QUALITY IMPROVEMENT THROUGH CLINICAL COMMUNITIES: EIGHT LESSONS FOR PRACTICE

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Abstract

Purpose: Approaches to quality improvement in healthcare based on clinical communities are founded in practitioner networks, peer influence and professional values. Evidence for the value of this approach, and how to make it effective, is spread across multiple disciplines. We review and synthesise relevant literature to provide practical lessons on how to use clinical community-based approaches to improve quality.

Design/methodology/approach: Diverse literatures were identified, analysed and synthesised in a manner which accounted for the heterogeneity of methods, models and contexts they covered.

Findings: A number of overlapping but distinct clinical community-based approaches can be identified in the literature, each suitable for different problems. The evidence for the effectiveness of these is mixed, but there is some agreement on the challenges that those adopting such approaches need to address, and how these can be surmounted.

Practical implications: Key lessons include: the need for coordination and leadership alongside the lateral influence of peers; advantages of starting with a clear programme theory of change; the need for training and resources; dealing with conflict and marginalisation; fostering a sense of community; appropriate use of data in prompting behavioural change; the need for balance between 'hard' and 'soft' strategies; and the role of context.

Originality/value: The paper brings together diverse literatures with important implications for community-based approaches to quality improvement, drawing on these to offer practical lessons for those engaged in improving healthcare quality in practice.

Introduction

In many areas of healthcare, a substantial gap exists between what evidence indicates is best practice, and what actually happens in routine care. In the face of often disappointing results from a range of quality improvement (QI) initiatives (Powell et al. 2009), how best to close such gaps and improve patient care continues to puzzle policy-makers, managers and practitioners. What is clear is that securing quality in healthcare requires systems for sharing knowledge, coordinating and organising activity, and encouraging cultures supportive of improvement. The literature on healthcare QI to date has tended to focus on micro-level interventions to improve behaviour – such as education to improve hand-washing, system redesign to reduce handover errors, or checklists to reduce surgical errors. Much is to be gained, however, from recognition of the broader institutional and organisational structures that are relevant to QI, including the social structures known technically as *networks*. In contrast to hierarchical relationships within formal organisations, contracts, or market forces, networks are distinctive for being held together and functioning through cooperative social connections (Powell 1990). In networks, exchanges occur through reciprocal, mutually supportive relationships, where aspects of trust, interdependence, and reputation are key to ensuring speedy and efficient exchange of "know how" (Powell 1990).

The interest in networks arises from growing recognition of their real significance in distributing knowledge, promoting new learning and harnessing collective action. A now impressive literature demonstrates the role played by networks operating across organisations in shaping knowledge flows within industry, in diverse fields (Lerner & Tirole 2002, Buhr & Owen-Smith 2010). Among other things, this work suggests that firms with more cohesive and extensive networks tend to perform better and be less prone to failure (Bunker Whittington et al. 2009). Networks are argued to help transmit information and produce innovation in high technology firms to the extent that "effective social networks determine a firm's chances for survival" (Castilla et al. 2000). Networks go beyond functioning as a facility for sharing valuable information; as *social* structures, they also help to condition and structure the norms and values guiding behaviour (Swedberg 2003).

In healthcare, networks are also the subject of a growing literature (Greenhalgh 2010). The likely benefits of creating horizontal links across individuals, teams and organisations to open up communication channels between those who may be facing similar challenges, yet might not otherwise interact, has generated considerable excitement (Dopson et al. 2002, Bate & Robert 2002, Øvretveit et al. 2002). In this review, we examine the role of network forms of organisation in healthcare QI. We build on both the general literatures on networks and those in healthcare specifically to identify and characterise the *clinical community* as a distinctive, especially promising, type of network-based QI effort. We use the same literatures to draw out practical lessons for those seeking to achieve change through this approach.

Methods

This review relies primarily on an "author-based" approach (Dixon-Woods 2010) that draws on long training and scholarly sensibility and skill to determine the relevance and quality of material. In order to structure the process, we drew on the principles of critical interpretive synthesis (CIS) (Dixon-Woods et al. 2006), though we do not claim to have conducted a full CIS. This approach seeks to provide an overview of a broad field that includes both empirical and theoretical work. It aims to analyse critically and build theory from the literature, taking account of the heterogeneous contexts and processes on which this evidence base is built. In carrying out this review, we:

- treated the review question as a compass, not an anchor, so that the question was open to being refined as the review proceeded;
- used iterative, intuitive searching of literatures combined with more formal systematic searching techniques;
- engaged in selective, judicious sampling of relevant literatures;
- sought to integrate the various literatures through a narrative argument.

The areas of literature in which we searched included: organisational studies; medical, economic and institutional sociology; social and community psychology; critical development studies; social movements; and innovation and diffusion studies. We examined original empirical research, theoretical and conceptual work, and reviews (both systematic and narrative). Systematic searching of Scopus citation and abstract databases initially used the following terms: clinical communit*[1], participat* governance, collaborative decision making, communit* of practice, clinical network, knowledge diffusion; plus, using Boolean 'and', collaborative* and health, communit* and quality improvement, participat* and health. These formal searches were supplemented greatly by personal knowledge and contacts (Greenhalgh & Peacock 2005). Relevant material generated through these searches was then supplemented through forward and backward reference chaining.

Findings

The findings from our integration and critical analysis of these literatures are presented in three parts. First, we describe some of the key claims made about why a community-based approach (as opposed to a bureaucratic-hierarchical, legal, or market-based approach) might be successful in improving healthcare quality. Second, we characterise what we term the 'clinical community for QI' as a particularly promising exemplar of network-based approaches to achieving positive change, and

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[1] The asterisk wildcard (*) is used to demarcate a truncation in order to search for all variations on the root of a word (e.g. community, communities).

identify some of its key characteristics. Finally, we identify eight specific lessons for successful use of the clinical community approach, highlighting some key challenges and potential solutions.

Ways of regulating activity and behaviour: law, hierarchies, markets and networks

Four primary ways of directing, organising, and coordinating (i.e., "regulating") activity and action are often distinguished across the legal, economics and sociology literatures: *law*, *hierarchy*, *markets*, and *networks*. Law is a form of command-based regulation, with formal rules set and compliance ensured through the threat of formal sanctions. Hierarchies, similarly, operate through formal rules, which are enforced through organisational hierarchies in which superiors direct the actions of subordinates. Markets, and market-like structures, control behaviour through competitive forces and price signals.

These three approaches have different strengths and weaknesses when it comes to improving quality and diffusing learning to support QI, particularly in professional groups. Hierarchies, though good at ensuring the efficient performance of routine tasks, are typically poor vehicles for learning, not least because their bureaucratic form tends towards rigidity and compartmentalisation, which can suppress motivation and opportunity both to learn and implement the results of learning. Although market-based forms of organisation may incentivise competing providers to offer high-quality services, they may equally limit knowledge generation, sharing and QI, because they tend to produce rivalrous behaviour and because price signals are poor at conveying information about "what works" or how it works in QI. Law-based mechanisms are typically too expensive to design, implement and enforce to use for many practical purposes, and their highly codified form and lack of flexibility are barriers to innovation and sharing of learning. It is because of these limitations that attention to the potential of network forms of organising and coordinating activity has grown so rapidly (Edwards 2002).

Despite the ubiquity of the term, there is still no single, consensually agreed definition of what constitutes a "network". The literature on networks is sprawling and diverse, having attracted interest from a wide range of disciplinary perspectives. Much of it as it applies to a healthcare context is already summarised elsewhere (Goodwin et al. 2004). For our purposes, the major distinction between networks and other approaches is *the extent to which they rely on cooperative social connections between their members.* Networks rely (primarily) on the volition of their members.

Networks may arise or evolve naturally – through connections between people who were trained together, for example – or they may be more deliberately created in order to achieve particular goals, as with, for example, managed networks in the NHS. Whether they are "natural" or "purposefully created", there are two key benefits of networked forms of organisation. The first is as an efficient and effective way of sharing knowledge and innovation, particularly when (as in healthcare) the knowledge base of a sector is complex, dispersed and expanding:

"Networks are particularly apt for circumstances in which there is need for efficient, reliable information. The most useful information is rarely that which flows down the formal chain of command in an organization, or that which can be inferred from shifting price signals. Rather, it is that which is obtained from someone whom you have dealt with in the past and found to be reliable." (Powell 1990)

The second is that networks also have important influences on people's behaviour because behaviour is always *socially embedded* (Granovetter 1985). The networks in which people participate shape the norms and values that guide their decisions and actions, the opportunities available to them, the constraints on what they do, and the activities they undertake.

A clinical community-based approach to QI in healthcare

Network forms are drawing increasing interest in healthcare for their potential in transcending organisational 'silos', which tend to constrain knowledge sharing (Sheaff et al. 2006). Networks have been around for a long time in healthcare, though it is only more recently that many forms of organisation have been recognised as networks. These networks vary in their origins, degree of formality, exclusivity of membership, and methods used to achieve their goals. What unites them is that they are "complexes of links between individuals and organisations, driven largely by the interests of those parties and their recognition of the value of working together" (Southon et al. 2005). Examples include the collegial structure underpinning the healthcare professions; "communities of practice" (Wenger 1998); QI collaboratives using specific methodologies to implement evidence-based practice (Schouten et al. 2008); managed NHS networks (Addicott et al. 2007); and social or professional movements that mobilise around particular concerns (Bate et al. 2004).

In addition to these, a newer network form that we term the "clinical community for QI" can be identified, and is especially interesting and important because of its combined focus on both learning and action directed towards improvement and consequent potential for effectiveness. Clinical communities exhibit many of the features of these other network forms, and to a large extent have evolved from them. In particular, they share many of the features of QI collaboratives, since the basic ideas behind them derive from the collaborative approach. However, unlike collaboratives, clinical communities are not distinguished by association with a particular QI methodology (e.g. rapid improvement cycles or plan-do-study-act (PDSA) cycles (Hulscher et al. 2009)), but by the structure and organisation of the network. One good example of a programme that we would see as characteristic of this approach is the Keystone Intensive Care Unit project, which received international attention for its report of a dramatic average reduction in central venous catheter bloodstream infections in over 100 participating ICUs in Michigan (Pronovost et al. 2006; Dixon-Woods et al. 2011).

What is a clinical community?

Several key features can be identified that help to differentiate the clinical community from other types of network-based QI efforts (Box 1). In the discussion that follows, we outline these in more detail, before drawing out salient lessons for using this approach as a means of QI.

Box 1. Key features of a clinical community

> **Clinical communities**:
> - are formed of **interdependent** groups and individuals;
> - consist of members who may **cross clinical and organisational boundaries**;
> - consist of members **united by a common purpose** linked to bridging the gap between best scientific evidence and current clinical practice;
> - consist of members who come together not merely to learn or share knowledge, but who are themselves **responsible for achieving** those aims;
> - **exploit the potential inherent in networks** for effective and low-cost knowledge generation and diffusion;
> - operate through **both vertical and lateral structures**;
> - deploy **peer influence** and use primarily **informal, social control mechanisms** to achieve change;
> - seek to **harness the power of the community** and its **collective wisdom** in seeking solutions to problems, including about contextual factors and local solutions.

We use the term "community" to describe a specific type of network whose members are interdependent in the sense that that they share common commitments to specific QI goals and work collaboratively to achieve these. A clinical community is bounded—it is not open to everybody—yet these boundaries are porous enough to transcend organisational, disciplinary, or professional boundaries and ensure inclusion of all relevant stakeholders, e.g. individuals from multiple specialities and professions, managers and patients. It therefore includes members who may have divergent worldviews, interests and identities), but agree to work collaboratively to achieve shared QI goals. A clinical community is not simply an arrangement for consultation or learning; the stakeholders have responsibility for achieving improvement. Put simply, the community must deliver on its own commitments through its own efforts. Achieving this will include successfully recruiting and mobilising members as co-agents in the negotiation of goals and strategies for change, *and* actively organising and coordinating learning, innovation, and action.

In coordinating *learning* and *innovation*, a clinical community exploits the potential inherent in networks for effective knowledge generation, growth and diffusion (Powell 1990, Adler 2001), taking

advantage of opportunities for practice-based learning and the sharing of 'know how', as well as 'know what' (Bate & Robert 2002). In coordinating *action,* a clinical community operates through both vertical and lateral (horizontal) structures. What we term a "vertical integrating core" is an essential feature of clinical communities that may be lacking from other network-type structures. The vertical core has responsibility for leading, organising and mobilising activities. However, it is the lateral (horizontal) links between members that give the community its force.

These features bring a number of advantages when it comes to *promoting change*. For clinicians, knowledge gained through experience and from peers is often more influential in changing behaviours than, say, hierarchical approaches that rely simply on dissemination (Dopson et al. 2002, Parboosingh 2002). The controls within a clinical community are primarily (though not exclusively) informal and social in character, and work through social norms as "economies of regard" (Offer 1997); there is considerable evidence the threat of social sanction may be more powerful in directing practitioners' behaviour than formal hierarchical or legal efforts (Freidson 1984, Lazega 2000). Establishing *shared* norms of conduct is crucial in supporting QI initiatives, as it ensures that *new* behaviours oriented towards improvement will be seen as positive within the group/by relevant peers (Aveling et al. 2009, Bosk et al. 2009). Further, a clinical community can combine benefits of basing the core components of interventions on high quality evidence identified by the vertical core with collaborative decision-making to facilitate customisations to local contingencies (Pronovost et al. 2008), and the sharing of "hot tips" (Hildreth & Kimble 2004) that can help shorten learning cycles.

Opportunities for debate and challenge are an important feature of clinical communities. Decisions that are acceptable to all stakeholders are more likely when people feel that different voices have been heard and orthodoxies have been exposed to challenge. The available evidence suggests that using participatory approaches may not only enable better informed and locally appropriate decisions, but may also foster collective learning and more sustainable outcomes, unite and motivate those with a commitment to solving problems, improve the chances of detecting the potential for innovation, and increase people's willingness to accept change (Adler et al. 2008, Cooke & Kothari 2001, Campbell & Jovchelovitch 2000, Grol & Grimshaw 2003). Community-based approaches are especially helpful in addressing the consistent finding that QI efforts are more likely to be productive when developed *within*, rather than *over*, professional groups (Martin et al. 2009b, Davies et al. 2007, Waring & Currie 2009).

Addressing challenges of community-based approaches: eight lessons

Though attractive in principle, analysis of the literature on participatory, community-based approaches highlights some potential challenges. In the discussion that follows, we draw on the current literature

across healthcare and other sectors to identify key lessons for developing and refining the clinical community approach to QI.

1. Foster a strong vertically integrating core

Notwithstanding romantic talk of self-organising, self-mobilising and cooperative communities, rapid disintegration can occur within structures that rely primarily on voluntary social connections. Clinical communities are a particular challenge because they require diverse professional groups to cooperate, and for this to occur across multiple organisational and sectoral boundaries. Research in other industries (Healy & Schussman 2003), has shown that successful communities typically retain some hierarchical features, to ensure community cohesion and integration, coordinate activity, and provide appropriate organisational resource and support. Rather than being entirely self-forming and emergent, successful clinical community projects need a vertically integrating core that provides leadership and coordination of activities. This is critical to providing direction and a uniting vision, enrolling new members, brokering between professional and organisational boundaries, and preserving harmony in a disparate group with potentially diverging priorities. Effective leaders also need to ensure that 'horizontal links' are not realised simply as aggregates of clustered projects, but as a fully integrated community (Bate et al. 2002, Holtman 2008).

It is crucial that leaders of community-based QI projects are perceived as credible and authoritative by the community's *members* (Øvretveit et al. 2002). Leaders are therefore likely to come from *within* the community. Members need to be able to trust the leadership: they must believe "the leader's objectives are sufficiently congruent with theirs and not polluted by ego-driven, commercial, or political biases" (Lerner & Tirole 2002). Some evidence points towards the value of multiple 'advocates' to maintain participation and support across different professional groups (Martin et al. 2009a) and at different levels – for example at board and ward level. One key task will involve allocating roles and the division of labour *before* commencing activities so the group is able to function properly and disputes about responsibility are averted (Dopson et al. 2002, Øvretveit et al. 2002). Processes for making decisions need to be clarified so that a balance is struck between ensuring equal participation and capitalising on the range of expertise within the community on the one hand, and avoiding protracted discussions that do not lead to consensus on the other.

Different types of leadership may be valuable at different stages. Early on, leaders may need to act as "moral entrepreneurs", engaging in consciousness-raising to challenge currently normal behaviour (Becker 1997). A critical challenge involves finding ways to redefine practices previously thought normal as no longer acceptable, without alienating those involved (Wilkinson et al. 2010). At later stages, someone who has already implemented the practice in question and has the requisite 'know how' can play a valuable role (Dopson et al. 2002).

2. Start from a clear theory of change, but be prepared to learn and modify

A clinical community should begin with a theory of change – an account of *why* the activities it will undertake should lead to the outcomes sought (Weiss 1995). Clarity is needed about how and why these are expected to achieve change. The range of strategies and tactics a community could use is large and cannot be listed in full here, but may include, *inter alia*, the use of audit, dissemination of guidelines, education sessions, deployment of IT systems or checklists, PDSA cycles, and peer exchange visits. A single intervention may incorporate multiple strategies; how specific methods are deployed may vary. However, programmes and the theories that guide them tend to mutate over time, and the assumptions that shape action evolve as programme designers learn from their implementation experiences. Clinical communities can take advantage of the fact that networks are "light on their feet" (Powell 1990) to adapt the programme dynamically and improvise as learning and challenges emerge. This feature also enables appropriate bespoke adaptation of interventions to suit local contexts. Inherent in a clinical community, then, is enough stability to ensure the coherence and integrity of the programme, but sufficient flexibility and dynamism to allow alterations likely to achieve objectives.

3. Identify and provide the right resources and training

The need for top-down input in the form of resources to support QI efforts is now clear from empirical studies (Øvretveit et al. 2002, Shortell et al. 1995). If clinical communities are to work, they not only need enabling resources but also the right set of skills and expertise, including data, project and change management techniques (Bate et al. 2002). Effective implementation of planned changes— and surmounting unexpected obstacles—is likely to require additional and timely training and support (Wilkinson et al. 2010), not just in relation to technical skills but also social and political skills.

QI activities can falter if they are seen to involve significant diversion of effort, time and resources from patient care, particularly if this seems unlikely to deliver commensurate benefits (Wilkinson et al. 2010). Within local settings, sustained political and managerial support, financial and material resources, and time to compensate for the additional burden participation may create, are all critical (Wilkinson et al. 2010). 'Buy-in' from senior and middle managers – demonstrated by provision of these resources – also plays a role in legitimising change initiatives within the wider organisational context (Powell & Davies 2001, McDermott & O'Dell 2001).

4. Hold the community together, and recognise and deal with conflict and marginalisation

Although there is a widespread tendency to imbue the concept of 'community' with notions of harmony, egalitarianism and consensuality, communities are in reality often fragmented, hierarchical and involve relations of conflict (Cornish & Ghosh 2007). Idealised community-based, participatory

approaches may come unstuck when faced with deeply ingrained cultural and institutional hierarchies, despite the commitment of those involved.

Ansell and Gash (2008) suggest imbalances in resources or power of different stakeholders, the degree to which stakeholders are incentivised to collaborate, and prior history of relationships among stakeholders can all impact on the ability of collaborative efforts to succeed. Clinical communities may be more successful when they capitalise on pre-existing community structures or networks rather than creating new communities from scratch (Campbell et al. 2007), drawing on existing relationships and communication channels. However, caution is needed to ensure stakeholders whose involvement is crucial are not excluded by drawing entirely on "old" networks. Evidence highlights the importance of involving not just healthcare professionals, but also patients, management and clerical staff, and of working across disciplinary boundaries and "turfs" (Dopson et al. 2002, Øvretveit et al. 2002, Wilkinson et al. 2010, Bate et al. 2002, Martin et al. 2009a).

Similarly, efforts to collaborate across organisational and professional boundaries can sometimes reproduce wider barriers to cooperation, innovation diffusion and knowledge transfer (Dopson et al. 2002, Grol & Grimshaw 2003, Waring & Currie 2009, Ferlie et al. 2001). Power inequalities between (and within) participating groups may be perpetuated, meaning the voices and interests of certain groups, particularly those in traditionally less powerful positions (e.g. nurses, patients), may be marginalised, even when there is rhetorical commitment to partnership (Aveling 2010, Finn et al. 2010, Martin 2008).

One key problem is that different groups and individuals (including project leads, managers, participating nurses or doctors) may have different perceptions and expectations about what constitutes 'success' (Øvretveit et al. 2002, Bate et al. 2002). Lack of consensus on what the clinical community is trying to achieve can undermine coordination and effective action, as well as create the potential for conflict or declining enthusiasm as expectations are disappointed (Øvretveit et al. 2002, Bate et al. 2002). Where groups have differing motivations for being involved, similar effects may be found. Consequently, it is desirable that consensus be established at the beginning of any QI initiative (and periodically collectively reviewed).

The quality of the scientific evidence underlying the intervention can affect consensus building efforts. Trying to persuade people to do something for which the evidence is weak is difficult, and likely to bring constant challenge (Wilkinson et al. 2010). Even when the scientific evidence is good, social processes – including exposing the interventions to debate and challenge – are usually required to establish its credibility and legitimacy among different groups (Dopson et al. 2002, Ferlie et al. 2001, Campbell & Jovchelovitch 2000).

Given the complexities and range of skills required to negotiate such challenges, some clinical communities are likely to benefit from additional facilitation, perhaps by individuals not perceived as

allied to any particular group. Some groups may need to be "empowered to participate" (Cornish 2006), for example through the imposition of rules specifically designed to challenge conventional hierarchies.

5. Foster a sense of community

Opportunities for collective meaning-making can help overcome the difficulties of divergent interests and perspectives. Elaborating a shared representation of the problem and roles and identities within the group supports the development of a 'sense of community'. This is important to the goals of QI, as research shows that people with a greater sense of community are more likely to offer their time and resources towards collective interests (Gillespie et al. 2008). Thus, rather than being supplied with directives 'from above', through critical discussion members can negotiate shared meanings, generating answers to questions such as 'What are we doing?', 'What are we trying to achieve?', 'What do we mean by 'quality'?'. Crucially, it is "this process of constructing meaning which provides organizational members with identity and cohesiveness" (Newell et al. 2001).

Communities characterised by strong and extensive reciprocal ties (high 'network density') also offer more fertile contexts for informal social controls by heightening the 'social observability' of individuals, and strengthening acceptance of group norms (Holtman 2008). This requires ongoing opportunities for interaction and communication within the community (Bate & Robert 2002), including informal socialising to facilitate the spread of 'know-how' and the sharing of experience amongst peers (Dopson et al. 2002, Øvretveit et al. 2002, Finn et al. 2010). Scheduling time for coffee breaks may be as important as formally convened activities at group gatherings.

Members with special roles may also be important. These may include the 'knowledge broker' (Lomas 2007, Aveling 2011) or 'boundary spanner' (Williams & Gibson 1990), who understands, and can move between, the different languages and perspectives of diverse groups, translating the concerns and ideas of one into a form persuasive and useful to another. With the right social and political skills (Hwang & Powell 2005), boundary spanners can also act as coalition builders, persuading and enrolling reluctant groups. These might be individuals or intermediary organisations (Martin 2011), which may be especially useful in securing access to resources or the support of those in more senior/powerful positions for the benefit of those more prone to exclusion (Aveling 2010, Woolcock 1998).

6. Collect and use data wisely

Data may be used to rupture perceptions that there is no 'problem' to be addressed—what Postl (2009) calls 'myth busting'. For example, comparative data can be used to demonstrate shortfalls in performance across regions or nations. At a psychological level, ruptures in taken-for-granted understandings tend to provoke the need for meaning-making, the re-organisation of identities and

norms, and so motivate participants to action (Zittoun 2008). Using process and outcome data can be a particularly effective means of contributing to the establishment of shared norms where teams within a clinical community are geographically dispersed. Regular feedback on performance can motivate sustained efforts by providing a sense of progress or keeping participants 'on task'—particularly in between face-to-face gatherings (Bosk et al. 2009) and when provided by peers (Grol & Grimshaw 2003). Using data throughout a programme is likely to help identify which innovations should be kept, which changed and which rejected (Berwick 1996).

Data collection and feedback thus form essential elements of the *process* of QI. It is generally preferable to have common targets and measures across all participating teams (Øvretveit et al. 2002). Choosing measures that can capture relevant quality issues is critical to avoid motivating participants to produce the 'right' numbers without the intended changes in practice (Anders 2005). Data (and their source) need to be seen as credible by potential participants, but not be too burdensome to collect. Pronovost and colleagues (2004) recommend the process of developing a measure of quality involves the following:

(i) prioritising the clinical area to be assessed;

(ii) selecting the type of measure;

(iii) defining and designing specification;

(iv) developing data collection tools;

(v) testing data collection tools and assessing the validity, reliability, and feasibility of measures;

(vi) developing scoring and analytical specification; and

(vii) obtaining baseline data.

7. Find the balance between hard and soft tactics

Leadership in a clinical community, because it relies primarily on relationships rather than authority structures, involves effective use of 'soft' tactics—such as persuasion and ongoing discussion—to facilitate and coordinate. However, a clinical community may also resort to 'harder' tactics (Vangen & Huxham 2003) to overcome resistance, inertia, and internal competition. It is important to be vigilant about the risk of undermining the community ethos and of cooption by more coercive, hierarchical modes of governance. Externally imposed performance management may undermine cooperation, commitment and ownership (Addicott et al. 2007). Equally, while 'light-touch', non-directive approaches may promote local ownership and participation, they may not—on their own—be enough to ensure sustained compliance amongst competing priorities. Communities need to be flexible and prepared to choose alternative strategies in response to changing circumstances.

8. Recognise the importance of context

Contextual factors are a significant influence on the outcomes of QI efforts. 'Context' can be conceptualised at multiple levels, from the national, regional or institutional, to local organisations and the culture specific to particular healthcare disciplines. The interdependence of community structures, strategies and multiple contextual layers generates the potential for an enormous variety of permutations and unique outcomes.

Recognition of contextual influences on knowledge processes speaks to the need to avoid a 'deficit model' whereby the failure to use or apply 'evidence' is attributed to deficits in understanding the evidence or its relevance. Rather, such re-interpretations should be understood as meaningful/functional responses to the contingencies of the local context. Contextual issues likely to be significant include the health issue, disciplines and specialisms involved (Grol & Grimshaw 2003, Waring & Currie 2009), and the local context of participants (Dopson et al. 2002, Øvretveit et al. 2002, Shortell et al. 1995). Existing culture, relations and resources within organisations may also undermine or enhance particular approaches or strategies (Finn et al. 2010, Dopson et al. 2002). The difficulty of altering historically established cultural norms should not be underestimated, particularly when the aim is to institute horizontally organised communities in a context characterised by hierarchical control and organisational silos (Currie & Suhomlinova 2006).

The wider policy context can also impact on the potential of community-based QI initiatives, complementing or countering them. National policies and target-setting can serve to divert or focus resources on particular areas, affect individuals' or organisations' motivation to take up new evidence or innovations, and/or impact on the legitimacy of communities. Coercive, top-down policy may have contradictory effects on practitioners' attitudes towards change, perhaps simultaneously encouraging or forcing them to take a more active interest in QI, while at the same time discouraging them from cooperating with others (Waring & Currie 2009). An overabundance of QI initiatives can also undermine the impact of individual interventions due to 'change fatigue'.

Conclusions

"Perhaps somewhat belatedly" (Greenhalgh et al. 2004), QI interventions have increasingly recognised the need to understand that change processes operate at collective, organisational and cultural levels. Understanding QI as a social process counters the unhelpful but pervasive tendency to conceptualise the diffusion-uptake process as a technical-rational, linear process that is about putting into practice predefined strategies for changing (individual) clinicians' behaviours (Grol & Grimshaw 2003). This review has identified the importance of network structures in QI, and has suggested we are now seeing the emergence of a network form that may be deemed a "clinical community for QI". This approach shares many features with – and has evolved from – other network approaches including QI collaboratives, communities of practice, and social movements.

Successful clinical communities will make the most of cooperation and a sense of community, but avoid overly romantic notions that obscure the tensions and challenges communities face when trying to unite different groups, interests, and organisations to secure a common goal. Clinical communities that work well are characterised by the careful balancing of bottom-up, localising, participatory and informal social processes *and* strong leadership, coordination and impetus from within—and sometimes from beyond or even 'above'. The advantages of clinical communities are easily destabilised; those attempting to structure them must tread a fine line in ensuring their input does not undermine the very characteristics which make clinical communities distinctive.

This review has identified eight key lessons for those involved in clinical communities for QI. These lessons come from synthesising a wide range of literatures offering important insights into the use of network- and community-style approaches to achieving change. The diversity of approaches that have been adopted—and the diversity of contexts in which these have been attempted—have resulted in a rich and varied literature, replete with helpful examples of how to do network-driven QI, but lacking universal 'laws' for success. As noted above, this is in part due to the importance of context in determining the usefulness or otherwise of particular strategies; more generally, as social processes are dependent on the agency of individuals, the interactions of groups and the cultures of organisations, community-driven approaches to QI cannot effectively be put into practice through the simple application of universal strategies. This also implies that understanding and optimising the clinical community approach to QI requires ongoing study—process evaluation—that examines how they operate in practice. Process evaluations can be sensitive to contextual contingencies of individual projects, while also generating more generalisable lessons that are useful to others, even if the idea of a strategy that will always deliver change—a QI panacea—is illusory.

References

ADDICOTT, R., MCGIVERN, G. and FERLIE, E., 2007. The distortion of a managerial technique? The case of clinical networks in UK health care. *British Journal of Management,* **18**(1), pp. 93-105.

ADLER, P.S., 2001. Market, hierarchy and trust: The knowledge economy and the future of capitalism. *Organization Sciences,* **12**(2), pp. 215-234.

ADLER, P.S., KWON, S.W. and HECKSCHER, C., 2008. Professional work: The emergence of collaborative community. *Organization Science,* **19**(2), pp. 359-376.

ANDERS, G., 2005. Good governance as technology: Towards an ethnography of the Bretton Woods institutions. In: D. MOSSE and D. LEWIS, eds, *The aid effect: Giving and governing in international development.* London: Pluto Press, pp. 37-60.

ANSELL, C. and GASH, A., 2008. Collaborative governance in theory and practice. *Journal of Public Administration Research and Theory,* **18**(4), pp. 543-571.

AVELING, E.L., 2011. Mediating between international knowledge and local knowledge: The critical role of local field officers in an HIV prevention intervention. *Journal of Community and Applied Social Psychology,* **21**, pp. 95-110.

AVELING, E.L., 2010. The impact of aid chains: Relations of dependence or supportive partnerships for community-led interventions? *AIDS Care,* **22**(1), pp. 1588-1597.

AVELING, E.L., CORNISH, F. and OLDMEADOW, J., 2009. Diversity in sex workers' strategies for the protection of social identity: Content, context and contradiction. In: B. WAGONER, ed, *Symbolic transformations: The mind in movement through culture and society.* London: Routledge, pp. 302-322.

BATE, S.P. and ROBERT, G., 2002. Knowledge management and communities of practice in the private sector: Lessons for modernising the National Health Service in England and Wales. *Public Administration,* **80**(4), pp. 643-663.

BATE, S.P., ROBERT, G. and MCLEOD, H., 2002. *Report on the 'breakthrough' collaborative approach to quality and service improvement within four regions of the NHS.* Birmingham: HSMC, University of Birmingham.

BATE, P., ROBERT, G. and BEVAN, H., 2004. The next phase of healthcare improvement: What can we learn from social movements? *Quality & Safety in Health Care,* **13**(1), pp. 62-66.

BECKER, H.S., 1997. *Outsiders: Studies in the sociology of deviance.* New York: Free Press.

BERWICK, D.M., 1996. A primer on leading the improvement of systems. *British Medical Journal,* **312**, p. 619.

BOSK, C.L., DIXON-WOODS, M., GOESCHEL, C.A. and PRONOVOST, P.J., 2009. Reality check for checklists. *The Lancet,* **374**, pp. 444-445.

BUHR, H. and OWEN-SMITH, J., 2010. Networks as institutional support: law firm and venture capitalist relations and regional diversity in high technology IPOs. In: L.A. KEISTER, ed., *Institutions and Entrepreneurship.* Bradford: Emerald.

BUNKER WHITTINGTON, K., OWEN-SMITH, J. and POWELL, W., 2009. Networks, propinquity, and innovation in knowledge intensive industries. *Administrative Science Quarterly,* **54**, pp. 90-122.

CAMPBELL, C. and JOVCHELOVITCH, S., 2000. Health, community and development: Towards a social psychology of participation. *Journal of Community and Applied Social Psychology,* **10**(4), pp. 225-270.

CAMPBELL, C., NAIR, Y. and MAIMANE, S., 2007. Building contexts that support effective community responses to HIV/AIDS: A South African case study. *American Journal of Community Psychology,* **39**(3-4), pp. 347-363.

CASTILLA, E.J., HWANG, H., GRANOVETTER, E. and GRANOVETTER, M., 2000. Social networks in Silicon Valley. In: L. CHONG-MOON, H. ROWEN and M. HANCOCK, eds, *The Silicon Valley edge: a habitat for innovation and entrepreneurship.* Stanford: Stanford University Press.

COOKE, B. and KOTHARI, U., 2001. *Participation: The new tyranny?* London: Zed Books.

CORNISH, F., 2006. Empowerment to participate: A Case study of participation by Indian sex workers in HIV prevention. *Journal of Community and Applied Social Psychology,* **16**(4), pp. 301-315.

CORNISH, F. and GHOSH, R., 2007. Necessary contradictions of 'community-led' health promotion: A case study of HIV prevention in an Indian red light district. *Social Science and Medicine,* **64**, pp. 496-507.

CURRIE, G. and SUHOMLINOVA, O., 2006. The impact of institutional forces upon knowledge sharing in the UK NHS: The triumph of professional power and the inconsistency of policy. *Public Administration,* **84**(1), pp. 1-30.

DAVIES, H., POWELL, A. and RUSHMER, R., 2007. Why don't clinicians engage with quality improvement? *Journal of Health Services Research and Policy,* **12**(3), pp. 129-130.

DIXON-WOODS, M., 2010. Systematic reviews and qualitative methods. In: D. SILVERMAN, ed., *Qualitative research.* London: Sage.

DIXON-WOODS, M., CAVERS, D., AGARWAL, S., ANNANDALE, E., ARTHUR, A., HARVEY, J., HSU, R., KATBAMNA, S., OLSEN, R., SMITH, L., RILEY, R. and SUTTON, A.J., 2006. Conducting a critical interpretive synthesis of the literature on access to healthcare by vulnerable groups. *BMC Medical Research Methodology,* **6**: 35.

DIXON-WOODS M.,BOSK C.L., AVELING E.L., GOESCHEL C.A., PRONOVOST P.J. 2011. Explaining Michigan: developing an ex post theory of a quality improvement program. Milbank Quarterly **89**, pp. 167-205.

DOPSON, S., FITZGERALD, L., FERLIE, E., GABBAY, J. and LOCOCK, L., 2002. No magic targets! Changing clinical practice to become more evidence-based. *Health Care Management Review,* **27**(3), pp. 35-47.

EDWARDS, N., 2002. Clinical networks. *British Medical Journal* **324**, p. 63.

FERLIE, E., GABBAY, J., FITZGERALD, L., LOCOCK, L. and DOPSON, S., 2001. Evidence-based medicine and organisational change: An overview of some recent qualitative research. In: L. ASHBURNER, ed., *Organisational behaviour and organisational studies in health care: Reflections on the future.* Basingstoke: Palgrave.

FINN, R., CURRIE, G. and MARTIN, G., 2010. Team work in context: Institutional mediation in the public-service professional bureaucracy. *Organization Studies,* **31**(8), pp. 1069-1097.

FREIDSON, E., 1984. The changing nature of professional control. *Annual Review of Sociology,* **10**, pp. 1-20.

GILLESPIE, A., CORNISH, F., AVELING, E.L. and ZITTOUN, T., 2008. Conflicting community commitments: A dialogical analysis of a British woman's World War II diaries. *Journal of Community Psychology,* **36**(1), pp. 35-52.

GOODWIN, N., 6, P., FREEMAN, T. and POSANER, R., 2004. *Managing across diverse networks of care: lessons from other sectors.* London: SDO.

GRANOVETTER, M., 1985. Economic action and social structure: the problem of embeddedness. *American Journal of Sociology,* **91**(1), pp. 481-510.

GREENHALGH, T., 2010. What is this knowledge that we seek to "exchange"? *Milbank Quarterly,* **88**(4), pp. 492-499.

GREENHALGH, T. and PEACOCK, R., 2005. Effectiveness and efficiency of search methods in systematic reviews of complex evidence: audit of primary sources. *British Medical Journal* **331**, pp. 1064-1065.

GREENHALGH, T., ROBERT, G., MACFARLANE, F., BATE, P. and KYRIAKIDOU, O., 2004. Diffusion of innovations in service organizations: Systematic review and recommendations. *Milbank Quarterly,* **82**(4), pp. 581-629.

GROL, R. and GRIMSHAW, J., 2003. From best evidence to best practice: Effective implementation of change in patients' care. *The Lancet,* **362**, pp. 1225-1230.

HEALY, K. and SCHUSSMAN, A., 2003. *The ecology of open-source software development.* Unpublished manuscript, available online at http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.13.4850&rep=rep1&type=pdf

HILDRETH, P.M. and KIMBLE, C., 2004. *Knowledge networks: Innovation through communities of practice.* Hershey: Idea Group.

HOLTMAN, M.C., 2008. A theoretical sketch of medical professionalism as a normative complex. *Advances in Health Science Education,* **13**(2), pp. 233-245.

HULSCHER, M., SCHOUTEN, L. and GROL, R., 2009. *Collaboratives.* London: The Health Foundation.

HWANG, H. and POWELL, W.W., 2005. Institutions and entrepreneurship. In: H. HWANG and W.W. POWELL, eds, *Handbook of entrepreneurship research.* Dordrecht: Kluwer Publishers, pp. 179-210.

LAZEGA, E., 2000. Rule enforcement among peers: A lateral control regime. *Organization Studies,* **21**(1), pp. 193-214.

LERNER, J. and TIROLE, J., 2002. Some simple economics of open source. *The Journal of Industrial Economics,* **50**(2), pp. 197-234.

LOMAS, J., 2007. The in-between world of knowledge brokering. *British Medical Journal,* **334**, pp. 129-334.

LOMAS, J., 2005. Using research to inform healthcare managers' and policy makers' questions: From summative to interpretive synthesis. *Healthcare Policy,* **1**(1), pp. 55-71.

MARTIN, G.P., 2008. Representativeness, legitimacy and power in public involvement in health-service management. *Social Science and Medicine,* **67**(11), pp. 1757-1765.

MARTIN, G.P., 2011. The third sector, user involvement and public-service reform: A case study in the co-governance of health-service provision. *Public Administration* in press.

MARTIN, G.P., CURRIE, G. and FINN, R., 2009a. Leadership, service reform and public-service networks: The case of cancer-genetics pilots in the English NHS. *Journal of Public Administration Research and Theory,* **19**, pp. 769-794.

MARTIN, G.P., CURRIE, G. and FINN, R., 2009b. Reconfiguring or reproducing intra-professional boundaries? Specialist expertise, generalist knowledge and the 'modernisation' of the medical workforce. *Social Science and Medicine,* **68**(7), pp. 1191-1198.

McDERMOTT, R. and O'DELL, C., 2001. Overcoming cultural barriers to sharing knowledge. *Journal of Knowledge Management,* **5**(1), pp. 76-85.

SHEAFF, R., SCHOFIELD, J., MANNION, R., MARSHALL, M., McNALLY, R. and DOWLING, B. (2006) *Achieving high performance in health care systems: The impact and influence of organisational arrangements.* London: SDO.

NEWELL, S., EDELMAN, L. and BRESNEN, M., 2001. The inevitability of reinvention in project-based learning. Paper presented at the 17th EGOS Colloquium, University of Lyon.

OFFER, A., 1997. Between the gift and the market: The economy of regard. *Economic History Review,* **50**(3), pp. 450-476.

ØVRETVEIT, J., BATE, P., CLEARY, P., CRETIN, S., GUSTAFSON, D., MCINNES, H.M., T., MOLFENTER, P., PLESK, P., ROBERT, G., SHORTELL, S. and WILSON, T., 2002. Quality improvement collaboratives: Lessons from research. *Quality and Safety in Health Care,* **11**(4), pp. 345-351.

PARBOOSINGH, J.T., 2002. Physician communities of practice: Where learning and practice are inseparable. *Journal of Continuing Education in the Health Professions,* **22**, pp. 230-236.

POSTL, B., 2009. *Health data, indicators and rankings.* Paper presented at Measuring Healthcare, University of Toronto.

POWELL, A.E. and DAVIES, H.T.O., 2001. Business process re-engineering: Lost hope or learning opportunity? *British Journal of Healthcare Management,* **7**(11), pp. 446-449.

POWELL, A., RUSHMER, R. and DAVIES, H., 2009. *A systematic narrative review of quality improvement models in health care.* Edinburgh: NHS Quality Improvement Scotland.

POWELL, W.W., 1990. Neither market nor hierarchy: Network forms of organisation. *Research in Organizational Behaviour,* **12**, pp. 295-336.

PRONOVOST, P., BERENHOLTZ, S. and NEEDHAM, D., 2008. Translating evidence into practice: A model for large scale knowledge translation. *British Medical Journal,* **337**, pp. 963-965.

PRONOVOST, P., NEEDHAM, D., BERENHOLTZ, S., SINOPOLI, D., CHU, H., COSGROVE, S., SEXTON, B., HYZY, R., WELSH, R., ROTH, G., BANDER, J., KEPROS, J. and GOESCHEL, C., 2006. An intervention to decrease catheter-related bloodstream infections in the ICU. *New England Journal of Medicine,* **355**(26), pp. 2725-2732.

PRONOVOST, P.J., NOLAN, T., ZEGER, S., MILLER, M. and RUBIN, H., 2004. How can clinicians measure safety and quality in acute care? *The Lancet,* **363**, pp. 1061-1067.

SCHOUTEN, L.M., HULSCHER, M.E., VAN EVERDINGEN, J.J., HUIJSMAN, R. and GROL, R.P., 2008. Evidence for the impact of quality improvement collaboratives: systematic review. *British Medical Journal* **336**, pp. 1491-1494.

SHORTELL, M., O'BRIEN, J., CARMAN, J., FOSTER, R.W., HUGHES, E.F.X.L.B., H. and O'CONNER, E.J., 1995. Assessing the impact of continuous quality improvement / total quality management: Concept versus implementation. *Health Services Research,* **30**(2), pp. 377-401.

SOUTHON, G., PERKINS, R. and GALLER, D., 2005. Networks: a key to the future of health services. *Australian Health Review,* **29**(3), pp. 317-326.

SWEDBERG, R., 2003. *Principles of economic sociology.* Princeton: Princeton University Press.

VANGEN, S. and HUXHAM, C., 2003. Enacting leadership for collaborative advantage: Dilemmas of ideology and pragmatism in the activities of partnership managers. *British Journal of Management,* **14**(S1), pp. S61-S76.

WARING, J. and CURRIE, G., 2009. Managing expert knowledge: Organizational challenges and managerial futures for the UK medical profession. *Organization Studies,* **30**(7), pp. 755-778.

WEISS, C., 1995. Nothing as practical as a good theory: Exploring theory-based evaluation for comprehensive community initiatives for children and families. In: J. CONNELL, A. KUCHISCH, L.B. SCHORR and C. WEISS, eds, *New approaches to evaluating community initiatives: Concepts, methods and contexts*. New York: Aspen Institute, pp. 65-92.

WENGER, E., 1998. *Communities of practice: Learning, meaning and identity.* Cambridge: Cambridge University Press.

WILKINSON, J., POWELL, A. and DAVIES, H., 2010. *Healthcare professionals' views on clinician engagement in quality improvement.* London: The Health Foundation.

WILLIAMS, P. and GIBSON, D.V., 1990. *Technology transfer: A communication perspective.* London: Sage.

WOOLCOCK, M., 1998. Social capital and economic development: Towards a theoretical synthesis and policy framework. *Theory and Society,* **27**, pp. 151-208.

ZITTOUN, T., 2008. Learning through transitions: The role of institutions. *European Journal of Psychology of Education,* **23**(2), pp. 165-181.