

Quality and Safety Between Ward And Board: A Biography of Artefacts

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Background

There has been concern about the quality and safety of NHS hospital services since the turn of the Millennium. A series of government policies and official reports has made a range of recommendations for improving quality and safety. This report focuses on one of the themes running through the policies and reports, concerning the need for more and better data about quality and safety, and for investments in information technologies to manage the data.

Following a difficult period for all NHS Trusts in the 2000's under the NHS National Programme for IT, they have made progress in integrating IT systems in the last few years. Clinicians can increasingly access detailed patient data anywhere within a hospital. But the second Francis report into the scandal at Mid Staffordshire NHS Foundation Trust in 2013, and subsequent reports by Donald Berwick and Sir Bruce Keogh, highlighted two problem areas. One was wards where – in spite of the investments – nurses did not have IT systems to help them to monitor and manage patients' risks, or to provide data to drive service improvement. The second was oversight of quality and safety in wards and departments. Trust boards and external agencies did not have access to routine data that would allow them to identify wards and departments which needed to improve. This study investigated the progress that acute NHS Trusts have made in developing and using technology infrastructures to enable them to monitor the quality and safety of services, between 2014 and 2016.

Aims and Objectives

The research had two aims. The first and principal aim was to establish whether ward teams in acute NHS Trusts had the information systems they needed to manage their own work, and report on that work to Trust boards and other stakeholders. The second aim was to establish the extent to which ward level dashboards provide a basis for achieving the openness, transparency and candour envisaged by Sir Robert Francis in his second report..

There were four research objectives:

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1. Assess the extent to which Trusts are able to integrate activity, quality, outcome and cost information in dashboards, to enable ward teams to manage their services effectively and to improve services over time;
2. Evaluate the impact of the use of dashboards on clinical and management practices at ward level;
3. Assess the extent to which dashboards provide data that are valuable to other local stakeholders, including Trust boards, Healthwatch and commissioners;
4. Identify the barriers and facilitators to the effective re-design and use of dashboards.

Methods

A telephone survey of 15 acute NHS Trusts was undertaken in the autumn of 2014, and a review of the content of board papers of all Trusts in England was undertaken in January 2015. The telephone survey was undertaken with chief nurses, or senior managers that they nominated, at acute NHS Trusts in the Yorkshire and Humber region. Interviews were recorded and transcribed, and the transcripts were analysed using Framework Analysis. The board papers were analysed by recording the presence or absence of a range of quality and safety indicators, including mortality, incidents and the measures in the NHS Safety Thermometer.

The telephone survey was used to identify sites for the main field study. Site selection was partly pragmatic and partly purposive. It was pragmatic because we could only select from sites that were within reasonable travelling distance of our offices – given the volume of fieldwork that we proposed - and that were willing to participate in the study. It was purposive in that we selected sites that either had real-time ward management systems, or had formally agreed implementation plans to deploy them. We also selected a mix of Foundation and non-Foundation Trusts, on the basis that they had different governance arrangements, and they might therefore be expected to use different data in different ways.

We then observed the use of information systems in four acute hospital Trusts. We collected data over an 18 month period at the four sites, between April 2015 and September 2016, using a combination of methods. One focus was on direct observation of working practices, on the

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basis that the evidence of our observation of people at work was more reliable than their accounts of the same work. We also used semi-structured interviews and analysis of site documentation to capture information about practices that we could not observe directly, such as discussions in meetings that we were not able to attend.

The Biography of Artefacts approach was used to analyse the data, making this a Science and Technology Study. The method is suited to the study of large-scale IT systems in organisations, where it is not feasible to study the systems in their entirety. The pragmatic solution is to observe developments at a number of 'key points' where significant things happen, such as ward nurses using data and IT systems in the course of their work, and board committees using data to scrutinise the quality and safety of services.

Further, if we want to understand any IT system in an organisation – understand why it looks the way it does today - we need to understand its history. The method therefore involves the development of a number of 'mini-biographies' based on observations made, over time, at each of the key points. A Biography of Artefacts is, then, made up of a number of mini-biographies, or five narratives of events unfolding over time.

Results

The survey of the board papers of acute Trusts showed that all Trusts received data on the quality and safety of services in January 2015. The telephone survey of 15 Trusts in the region revealed that two Trusts already had real-time ward management systems, and four had firm plans to implement them.

Five mini-biographies were developed, focusing on different aspects of hospital data and technology infrastructures: the uses of technologies on wards, the work of information and informatics teams, board committees, directorates (also called clinical business or support units), and national and local agencies. The mini-biographies set out the direction of developments at the four Trusts between 2013 and 2016.

The wards that we studied at the Trusts had the information systems that they needed to manage the quality and safety of services. The data were an important source, but not the only source, of information for managing the wards: handovers, regular meetings and informal discussions in the course of shifts were all important. The use of IT systems, including electronic whiteboards and tablets, varied between Trusts.

Board and board quality committees received increasing volumes of data about the quality and safety of services between 2013 and 2016. These data provided board and committee members with assurance about services in wards and departments, and they were able to use data to identify issues that merited discussion. There were a number of wider developments during the study period, for example in the introduction of meetings where staff could raise concerns. Taken together, boards had effective oversight, and members felt that 'nasty surprises' were much less likely than three or four years earlier.

The mini-biographies portray the development of data and technology infrastructures over a period of years, to support the movement of data from ward to board, and beyond to national and local agencies. The overall form of the infrastructures had been substantially determined by national agencies, and was geared to data processing – to capturing and validating data for submission to national agencies. Trust boards had taken advantage of these data and use them to provide assurance about quality and safety. Less positively, the infrastructures had developed in piecemeal fashion, with different technologies used to handle different quality and safety data.

The deployment of real-time management systems on wards, including electronic whiteboards and mobile devices, marks an important departure from the centralized data processing model. The systems support the proactive management of clinical risks and are used principally by nurses, who have made substantial contributions to their designs.

These developments have occurred within a broad context, with Trusts making concerted efforts to improve the quality and safety of services, and publishing far more data about their performance, than just three years earlier. Trust level data suggest that quality and safety improved at all four Trusts between 2013 and 2016. Our findings indicate that the technology

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infrastructures had contributed to these improvements. There remains considerable scope to rationalise those infrastructures.

Conclusions

NHS organisations face a major strategic choice concerning its data and technology infrastructures. The ward and infrastructure mini-biographies showed that the technology infrastructures within the Trusts are only partial amalgams – they are also fragmented. The separate national systems for reporting activity (including mortality), incidents and complaints, and the NHS Safety Thermometer, limit the extent to which Trusts have been able to integrate the management of quality and safety data. Fragmentation is mandated by NHS Digital, with its piecemeal arrangements for submission of the different types of data.

One option is to continue with essentially parallel systems – to continue with the current arrangements. A second option is to phase out the current ‘data processing model’. Only data captured in the course of clinical work would be captured, and subset of those data would be submitted to national bodies. This would mark a step change in thinking and practice, towards real-time management and data-driven quality improvement. The third option is to move to a comprehensive, centralized – NHS-wide - real-time information system. This would, again, rely on data captured in the course of clinical work, but the data would be made available external bodies, which would take responsibility for the quality and safety of services. The path taken will have a major impact on the design and use of Trust infrastructures for many years to come.

Implications for health care

1. Real-time ward management systems have been developed largely in-house, using agile methods and with ward nurses closely involved. They mark a significant departure in thinking and practice from the NHS' historical reliance on commercially available data processing systems. Acute Trusts that are not already investing in these systems should consider them.
2. The Trusts are acutely aware of the potential locked in the datasets in their data warehouses, and in their informatics and information teams. Their capacity to exploit the potential is currently very limited: most of their time is committed to preparing national data submissions. Trusts need to be able to free up staff time if they are to achieve data-driven quality improvements.
3. The development of real-time management systems presents the NHS with a strategic choice. Will sustained and substantive quality and safety improvements be achieved by centralizing authority, and hence the flow of data, to boards and to external agencies? Or will they be achieved by the clinical teams caring for patients, supported by real-time management systems? The decision will have a major effect on the future development of these critical infrastructures.

Recommendations for Research

1. The growth in the use of mobile technologies on wards for the management of clinical risks, as well as for recording patients' status and treatment, may have effects on the quality and safety of services. These effects need to be established.
2. Similarly, there has been a significant growth in the use of electronic whiteboards on acute wards in the last three years. This study raises a question: are they interim technologies, that will disappear when mobile devices are ubiquitous, or do they have an important role to play in monitoring the quality and safety of services?
3. National data submissions have developed in piecemeal fashion during the last two decades. A number of reports have drawn attention to the time that clinicians spend recording data or searching for it, but this is the first study that has highlighted the opportunity costs, in time and resource use, for national submissions. The overall design of national data submissions, and their costs and value, merit review.
4. Acute Trusts now have data warehouses, which appear to have considerable potential to support analyses of current performance and modelling options for service improvements. Trusts' use and the scope for wider exploitation of these datasets needs to be evaluated.

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