sent by post. Otherwise, all questionnaires and reminders were sent by post. The questionnaire also sought sites’ agreement to receive further information about participation in the next phase of the research involving user and patient interviews (subject to further funding). The covering letter stressed that the form should be completed after consultation with colleagues in order to facilitate a valid picture of staff behaviour in the site. This method has been used previously to capture computing behaviour in Scottish clinical practice (Morris et al. 2003).

Results

Key results from the survey of project managers

The results of the survey confirmed the wide variability of local IM&T infrastructure foundations and products employed to achieve the ECCI deliverables, and identified several barriers and facilitators to implementation. Key findings are summarized below.

Variation in technologies

Several information technology (IT) solutions were being used to address each deliverable. Of these, those produced by the national programme were the most common, however, other locally produced, commercial and legacy systems were evident. To summarize, at the date of the survey the number of electronic products used to achieve each of the six deliverables was as follows:
• outpatient booking (8);
• referral (9);
• discharge correspondence (20);
• results reporting (13);
• clinic letters (15), and
• clinical e-mail (5).

Project management methods

The methods used to manage regional ECCI projects varied across the sites. They included specific approaches, such as Prince2 (12 sites claimed to be using versions of this method), methods based on previous experience (3) and non-specified management methods (1).

Personnel and resourcing

The size and composition of project teams varied widely, with some containing a range of staff members occupying different roles and others having fewer team members with multiple remits. The extent to which individual team members were funded by the local ECCI budget, or other sources, also varied.

Guidance received

Respondents were asked to indicate their perception of the level of guidance they had received from the centre with regards to various aspects of developing, implementing and monitoring the progress of local ECCI projects. Results indicated general satisfaction with the guidance received in relation to bidding for funding, formulating project plans and setting up a local ECCI team. However, project managers felt that they would have benefited from more advice and guidance on monitoring the progress of ECCI deliverables and evaluating the impact of ECCI. Respondents also highlighted a need for greater guidance on choosing IT products, undertaking formal needs/benefits analysis, organizational development, recurrent resourcing implications, continuation/exit strategy and project management methodology.

Selected results from site visits and stakeholder interviews

Fifty-seven interviews were carried out across the seven in-depth evaluation sites. Interviewees included project managers, organizational development personnel, training personnel, IT personnel, project clinicians, patient representatives and health board executives responsible for financial and strategic aspects of the projects. Key qualitative results are presented below.

Team composition and structure

All regional ECCI projects were configured uniquely in terms of dedicated and non-dedicated staff and organizational structure. Organizational charts revealed the complexity of project configuration and stakeholder involvement. In some cases projects were characterized by a traditional hierarchical structure, with clear management, well-defined roles, and several dedicated and adequately resourced team members. At the other extreme, they consisted of one or two individuals relying on the good will of others for task support. In certain regions, ECCI was clearly integrated within an overarching health board strategy, which was associated with good levels of communication and activity across parallel initiatives. Elsewhere ill-defined ownership and multiple competing interests led to an unwieldy and changeable ECCI project structure that acted as a barrier to effective management and progress.

ECCI focus

The nature of ECCI varied across regions. Local interests and existing systems and IM&T programmes led to different deliverables being prioritized with few sites choosing to focus on all six. In certain areas, ECCI had emerged more as a development programme than an implementation programme, with emphasis being placed on the creation of new systems, while elsewhere roll-out of systems was the primary focus. The ratio of development to implementation was affected by the maturity of existing clinical technology programmes in the area (e.g. whether or not tools for achieving ECCI were already available), and project teams’ perceived dependence on national systems for delivering ECCI. In regard to the latter, it had been planned that these systems would be available at the outset of the ECCI programme, however, development difficulties had delayed their progress, with the result that some sites proceeded by developing new systems, others chose to refine and roll-out their existing or emerging systems, and yet others delayed their activ-
Ities in order to wait for the national products to become available (the latter tended to be regions with the least pre-existing IM&T capability).

Integration of ECCI into local IM&T strategies

Where ECCI was high on the local IM&T agenda, and there was buy-in from senior clinicians and managers, clinicians on the ground appeared more likely to embrace the new electronic products. Likewise, where local health trusts had historically enjoyed good relationships, ECCI tended to be seen as neither a primary nor secondary care focused initiative but one that would benefit all care sectors. This contributed to wider acceptance of ECCI across the Health Board area as a whole. Resourcing and sustainability issues were also affected by these factors. Where ECCI was viewed as a stand-alone venture, projects faced the threat of an abrupt end, whereas ongoing resourcing for continuation was more likely to have been identified in areas where it was seen as part of an overall strategy.

Managing expectations

Participants identified managing the expectations of users as one of the major tasks of ECCI. In order to encourage people to change to a new way of working it can be necessary to emphasize the benefits of such a change. Users may then develop expectations that can be difficult to fulfil. Delays in the development and implementation of national systems meant that, in certain sites, having encouraged users to take on new products, these were either not available at previously agreed times or did not function to the standard expected. This led to a loss of good will and enthusiasm, which had a detrimental effect on roll-out and uptake. Elsewhere, anxieties about raising expectations in the absence of suitable products led project teams to delay clinical outreach work.

Dependence on other stakeholders

Respondents in several sites highlighted the dependence of their task on cooperation from other stakeholders within the health board area. For example, in certain areas, implementation of laboratory results reporting had been hampered by the reluctance of laboratories and/or medical records departments to change their ways of working or their established computing systems (fears over system reliability and lack of projected benefits were cited).

Likewise, resistance to the opening of clinic appointment lists, based on concerns about the power of consultants to prioritize patients, had acted as a barrier to implementation of direct electronic outpatient booking.

Benefits

Few regional team members were able to offer rich comments on the benefits of ECCI to users or patients. In relation to professional users, while standard answers were given (e.g. faster access to discharge letters), it was felt that, in general, ECCI was more about changing ways of working than improving clinical efficiency or effectiveness. For example, where paper-based laboratory results were already received rapidly following test requests, the time saved by electronic reporting was thought to have a negligible impact on clinical practice or outcomes. It was also acknowledged that, given the stage of the programme, the costs of learning new approaches may be outweighing any potential benefits. Nonetheless, in the rare cases where local evaluation had been conducted, such as informal user interviews following a label-printing initiative and a comparison of paper and electronic discharge documentation, benefits were reported (e.g. improved data quality).

In terms of benefits to patients, many respondents expressed the view that ECCI would be unlikely to be perceived by or directly influence this group, because its primary targets are professional users and organizational processes. These respondents included patient representatives who would be expected to have an informed view on the subject. Where efforts to engage wider patient groups with the ECCI programme had been made, these had met with little success. Nonetheless, an anecdotal account of a breast cancer patient receiving a hospital appointment in the general practitioner (GP) surgery, revealed the potential of such systems to affect patient satisfaction and outcomes.

Hidden benefits and recognition of effort

Several sites had identified community and non-consultant led services as the natural targets for ECCI. However, these sectors are excluded from the
national ECCI directive; hence participants felt that beneficial work they had conducted had not been recognized by the centre. Likewise, many teams felt that their success had mainly been judged in terms of roll-out of products across the service, but regarded other types of progress as relevant and worthy of recognition. For example, when asked to identify the local successes of ECCI, a common response across sites was ‘getting GP’s and consultants around the same table talking to each other’.

Results from the national minimum dataset

Results from the monthly minimum dataset indicate that progress is being made on all deliverables, although there is considerable variation between sites and no single deliverable achieved complete implementation by the original March 2003 deadline. Of the six deliverables, implementation of laboratory results reporting has been most promising, followed by that for referrals. Implementation of the remaining deliverables remains patchy, although access to systems exceeds usage. Roll-out of electronic outpatient booking is the least advanced. Table 1 presents selected results from the minimum dataset, indicating readiness and usage figures at the last date of recording, expressed as percentages of relevant primary or secondary care sites in Scotland. Figure 1 presents the results in terms of the actual numbers of communications sent electronically as a proportion of total volume in the sequential monthly observation periods between August 2002 and May 2003.

While the results presented in Table 1 and Fig. 1 reflect the availability and use of ECCI deliverables, the wider dataset shows that progress has been made with other aspects of implementation. For example, although the number of referral letters electronically transmitted increased by 13% between August 2002 and May 2003, the number of GP practices with staff trained to use an electronic referral system increased by 25%.

Results from the user survey

The survey achieved a response rate of 64% for primary care sites, which compares favourably with returns of 30% for a recent survey of primary care computing in Scotland (Morris et al. 2003). In contrast, the response from secondary care sites was sub-optimal (34%), undoubtedly reflecting the lack of named contacts for this sector. Additional procedures are underway to increase the secondary care response rate and only the primary care results are summarized here.

As noted previously, the survey targeted practices where it was known that one or more of the four key ECCI deliverables had been rolled out. This sample represents 17% of all Scottish practices; hence the respondents represent 11%. A total of 93% of responding practices reported using electronic laboratory results, 58% electronic referrals, 42% electronic discharge correspondence and 16% electronic outpatient booking. When asked about the frequency with which each deliverable was utilized by those who had access to it, daily or weekly use was reported by 90% of practices for electronic results, 96% for electronic discharge letters, 92% for electronic referrals and 28% for electronic outpatient booking. Descriptive data from this exercise provide important information to assist with interpretation of the minimum dataset returns, highlighting the extent to which individual ECCI deliverables are being utilized in practices where they are available. Figure 2

<table>
<thead>
<tr>
<th>Table 1 Selected results from the Electronic Clinical Communications Implementation (ECCI) minimum dataset, showing access to and usage of deliverables across all Scottish Health Board areas, as of end May 2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>GP practices with access to electronic results reporting software (e-RR)</td>
</tr>
<tr>
<td>GP practices using e-RR</td>
</tr>
<tr>
<td>GP practices with access to electronic outpatient appointment booking systems (e-OPB)</td>
</tr>
<tr>
<td>GP Practices using e-OPB</td>
</tr>
<tr>
<td>GP practices with access to an electronic referral system</td>
</tr>
<tr>
<td>Referral letters electronically transmitted</td>
</tr>
<tr>
<td>GP practices using clinical e-mail</td>
</tr>
<tr>
<td>Consultant led departments using clinical e-mail</td>
</tr>
<tr>
<td>Hospital wards able to send electronic immediate discharge letters (e-IDLs)</td>
</tr>
<tr>
<td>Wards generating and sending e-IDLs</td>
</tr>
<tr>
<td>Specialties able to generate clinic letters electronically (e-CLs)</td>
</tr>
<tr>
<td>Specialties generating and sending e-CLs</td>
</tr>
</tbody>
</table>

GP, general practitioner.
shows the proportion of primary care staff reportedly using the four main deliverables in the survey sites (averaged across relevant practices). These are broken down by user group, including doctors, nurses and administrative staff.

Figure 2 reveals clinical staff to be the most common users of electronic results reporting and referrals software, while in the case of hospital discharge correspondence and outpatient booking, administrative and clerical staff are as likely to be involved. More doctors than nurses are using the systems.

Reported awareness of the ECCI programme was variable. While most respondents were aware if a particular ECCI-related function was being served by their practice IT systems, many were unable to explicitly name the product. Awareness appeared to be highest in the regions with a clear product suite and proactive ECCI user engagement programmes. Of those responding to the question asking how they had heard about ECCI, most referred to an internal contact, such as a GP or practice manager, rather...
than the regional ECCI implementation team. No site reported using products for all ECCI deliverables and most reported using only one or two. For each deliverable, benefits and drawbacks were identified. For example, ‘more efficient referrals’, ‘quicker access to lab results’, ‘being able to ask for a consultant’s advice via e-mail’, ‘being able to download discharge letter into patient’s computer log’ vs. ‘takes too long’, ‘can be unreliable’, ‘doesn’t always log results’, ‘system incompatibility requires double data entry’. Perceived facilitators and barriers to implementation included ‘stakeholder meetings’, ‘easy to use and it works’, ‘good help and training’, ‘personnel communication, involvement and commitment of staff’, ‘good contact and support from local ECCI team’ vs. ‘lack of involvement of clinicians in design’, ‘lack of NHS Net reliability’, ‘bugs in the systems’, ‘lack of familiarity with IT’, ‘lack of strategic planning and leadership’, ‘slow product development’ (lack of trust in e-communications and failure to meet early expectations were also mentioned). Responses reflected the prevalence of specific deliverables, with most referring to results reporting, referral and discharge letters. Clinical e-mail was mentioned rarely, as was e-booking. In the latter case, most comments were negative.

Discussion

The complexity of the ECCI programme represented a challenge for evaluation. Not only did it encompass six demanding deliverables, the nature of the 16 regional projects varied in important ways that meant that it was not possible to compare like with like in a standardized manner. This was compounded by limitations in the availability of quantitative data. The mixed methods approach was taken for these reasons.

Results from the survey of ECCI project teams across Scotland and interviews in key evaluation regions, revealed wide variation between sites with respect to the deliverables targeted, computing solutions pursued, progress and timescales, project management and team characteristics, user-engagement strategies and pre-existing clinical computing capability. In many regions, ECCI was characterized more as a development project than an implementation project. This reflects the unfortunate timing of the programme, which was planned to coincide with a related initiative to produce a suite of ECCI-relevant informatics tools (NHSScotland 2003b). Problems with the latter meant that many ECCI projects had to proceed using novel means. These problems have now largely been resolved and a national product suite is becoming available, which is beginning to rationalize the technologies being used. The survey and interviews also revealed regional teams’ perceptions of the level of guidance and support they had received from central government for implementing ECCI. A number of areas of concern were highlighted. These were fed back to the centre at an early stage and remedial action was quickly taken (e.g. provision of project management training and organizational development support). In addition, interviews revealed the importance of ownership and prioritization of ECCI by senior Health Board personnel, in terms of implementation, resourcing and continuity, and illustrated the value of integrating the programme into a region-wide health care IM&T strategy. User resistance to change and problems of unmet expectations were identified as key barriers to implementation. On the whole, few immediate benefits for professional users were perceived by ECCI project staff, and less for patients, although it was acknowledged that the former would be likely to ensue once wide implementation has been achieved.

The national minimum dataset was developed in response to the lack of appropriate data monitoring at the time the evaluation was initiated. Although it proved impossible to include indicators of impact and quality, the dataset has been of value for demonstrating the progress of different Scottish regions in implementing the ECCI deliverables. The earliest deliverable to be implemented was electronic results reporting, with 74% of laboratory disciplines now offering this service and 36% of primary care sites actually using it. Progress with the remaining deliverables has been slower. Although access is running between 3% and 47% across these deliverables, reported system usage varies from 2% to 18% (18% for referrals and under 10% for discharge and clinic correspondence, and outpatient booking). These numbers are set to increase as the national product
set becomes available and substantial progress is expected by the March 2004 deadline. The minimum dataset, nevertheless, reveals that readiness to implement ECCI is on the increase, with growing numbers of staff becoming trained to use the systems. This emphasizes that ECCI has not only been about the implementation and use of computing systems, but also about the preparation of users to deal with new ways of working.

The survey of ECCI-adopter sites sheds a more optimistic light on the results of the minimum dataset. Results reveal that in sites where systems have been actively rolled-out, larger numbers of users are engaging with them. For example, 90% of respondents with access to electronic results reporting claimed to be using it weekly or more often. In the case of electronic outpatient booking, the deliverable with the slowest rate of uptake, of sites where the system was available 28% reported using it daily or weekly, indicating that when systems are in place and have been accepted they will be used. Doctors and administrative staff were the most common users of the systems. Lower usage by nurses reflects their lesser access to desktop computers. Qualitative data from the user survey indicate a number of perceived benefits and drawbacks of the ECCI deliverables which, in the absence of quantitative impact and quality data, provides an informative indication of the programme’s effect on clinical practice. These results suggest that the new technologies may help to improve the speed and convenience of electronic clinical communication, although technical glitches and lack of stakeholder involvement can hinder adoption.

Although it was initially the flagship deliverable for ECCI, implementation of electronic outpatient booking has been disappointing and negative views about it have been expressed by both users and project teams. This reflects the complexity of the processes involved, which have implications for ownership and prioritization. As a result of this experience this deliverable is to be refocused on partial or token booking, rather than direct booking from the GP surgery, and it is anticipated that this will improve uptake. Examples of alternatives gleaned from the UK NHS electronic booking programme will undoubtedly prove helpful to this process (NHS Modernization Agency 2002).

While available data demonstrate that implementation of ECCI has been a challenging and difficult process, many otherwise hidden benefits have been revealed by the evaluation. One of the most important of these has been the impact of ECCI on personal communication across sectors of the health care service, without which the programme would not have been possible. ECCI has also raised the profile of IM&T across the health service in Scotland and has triggered improvements in infrastructure and technological innovation that would not have otherwise been achieved. Lessons learned from the evaluation have been embraced by NHSScotland strategists and are being used to inform ongoing initiatives. These include the importance of synchronizing compatible programmes in order to maximize output and minimize duplication of effort, formalizing procedural guidance for project teams, and implementing rigorous data collection procedures at the outset of new programmes so as to enable demonstration of their impact and cost-effectiveness. The tendency for IM&T implementation programmes to take longer than anticipated has also been noted, and will be borne in mind when planning future such initiatives.

Additional funding is being sought for an interview study to establish whether ECCI has impacted on the patient experience and to obtain in-depth qualitative data from users about their perceptions of the influence of ECCI on clinical processes and outcomes.

Conclusion

Implementing a programme of clinical communications technologies in Scotland has been more difficult than anticipated and the timescale has been extended accordingly. Nonetheless, implementation is showing a steady increase over time and is set to rise rapidly. The programme has led to wider improvements in the IM&T infrastructure of the Scottish health service and has stimulated communication between stakeholders in different health care sectors. Overall, the project demonstrates the importance of ‘people and organizational issues’ for informatics implementation (Lorenzi & Riley 2000; Kaplan et al. 2001). Lessons learned from the evaluation study are already being used to inform related government initiatives.
Acknowledgements

We thank our steering group members (Peter Donnan, Elizabeth Mitchell, Jill Morrison, Graham Smith, Ian Ricketts, Peter Gregor, Andrew Morris, and Alastair Thompson) for their input into the project, the ECCI central team for their assistance, and the Scottish Executive Health Department for funding the research.

References