Perspectives on telehealth and telecare

Learning from the 12 Whole System Demonstrator Action Network (WSDAN) sites

WSDAN briefing paper

Richard Giordano

Mike Clark

with

Nick Goodwin

This paper, the third in a series of WSDAN briefing papers, examines the experiences of the network's 12 member sites in implementing telehealth and telecare. It examines the challenges and barriers they faced, and the progress they made, in developing and adopting new technologies. It analyses the key issues and lessons learned for sustaining growth in the deployment of telehealth and telecare in the future.

Authors:
Richard Giordano, Senior Lecturer, School of Health Sciences, University of Southampton
Mike Clark, Co-Project Lead, Whole System Demonstrator Action Network (WSDAN) with
Nick Goodwin, Senior Fellow, The King's Fund and Co-Project Lead, WSDAN

The WSDAN Steering Group members are:

Mike Clark	WSDAN Co-Project Lead
Tim Ellis	WSD Programme Director, Department of Health
Richard Giordano	Senior Lecturer, Management and Leadership in Health and Social Care, University of Southampton
Nick Goodwin	WSDAN Co-Project Lead
Stephen Johnson (Chair)	Head of Long-Term Conditions, Department of Health
Stanton Newman	Dean, School of Community and Health Sciences, City University
Jeremy Porteus	National Programme Lead - Networks (Housing and Telecare), Department of Health
Susan Royer	WSDAN Co-Ordinator

If you have any questions about this briefing paper, please email us at: wsdnetwork@kingsfund.org.uk.

Alternatively, you can write to us at:
WSD Action Network
c/o The King's Fund
11-13 Cavendish Square
London
W1G 0AN

Contents

Key Points

- Between 2008 and 2011, The King's Fund and the Department of Health Care Networks worked with 12 sites in England to undertake research and provide educational and experiential learning opportunities as part of the Whole System Demonstrator Action Network (WSDAN).

- One of WSDAN's key aims was to examine the progress and impact of telecare and telehealth interventions across these sites, to provide evidence and learning to feed into the larger Whole System Demonstrator evaluation.

- Three themes emerged as particularly important areas for consideration when adopting telehealth and telecare: leadership; working practices, skills and development; and data management.

- Key characteristics for growth and sustainability exhibited across the 12 sites included: collaboration within and across organisations; leadership; developing alliances and partnerships; identifying critical services; developing a shared vision; cultivating participation; building capacity; exploiting funding opportunities; and working across professional boundaries.

- While these factors appear necessary to sustain and expand telecare and telehealth services, they are insufficient on their own. Other areas that need to be addressed include: fostering fundamental service redesign; supporting professional development and staff training; analysing and designing the infrastructure prior to equipment being deployed; applying recognised standards; making decisions based on good interpretation of available data and evidence; and developing governance arrangements at national level to avoid regional variations in services.

- The changing political environment, including NHS reforms and reductions in local government funding, have also had a significant, negative impact on the adoption of telehealth and telecare services. As resources for investment have become squeezed, the continuity of focus provided by local leaders and champions has been eroded. For new technologies to be taken forward, it has been paramount to present robust business cases and sustainability plans that are structured around improved health and social care outcomes as well as efficiency deliverables (Quality, Innovation, Productivity and Prevention, or QIPP).

Key lessons

The key lessons emerging from the experiences of the 12 WSDAN sites point to a number of areas that need to be addressed for the successful adoption of telehealth and telecare.

- **Undertaking fundamental service redesign.** The logic of telehealth rests on the principle that enrolled patients can be monitored remotely and visits can be intelligently targeted. It will not be possible to scale up telehealth services without increasing individual caseloads, and individual caseloads cannot increase unless professionals are prepared to work differently.

- **Reshaping professional development and staff training.** There is a clear need to embed new ways of working in order to take advantage of the benefits that telecare and telehealth can offer. This cannot happen unless staff development and guidance aim to build core competences – for example, in how to interpret

data, how to make decisions based on those data, setting parameters for individual patients, and how to apply (and enforce) standard protocols, both on site and in the field.

- **Ensuring that technology meets service needs.** Some sites procured equipment from vendors (or were given equipment) before undertaking any structured analysis about how they wished to redesign care services. Neglecting the analysis and design phases often leads to a costly waste of resources, with equipment procured being either underused or not used at all. Interoperability and connectivity problems (both technical and service aspects) severely restrict the potential to provide seamless integrated care to patients and users.

- **Applying and developing quality standards.** Applying standards to data and information that are generated, and the procurement and interoperability of technologies, should be a key feature of future telecare and telehealth programmes.

- **Encouraging decision-making based on available data *and* evidence.** Given the limitations of the evidence, health and social care teams need to learn from experience when developing new services through continuous monitoring and quality improvement processes. Using data and evidence collected from sites currently deploying new technologies can help to open up a variety of solutions and approaches that might otherwise remain hidden.

- **Developing an integrated governance structure.** As telecare and telehealth services grow in the future – and as more people benefit from them – there needs to be a governance structure that ensures that each programme's goals are achieved. This needs to be integrated, involving all stakeholders, with a clear remit to meet the needs of users and patients.

Introduction

There is increasing interest in England in finding new, more efficient ways to provide care services that address the growing needs of people with long-term medical conditions and ongoing social care needs. The need to find new ways of delivering health and social care is all the more acute because of limitations on resources available in the coming years compared with previous years. By 2019, the percentage of gross domestic product (GDP) devoted to health care is predicted to fall from 8.2 per cent (its historic high) to 6.7 per cent (by that date, the *Wanless Social Care Review* had envisaged spending at 9.8 per cent of GDP) (Appleby 2011). With the state also currently spending £14.5 billion per year on adult social care in England (just over half of this on services for older people), but with future cuts in funding already announced, the current funding system has been described as unsustainable (Dilnot 2011).

Even if health and social care budgets were to increase over time, there has been a longstanding recognition that money alone cannot address the gap between resources and increasing demand. Instead, regardless of political party affiliation, many policy analysts agree that the increasing demand for health and social care services can best be met by more efficient and effective management and deployment of resources (Webster 2002), along with integrated governance in support of client-centred care (Light and Dixon 2004).

Telehealth and telecare have the potential to play an important role in delivering more cost-effective care. Through enabling a client-centred, integrated and home-based system, it is possible to support more people to live independently and so reduce the need for institutional care in a nursing home or hospital. While some studies demonstrate cost-improvement gains (eg, Darkins *et al* 2008; Brownsell *et al* 2008), it is not clear from most other studies whether cost-efficiencies have been, or can be, made. Systematic reviews conclude that there is not yet enough evidence to support an assumption that sustained, long-term efficiency gains can be brought about through the adoption of telecare and telehealth services (Barlow *et al* 2007).

The evidence is also characterised by studies that are not reliable enough to support evidence-based decisions. For example, Bergmo (2009) found that the majority of evaluations 'were not in accordance with standard evaluation techniques and still have a long way to go before decision makers can rely on them to produce valid and reliable cost-effectiveness data' (p 8). Although a number of small-scale evaluations have been carried out, there are very few English studies that provide empirical evidence of the management and training needs of staff to support large-scale telecare and telehealth operations (*see* Alaszewski and Cappello 2006).

The Department of Health in England has a longstanding interest in understanding the efficacy and effectiveness of telecare and telehealth. In 2006, it commissioned the Whole System Demonstrator (WSD) programme and selected three sites (Kent, Cornwall and Newham) to be part of a cluster randomised controlled trial (RCT). The aim was to provide 'proof of concept' as to whether technologies can promote long-term health and independence, improve quality of life for users and their carers, improve the working lives of health and social care professionals, and provide evidence for cost-effective and clinically effective ways of managing people with long-term conditions (Department of Health 2006). With about 5,830 people in the intervention and control groups, the evaluation is thought to be the world's largest randomised controlled trial of telecare and telehealth (Department of Health 2009).

The Whole System Demonstrator Action Network (WSD Action Network 2011) has run alongside the WSD programme. Involving 12 member sites (which were applicants in the WSD process and interested in developing their programmes), the network combined research, dissemination of news, education, and experiential learning to examine the progress and impact of telecare and telehealth across health and social care. This paper explores their experiences and draws out lessons that can be learned to inform future projects elsewhere. It does so in the light of proposed changes to the funding and delivery of health and social care.

Methods

This is a qualitative study of the experiences of the 12 WSDAN sites.* These sites were typically composed of a primary care trust (PCT) and a local authority. Representatives in the network were generally middle and senior managers responsible for assistive technology, older people's services, the management of people with long-term conditions, and commissioning. We have made no attempt to discern the effect of local projects on user/carer outcomes and experience. Nor have we attempted to ascertain return on investment (for example, by seeing whether there was a reduction in unnecessary accident and emergency (A&E) admissions as a consequence of local programmes). Instead, our aim is to sketch out the experiences of project planners and participants, and to use these to inform future projects and programmes.

From late 2008 to 2010, the authors collected notes and observations at WSDAN site meetings, meetings at the Department of Health, and regional conferences at seven locations around the country. The regional conferences also used interactive audience polling to identify the progress being made by each site, and examine challenges and barriers to the implementation of telehealth and telecare. Notes and polling results from the meetings and events were used to construct SWOT (strengths, weaknesses, opportunities, threats) parameters used in a subsequent online survey sent to participants at all WSDAN sites. The survey asked project participants to select a parameter, such as 'innovative ways of working' or 'data management', and categorise it as a strength, weakness, opportunity or threat to their project or programme. We also asked participants to note if the SWOT parameter was important to the project.

Typically, SWOT is a framework for analysing strengths, weaknesses, opportunities and threats (Johnson *et al* 1989) as part of a structured activity in forward strategic planning and action (Weihrich 1982; Houben *et al* 1999; Mintzberg 1994). The strengths and weaknesses are typically based on an internal audit of the organisation. Opportunities and threats relate to environmental or external factors that need to be taken into account when planning strategic actions. Opportunities represent factors that can be beneficially exploited, while threats need to be considered because of the potential damage they can do to an organisation.

Rather than use SWOT parameters solely for forward planning, we used them as a way of eliciting how individuals involved in those projects *interpreted* the events, challenges, and enablers they experienced during the programmes. We therefore used SWOT parameters to gain a retrospective understanding of the projects, and as a means of engaging participants to discuss their experiences further. We might think

---

*Barnsley, Birmingham, Croydon, East Riding of Yorkshire, Hull, Lancashire (one PCT was involved together with the Council), Leeds, Leicester, Lincolnshire, Norfolk, Nottingham and Southampton.

of this as a retrospective audit. As the programmes are generally ongoing, it is possible for each site to adjust their approach based on the SWOT outcomes. All sites visited are still developing their telecare programmes; however, their telehealth take-up is variable.

The web-based, online survey was administered and completed in early 2011. We received eight responses from health care staff, and six from social care staff, representing all 12 WSDAN sites (*see* Appendix 1 for a copy of the online survey). The survey was followed up by focus groups at six WSDAN sites selected so that we could get maximum variation between urban and rural sites, and site size. The focus groups allowed us to explore participants' experiences in more detail, and to test some of our overall observations.

Results

Three key themes emerged from our research into the progress made by the 12 sites in adopting telehealth and telecare. These were:

- leadership and management

- work practices, skills and development

- data management.

In this section, we explore each theme in turn, and discuss their implications for the adoption of telehealth and telecare.

Leadership and management

The health and social care reforms of the past decade have highlighted the need for locally delivered programmes, greater accountability through engagement with local communities, and stronger partnership working both within and across agencies (*see*, for example, HM Government 2008; Ham *et al* 2011). Leaders are tasked with transforming organisations into outward-facing, accountable institutions that serve the needs of the public. The challenge to public leadership is to co-ordinate services, share ideas, knowledge, and know-how across organisations and institutions, and respond to (indeed anticipate) the needs of the communities they serve. This calls for greater problem-solving, co-ordination, and communications skills than managers had in the past who, as Brookes and Grint (2010, p 6) assert, 'simply transacted public business'.

Leadership is especially important when designing and implementing new information systems that span functional boundaries – whether those systems are 'traditional' information systems used in businesses, or enhanced information and communications technology (ICT) that demands a change in work practices in health and social care. Purchasing equipment is more or less a transaction; deploying information technology and making the best use of it is a long-term process that affects how things are done – and who does them. Procurement and implementation, though difficult, are relatively easy to enact when compared with motivating others to follow a lead, leading staff to change existing work practices, and co-ordinating both services and resources across traditional organisational boundaries. Poor leadership skills that do not embrace long-term process change are the single most important reason why new technologies or process innovations fail (Sauer 1993).

It should therefore come as no surprise that health care and social care respondents to our survey (*see* Appendix 1) view *leadership and local champions* as critical in getting the projects off the ground, building support, and convincing others of the value of the programmes. The critical importance of leadership behaviours to the conduct of the programmes was also cited, and we discussed this in more detail in the follow-up face-to-face interviews and focus groups.

Key leadership behaviours

Certain factors were identified as being key to building collaboration and gaining support from multiple stakeholders: principally, people at the top of the organisation having a clear vision of telehealth and telecare, sharing this vision with employees, and fostering leadership behaviours among staff at all levels. The vision and leadership behaviours were shared; there were networks of staff that embodied leadership behaviours such as building momentum, staying focused, organising, communicating, influencing, bidding for resources, and shaping the vision. These behaviours spanned laterally across health and social care, and vertically within both types of organisation. The strongest examples are characterised by shared leadership and partnerships across health and social care, where risks and responsibilities were often shared. This sense of shared vision and collaboration encouraged a supportive culture, with clear priorities.

Where such leadership was evident, communication and co-ordination between health and social care organisations was excellent and ongoing. Meetings between health and social care groups at some sites were characterised by the sharing of experiences and the integration of experiences and ideas. They understood that benefits to patients/users from telecare and telehealth services were more important than organisational and structural barriers, and devised tactics to overcome those barriers. For example, the leadership team at one site held regular meetings so that members of health care and social care teams could query each other's practices with the intention of improving them; together, they developed innovative ways of sharing and using resources, and identified external risks and opportunities. In some cases, there was flexibility around the use of budgets and outcomes across service sectors, as well as a common understanding of priorities, and shared use of language. Service logistics and back office were merged across sectors. There was some limited evidence of the integration of technology into work practices.

Engaging patients and carers as key stakeholders

Telehealth and telecare staff working directly with patients and alongside other professionals showed an ability to listen, and to act on what they heard. Some sites built close relationships between staff promoting technology-based services and clinicians and patients/service users, which sometimes fostered co-production and bottom-up design. In both telecare and telehealth, there were strong examples of involvement by a range of stakeholders, including patients and service users. Patient involvement not only comprised patients managing (and being more aware of) their own condition, but also patients influencing processes. There are examples where patients' carers and family members were involved in drawing up and 'owning' the care plan. A case manager from one site reported how they changed the questions they asked after receiving patient feedback:

We ask questions of patients every day, and they may not be the right ones – and the patients know this. They often come back to us with different questions that hit the mark, and now we use those.

As well as patients taking more responsibility for managing their condition, the quote above suggests that care workers often view patients as co-designers of their care, and that patients assume a small, but important, leadership role in their care, including having realistic expectations, as well as adhering to clinical advice. The aim should be to have carers actively involved in managing support for telecare and telehealth. Moreover, as patients become more confident with managing their day-to-day symptoms and exacerbations, it may be possible, in some cases, to remove the technology.

There were some good examples of project management. Some sites measured progress against strategy, with representatives from both social and health care teams reporting back on progress. Some sites used PRINCE2 methods, with one making structured changes to this method so it had a better fit to the programme's context, and had a stronger resource-tracking element.

Building relationships and balancing short-term with long-term goals

Sites that had made significant progress with adopting telehealth and telecare were characterised by a continuity of leadership along two dimensions. First, the individuals involved were able to build stable and growing long-term relationships, both within the project and in their regions. Second, they balanced short-term project objectives with clear, long-term strategic objectives and priorities, and managed resources to achieve those objectives over an extended period of time. In some cases, they were able to build partnerships with a broad range of vendors and organisations, including universities, police and fire services, mental health trusts, learning and physical disability services, community equipment services, housing organisations, third sector and other providers, and representatives of service users. By building trust both within and outside their organisations, they built a valuable stock of social capital which they could draw on to help them drive through a consistent strategy for change.

Like their health care counterparts, social care managers were able to convince others of the opportunities and benefits of using technology-based solutions – indeed, spreading the word about the benefits of telecare and telehealth is one of their strengths. Social care leaders, however, often went one step further. They tended to be much more entrepreneurial, were more willing to take business risks, and were considering spinning out their operations as social enterprises or trading arms. Perhaps one of the reasons for this is that social care has a longer history of working with independent and third sector providers. They may, therefore, be more open to entrepreneurial approaches, and new organisational structures such as social enterprises.

Typically, social care organisations were able to authorise telecare investment and mainstreaming activities on a balanced business case based on user and carer benefits, lower cost, and potential for reduced admissions. This contrasted with health organisations, which had generally not been able to move past the project level because of cost, limited evidence, and reluctance to change service configurations. Social care practitioners, including occupational therapists, have often adopted innovative and customised approaches to meet the needs of service

users. This includes early intervention and preventative approaches as well as crisis management.

To sum up, the leadership strengths that were evident at many of the WSDAN sites included:

- delegating authority and responsibility

- using well-developed communication and persuasion skills, within and outside organisational boundaries

- building and maintaining a vision across all levels and categories of staff

- engendering shared ownership with stakeholders (including users and their carers)

- maintaining a continued focus over time

- seeking new opportunities/being entrepreneurial

- using project and resource management skills.

These are strengths that other studies suggest increase the likelihood that the telecare and telehealth programmes can be sustained (Martin *et al* 2011; Clark and Goodwin 2010).

Although some project sites were relatively successful at building relationships across groups, some were not. One weakness identified in the follow-up interviews was the lack of tenacity or persuasion skills needed to build an *integrated leadership* effort across social care and health care. For example, one social care respondent said:

> *[We have an ehealth group] composed of very different types of players – and here's where you potentially can have impact. But we haven't been able to get those groups linked across networks – there hasn't been the leadership to link with other networks. There's a lot of political things going on, and there hasn't been anyone who could get this out of the way. Most of all, there hasn't been leadership from the council. We do have some well-known and respected champions, but where is it from the council? And we need leadership from general practitioners. Where is it?*

At almost every site, there were problems in engaging GPs and finding GP champions. This was due to a perceived lack of evidence, costs, loss of face-to-face contact, fear of extra work in handling patient data on a regular basis, and low interest among GPs in social care options. One supporter of assistive technology said:

> *There's been very little GP involvement… They sometimes want COPD [chronic obstructive pulmonary disease] patients all for themselves, and they don't trust us with their patients. They see us as trendy nonsense.*

Differences in approach between health care and social care

There is a marked difference in the value, design and function of programme evaluations and preparation of business cases between health care and social care practitioners. Health care leaders have a different quality threshold for the design of evaluations than their social care counterparts. Health care leaders showed a preference for learning about the effects of their work through evidence-driven evaluations. Sites conducted small-scale patient satisfaction surveys, and analysed information to determine if patients were engaged. One site carried out a small-scale

randomised controlled trial (RCT) for patients with chronic obstructive pulmonary disease (COPD) in conjunction with universities. Other examples include analysis of evidence for reduced nursing, GP and outpatient visits at one site, while another measured unnecessary ambulance use. Social care leaders generally placed much less importance on systematic evaluations (especially those whose metrics were the number of A&E admissions or unplanned readmissions), although at least one site participated in a national initiative to determine whether telecare delivered on expected efficiencies. Social care leaders instead looked for improvements that would reduce anxiety or stress on the part of carers based on observation, or through non-randomised, uncontrolled participant surveys on quality-of-life issues.

While most health care respondents believed that RCTs were not feasible in their contexts, they did believe there should be systematic collection and evaluation of data in order to assess performance, effectiveness and cost efficiencies such as fewer hospital admissions.* They held this view even if they were not in a position to conduct such studies themselves. (They eagerly awaited the results of the large-scale evaluation being conducted on the Whole System Demonstrator projects.) Social care respondents, however, believed that they needed to collect and analyse only enough evidence to show that their programmes were working – for instance, showing an improvement in the quality of life for users or carers (although this may change as local authorities become more efficiency driven). Finally, health care participants appeared to be concerned with cost savings metrics that are driven by the QIPP (Quality, Innovation, Productivity and Prevention) agenda and the 'Nicholson challenge' to the NHS to find £20 billion in efficiency savings for reinvestment by 2014. Social care participants were much more concerned with manifest improvements in the quality of day-to-day life, and early intervention and prevention approaches. May (2006) makes a distinction between the two views, referring to the former as *evidence-based practice*, and the latter as *practice-based evidence*. For health care practitioners, evidence is intended to support transferable knowledge that can inform policy. For telecare, the evidence that matters is local and qualitative, and is the outcome of demonstration projects. These models emphasise both workability and, within the context of the project, cost-effectiveness (May 2006, pp 524–5).

The survey results mirror different approaches to evaluations, with social care respondents seeing them as a strength. Health care respondents viewed evaluations as an opportunity, thereby suggesting that value will accrue at some point in the future, but not now. As one social care respondent said:

> *These [evaluations] are difficult to do and set up. I don't see the point. There's a real imperative just to get on and do it.*

Another said:

> *The evidence doesn't have to be the gold standard. We need only to do a 'soft touch' here where we can prove that the academic evidence is mirrored [here].*

On the other hand, a health care manager said:

> *We have to convince commissioners of the value of this work, and they won't be convinced if we simply **insist** that the programme is working. We're going to have to collect ambulance data and make a clear case to them. Reducing ambulance*

---

*This view aligns with other research that RCTs are not always embraced by medical practitioners. *See*, for example, LeRouge *et al* 2010, pp 906–7.

usage does save money, and we have to show how much. But it also makes the ambulance available to others, and it certainly improves the lot of someone who avoids using an ambulance if it's not needed. They [commissioners] *have other programmes wanting support, and we have to convince them to support this.*

This quote suggests that health care respondents must convince sceptical commissioners who are most comfortable when presented with what they believe is unbiased evidence, systematically collected, which shows that investments should result in new efficiencies and cost savings. It also suggests a difference between social care and medical models of delivery. While health care practitioners tend to value systematic enquiry (LeRouge *et al* 2010), social care practitioners appear to be influenced by a crafts base – knowledge on how to do something through experience – that cannot be reproduced either by a randomised controlled trial or a systematic evaluation. Ferlie *et al* (2005, p 14) note that some surgeons and obstetricians (that is, those who work with their hands) believe that randomised controlled trials cannot express many aspects of clinical experience.

This is not to suggest that health care practitioners at the WSDAN sites are more expert in their approach to the design and use of evaluations than their social care counterparts, or even that their evaluations are more valid or rigorous. Their over-riding concern with cost savings (in order to convince commissioners), while important, is just one indicator. Focusing on a single metric can mean that other questions are overlooked, such as '*What works under what conditions, and for whom?'* Such questions often support organisational learning, and contain lessons on how to improve the effectiveness, reach, quality, and efficacy of a programme by exploring alternative approaches or maximising the programme's effect for various sub-populations (Pawson and Tilley 1997).

What does this have to do with leadership? The different views held by health care and social care leaders about how to use evidence and evaluations reflect their respective leadership styles, strengths and weaknesses. Social care respondents appeared to be entrepreneurial and have a higher tolerance for taking risks. This is a style that often leads to innovation and responsive service design, although the data supporting exactly what that design should be might be unstable. Health care respondents seemed to place much more emphasis on collecting data to assess the effects of an intervention, particularly its return on investment. While this approach often results in an evidence-based efficient use of resources, interventions can be conservative or limited in scope. Neither group uses evidence to its maximum effect: social care respondents appear to be impatient with systematic data collection and rigorous evaluation; health care respondents often tend to see return on investment as the most important (or only) indicator of success.

One emergent school in leadership theory argues that the ability to learn systematically about the effects of organisational interventions (and derive lessons from relevant academic and practice literature) is an important component of excellent leadership behaviour, across all types of organisations. The use of data and evidence can help to liberate the organisation from the biases of the leader, and may open up a variety of approaches and solutions that might otherwise remain hidden. This research suggests that an inability or unwillingness to systematically collect data and examine evidence from an initiative can result in leadership that relies on obsolete knowledge from past experience, personal preferences, hype, and actions that capitalise on the leader's strength (that is, 'to a hammer, everything is a nail') (Rousseau *et al* 2008). In

the worst cases, the leader shows an inability to 'face hard facts' (Pfeffer and Sutton 2006).

We have noted that both health and social care groups were skilled at building relationships. This, however, can sometimes be a double-edged sword. At some of the 12 sites, there were close links with industry that could, at times, result in a vendor-led 'push' of technology instead of a demand-led 'pull'. Unless the project leader has a clear strategy and a structured method of achieving their objectives, this could, *and sometimes did*, result in a mismatch between supply and demand, with equipment either not being used, or not used to its best effect.

The introduction of new technology and the pace of change of that technology can outstrip the ability of social and health care professionals to come to grips with it. This is particularly true when attempting to change work practices and methods of staff training, and with handling and managing data. As one manager said, 'We get the equipment, but we don't have the right people.' These issues will be discussed in the following two sections.

Key points

- Strong leadership and local champions are critical in getting telehealth and telecare projects off the ground, in building support, and in convincing others of the value of such programmes.

- Continuity of leadership helps build relationships and retain a focus on long-term objectives.

- Having a clear and shared vision between partners provides focus and a framework for collaboration; partnerships should include product vendors, and service users and their carers.

- Understanding and focusing on the benefits to patients and users can enable organisational and structural barriers to be overcome.

- Ongoing communication and co-ordination between health and social care partners helps support the development of shared understanding and working practices.

- Successful sites invested in developing strategic goals, and project and resource management.

- Sites with a more entrepreneurial (risk-taking) approach were more likely to seek out opportunities to innovate.

Work practices, skills and development

Work practices – how someone works, what it means to the practitioner, how they improvise, what they learn – are notoriously difficult to change among skilled professionals in general (Orr 1998) and clinicians in particular (Ferlie *et al* 2005; Martin *et al* 2009). The reasons behind this resistance to change include the status that practice and knowledge affords its owner (Carlile 2004; Martin *et al* 2009), the influence of organisational culture and the pull of history (Barley 1986), the link between professional practice and professional identity (Lamb and Davidson 2005; Fagermoen 1997), the influence of small-group behaviour on practice (Levy 2001),

and a difficulty to communicate across functional groups (Star and Griesemer 1989), among many others. New technologies present particularly thorny problems because they often alter the environments in which existing work practices develop and are sustained, along with the social relations of those working in them (Barley 1986; Suchman *et al* 1999).

Changing work practices – supported through staff development and fostering an understanding of the benefits of new working practices – are key to implementing new technologies, particularly in telehealth (Wertenberger *et al* 2011). Skills development for new work practices, however, is often overlooked when designing and evaluating telecare and telehealth projects. For example, both Darkins *et al* (2008) and Lehoux *et al* (2002, p 902) argue that promoters of telehealth tend to 'downplay' human and organisational issues, particularly the effects of change on existing work routines and the need to develop new practices. The lack of skills development can be problematic though; many programmes fail because existing work practices and routines either do not change, or change only intermittently. This results in a situation whereby some practices are obsolete and not fit for purpose. Indeed, not paying attention to the effects of new technologies on existing work patterns can disrupt professional tasks, engender a range of unsafe practices, and provoke a storm of resistance (White *et al* 2010; Bødker *et al* 1991; Berg 1999).

Strategies to change work practices and promote staff development

Work practices, *skills* and *staff development* emerged as important themes in both the survey and focus groups. There were some good examples of strategies to change or influence clinical practice, particularly among GPs. The most powerful strategy was to include clinicians who could make good use of telecommunications technologies at the earliest stages of planning, and to encourage them to be actively engaged at the design stage of the project. These efforts to secure participatory co-design helped to construct a process that mapped on well to the GP's existing practice, and was one that they understood well and trusted. This approach parallels that outlined by Lehoux *et al* (2002, pp 889–902), who suggest that to influence clinician practice, you have to identify those clinicians who exploit images or numerical data, and work with them to make the process routine in their own practice – through social and cultural as well as technical adaptations.*

An example of this occurred at one site we visited. Two podiatrists said that they were shown a screen full of data from a patient with COPD. One said:

> *I looked at the screen of COPD data, and after a time I didn't see the data any longer. I saw a foot. And I thought of how many amputations we could avoid if we could examine diabetic feet remotely. You don't have much time to save a foot, and we could use this technology to get to the patient before he could get to us.*

Members of the telehealth team then worked closely with the podiatrists to develop a strategy to identify diabetic patients, and adapt the technology to their existing examination and triage practice. They now routinely use telecommunications in their work, and help other podiatrists incorporate the technologies into their own practice.

---

*There is anecdotal evidence from the United States about the numbers of physicians who want to use smartphones and iPads to access patient records, drug formularies, and other expertise. These physicians may be more amenable to patients using technology.

Changing routines and engendering innovative ways of working, however, only went so far. Although survey respondents from both health and social care identified 'innovative ways of working' as either a distinct strength or opportunity, their responses appear to represent their own changed habits, rather than the habits of others. Indeed, there was a general consensus among participants in the observed meetings and focus groups that new work routines are not yet fully embedded throughout the projects. The survey results reinforce this; they show that both social and health care respondents identified 'workforce skills' as a weakness, and 'resistance to change and innovation' as a threat to their programmes.

Differences between health care and social care

In general, changes to work practices among WSDAN members appear to be much more difficult in health care than in social care settings, which again highlights the social care versus medical models of service delivery. The medical model stresses the importance of the face-to-face encounter, and GPs and nurses are often driven by their need for hands-on patient contact. Moreover, telehealth has only been available since around 2004. In contrast, over recent years, social care has outsourced home care services to third parties; social care practitioners typically no longer see users unless there is an emergency or clients' care needs have changed. There are also robust models of work that are applied to social care from the community alarm industry. Around-the-clock control centre cover supplements the limited availability of practitioners and supports users to live independently at home. Social care and housing have been practising telecare in one form or another for 20 years or more.*

Therefore, one can argue that there is less resistance to change among social care practitioners because telecare is not so different from what they already do. One social care manager explained it like this:

> *We're accustomed to large caseloads, and the technology fits into what we do. The technology is basically an alert service. We respond to calls. So when someone presses a button on the pendant, we know how to respond.*

Balancing new demands with traditional roles

In health care, particularly nursing, there is a tradition of providing care to the individual patient. Making the sometimes difficult transition to new work practices stems, in part, from the nurse developing a holistic relationship with the patient. This is a key characteristic of nursing practice, and many nurses and other health professionals construct their professional identity around it – 'how they work is what they are' (Fagermoen 1997). Indeed, some research has also suggested that many nurses

---

*As we noted, resistance to new work practices seems stronger among health care practitioners than their social care counterparts. This does not imply, however, that there is no resistance in social care. There is evidence of union resistance to moving from local authority control to becoming a social enterprise. Although some social care managers in this study looked forward to establishing social enterprises as a means of expanding their work and providing a broader range of services, there are significant implications regarding social enterprise governance and ownership, conditions of employment, job security, and pensions (Marks and Hunter 2007). The leading union representing social and health care workers in England views social enterprise 'as a way to dress up wholesale privatisation plans' (UNISON 2011).

place a high value on the psychological (as opposed to financial) rewards that derive from contact with patients. One study in Belgium, for example, found that nurses value compliments by patients more than they value pay or other financial rewards (De Gieter *et al* 2006).

This relationship, built on face-to-face contact, is important to many nurses and clients at the WSDAN sites. They tend to view patients as individuals, rather than as 'cases' – and the introduction of information and communications technology (ICT) in their work settings can create a psychological 'distance' between nurses and their clients. From their perspective, the relationship becomes one with a communications device rather than with a person (Giordano 2008). Moreover, many nurses fear that patients may become isolated, and that they may no longer see the state of the patient's home ('the cleanliness and smell', according to one nurse), which can be an important indicator of health problems or depression.

As one clinician said:

Clinicians like to be with patients – they don't like to work next to a computer.

A nurse said:

You can develop a relationship with your patients, and you want to see them. <pauses> When one of them dies, it still hurts a little and you miss them. Popping in for a cup of tea means a lot to them. <pauses> And it can mean something to us.

This, consequently, can lead to manifest resistance to changing their visibility patterns, and thereby increasing their overall caseloads. It is unlikely that telehealth can adopt larger caseloads given current service configurations based on home visits (Clark and Goodwin 2010). Moreover, the paradox here is that other patients who are sicker or in crisis are not being seen while a nurse is visiting a patient who may not need any attention at that point in time.

Given the growing number of people with long-term conditions, reductions in available skilled nurses, and the growing burden on informal carers, it will no longer be possible to support everyone with home nursing contact.

As one manager said:

There is a real challenge in changing visibility patterns – people are still visiting a lot. Nurses say to me, 'But people really love to see a nurse.' And it's really challenging for me to get them to change their visiting patterns. I may say to them that we can get 'more for the same' or 'we can achieve better for less', but some still want to go out there and see the patient.

Some nurses seem to lack the training or the motivation to manage their caseload or to seek new ways of managing their patients. It is possible that some basic tools are not widely used. For example, a cardiac nurse reported that some matrons lack the ability to triage heart failure 'because now they have 80 to 100 cases each'. One manager said:

Community matrons are afraid that this [telehealth] will double their caseload. A team is hard to set up and manage – and the way that caseloads are managed makes all the difference. You have to plan your work, and you need co-ordination so you don't fight through traffic to see a client. Staff come on to the team, and it's clear that they are not ready. They're scared! They find it hard to accept that once they are on the team, they don't have to visit everyone. You don't need to check everyone.

Another said:

> *Case managers have 150 clients, but only 7 or 8 are open cases, and there's a need for real face-to-face support* [for them that is] *critical at any one time. It's a question of scaling up skills… knowing how to manage their caseloads… When a nurse visits someone, you want the nurse to be there when the nurse should be there and do the work that only a nurse should do.*

How leaders deal with resistance to change

The leadership response to the inability or unwillingness to change existing work practices is not clear. Most leaders say that after initial resistance, clinicians see the value of telehealth – that is, exposure to the service raises awareness, competence and acceptance. Only some clinicians – mostly community matrons and specialist nurses – are likely to be won over, but the numbers still remain relatively small. One manager, who used another approach, laughed and said, 'At some point, you have to resort to pounding your fist on a table.'

So there is some resistance that is possibly caused by a professional desire not to make the change away from a traditional one in which they see the patient face-to-face. But there also appears to be a lack of formal professional development that helps practitioners to make decisions and prioritise cases and visits based on incoming data, to work from standard protocols, and to set parameters for individual patients receiving telecare or telehealth. As long as guidance from the National Institute for Health and Clinical Excellence (NICE), the Map of Medicine, specialist guidance and education programmes do not yet formally recognise a role for these technologies in case management, a major difficulty remains. In practice, case managers may become very reactive – responding only to patients on their caseload who contact them with problems on a daily basis. It is becoming more difficult for practitioners to manage ever-growing caseloads efficiently and effectively within current service configurations.

The response to this should be both local and national. At the local level, leaders need to manage organisational culture so that it provides both ongoing and strengthening support for those whose work practices are most affected, particularly those in the nursing profession. This is particularly true for those whose professional identity is bound up with their work practices (Lamb and Davidson 2005). That is, a well-developed programme of professional development should be implemented locally to help those involved in delivering telehealth and telecare projects. A recent study in New Zealand highlights the need for such scaffolding and what it terms 'fading'. The scaffolding provides master support to trainees and the fading gradually gives new telehealth recruits more responsibility as part of their professional development (Basu *et al* 2010). We saw little or no first-hand evidence of either at the 12 WSDAN sites, although some were beginning to work with newly established Health Innovation and Education Clusters (HIECs) and with local universities, which might affect pre-registration education and professional development.

Although some HIECs have the potential to influence pre- and post-registration training and development of nurses and other health care professionals (for example, through online toolkits), at the moment there is no *national* programme to change work practices or to build workforce skills that are most appropriate to telehealth. These include managing and triaging large caseloads, using data to make decisions, developing and then adhering to assessment and treatment protocols, communicating

and sharing the right data across interdisciplinary teams, or choosing and evaluating the most appropriate technologies.

The US Veterans Healthcare Administration (VHA) is a good example of such a model. At its three national training centres, potential care co-ordinators develop the skills they need to learn how to use national patient assessment protocols, how to choose and evaluate the most appropriate technologies, and how to use protocols in the field. The VHA has more than 10 years' experience of delivering home-based telehealth as part of an organisation-wide transformation programme; it is a worldwide leader on delivering telehealth at scale, with over 50,000 active users across the United States. For telehealth, staff participants get 12 hours of online training, plus 2–4 weeks of hands-on training locally. In four years (2004 to 2008), 1,500 care co-ordinators have been trained on site, and 5,000 trained online (Darkins *et al* 2008). The goal is to develop, at national level, the people skills and operational procedures needed to deliver care efficiently. Standardising care quality has helped to minimise variation in how telehealth is applied locally (Hill *et al* 2010).

Key points

- Telehealth and telecare challenge existing working practices and can provoke opposition from professionals providing care.

- Involving key professionals from the outset in the planning and design of a telehealth or telecare project helps build understanding, trust and participation.

- Most sites reported that new work routines to support technology-enabled services were not embedded in their projects. Overcoming resistance to adopting new ways of working was more difficult in health care than social care.

- There was a lack of formal professional development to support new systems of working – for example, in managing and triaging large caseloads, using data to make decisions and to target intervention, adhering to treatment protocols, communicating and sharing data between multi-disciplinary team members, and supporting the use of the appropriate technologies by both professionals and users.

- Clear strategies to influence professional behaviours, and support the development of new skills and working practices, are required. There is also a need for a national strategy and external support to project sites to build the necessary workforce skills.

Managing data

If the goal of better integrated care is to increase collaboration between health and social care organisations so that they deliver a more seamless service that improves the health and well-being of populations, then the key enabler is integrating systems for communicating and processing information. Integrated telecare and telehealth depend on integrated information systems. Telehealth and telecare are unusually complex information systems that support data integration, interoperability between devices and organisations, and health care and social care functions, while maintaining quality, patient/user safety, and confidentiality.

The complexity of these systems can, and often does, result in a proliferation of stand-alone systems, disparate databases (and database schema) that cannot communicate with each other, a lack of data integration, and poor or no automated decision support (Ackerman *et al* 2010, pp 93–4; Wright *et al* 2009; Networking and Information Technology Research and Development (NITRD) 2009). Aside from the organisational problems this poses, there is a risk to patient safety. Fragmented systems in health care can lead to erroneous or incomplete information that results in medical errors or inadequate care (Pirnejad *et al* 2008). Finally, data and systems fragmentation make systematic and coherent reporting to the public difficult, because there may be a lack of standardisation in indicators or their meaning (Suchy 2010). The research literature suggests that *availability* of information technology and data is not the problem. Instead, the trouble stems from attempting to share information across systems, making sense of data, and a lack of inter-agency co-ordination (O'Toole *et al* 2011).

Both social care and health care respondents to the online survey identified data management as a weakness in their programmes. The subsequent interviews we carried out with them strengthened and elaborated on this sentiment. The themes that emerged from the discussions included data integration and interoperability, data governance and integrity, and using data to drive decisions.

Data integration and interoperability

There are a number of telecare and telehealth systems available from commercial vendors. Typically, vendors have proprietary approaches to storing and maintaining access to information and data; each vendor collects and stores limited demographic and contact information based on the scope of services they offer. However, there is a lack of standardisation in how data are structured, stored, transmitted and accessed. Connectivity across telecare and telehealth platforms is at a very early stage of development, as are links to health and social care record systems. This is a significant weakness. It is not possible to build a fully integrated, distributed information system using telecare and telehealth without the adoption of shared standards. The tools for developing these standards and protocols do exist, but they have not yet been applied at the 12 WSDAN sites. The location of servers, system security, user-held health records, and the use of 'cloud computing' (the delivery of computing as a service rather than a product) through which to store and manipulate data are additional factors that WSDAN sites will need to consider as they roll out their programmes.

Data fragmentation emerged as a major concern across the sites we visited. A common problem identified by respondents was that different record systems do not have the capacity 'to talk to each other'. For example, home care data are not available to health professionals, and telehealth and telecare data do not link with GP data. If there is a telecare alert that someone has fallen at home, the data are not automatically available to a nurse or falls clinic so that gait, blood pressure or medication can be reviewed. One site we visited had telehealth systems provided by two vendors. If they wish to review their telehealth patients, they have to log in/out of each system in a web browser then log in/out of their patient record system, which is separate. No one sees the full picture for an integrated, client-focused service.

As one respondent said:

> *Data management is a weakness. Who has access? Who stores the data? Who*

manages it? Who is ultimately responsible for it? Who faces any legal risks? Our problem here is that data can be held by different companies in silos. You always have things running in parallel, and no one has a complete picture of the user.

Another said:

We have plans to integrate data, and to collect data from users like a point-of-sale system. We can then build up a rich picture of each user, and spot patterns – we can get fine-grained, detailed information at the client level. But right now we don't have a way of interconnecting the whole system.

One site reported that the lack of data integration means that their data cannot be used to support automated decision support tools such as predictive modelling and data mining (Ackerman *et al* 2010, p 94). Another reported that GPs do not have access to social care data, which might be instrumental in shaping the best or most appropriate patient pathway. The intelligent use of available user and patient data from a wide variety of sources through formal agreements remains a challenge for health and social care professionals.

Data governance and integrity

Since the publication of *Information for Health* in 1998 (NHS Executive 1998), new legislation and standards have been put in place to ensure the protection of private patient and client information (Huston 2005; Audit Commission 2002). While these efforts have helped to establish standards to improve the quality of data, as well as to protect patient confidentiality (for example, hospital admissions are anonymised), some respondents saw data governance as a distinct obstacle to providing telecare and telehealth services because it slowed down the decision-making process, and added a layer of complexity that, in their view, was not needed.

As one health care respondent said:

The state is so tied up with governance that people are going to die. I know this is a strong point of view, but this is what I believe. If you keep looking over your shoulder at governance, you just can't move. You need standards, but not so much that you can't move.

There is a need to get the right balance between governance and regulatory requirements, and the provision of effective and efficient health and social care support to users and patients.

Others, however, had concerns over the integrity of the data, an area where the application of national efforts on data quality could make a real difference. The questions they raised included:

- How can you be sure that the data are from the actual patient when a call comes in?

- How can you be sure that the data at the home and the data held remotely are the same?

- What standard protocols are there to assure the accurate migration of data from home devices to nurse to GP?

- What are the standards for home devices, and how can these be kept up to date?

- How do you validate smartphone applications used in support of telecare and telehealth?

One respondent said:

You have to be concerned with the data. We don't have access to GP records. We think the record-keeping isn't very good, and there's no consistent use in the community. Not all visits are recorded faithfully or at all.

The concerns and risks around data management can become a significant barrier to implementation in some areas. Some work has been completed and presented at WSDAN events to examine how device data can be incorporated into GP records (WSD Action Network 2010).

Using data to drive decisions

Most respondents said that making data usable was a challenge for them because, as we have seen, it is difficult to share data across systems, and there is some concern over the quality of the data. There is also a concern that practitioners do not yet have the proper training and experience to make judgements based on the data. One health care respondent said:

How we can make data usable is a real challenge for us. The data will contain trends that can help you predict. It really contains patterns that we would like to see and use. But clinicians need time to interpret this. And the clinician has to be of an interpretive sort – someone who can interpret and make sense of the data. But there is a real lack of training and support for interpretation.

When sharing data, it is not clear how much another user will want or require. For example, how much does a GP want to know about a patient who is receiving telehealth or telecare services? All of the data? Just the trends? Only what they ask for? Should it go to the GP in batches? Or should the GP be able to interrogate the data at will?

Data usability and governance are difficult questions to address and, unsurprisingly, the 12 WSDAN sites are having difficulty grappling with these issues. Their problems are particularly acute because they are attempting to share information and co-ordinate actions and services across organisational and functional boundaries. Data are used by different people who work for different organisations, which have overlapping yet different objectives. To add to this complexity, the information that they need to share is often neither owned nor controlled by them collectively. Daily health data have never been collected on a regular basis before outside of hospitals. It will take some time for systems and individuals to understand the significance of individual results and trends. The WSDAN sites are identifying that triage is vital to ensure that practitioners are not overwhelmed, while still maintaining responsibilities for maintaining health and social care records.

There are, in fact, two issues that emerge from the 12 sites: one concerns technical issues, the other organisational governance. The technical issues can be addressed by settling on technical standards. Governance, however, needs to be addressed by a third party that is tasked with enforcing standards and processes.

It is axiomatic that integration cannot occur without strict adherence to open data standards, access standards, telecommunications standards, and standard processes (such as the use of standard ontologies) which ensure that the meaning of the data is not lost or misinterpreted. Designing and implementing these standards is beyond the reach of the 12 WSDAN sites, and is instead the domain of national and international

standardisation efforts. The WSDAN sites, however, clearly illustrate the need for them.

When one achieves an integrated service from different providers linked by data and information, it is relevant to ask, '*Where is the boundary of the organisations providing that service?'* One school of thought holds that the boundaries of such an organisation are virtual, rather than physical or organisational (*see*, for example, Marchionini 2002). They are established according to where information flows, and how that information is used to carry out organisational agendas (Brown and Duguid 2000). In some of the 12 WSDAN sites, the long-term vision has been to achieve an integrated social care and health care service for users, but information does not flow easily from one service to another. For the user who wants to avoid repeating their details from one practitioner to another, this boundary makes the seamless transition between services impossible. Further, the boundary between information and knowledge flows tends to reinforce the different goals of social services and health services.

There is a further complexity that WSDAN sites have begun to consider. Some users or patients have NHS or social care personal budgets and/or use their own computers and smartphones to manage their personal health records. While supporting self-management and personal ownership for people with long-term conditions, these user-owned records present significant additional challenges to health and social care practitioners.

When organisational and, by implication, individual goals are different, how can they be brought into equilibrium? It is not enough to settle on standards; what is needed is a different way of conceptualising the combined services so that data could flow from one service sector to another (possibly incorporating user-held data), and be used to the benefit of users, patients, and other stakeholders. One approach might be to view integrated social and health care as an example of an extended enterprise – a loosely coupled, self-organising network of organisations that combine their services to provide new products or services to a specific market (*see* Ross *et al* 2006). This, perhaps, largely describes the current relationship between telehealth and telecare projects and their commercial partners and collaborators at the 12 WSDAN sites – it certainly describes those sites that are involved in forming social enterprises, trading arms and other service configurations. This arrangement, however, lacks the ability to answer the questions, *'What should the objective function of this enterprise be? Who is responsible for delivering quality of outcomes and for managing budgets? How can such responsibilities be enforced?'*

It is not uncommon to ask the first two questions, but the third is often neglected. The third question, however, is critical, and should be asked *before* any telehealth/telecare equipment is deployed in someone's home, because its answer leads to the programme's governance structure. In their landmark paper on the theory of the firm, Jensen and Meckling (1976) view the organisation as nothing more than a nexus of contracting (both implicit and explicit) relationships that, among other things, control individuals and help to ensure that individual and group activities meet the needs of stakeholders. The contractual relationships are important because they make explicit who the stakeholders are, and the limits and types of individual and groups activities that serve stakeholder interest.

Jensen and Meckling (p 8) write that this view of the firm is not limited to corporations, but to any organisation:

This includes firms, non-profit institutions such as universities, hospitals, and foundations, mutual organisations such as mutual savings banks and insurance companies and co-operatives, some private clubs, and even governmental bodies such as cities, states, and the federal government, government enterprises such as … the Post Office, transit systems, and so forth.

So, the data management problems that the WSDAN sites face highlight a larger problem concerning the overall governance of their programmes. It is not clear at this time that there is, or indeed will be with future reforms, a higher authority to ensure a seamless social care and health care service, as there is, to some extent, between primary care and secondary care in the NHS. If there were, one could reasonably assume that the sites and their vendors would apply open standards to data, databases, query languages, telecommunications, and display. What is more, the upstream IT activities would be aligned with the needs of the service. Finally, individuals would think of themselves as providing an integrated service, and be appraised on that basis – not as a member of a social care or health care organisation.

Governance, however, is an issue that goes beyond the reach of the 12 sites. Given that integrated telecare and telehealth will probably loom ever more important in the future, it demands national attention – it could, for instance, fall under the remit of the new NHS Commissioning Board.

Our study of the experiences of the 12 WSDAN sites was carried out before the introduction of the recent wave of NHS reforms announced by the coalition government. However, we believe the lessons we have drawn out are relevant for the future. Having said this, the commissioning and provider landscape will change, and these changes will no doubt affect the future of telecare and telehealth. In the next section, we consider the impact of those changes.

Key points

- An integrated information system is a prerequisite for the effective operation of telehealth and telecare services.

- The lack of standardisation in relation to how data are structured, stored, transmitted and accessed, leads to fragmentation. The lack of shared standards and an ability to integrate data and information is commonplace, and represents a significant weakness.

- The concerns and risks around data governance and data management are a significant barrier to implementation in some areas.

- Data and information are required to drive decision-making, but existing systems have not adequately addressed the boundary between health and social care data, and between primary and secondary care data.

How health and social care reforms may affect telecare and telehealth in the WSDAN sites

In July 2008, when WSDAN was set up, it was not envisaged that just three years later, the overall NHS budget in England would be flat, the service would need to find savings of up to £20 billion, and that local authorities would have to find unprecedented year-on-year savings.

Back in 2008, local social care authorities were in the process of mainstreaming telecare following two years of Department of Health funding, while there was increasing interest in telehealth to support the home-based management of people with long-term conditions. By 2011, it was estimated that between 1.6 and 1.7 million people were benefiting from telecare, and over 5,000 people were benefiting from telehealth (Clark and Goodwin 2010).

During this three-year period, WSDAN members have felt increasingly pressured to find service efficiencies through the use of technology. This has not only affected the focus of telecare and telehealth business planning, but has also reduced the opportunities for network members to come together and share their progress. Also, while waiting for the evidence from the WSD programme evaluation, there has been only very limited government vision and policy direction in England to maintain the initial momentum. Some services have been protected by diverting a small amount of NHS money into social care; however, access to these additional funds remains limited in the WSDAN sites. Until the WSD programme produces clear evidence about outcomes – prompting changes to policy direction, consideration of incentives, and reimbursement – commissioners and service providers will have to continue to make their own cases based on the available evidence and fewer resources.

To add to the complexity of the challenge ahead, the government has embarked on a series of NHS reforms which, over the next two years, will significantly change the commissioner and provider landscape. From our survey responses and focus group meetings, it was clear that the reforms were starting to have an impact on WSDAN sites – for instance, the clustering and ultimate removal of the primary care trust (PCT) tier and the transfer of funding over time to clinical commissioning groups were affecting the availability of resources for telehealth. There are also concerns about the increasing loss of site champions and leaders, as well as implementation expertise, as services are re-organised and staff are displaced or, as has happened in some cases, staff are no longer being employed by their organisations.

Changes in the commissioning landscape

The changes in the commissioning landscape, due to NHS reforms and reductions in local authority funding, can be summarised as follows.

- **Responsibility for commissioning is being transferred from 151 PCTs to potentially 200–300 clinical commissioning groups.** These groups would be responsible for commissioning services for individual patients and whole populations within a tougher financial environment, where NHS efficiencies of £20 billion need to be found by 2014 for reinvestment. The WSDAN sites report that clinical commissioning groups are very much at an early stage of development, and interest in telehealth is limited to a handful of GPs.

- **Some commissioning activities are being carried out at national or regional**

level by the NHS Commissioning Board. Clinical senates and clinical networks are also being developed to provide co-ordination and advice and to scrutinise the plans of commissioning groups. Senates and networks, in particular, could be key forums for promoting the adoption of telecare and telehealth services. In addition, Monitor is expected to protect and promote patients' interests.

- **There is greater encouragement for more integrated commissioning across health and social care.** Joint Strategic Needs Assessment (JSNA) responsibilities are being transferred from PCTs to clinical commissioning groups, with some local democratic input via health and wellbeing boards. It is too early to assess the impact of health and wellbeing boards in supporting the development of telecare and telehealth programmes, but it is possible that local authority telecare champions may advocate take-up of telehealth within integrated commissioning plans.

- **Greater choice for patients will be supported by limited competition, innovation, service transformation, and the use of personal health budgets.** The use of direct payments and personal budgets in social care and health care respectively is set to increase, Commissioners will need to consider providing information for budget-holders about available services, including telecare and telehealth. There are only limited numbers of social care budgets using telecare at this time, with no known telehealth examples.

- **There is renewed emphasis on care pathways and closer working across primary and secondary care, particularly for people with long-term conditions.** This can provide opportunities for technology-based solutions to be integrated into care pathways based on WSD, WSDAN and other available evidence.

- **There is a focus on QIPP (Quality, Innovation, Productivity and Prevention) targets, including better referral management, improved urgent care planning, and innovative management of people with long-term conditions.** A number of PCTs, clusters and clinical commissioning groups have started to consider how telehealth can be aligned with QIPP objectives.

- **There are continuing pressures to develop out-of-hospital solutions that support people at home and in the community.** WSDAN sites have identified that technology can support significant numbers of users and patients to live independently and have fewer hospital admissions. But WSD trial outcomes will have a significant impact on take-up.

- **There is a greater focus on outcomes (including the Quality and Outcomes Framework (QOF) and patient-reported outcomes) as well as risk-sharing.** This could include the management of people with long-term conditions.

- **Consultancies and third party organisations will provide commissioning and transaction support, referral management, risk management and predictive modelling, care pathway improvements, and 'any qualified provider' procurement.** In future, commissioners could have greater choice of telecare and telehealth providers.

- **Geographical boundaries will not always coincide with other commissioners and providers, although clinical commissioning groups should not cross local authority boundaries.** This presents a challenge for some WSDAN local authority sites, who may have to work with multiple health commissioners.

- **It is expected that the pace of commissioning changes will vary across the country.** Some clinical commissioning groups are early adopters, but there is potentially a long tailback. Of 220 additional clinical commissioning group pathfinders identified, only one mentioned telehealth among their priorities.

- **Initially, there is likely to be a lack of co-ordination, continuity and expertise, as service providers are distanced from commissioners and new organisational structures take time to bed in.** WSDAN sites were concerned about a transition period of two or more years, which could significantly slow down the adoption of telecare and telehealth services.

Changes in the provider landscape

Many of the WSDAN sites are also affected by changes in service providers, as community health teams leave their established PCT bases and are merged into other services or become stand-alone organisations. In addition, local authorities are examining possible support for stand-alone or outsourced services as they try to implement efficiency programmes.

The changes in the provider landscape can be summarised as follows.

- **The number and diversity of providers will increase initially as local authorities and PCTs further externalise services and a mixed marketplace of service providers is developed.** These are likely to include trading arms, social enterprises, commercial and not-for-profit organisations, and social work practices. The public services White Paper may further accelerate these changes.

- **Some community GP provider units are likely to emerge.** These may include on-site diagnostics, ultrasound, chemotherapy, and possibly telehealth and telemedicine support.

- **Pharmacists and other professionals are likely to extend their roles.** This will probably be most evident in relation to minor injuries, the management of people with long-term conditions, and vascular and other health checks.

- **Greater competition around quality and, in some cases, price will mean leaner organisations focused on outcomes and risk-sharing.** This may benefit telecare and telehealth services, where evidence is still being gathered.

- **There is likely to be a degree of vertical and horizontal integration with social care services, with sharing of back office and user/patient record systems.** Users, patients and carers as well as operational staff would generally welcome a more seamless service using a single point of contact and cross-platform technology support.

- **There will be greater potential for end-to-end managed care solutions for specific population groups such as patients with dementia or COPD, and, for example, health promotion programmes to tackle obesity.** Outcome-focused services and risk-sharing with vendors could be successful in scaling up telehealth services.

- **Outreach nursing and therapy services will extend from acute hospitals into the community to reduce readmissions and generate income outside of the current national tariff.** A number of acute hospitals have acquired community health teams. As tariff income reduces from fewer hospital admissions

and possible bed closures, there are opportunities to ramp up new, seamless telehealth services in the community.

- **There will be greater consolidation and streamlining, from hospital services to telecare control centres.** Efficiency drives will inevitably rationalise service provision and develop leaner organisations.

- **The role of NHS Direct will change as 111 telephone services become established.** These and other telephone-based services, such as Birmingham OwnHealth and Nottingham OwnHealth, can form the basis of a scalable telehealth service.

- **There will be changes to outcome-based contracts and service level agreements (SLAs).** Efficiencies, quality improvement programmes and competition between providers will sharpen up specifications, tenders, SLAs and contracts, and promote innovation.

- **There will be adjustments to skill-mixes for case managers, community health and social care services.** Rationalisation of provider health services in their new work environments will lead to a greater focus on who does what. This could lead to more effective and efficient triage services to enable specialist nurses and community matrons to focus on patients that would benefit from their attention. Social care and other service providers may provide control centre and triage services in future.

While commissioners are finding their way through the NHS reforms and local authority efficiency programmes, there are opportunities for service providers to gain significant ground by offering innovative services. There is evidence of this within a number of the WSDAN sites we visited in 2011.

Conclusion

With regard to the progress they have made implementing telecare and telehealth, the 12 WSDAN sites exhibit many of the characteristics of leading or high-profile sites around the country. In terms of numbers of additional users and expenditure, they are not always at or near the top of the table though. Possibly as a result of consistency in leadership arrangements at the 12 sites, we did find evidence of learning from successes as well as setbacks. There was also evidence of cross-boundary and integrated working (including housing and the third sector), innovative thinking (telephone support and telecoaching), and a determination to identify and resolve problems as they arise. We found a number of significant telehealth developments such as links to centres of excellence (universities and HIECs). There is also a focus on delivering benefits for users, patients, carers and their families, as well as generating service efficiencies. But together with non-WSDAN sites, they face significant challenges, including ongoing service evaluations to support business cases, working at scale, staff turnover, data handling, and incomplete service transformations.

Overall, the 12 sites exhibit many of the characteristics for growth and sustainability identified in the literature (Singh *et al* 2010; Obstfelder *et al* 2007). The key features include:

- **Collaboration within and across organisations**. All of the sites displayed high levels of collaboration among practitioners, with close co-ordination and sharing of knowledge and experience between health care and social care, and some shared risks.

- **Distributing leadership.** Practitioners at all levels of the organisations displayed leadership characteristics such as building momentum, staying focused, organising, communicating, influencing, locating and bidding for resources, and shaping the vision.

- **Developing alliances within the community,** especially with primary care.

- **Developing external partnerships,** principally with external vendors, the third sector, police/fire services, and user representatives.

- **Identifying critical services** where people are most likely to benefit from services in the home, such as diabetes, COPD, and heart failure.

- **Engaging external specialists,** including university specialists and peers, facilitated through WSDAN events.

- **Developing a shared vision** and raising awareness among all staff, which encourages all involved to take practical steps to achieve that vision, and promotes the rationale for why others should invest in the services.

- **Cultivating participation.** As we have seen, many sites engaged with consultants to develop and expand the service and adapt it to their working practices; most engaged patients and users to help improve the service.

- **Developing generative capacity.** Some leaders actively sought partners and participants to generate new services and new funding models, such as social enterprise and in-house trading arms. Most leaders championed telecare and telehealth, and encouraged others to see the benefits they offer.

- **Exploiting funding opportunities.** It is fair to say that many of the leaders at

the 12 sites have well-developed entrepreneurial skills. They were proactive in seeking resources, and did not expect that their funding stream would emanate from a single source. Given the cold economic climate, many had actively begun to position their services as a social enterprise for the future, and some planned to expand beyond their local areas.

- **Exploring technical options.** Most participants were eager to exploit new technologies, or innovate with existing ones. For example, one planned to develop fine-grained knowledge of the individual user so that this information could be used by social care to target services; another explored getting users to send in various readings by text message.

- **Working across professional and functional boundaries.** All the sites we visited showed a degree of collaborative working across organisational, professional and functional boundaries.

- **Developing strong project management plans, and keeping tight control over resources.** Sites regularly measured their progress against expectations, and used structured project management techniques.

Although these characteristics are necessary to sustain and expand telecare and telehealth services, they are insufficient. Other areas need to be addressed, which include:

- **Fostering fundamental service redesign.** We have seen that many nurses and other health professionals found it difficult *not* to visit patients. This obviates the logic of telehealth, which rests on the principle that enrolled patients can be monitored remotely and visits can be intelligently targeted. It is not possible to scale up telehealth services without increasing individual caseloads, and individual caseloads cannot increase without fundamental changes to how patients are visited, and, therefore, the working practices of some health professionals.

- **Promoting professional development and staff training.** Fundamental service design cannot happen without ongoing structured professional development and staff training for new and existing staff alike. As we have seen, there is a clear need to embed new ways of working in order to take advantage of the benefits that telecare and telehealth can offer. For this to happen, new recruits need development and guidance, as well as 'scaffolding' at the local level, that builds competence in stages. Moreover, staff need training and ongoing support in how to interpret data, how to make data-based decisions, setting parameters for individual patients, and how to apply (and enforce) standard protocols, both on site and in the field. Such training and development must be national in scope to avoid regional variations in the quality of services. The example of the VHA in the United States could provide the basis for a model of national training and development.

- **Analysing, designing and implementing the infrastructure first, then getting the equipment – not the other way around.** This is an inviolate rule of systems design (Avison and Fitzgerald 2006). Some sites procured equipment from vendors (or were given equipment) before they had undertaken any structured analysis or design, and therefore got locked into those systems. For example, much of the staff training was vendor-driven. Staff were trained in how to use those systems rather than receiving more generic training that could be applied across all systems. There is a danger that the processes are governed by the

vendor's approach rather than responding to users' and carers' needs, without the crucial first step of identifying people who could benefit from technology-based solutions. Neglecting the analysis and design phases often leads to a costly waste of resources. In some cases, equipment procured by some WSDAN sites was not used at all, or was underused. Furthermore, neglecting the infrastructure often results in systems not being able to 'talk to each other'. We observed widespread technical/device interoperability and connectivity problems across the sites, especially between social care and health care. This severely restricted the potential to provide seamless, integrated care to patients and users.

- **Applying open, international standards where possible, and supporting their adoption.** Applying open standards to data, access techniques, database design, and telecommunications avoids being tied to a single vendor (who maintains proprietary standards) in the future as needs change. It also facilitates the sharing and processing of data across systems and organisations. There are some standards in place and others are being developed; policy-makers should ensure that these standards are applied throughout any future telecare and telehealth programmes, as well as to procurement.

- **Encouraging decision-making based on data and evidence.** The social care respondents to our survey expressed little patience for conducting systematic, well-designed evaluations, whereas the health care respondents mostly relied on single indicators (cost-effectiveness) as a measure of success. Both approaches severely limit their respective organisations' ability to learn from experience, identify new services to meet patients' needs, and continuously monitor and improve quality. We have argued that the use of data collected from sites, and evidence (benchmarking, written literature, etc), can help to liberate the organisation from the biases of the leader. It may also open up a variety of approaches and solutions that might otherwise remain hidden.

- **Developing a governance structure.** As telecare and telehealth services grow in the future – and as more people benefit from them – there needs to be a governance structure that is fit for purpose. This means having a governance structure that enables the programme's objectives to be achieved, and meets the needs of all stakeholders – especially users and patients. To avoid regional variations in quality, this governance structure should be national in nature. The NHS Commissioning Board and clinical networks and senates could issue guidance and advice and even show some policy direction, which could also apply to evidence and interoperability.

APPENDIX: The online survey of the 12 WSDAN sites

1. With respect to your telecare/telehealth programme, please classify each item on the left as a Strength, Weakness, Opportunity or a Threat.

	Strength	Weakness	Opportunity	Threat	Click here if important to programme outcome	Don't know	Does not apply
Leadership and local champions	☐	☐	☐	☐	☐	☐	☐
Innovative ways of working	☐	☐	☐	☐	☐	☐	☐
Mainstreaming projects or pilots	☐	☐	☐	☐	☐	☐	☐
Data management	☐	☐	☐	☐	☐	☐	☐
Managing service integration	☐	☐	☐	☐	☐	☐	☐
Stakeholder involvement	☐	☐	☐	☐	☐	☐	☐
Body of local knowledge of what works	☐	☐	☐	☐	☐	☐	☐
Innovation during financial constraints	☐	☐	☐	☐	☐	☐	☐
Staff acceptance of change and innovation	☐	☐	☐	☐	☐	☐	☐

2. With respect to your telecare/telehealth programme, please classify each item on the left as a Strength, Weakness, Opportunity or a Threat.

	Strength	Weakness	Opportunity	Threat	Click here if important to programme outcome	Don't know	Does not apply
Results of outcomes and evaluations	☐	☐	☐	☐	☐	☐	☐
Results of technology investment	☐	☐	☐	☐	☐	☐	☐
Changes to caseload management	☐	☐	☐	☐	☐	☐	☐
Challenges to traditional models of care	☐	☐	☐	☐	☐	☐	☐
Vision from the top of the organisation	☐	☐	☐	☐	☐	☐	☐
Ability of commissioners and providers to innovate	☐	☐	☐	☐	☐	☐	☐
Extent to which staff are motivated and become involved	☐	☐	☐	☐	☐	☐	☐

Comments:

3. With respect to your telecare/telehealth programme, please classify each item on the left as a Strength, Weakness, Opportunity or a Threat.

	Strength	Weakness	Opportunity	Threat	Click here if important to programme outcome	Don't know	Does not apply
Predictive modelling and risk stratification	☐	☐	☐	☐	☐	☐	☐
Consent, confidentiality, and privacy issues	☐	☐	☐	☐	☐	☐	☐
Attitude of leaders and decision-makers	☐	☐	☐	☐	☐	☐	☐
Entrepreneurial thinking	☐	☐	☐	☐	☐	☐	☐
Commissioning guidance	☐	☐	☐	☐	☐	☐	☐
Working without additional funding	☐	☐	☐	☐	☐	☐	☐
Effects on your carbon footprint	☐	☐	☐	☐	☐	☐	☐
Rate of technology adoption	☐	☐	☐	☐	☐	☐	☐
Availability of broadband	☐	☐	☐	☐	☐	☐	☐

Comments:

4. With respect to your telecare/telehealth programme, please classify each item on the left as a Strength, Weakness, Opportunity or a Threat.

	Strength	Weakness	Opportunity	Threat	Click here if important to programme outcome	Don't know	Does not apply
Personalised services with budget options, choice and control	☐	☐	☐	☐	☐	☐	☐
Building a business case	☐	☐	☐	☐	☐	☐	☐
Availability of local and wider robust evidence base	☐	☐	☐	☐	☐	☐	☐
Cost of equipment/ products	☐	☐	☐	☐	☐	☐	☐
Strategies to deliver care closer to home	☐	☐	☐	☐	☐	☐	☐
Focus on self-care and long-term conditions	☐	☐	☐	☐	☐	☐	☐
Change to monitoring of health metrics and outcomes	☐	☐	☐	☐	☐	☐	☐
Costing of services for personal budgets	☐	☐	☐	☐	☐	☐	☐
Integrated working (eg, health and social care)	☐	☐	☐	☐	☐	☐	☐

Comments:

5. With respect to your telecare/telehealth programme, please classify each item on the left as a Strength, Weakness, Opportunity or a Threat.

	Strength	Weakness	Opportunity	Threat	Click here if important to programme outcome	Don't know	Does not apply
Users involved in their care plans	☐	☐	☐	☐	☐	☐	☐
Consumer market for products and services	☐	☐	☐	☐	☐	☐	☐
Decommissioning of extant ineffective services	☐	☐	☐	☐	☐	☐	☐
Resistance to change and innovation	☐	☐	☐	☐	☐	☐	☐
Workforce skills	☐	☐	☐	☐	☐	☐	☐
Identifying clients who would most benefit	☐	☐	☐	☐	☐	☐	☐
Availability of care pathways and case management approaches	☐	☐	☐	☐	☐	☐	☐
Customising services for individuals	☐	☐	☐	☐	☐	☐	☐

Comments:

6. With respect to your project or pilot, please classify each item on the left as a Strength, Weakness, Opportunity or a Threat.

	Strength	Weakness	Opportunity	Threat	Click here if important to programme outcome	Don't know	Does not apply
Integrated partnership with pooled funds	☐	☐	☐	☐	☐	☐	☐
Digital inclusion	☐	☐	☐	☐	☐	☐	☐
Fair access to care services criteria	☐	☐	☐	☐	☐	☐	☐
Support for the wider population	☐	☐	☐	☐	☐	☐	☐
Strategies for prevention and/or personalisation	☐	☐	☐	☐	☐	☐	☐
Quality standards for services	☐	☐	☐	☐	☐	☐	☐
Technology standards for equipment	☐	☐	☐	☐	☐	☐	☐

Comments:

7. Please list any other factors that have affected your programme, and identify them as a Strength, Weakness, Opportunity or a Threat.

8. Please provide the name of the person completing this questionnaire, and the name of the organisation.

Name	
Name of Organisation	

9. Post type (choose all that apply)

☐ Director

☐ Senior manager

☐ Telecare or telehealth lead

☐ Commissioner

☐ Service provider

☐ Other (please specify)..

10. Approximate number of telecare installations.

11. Approximate number of telehealth installations.

REFERENCES

Ackerman MJ, Filart R, Burgess LP, Lee I, Poropatich RK (2010). 'Developing next-generation telehealth tools and technologies: patients, systems, and data perspectives'. *Telemedicine and e-Health*, vol 16, no 1, pp 93–5.

Alaszewski A, Cappello R (2006). *Piloting Telecare in Kent County Council: The key lessons. Final report.* Canterbury: University of Kent, Centre for Health Services Studies.

Appleby J (2011). 'An NHS ice age may have only just begun'. *Health Service Journal*, 1 June. Available at: www.hsj.co.uk/comment/opinion/an-nhs-ice-age-may-have-only-just-begun/5030202.article (accessed on 21 October 2011).

Audit Commission (2002). *Data Remember: Improving the quality of patient-based information in the NHS*. London: Audit Commission. Available at: www.auditcommission.gov.uk/SiteCollectionDocuments/AuditCommissionReports/NationalStudies/dataremember.pdf (accessed on 21 October 2011).

Avison DE, Fitzgerald G (2006). *Information Systems Development: Methodologies, techniques and tools*. Maidenhead: McGraw-Hill.

Barley SR (1986). 'Technology as an occasion for structuring: evidence from observations of CT scanners and the social order of radiology departments'. *Administrative Science Quarterly*, vol 31, no 1, pp 78–108.

Barlow J, Singh D, Bayer S, Curry R (2007). 'A systematic review of the benefits of home telecare for frail elderly people and those with long-term conditions'. *Journal of Telemedicine and Telecare*, vol 13, no 4, pp 172–9.

Basu A, Seaton P, Kirk R, Hanley E, Sheehan D, O'Steen B, Allan M (2010). *Review of the Effectiveness of Educational Tools for Teaching Telehealth Care: Final report*. Christchurch, NZ: Health Sciences Centre, University of Canterbury.

Berg M (1999). 'Patient care information systems and health care work: a sociotechnical approach'. *International Journal of Medical Informatics*, vol 55, no 2, pp 87–101.

Bergmo T (2009). 'Can economic evaluation in telemedicine be trusted? A systematic review of the literature'. *Cost Effectiveness and Resource Allocation*, vol 7, p 18.

Bødker S, Greenbaum J, Kyng M (1991). 'Setting the stage for design as action', in J Greenbaum and M Kyng (eds) *Design at Work: Cooperative design of computer systems*. New Jersey: Lawrence Erlbaum Associates Inc, pp 139–54.

Brookes S, Grint K (2010). 'A new public leadership challenge?' in S Brookes and K Grint (eds) *The New Public Leadership Challenge*. London: Palgrave Macmillan.

Brown JS, Duguid P (2000). *The Social Life of Information*. Boston: Harvard Business School Press.

Brownsell S, Blackburn S, Hawley M (2008). 'Evaluating the impact of 2nd and 3rd generation telecare services in older people's housing'. *Journal of Telemedicine and Telecare*, vol 14, no 1, pp 8–12.

Button G, Harper R (1995). 'The relevance of "work practice" for design'. *Computer-Supported Cooperative Work*, vol 4, no 4, pp 263–80.

Carlile PR (2004). 'Transferring, translating, and transforming: an integrative framework for managing knowledge across boundaries'. *Organization Science*, vol 15, no 5, pp 555–68.

Clark M, Goodwin N (2010). *Sustaining Innovation in Telehealth and Telecare*. WSDAN Briefing Paper. London: WSD Action Network.

Darkins A, Ryan P, Kobb R, Foster L, Edmonson E, Wakefield B, Lancaster AE (2008). 'Care Coordination/Home Telehealth: the systematic implementation of health informatics, home telehealth, and disease management to support the care of veteran patients with chronic conditions'. *Telemedicine and e-Health*, vol 14, no 10, pp 1118–26.

Darkins A (2010). 'Telehealth in the VA: Telehealth continues to make its mark'. *VHA Telehealth Quarterly*, vol 10, no 1, p 2. Available at: www.telehealth.va.gov/newsletter/2010/101010-Newsletter_V0110Iss01.pdf (accessed on 21 October 2011).

De Gieter S, De Cooman R, Pepermans R, Caers R, Du Bois C, Jegers M (2006). 'Identifying nurses' rewards: a qualitative categorization study in Belgium'. *Human Resources for Health*, vol 4, p 15.

Department of Health (2009). *Whole Systems Demonstrators: An overview of telecare and telehealth*. Available at: www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_100946 (accessed on 21 October 2011).

Department of Health (2006). *Our Health, Our Care, Our Say: A new direction for community services.* Available at: www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_4127604.pdf (accessed on 21 October 2011).

Dilnot A (2011). *Fairer Care Funding: The report of the Commission on Funding of Care and Support*. Available at: www.dilnotcommission.dh.gov.uk/our-report/ (accessed on 21 October 2011).

Fagermoen MS (1997). 'Professional identity: values embedded in meaningful nursing practice'. *Journal of Advanced Nursing*, vol 25, no 3, pp 434–41.

Ferlie E, Fitzgerald L, Wood M, Hawkins C (2005). 'The (non) spread of innovations: the mediating role of professionals'. *Academy of Management Journal*, vol 48, no 1, pp 117–34.

Giordano R (2008). 'Professional identity and knowledge sharing: a case analysis of a wiki to support public health professionals'. Paper presented to the 4th International Conference on eSocial Science, Manchester, UK, 18–20 June. Available at: www.ncess.ac.uk/events/conference/programme/workshop1/?ref=/programme/fri/3cgiordano.htm (accessed on 21 October 2011).

Ham C, Baker GR, Docherty J, Hockey P, Lobley K, Tugendhat L, Walshe K (2011). *The Future of Leadership and Management in the NHS: No more heroes.* Report from The King's Fund Commission on Leadership and Management in the NHS. London: The King's Fund. Available at: www.kingsfund.org.uk/publications/nhs_leadership.html (accessed on 21 October 2011).

HM Government. Communities and Local Government (2008). *Creating Strong, Safe and Prosperous Communities: Statutory guidance*. Available at: www.communities.gov.uk/documents/localgovernment/pdf/885397.pdf (accessed on 21 October 2011).

Hill RD, Luptak MK, Rupper RW, Bair B, Peterson C, Dailey N, MSN, Hicken BL (2010). 'Review of Veterans Health Administration telemedicine interventions'. *The American Journal of Managed Care*, vol 16, no 12, pp e302–e310.

Houben G, Lenie K, Vanhoof K (1999). 'A knowledge-based SWOT-analysis system as an instrument for strategic planning in small and medium sized enterprises'. *Decision Support Systems*, vol 26, no 2, pp 125–35.

Huston JL (2005). 'Information governance standards for managing e-health information'. *Journal of Telemedicine and Telecare*, vol 11 (suppl 2), pp 56–8.

Jensen MC, Meckling WH (1976). 'Theory of the firm: management behavior, agency costs and ownership structure', originally published in *Journal of Financial Economics*, vol 3, no 4, pp 305–60. Accessed through the Social Science Research Network, http://papers.ssrn.com/s013/papers.cfm?abstract_id=94043 (accessed on 21 October 2011).

Johnson G, Scholes K, Sexty RW (1989). *Exploring Strategic Management*. Scarborough, Ontario: Prentice-Hall.

Lamb R, Davidson E (2005). 'Information and communication technology challenges to scientific professional identity'. *The Information Society*, vol 21, issue 1, pp 1–24.

Lehoux P, Sicotte C, Denis JL, Berg M, Lacroix A (2002). 'The theory of use behind telemedicine: how compatible with physicians' clinical routines?' *Social Science & Medicine*, vol 54, no 6, pp 889–904.

LeRouge C, Tulu B, Forducey P (2010). 'The business of telemedicine: strategy primer'. *Telemedicine and eHealth*, vol 16, no 8, pp 898–909.

Levy PF (2001). 'Nut Island effect: when good teams go wrong'. *Harvard Business Review* (March), pp 51–9.

Light D, Dixon M (2004). 'Making the NHS more like Kaiser Permanente'. *British Medical Journal,* vol 328, pp 763–5.

Marchionini G (2002). 'Co-evolution of user and organizational interfaces: a longitudinal case study of WWW dissemination of national statistics'. *Journal of the American Society for Information Science and Technology*, vol 53, no 14, pp 1192–1209.

Marks L, Hunter DJ (2007). *Social Enterprises and the NHS: Changing patterns of ownership and accountability*. London: UNISON.

Martin GP, Currie G, Finn R (2009). 'Reconfiguring or reproducing intra-professional boundaries? Specialist expertise, generalist knowledge and the 'modernization' of the medical workforce'. *Social Science & Medicine*, vol 68, no 7, pp 1191–98.

Martin GP, Currie G, Finn R, McDonald R (2011). 'The medium-term sustainability of organisational innovations in the National Health Service'. *Implementation Science*, vol 6, no 19.

May C (2006) 'Mobilising modern facts: health technology assessment and the politics of evidence'. *Sociology of Health & Illness,* vol 28, no. 5, pp 513–532.

Mintzberg H (1994). *The Rise and Fall of Strategic Planning*. Hemel Hempstead: Prentice Hall Europe.

NHS Executive (1998). *Information for Health: An information strategy for the*

modern NHS 1998–2005. Available at: www.dh.gov.uk/prod_consum_dh/groups/
dh_digitalassets/@dh/@en/documents/digitalasset/dh_4014389.pdf (accessed on 23
October 2011).

NITRD (2009). *High-Confidence Medical Devices: Cyber-physical systems for
21st century health care. A research and development needs report*. Arlington, VA:
Networking and Information Technology Research and Development Program, High
Confidence Software and Systems Coordinating Group. Available at: www.nitrd.gov/
About/MedDevice-FINAL1-web.pdf (accessed on 23 October 2011).

Obstfelder A, Engeseth KH, Wynn R (2007). 'Characteristics of successfully
implemented telemedical applications'. *Implementation Science*, vol 2, no 25.

Orr JE (1998). 'Images of work'. *Science, Technology, & Human Values*, vol 23, no 4,
pp 439–55.

O'Toole LJ, Slade CP, Brewer GA, Gase LN (2011). 'Barriers and facilitators to
implementing primary stroke center policy in the United States: results from 4 case
study states'. *American Journal of Public Health*, vol 101, no 3, pp 561–6.

Pawson R, Tilley N (1997). *Realistic Evaluation*. London: Sage.

Pfeffer J, Sutton RI (2006). *Hard Facts, Dangerous Half-Truths, & Total Nonsense:
Profiting from evidence-based management*. Boston: Harvard Business School Press.

Pirnejad H, Niazkhani Z, Berg M, Bal R (2008). 'Intra-organizational communication
in healthcare: considerations for standardization and ICT application'. *Methods of
Information in Medicine*, vol 47, no 4, pp 336–45.

Ross J, Weill P, Roberston DC (2006). *Enterprise Architecture as Strategy: Creating a
foundation for business execution*. Boston: Harvard Business School Press.

Rousseau DM, Manning J, Denyer D (2008). 'Evidence in management and
organizational science: assembling the field's full weight of scientific knowledge
through syntheses'. *The Academy of Management Annals*, vol 2, no 1, pp 475–515.

Sauer C (1993). *Why Information Systems Fail: A case study approach*. Oxford: Alfred
Waller Ltd.

Singh R, Mathiassen L, Stachura ME, Astapova EV (2010). 'Sustainable rural
telehealth innovation: a public health case study'. *Health Services Research*, vol 45,
no 4, pp 985–1004.

Star SL, Griesemer JR (1989). 'Institutional ecology, 'translations' and boundary
objects: amateurs and professionals in Berkeley's Museum of Vertebrate Zoology,
1907–39'. *Social Studies of Science*, vol 19, no 3, pp 387–420.

Suchman L, Blomberg J, Orr JE, Trigg R (1999). 'Reconstructing technologies as
social practice'. *American Behavioral Scientist*, vol 43, no 3, pp 392–408.

Suchy K (2010). 'A lack of standardization: the basis for the ethical issues surrounding
quality and performance reports'. *Journal of Healthcare Management*, vol 55, no 4, pp
241–51.

UNISON (2011). 'Private practices for social workers – Big con trick'. Briefing Paper.
Available at: www.unison.org.uk/localgov/pages_view.asp?did=12914 (accessed on
23 October 2011).

Webster C (2002). *The National Health Service: A political history*, 2nd ed. Oxford:
Oxford University Press.

Weihrich H (1982). 'The TOWS matrix – a tool for situational analysis'. *Long Range Planning,* vol 15, no 2, pp 54–66.

Wertenberger S, Chapman KM, Wright-Brown S (2011). 'Transforming nursing in a national healthcare system: an example of transformation in action'. *Nursing Administration Quarterly*, vol 35, no 3, pp 260–69.

White S, Wastell D, Broadhurst K, Hall C (2010). 'When policy o'erleaps itself: the "tragic tale" of the Integrated Children's System'. *Critical Social Policy*, vol 30, no 3, pp 405–29.

Wright A, Sittig DF, Ash JS, Sharma S, Pang JE, Middleton B (2009). 'Clinical decision support capabilities of commercially-available information systems'. *Journal of the American Medical Informatics Association*, vol 16, no 5, pp 637–44.

WSD Action Network (2010). 'Telehealth information integration project'. Presentation by Michael Dillon at WSDAN roadshow, Stansted, 11 February. Available at: www.wsdactionnetwork.org.uk/past_events/wsdan_roadshow_11.html (accessed on 23 October 2011).

WSD Action Network (2011). 'About WSDAN'. Available at: www.wsdactionnetwork. org.uk/about_wsdan/index.html (accessed on 23 October 2011).