Complexity in practice: understanding primary care as a complex adaptive system

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ABSTRACT

Background This series summarises new empirical research on quality improvement through case studies of the implementation of clinical governance arrangements in two primary care organisations (PCOs).

Objective To describe a new socio-technical model for effective quality improvement and clinical governance.

Method The research strategy included a literature review, survey, in-depth interviews, participant observation and purposively sampled case studies, conducted within a social constructionist ontological perspective. This approach contextualises the origins of clinical governance and the trend towards collaborative partnerships and federated models of practice, enabled by developments in primary care informatics.

Results People operating within multidisciplinary networks communicate with each other to determine actions that govern their most relevant concerns. Quality improvement in two PCOs is enabled through social interactions between individuals and groups with complex relationships; and information technology (IT) systems which make some aspects of the quality of care explicit.

Conclusions The results are real-world exemplars of the emergent properties of complex adaptive systems. Improving clinical governance in primary care requires both complex social interactions and underpinning informatics. The socio-technical lessons learned from this research should inform future management approaches.

Keywords: clinical governance, complex adaptive systems, informatics, primary care, quality assurance, socio-technical

Box 1 Definition of primary care informatics

The term primary care informatics, used throughout this paper, follows the definition proposed by de Lusignan. The scientific study of data, information and knowledge, and how they can be modelled, processed or harnessed to promote health and develop patient-centered primary medical care. Its methods reflect the biopsychosocial model of primary health care and the longitudinal relationships between patients and professionals. Its context is one in which patients present with unstructured problems to specially trained primary care professionals who adopt a heuristic approach to decision making within the consultation.
technology to improve quality and implement clinical governance.

Background

The Labour Government that came to power in 1997 introduced strategies based on developing collaborative partnerships and federated models of practice. The paper *The New NHS: modern, dependable* argued that the health service operated within an increasingly competitive world that was more demanding, less stable and the consequences of failure more immediate. The reforms sought to reduce inequalities, inefficiencies and fragmentation in service provision, and ensure financial balance within the NHS, thus promoting a whole-system ideology. The White Paper mandated the creation of governance linked networks to manage health services. Clinical governance became a key part of an evolutionary modernisation and quality improvement programme. The following gives a definition of clinical governance:

A framework through which the NHS organisations are accountable for continuously improving the quality of their services and safeguarding high standards of care by creating an environment in which excellence in clinical care will flourish.

Clinical governance policy 'generally reflected the most heavily nationally promoted quality initiatives'. These were subsequently clarified as including clinical audit, risk management, quality assurance, clinical effectiveness and staff/organisational development. This greater degree of monitoring, control and accountability was supported by integrated general practice electronic care records.

Towards the end of the 20th century, a fundamental NHS strategic shift supported choice, diversity and new models of care within a patient-led NHS. Collaborative partnerships and federated models of practice evolved. Increased utilisation and development of electronic care records became essential to support the strategic drive for quality and efficiency within primary care, in terms of communicating details about registered populations and providing evidence of achieving population-based health targets.

Aims

To identify the key themes that underpin the effective management of governance programmes.

Objectives

- To describe the development and implementation of clinical governance within two PCOs from the perspective of participants.
- To explore the differences between the two approaches, identifying generic lessons for the management of primary care quality improvement programmes.
- To review governance, social network analysis (SNA) and CAS theories to inform the development of a conceptual framework.
- To apply the framework in order to explain empirical findings from the two case studies.
- To define the role of informatics in enabling effective management of governance programmes.

Methodological approach

I purposively sampled two contrasting case studies. I chose a social constructionist approach to the case studies. The methods used to collect and analyse the data from a range of sources (personal experience, survey, in-depth interviews, analysis of secondary data sources and participant observation), including respective strengths and weaknesses, are described in detail by the researcher elsewhere.
Review of the literature

Key themes that influenced the conceptual framework are summarised next as ‘The importance of theory is to help the investigator summarise previous information and guide his future course of action’.19

Governance models

Models of governance provide the framework within which quality improvement programmes operate. The literature describes a ‘shift from government to governance’ involving the whole system, which cannot be controlled with any degree of certainty.20–29 Clinical governance is determined through a combination of targets, incentives and principles of self-assessment.30–33 On the basis of the literature review, Table 1 illustrates a conceptualisation of governance models, themes and influences on quality.

The network model accommodates the characteristics of earlier formulations, and both positive and negative influences.

Complex adaptive systems

Key elements and principles that characterise a CAS34–42 are introduced below – they form useful models of the types of social interactions between professionals looking to implement change.

CAS element – multiple agents, different world views

Democratic principles lead to mutual adjustment.

CAS element – self-organising networks

Mutual causation – influence is exercised both by the system on the units, and by the units on the system:

In an astonishing variety of contexts, apparently complex structures or behaviours emerge from systems characterised by very simple rules. These systems are said to be self-organised and their properties are said to be emergent.36

CAS element – co-evolution and system adaptation

Allow time for properties to emerge, avoid disturbing ecologies with major change.

The literature suggests that CAS theories are a valuable tool to help make sense of natural phenomena, which include human responses to problem solving within organisations.

Results

Four main themes emerged. Three are predominantly social, and one is technical:

1 Multiple stakeholder perceptions, preferences and priorities.
2 Emphasis on a positive approach supported by education, training and development.
3 Resource concerns aligned to pace of quality improvement development.
4 Development of communication and information systems supported by technology.

Initial dialogue centred on topics familiar and meaningful to those involved locally. A perceived need to contemplate an integrated care domain was expressed as:

‘With the knowledge that in a few years time we will be ... working hand in hand with social workers, social services having a more holistic approach to health it is nice to know that will happen ...’ GP

One explanation is that the way in which clinical governance was conceptualised determined the scope and scale of the change involved in implementation. For example, early discussion speculated on a need to demonstrate accountability. This led to a coordination of actions that were linked around the problem of how to demonstrate accountability within each PCO. The following account demonstrates a common response:

‘Clinical governance is not going to prevent another Shipman ... Mm hopefully it will prevent things like the Bristol case because people should be comparing their work with other similar groups ...’ GP

‘It (clinical governance) is setting standards by which we, as clinicians and non-clinicians, hope to arrive at and by which we have a channel by which we can follow to make sure we are doing the job correctly.’

Such preferences provide an explanation as to why those observed locally fostered team-based evaluation and reflection, illustrated by the following quote:

‘I think that it (clinical governance) is something that is developed as part of a team and that (it) would be impossible to do really without that.’

The terms ‘interact’, ‘links’, ‘intertwined’ and ‘team’ suggest that an emphasis was placed on facilitating collaboration in recognition of increasing interdependencies. The development of collaboration based on
self-assessment, evaluation and feedback ensured the recognition and rewarding of initiatives achieved by sharing information. For example, participants received an incentive payment for undertaking a locality-wide CHD clinical audit in 1999. The findings suggest that the social interaction of varying stakeholder perspectives resulted in a breaking down of barriers to integration through mutual adjustment. There was a general acknowledgement that working in isolation was no longer an option and that some form of collective accountability was necessary. This led to: increased utilisation of electronic health records and consensus on standardisation of data and coding in order to pool and share information; the development of templates to facilitate standardised data capture (as reported by the researcher elsewhere); baseline audits on quality.

Table 1 Conceptualisation of various governance models, themes and influence

<table>
<thead>
<tr>
<th>Theme</th>
<th>State model</th>
<th>Corporate model</th>
<th>Market model</th>
<th>Network model</th>
<th>Influence on quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accountability</td>
<td>Rationality; rules and procedures; inputs&gt;outputs; standards; professional expertise</td>
<td>Leadership direction. Long-term planning. Budget control</td>
<td>Maintain financial balance through market forces</td>
<td>Non-hierarchical, based on relations and interdependencies. Governance not government. Self-assessment</td>
<td>Earned autonomy; based on relationships that evolve</td>
</tr>
<tr>
<td>Collectively binding decision making</td>
<td>Public interest; materialism; economic performance; social inclusion pressures</td>
<td>Vision. Harmonisation. Staff focus</td>
<td>Fails to consider social benefits, or levy the full cost of market activity</td>
<td>Taxation funded but jointly provided by mix of separate private and public providers</td>
<td>Mutual recognition of common or complementary strategic agenda</td>
</tr>
<tr>
<td>Develop communication systems and feedback</td>
<td>Procedural factors; maximise system’s purpose</td>
<td>Movement of parts within the system; need to develop infrastructure</td>
<td>Need for high standard of information to support exchange of transactions</td>
<td>Based on reciprocal information requirements – systems evolve</td>
<td>Established through coalitions, reducing asymmetry of information</td>
</tr>
<tr>
<td>Cultural change</td>
<td>Not specifically addressed</td>
<td>Shared national and local ownership</td>
<td>Based on private sector ideals</td>
<td>Relationship building</td>
<td>Open, trusting relationships</td>
</tr>
<tr>
<td>Build capacity and capability</td>
<td>Not specifically addressed</td>
<td>Ensure skills available in the workforce to meet new challenges</td>
<td>Based on assumptions to equip systems to support quality improvement</td>
<td>Emphasis on education and training, knowledge transfer</td>
<td>Flexible, based on knowledge transfer</td>
</tr>
<tr>
<td>Mechanistic tools</td>
<td>Not specifically addressed</td>
<td>Structured observation</td>
<td>Break NHS products and services down into units of analysis</td>
<td>Not specifically addressed</td>
<td>Clinical audit; quality assurance</td>
</tr>
<tr>
<td>Competitive strategies</td>
<td>Rationality</td>
<td>Incentives</td>
<td>Market forces</td>
<td>Self-organising</td>
<td>Competition for resources</td>
</tr>
</tbody>
</table>
and increased automation of process links through small, incremental advances. These initiatives were supported through education and training based on schemes that incorporated elements of protected time and the use of carrot, rather than stick, approaches. Communicative infrastructures were noted as incrementally developing throughout the period of study, along with the automation of processes to meet the needs of increasing and widening interdependencies.

The findings from the study show both how thinking from a CAS perspective can enhance understanding and insight into the subjective and socially constructed nature of the process of implementation, and the relevance of context. This opens up a different way of acting and relating – the CAS perspective provides insight into the various perceptions and complex efforts which support quality improvement programmes. The CAS approach explains why autonomous practitioners use their efforts to continue their right to self-regulate through the principle of earned autonomy. The findings also show that the complexity is partly attributable to a greater emphasis on the inclusion of a range of stakeholder perceptions, including those of patients and the public. The findings of this study show the importance of multidisciplinary approaches that capture individual contributions to quality improvement, which take time to establish but provide a degree of flexibility through innovation and experimentation, supported by increased utilisation and development of electronic care records.

Conclusion

This paper has described developments in primary care informatics and the trend towards federated models of practice and has introduced the concepts of clinical governance and complex adaptive systems. Clinical governance programmes have been possible because of developments in the use and functionality of electronic care records, principally in primary care. However, ‘whole system’ thinking and interdisciplinary coordination are equally important enablers. CAS principles provide a framework which enables insight into how those operating within social networks communicate with each other to determine actions that govern their most relevant concerns.

ACKNOWLEDGEMENT

Thanks to the Editorial Board, in particular Ian Herbert, for comments on previous drafts.

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CONFLICTS OF INTEREST

None.

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Accepted April 2010