

Making sense of evidence in management decisions: the role of research-based knowledge on innovation adoption and implementation in health care

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Declared competing interests of authors: none

The views and opinions expressed by the interviewees, in the verbatim quotations, are those of the interviewees and do not necessarily reflect those of the authors, those of the NHS, the NIHR, NETSCC, the HS&DR programme or the Department of Health.

Published March 2014

DOI: 10.3310/hsdr02060

Scientific summary

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Health Services and Delivery Research 2014; Vol. 2: No. 6

DOI: 10.3310/hsdr02060

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Background

It is increasingly accepted that patient care can be improved through the implementation of evidence-based innovations and the mobilisation of research findings informing 'best practice'. Successfully implementing innovations in complex organisations, such as the UK's NHS, is often challenging, as multiple contextual dynamics mediate the process. Research studies have explored the challenges of introducing innovations into health-care settings and have contributed to a better understanding of why potentially useful innovations are not always implemented in practice, even if backed by strong scientific evidence. Mediating factors include health policy and health system influences, organisational factors, and individual and professional attitudes, which include perceptions of decision-makers of innovation evidence. These studies further suggest that the nature and definition of evidence is often ambiguous and contested among diverse professional groups. This is further exacerbated when multiprofessional teams dispersed across hospital departments must deliver on cross-cutting deliverables such as infection prevention and control in acute care. Despite substantial research in the field, there has been limited empirical investigation into how different forms of evidence are accessed, reviewed and used by organisational decision-makers (in contrast to individuals) during innovation adoption and implementation. These health-care decision-makers have varying backgrounds and include clinical hybrid managers (e.g. nurses, doctors, pharmacists by training and profession) and non-clinical staff. We also know little about how these managers from a diverse range of professional backgrounds make sense of evidence collectively when they come together to take organisational decisions. We also have a limited understanding of how this collective sensemaking mediates the uptake of health innovations.

Aims and objectives

The study's broad aim was to investigate the use of different sources and types of evidence, including research-generated knowledge in health-care management decisions. A key objective was to explore the process of innovation in health-care organisations and the construction and use of evidence by decision-makers in this process. The search for, and assessment and use of, evidence by diverse decision-makers at the different stages of the innovation process was explored, looking at specific technology examples. Our analysis also captured the facilitating or constraining influences on the use of evidence during innovation decision-making at multiple levels. These were (1) the influences of wider macro-level contextual dynamics, (2) the processes by which health-care managers constructed meaning of available evidence and how they used such evidence when deciding on adoption or rejection, and (3) implementation of innovative technologies (the micro level).

The study aimed to address the following key research questions:

- How do managers make sense of evidence?
- What role does evidence play in management decision-making when adopting and implementing innovations in health care?
- How do wider contextual conditions and intraorganisational capacity influence research use and application by health-care managers?

Methods

Our research design comprised multiple case studies and used mixed methods. We analysed both contemporary and retrospective examples of technology adoption and implementation processes in acute-care organisations across England. We employed structured survey questionnaires, in-depth interviews, systematic analysis of relevant secondary data and field visits to empirical sites to understand the rationale and challenges involved in sourcing and using evidence in relation to innovative technologies. We also incorporated active input into the research process from a multidisciplinary project steering group that helped to construct meaning and interpret research findings. We focused our analysis on the empirical setting of infection prevention and control. We analysed the data using a combination of inductive and deductive reasoning (with the use of a conceptual framework as a sensitising device on key emerging themes). We employed theories of organisational innovation adoption and sensemaking in organisations to interpret the data, informed by our review of the literature.

The research design consisted of two phases. Phase 1 focused on the espoused use of evidence by senior, mid-career and junior managers, as well as diverse clinical hybrid managers. We employed structured survey questionnaires (embedded in the interview guide and administered during the face-to-face interviews) involving 126 informants in nine acute-care organisations (NHS trusts); we also conducted 126 in-depth semistructured interviews with the same key informants. We purposefully sampled for senior (e.g. medical director, director of nursing, director of research and development), middle and operational managers and health professionals (from various backgrounds including medicine, nursing, pharmacy) in managerial roles across each trust and, specifically, in infection control. Phase 2 explored the use of evidence in practice and in context, at the point of decisions, and included informants involved in the adoption decisions and implementation of particular technologies in infection prevention and control. In phase 2 we conducted 65 semistructured interviews across eight NHS trusts. In each trust we sampled for three technologies fulfilling the following criteria: (1) being considered for adoption at the time of the study, (2) successfully adopted and implemented, and (3) rejected or discontinued after initial adoption. Using a systematic options appraisal, we bounded the technology by infection prevention control priority area (environmental hygiene/cleaning/disinfection) and time frame of the organisational adoption decision (technologies prior to 2007 were not included to avoid recall bias and incomplete data owing to staff turnover).

Findings

- In phase 1, a range of sources and types of evidence were reported as being accessed and used by non-clinical staff and clinical hybrid managers. Access to and use of evidence types and sources varied greatly among professional groups. Evidence types included research-generated information on innovation decisions from national bodies and agencies, local trial data, peer exchange or, less often, input from external agents such as management consultants.
- No difference was reported in accessing evidence sources by NHS professionals in hospitals when comparing different organisational types – Academic Health Sciences Centre, foundation trust or acute trust/district general hospital. The dominant sources across professionals and the organisational sample were The Cochrane Library, the National Institute for Health and Care Excellence (NICE), National Service Frameworks, NHS Evidence and the former National Patient Safety Agency (NPSA). A regional network effect was identified for those trusts participating in the Department of Health Showcase Hospitals Programme and the NHS Institute for Innovation and Improvement, and those located in north-west England, using evidence from the National Technology Adoption Centre and the Department of Health Smart Solutions Programme.
- In phase 1, clinical staff reported a strong preference for science-based, peer-reviewed and published evidence, although the extent to which they used such evidence in practice varied, as reported in phase 2. In addition, all groups called upon experiential knowledge and expert opinion. Nurses overall drew upon a wider range of evidence sources and types. Non-clinical managers tended to sequentially prioritise evidence on cost produced by national-level sources, and implementation trials and cost

information from within their own or other hospital organisations, considering the biomedical evidence after this form of evidence.

- Research evidence identified as missing by respondents in our sample included behavioural studies; implementation research; and organisational or management research. Pharmacists reported a higher need for behavioural studies, which is in contrast to doctors, who did not perceive these as a priority. This is despite the fact that a significant body of such research evidence exists in health services research and mainstream management journals. When probed, most respondents were not aware of these journals, and did not report reading them.
- Respondents highlighted that the very nature of evidence around innovations was emergent, iterative and changing.
- We identified no clear observable pattern between adoption or implementation outcomes and 'evidence strength on efficacy' or 'expected budget impact' of the studied technologies when considered in isolation. Low perceived practice impact was more likely to be linked with successful adoption and trust-wide implementation. The combination of all three dimensions of evidence better explained outcomes and these were consistently considered in tandem by decision-makers across all microcases in phase 2. In phase 2, we systematically mapped 27 innovation journeys of 18 unique environmental hygiene technology products across eight trusts. This revealed the types and sources of evidence used by diverse stakeholder groups along the three substages of initiation, adoption decision and implementation. There were significant differences between the types and sources reported in phase 2 and those reported in phase 1. For example, sources such as The Cochrane Library, NICE, National Service Frameworks, NHS Evidence and the former NPSA did not feature in those decisions concerning adoption – or non-adoption – of these technology products. Although in phase 1 a low importance for industry as a source of evidence was reported, supplier product documentation and demonstrations featured most frequently in decisions in phase 2.
- For the particular organisational decisions studied (adoption and implementation of innovative technologies) evidence generated from research did not offer unambiguous or universal prescriptions for action, and even did not always emerge as the primary evidence source. In most cases, a plurality of types of evidence was used, which were contingent on the local context, offering a range of potential sources to guide decision-making.
- Different types of evidence were interwoven and contributed to local decision-making discourses. In these discourses research evidence, personal experiences and knowledge, relationships with the suppliers, politics, resources, national performance targets, national and organisational policies, organisational and departmental priorities and clinical pressures (infection outbreaks) were continuously at play and have shaped decision-making outcomes.
- Critical events, external pressures and the trusts' distinct organisational cultures were widely perceived by respondents to have a significant, but differential, impact on evidence use during the decision-making process. Infection outbreaks, financial pressures, performance targets and trusted relationships with suppliers seemed to induce an emphasis on 'what works' and a less rigorous approach to evidence use, leading to the adoption of products with an emergent evidence base on efficacy. On the other hand, trust infrastructure redevelopment projects, a strong emphasis on patient safety and collaboration or teamwork appears to widen scope for evidence access, review and use in decision-making.
- The different forms of evidence were not simply accessed and applied 'at face value' by the decision-makers. It was necessary to continuously interpret and (re)construct the evidence in some way, according to one's own professional identity, organisational role, team members and audience, and organisational objectives. Far from being merely technical or 'scientific', we found this process to be highly iterative and 'messy'. Many questioned what counted as evidence.
- Professional identities impacted upon prospects for meaningful knowledge exchange and individual knowledge and evidence selection. In these evidence discourses, members of professional groups viewed and used evidence differently. For doctors and non-clinical managers, plausibility to self of a type of evidence sufficed to bring it into the decision-making process. Nursing staff also sought plausibility and acceptance of the evidence from other groups, before formally contributing evidence into decision-making.

- A difficulty is reported in making sense of evidence by a sizeable proportion of members of all professional groups in our sample, which also includes senior and experienced professionals.
- Overall, we found diverse 'evidence templates' in circulation and in use, namely 'biomedical-scientific', 'practice-based experiential' and 'rational-policy', which defined what constitutes acceptable and credible evidence in the decision-making process. Informants variably drew on those templates to make sense of the evidence and of the problem under consideration.

Conclusions

In our empirical cases, we observed that organisational contexts, policy mandates and professional identities mediated the use of evidence in the adoption and implementation of the specific health technology products examined.

In particular, evidence sources and types appeared to be variably prioritised and used by decision-makers depending on their professional background. Doctors and nurses prioritised evidence on the clinical efficacy and effectiveness of innovations. Non-clinical managers and nurses relied more on their own, or peer, experiential knowledge in contrast to doctors, who showed preference for more systematic forms of knowledge. Non-clinical managers and nurses considered evidence on 'ease of use', including local trials of innovative products and technologies, as highly important. In addition, the various professional groups drew variably on co-existing evidence templates to help them to make sense of the evidence base. Nurses drew on all diverse templates and aimed for evidence plausibility to self and others and were the only professional group who explicitly tried to make the case to other stakeholders. Non-clinical managers also drew on all diverse templates but aimed primarily for evidence plausibility to self. In contrast, doctors drew primarily on the biomedical-scientific template and were exclusively concerned with evidence plausibility to self.

These observations have obvious implications for decision-making, especially who to involve, the breadth of the evidence base needed to be considered, the confluence of different templates for making sense of the evidence and how consensus in a multiprofessional context can be achieved. An evidence-based management approach that inflexibly applies the principles of evidence-based medicine, our findings suggest, neglects how evidence is actioned in practice and how codified, systematised knowledge generated from research inter-relates with other forms of evidence that are also valued by decision-makers. Experience, personal knowledge and expertise, perspectives and preferences of stakeholders, policy mandates and endorsement, and evidence from the local context all may contribute as credible and relevant evidence sources. The NHS and other health systems have explicit policy goals to promote the uptake of innovations and systematise new practices across health-care organisations. Our findings suggest that local processes and professional and microsystem considerations play a significant role in adoption and implementation. On the basis of this, and significant other research, this policy goal of systematisation appears to be infeasible, because of the idiosyncrasies of situated circumstances and cultures. This has substantial implications for the effectiveness of large-scale projects and systems-wide policy.

Funding

Funding for this study was provided by the Health Services and Delivery Research programme of the National Institute for Health Research.

Health Services and Delivery Research

ISSN 2050-4349 (Print)

ISSN 2050-4357 (Online)

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The research reported in this issue of the journal was funded by the HS&DR programme or one of its preceding programmes as project number 09/1002/38. The contractual start date was in November 2010. The final report began editorial review in November 2012 and was accepted for publication in July 2013. The authors have been wholly responsible for all data collection, analysis and interpretation, and for writing up their work. The HS&DR editors and production house have tried to ensure the accuracy of the authors' report and would like to thank the reviewers for their constructive comments on the final report document. However, they do not accept liability for damages or losses arising from material published in this report.

This report presents independent research funded by the National Institute for Health Research (NIHR). The views and opinions expressed by authors in this publication are those of the authors and do not necessarily reflect those of the NHS, the NIHR, NETSCC, the HS&DR programme or the Department of Health. If there are verbatim quotations included in this publication the views and opinions expressed by the interviewees are those of the interviewees and do not necessarily reflect those of the authors, those of the NHS, the NIHR, NETSCC, the HS&DR programme or the Department of Health.

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