Clinical leadership and commissioning practice in healthcare innovation networks: An empirical analysis of CCGs in England

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Research

Clinical leadership and commissioning practice in healthcare innovation networks: An empirical analysis of CCGs in England

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Abstract

Objective: We use innovation and social network theory in order to explore the emerging role of clinicians in leading newly established clinical commissioning groups (CCGs); we examine how GPs lead the orchestration of their healthcare networks as they facilitate healthcare innovation; we also provide insights on emerging forms and functions of CCG entities and discuss their strengths and shortcomings in relation to network leadership tasks.

Design: Mixed-method, multi-site, case study research

Setting: Six clinical commissioning groups and local clusters in the East of England (EoE) area, covering in total 208 general practices and 1,662,000 population.

Methods: Semi-structured interviews with 56 lead GPs, practice managers and staff from the local health authorities (PCT) as well as various healthcare professionals; 21 observations of CCG board and executive meetings; electronic survey of 58 CCG board members (these included GPs, practice managers, PCT employees, nurses, and patient representatives).

Main outcome measures: collaborative relationships between CCG board members and parties from their broader healthcare network; GP's new role from an innovation network leadership perspective; strengths, issues, and areas for development of CCGs.

Results: Drawing on innovation network theory enables a unique understanding of the clinical commissioning activities of the GPs and their efforts to establish best practices as well as develop new services tailored to the needs of their population. In this context we identified three innovation network leadership processes: managing knowledge flows, managing innovation coherence, and managing network stability. Overall we find that knowledge sharing and effective collaboration among GPs are key leadership roles that enable network stability and the alignment of CCG objectives with those of the wider health system (innovation coherence). Even though activity varied between commissioning groups, collaborative initiatives were common between the clusters we observed. Most of the GPs involved in their locality or commissioning group had some idea regarding the major objectives of the CCG agenda though there was ongoing uncertainty around the future of the reform. In any case, there was significant variation among CCGs around the level of engagement with providers, patients, and local authorities. Clinicians were often unaware of the value that this input carries and would pursue commissioning decisions without it. Locality (sub)groups played an important role in this context because they linked commissioning decisions with patient needs and brought leaders closer to frontline stakeholders. Lack of local GP engagement adds uncertainty to the system and increases the risk of commissioning decisions being irrelevant and inefficient from a patient and provider perspective. Finally, increased dialogue between clinical leaders and the Department of Health (DoH) and regional health organizations is deemed to be necessary for these leaders to enable innovation and provide stability to the

system.

Conclusion: Managing knowledge mobility, healthcare innovation coherence, and network stability are three clinical leadership processes that CCGs need to consider in order to coordinate their network and facilitate the development of good clinical commissioning decisions, best practices, and innovative services. To successfully orchestrate these processes, CCG leaders need to take advantage of their (network) position and their clinical expertise in order to establish appropriate collaborations that may improve the healthcare service in the UK.

Article summary

Article focus

- This study builds on the fact that clinical commissioning is an important element of modern medical practice and has the potential to have a profound impact on patients and the public
- Following the recent reform of the healthcare sector in England, it examines how GPs lead the orchestration of their healthcare networks as they facilitate healthcare innovation in their CCGs.

Key messages

- Clinical commissioning is a complex social practice that can be viewed as the orchestrating activity of large innovation networks through a set of coordination processes
- In this context encouraging knowledge sharing and collaboration between clinicians and other healthcare professionals are key tasks of clinical leadership and play a significant role in order to ensure innovation coherence and stability of the network
- Lack of clear political stimulus discourages lead general practitioners and boosts uncertainty which can hinder the activities of the CCGs
- Clinical leaders need to focus on enabling value to be add to services and systems locally as well as group-wide and ensure a patient-centered healthcare service integration
- Good commissioning should go beyond macro data analysis (aggregate population measures) and incorporate insights developed through multi stakeholder perspectives and micro (practice-level) data and events

Strengths and limitations of this study

- A particular strength of this study is that it provides in-depth accounts of the changes in commissioning practice and the emerging role of GPs as healthcare network leaders.
- The use of multi-method approach (interviews, observations of CCG board meetings, extensive study of documentation, and CCG network analysis) allowed us to validate our findings and ensure there was no bias due to limitations of specific methods.
- In that we were able to uncover different perspectives of knowledge sharing and collaboration among healthcare professionals and provide evidence on the influence of GPs and their ability to coordinate and lead commissioning tasks.
- The relatively small number of observations has always been a limitation when it comes to qualitative evidence and analysis of interview data.
- In addition, the richness of our data were subject to time constraints of participants and their willingness to share information about their activities often deemed as confidential. Having said that, similar themes emerged and common issues were identified between the different CCGs.

Introduction

Following the announcement of the latest NHS reform[1] the health system in the UK has entered a new cycle of radical changes that aims to improve healthcare outcomes and increase efficiency. At the centre of the strategy proposed by the current coalition government is to “liberate the NHS” by putting clinicians “in the driving seat and set hospitals free to *innovate*, with stronger incentives to adopt best practice”[1] (Department of Health 2010), thus, challenging the way commissioning of healthcare services is organised and executed. In this context, the new Health and Social Care Bill creates a duty for the new Clinical Commissioning Groups (CCGs) to “promote research and innovation and the use of research evidence.”

Commissioning of healthcare services is traditionally understood to be the process by which “the health needs of a population are assessed, the responsibility is taken for ensuring that appropriate services are available

which meet these needs, and the accountability for the associated health outcomes is established"[2]. Until recently, commissioning activities such as planning (assessment and evaluation), purchasing (identifying and negotiating), and monitoring health services[3, 4] were performed primarily by non-clinical managers in primary care trusts (PCTs). However, the recent reform intends to transfer commissioning duties over to general practitioners (GPs), nurses, and other healthcare professionals. As part of the new organisational structure it has been estimated that clinicians could control almost £65 billion of NHS funding yearly – a figure which accounts for more than half of the current NHS annual budget – in order to carry out the commissioning of health services[5].

Based on the NHS White Paper[1] the main reason for such an immense experiment is to provide flexibility and freedom to GPs to develop innovative, high-quality services that will increase the quality of healthcare and accomplish better use of the available resources. Given that *healthcare service innovation* is inherent in, and central to, the new commissioning structure, we studied the newly established clinical commissioning groups (CCGs) using an innovation network theory approach where GP leaders are seen as innovation network *orchestrators* within their healthcare service environment and CCGs as *innovation hubs*. Drawing on innovation theory enables us to obtain a unique understanding of the clinical commissioning activities of the GP leaders and their efforts to establish best practices as well as develop new services tailored to the needs of their population. We believe that this approach will shed light on the emerging forms and function of evolving commissioning entities and will offer a fresh viewpoint on clinical commissioning and innovation in healthcare.

The effectiveness of clinical commissioning and its potential to deliver has long being discussed in health services research. In the past couple of decades, different GP-led purchasing schemes have been tried receiving mixed signals from clinicians, policy makers, and the public. Figure 1 provides a timeline of clinical commissioning initiatives since 1991 when the internal market reform took place and the separation of purchasing and providing health services was introduced for the first time in the UK[6].

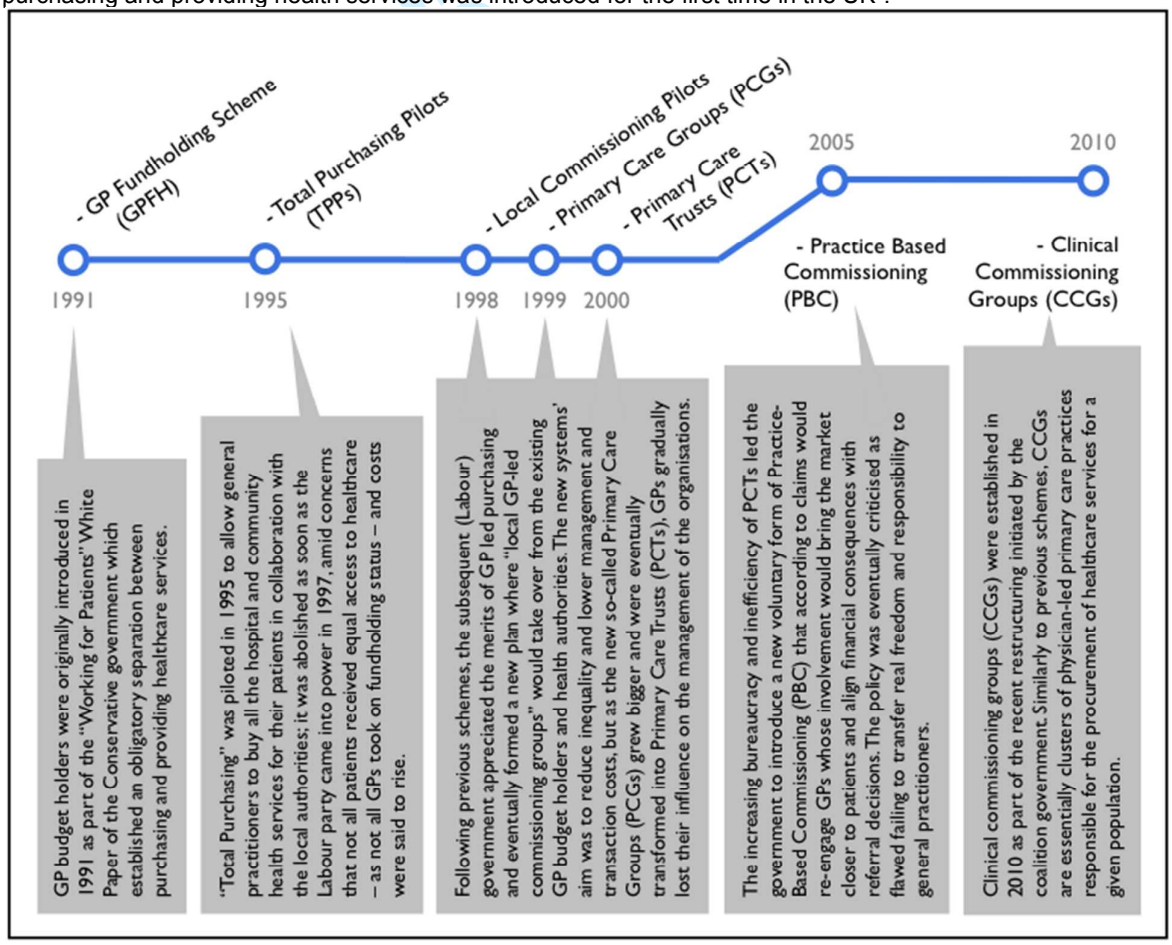


Figure 1. Clinical commissioning initiatives since 1991

Despite the variability of the different policies, all the implemented GP-led commissioning models aimed at improving quality and outcomes of healthcare services. Commissioning decisions have a great impact on the

health system so the demand for particular knowledge and capabilities is particularly high. Within the current process GP leaders need to develop their expertise, manage and share knowledge, collaborate with colleagues and external stakeholders, and seek advice from peers in different clusters in order to be innovative and develop novel commissioning arrangements.

Although network leadership that seeks to achieve collaboration and knowledge sharing is important in the commissioning process, research in this area has largely been focused on describing and comparing the different policies[6, 7], and measuring resource allocation and economic outcomes[8, 9]. Our innovation network theory approach will explore GP-led commissioning by looking at knowledge mobility and collaborations between clinicians, PCTs, patients, providers, and other entities which play an important role in the development of novel commissioning arrangements and improved outcomes. We carried out research on clinical commissioning groups that examined the current function and emerging forms of CCGs; analysed how CCG leaders orchestrate commissioning activities in three processes: managing knowledge flows, managing innovation coherence, and managing network stability; identified strengths, issues, and areas for development of the newly established CCGs; and contributed to the theoretical and methodological knowledge base in the study of clinical leadership and commissioning practice.

Methods

This study is part of the Collaborations for Leadership in Applied Health Research and Care (CLAHRC) initiative, funded by the National Institute for Health Research (NIHR), which aims at supporting and translating research evidence into NHS practice. The study itself took place within NIHR CLAHRC for Cambridgeshire and Peterborough and was facilitated from the collaborative partnerships between the University of Cambridge and surrounding NHS organizations.

Design and theoretical framework

We conducted a theoretically informed, mixed-method case study research across multiple CCG sites. While the responsibilities of the CCGs (initially known as GP commissioning consortia) are outlined in the recent White Paper, very little is known about the organisational practices commissioners adopt to develop novel local services. To fill that gap, the aim of the project is to understand the emerging role of CCG leaders and outline their coordination activities as orchestrators of their service innovation network. In this process we chose to adopt innovation and network theory for two reasons. First, the delivery of clinical commissioning and development of innovative services around it require complex collaborations between a large number of stakeholders including patients and the public, local government and authorities, acute and other providers, in the form of a value network. These so-called *innovation networks* are often characterised by loose, semi-temporal linkages between actors who seek to employ the right resources and engage in strategic collaborations in order to deal with specific problems and develop innovative services and solutions[10]. Secondly, this network-centric innovation model also recognises the need for a leading hub-entity that will orchestrate the innovation activity within the network through a number of coordination processes[11, 12]. Therefore, by mapping our findings on this theoretical framework we were able to identify various orchestrating processes that CCG leaders as innovation hubs use. In addition, we are able to pinpoint particular strengths, issues and areas for further development of CCGs.

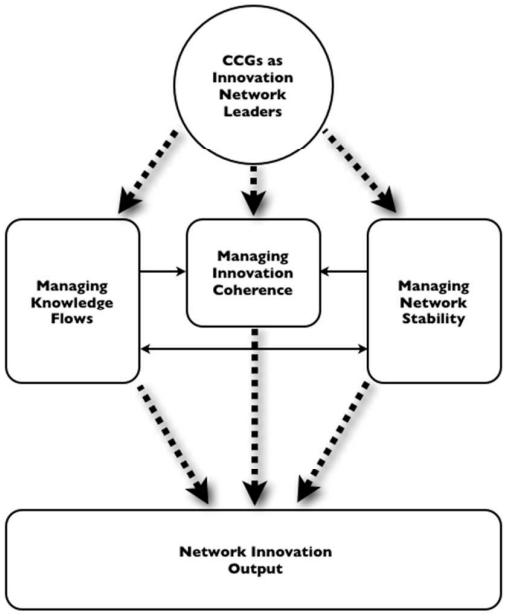


Figure 2. The role of CCGs as innovation network leaders and the management practices used to enhance innovation development

Sampling

We started our fieldwork by studying eight clinical commissioning groups and local clusters (also called localities) in the East of England region, six of which we studied in-depth (sites A, B, C, D, E, and F). The six commissioning groups that were investigated systematically (sample groups) covered mixed patient populations varying between 50,000 and 550,000 patients. In total, our sample groups covered 1,662,000 patients served by 208 general practices. The number of Board members of the CCGs also varied according to the size of the population they covered with the smallest numbering 4 members and the largest 14. The total number of Board members of all six commissioning groups at the time of data collection was 63.

The first wave of GP commissioning consortia took place in December 2010 and introduced 52 "pathfinders" initially covering 12.9m people. Second, third, and fourth waves followed soon after and by the end of April 2011 GP commissioning covered 9 out of 10 people in the UK[*]. Most of the groups in our sample were given pathfinder status during the first two waves. Table 1 presents all the main characteristics of our CCGs and localities sample, and points to the variability of network structure. The size variation in our sample is similar to the national statistics of the first two waves (numbering 137 consortia): the average population covered per CCG was approximately 207,000 with standard deviation 146,000 (min 14,000/max 693,000), and the average number of practices under a CCG was 30 with standard deviation 22 (min 1/max 105).

	Status	Wave	Covering		Localities	Board representation			Executive	PBC
			Population	Practices	(Clusters)	Sec/Care	Nurse	Patient	Support	roots
Site A	CCG	1	300,000	30	6	N	N	Y	N	N
Site B	CCG	2	550,000	60	4	N	N	Y	N	Y***
Site C	Locality	-	50,000	4	-	N	N	N	N	Y*
Site D	CCG	2	325,000	47	2	N	Y	N	Y	Y***
Site E	CCG	1	230,000	27	2	Y	Y	Y	Y	Y**
Site F	CCG	1	77,000	10	-	N	Y	Y	Y	Y***

[*] Statistics as well as interactive maps on GP commissioning consortia can be found online at: www.gponline.co.uk

Table 1. Main characteristics of CCGs and localities sample

Data collection and analysis

Access and pilot interviews were initiated in November 2010 and the main data collection took place between February and December 2011. In total 56 healthcare professionals were interviewed: 35 Board members (mostly GPs but also PCT employees and practice managers) plus an additional 21 people from various organizations including acute provider representatives, and health authorities executives. In addition, we observed 21 CCG board meetings and executive committees within local clusters. This helped us to witness how these groups work in action rather than rely solely on the espoused views of their members. We kept field notes during meetings and transcribed all interviews after recording (apart from few exceptions). We used ATLAS.ti to categorize, code, and analyze qualitative data including hundreds of pages of background documents such as national-level policy reports, minutes from meetings, and speech transcripts from conferences and workshops.

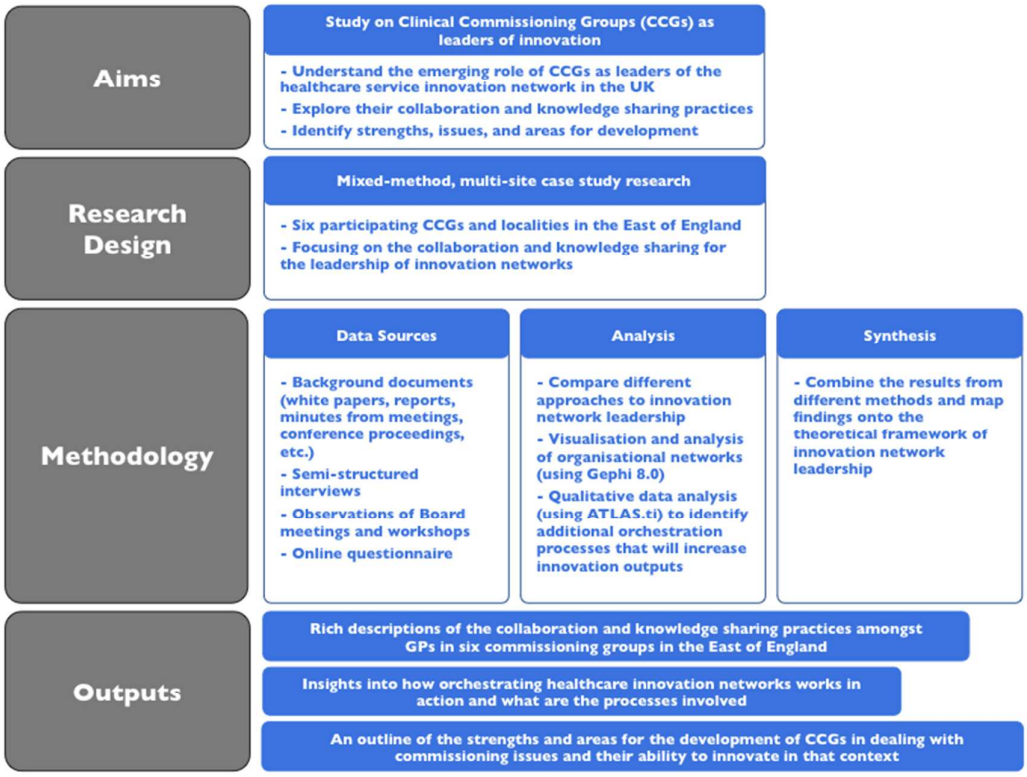


Figure 3. Summary of the study protocol

Having CCG board members as our unit of analysis helped us to confine our research and also limit our study of their healthcare innovation network to their immediate contacts. Moreover, GP leaders as main stakeholders also assisted us in identifying potential targets to question. Additional interviewees were also recognized through the observation of board meetings with the intention of getting a variety of perspectives and evidence. Interviews usually lasted between 35' and 90' minutes and were conducted either by phone or in person. We compared organizational forms and leadership routines across the six groups and highlighted their variations. Key themes that emerged from the interviews were coded according to the orchestration processes with which they were related. Based on network leadership theory, three innovation network orchestration processes were identified as relevant with our CCG study: managing knowledge flows, managing innovation coherence, and managing network stability.

	GPs	PCT employees	Practice Managers	Hospital	Other	Total	Meeting Observations	Survey Participation
Site A	3	3	2	1	1	10	5	100%
Site B	6	5	3	1	1	16	7	92%
Site C	5	3	0	0	0	8	3	100%
Site D	3	1	2	0	1	7	2	92%
Site E	3	0	1	1	3	8	1	88%
Site F	1	1	1	1	3	7	3	83%
Total	**21**	**13**	**9**	**4**	**9**	**56**	**21**	**92%**

Table 2. Breakdown of the interviewees by site and type

In order to provide external validity to our research results, and debate whether the theoretical approach we have used could be useful for the future development of CCGs nation-wide we presented our findings to a number of CCG board of directors and (particularly to those that were interested in the feedback) at a regional event on clinical commissioning where most of the commissioning groups were represented.

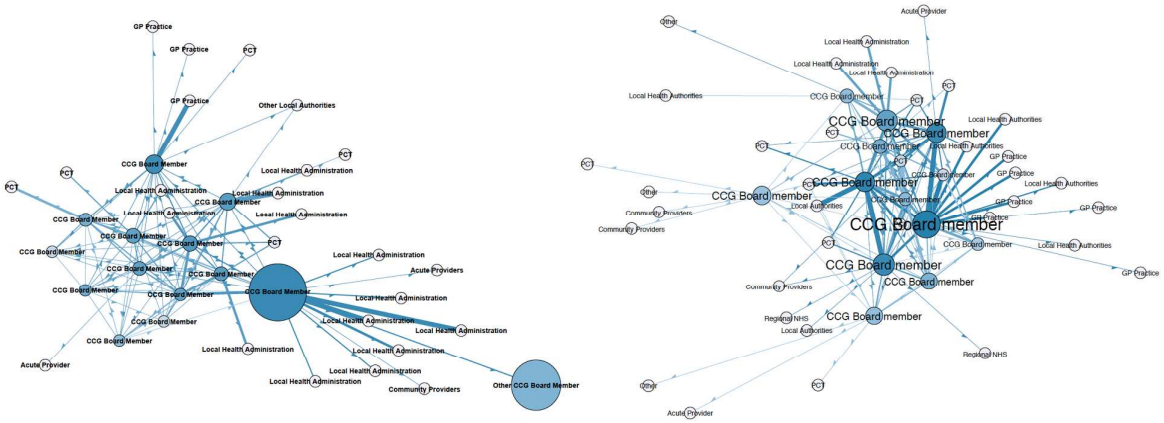
Social network analysis

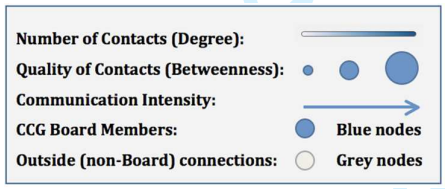
In addition to interviews, CCG documentation and other publications, we also collected responses using an electronic survey on knowledge sharing and collaboration practices that was sent out via email to all Board members of the CCGs we studied. The response rate for this was approximately 92%[†] and the results helped us to identify knowledge exchange patterns amongst board members and outside parties regarding clinical commissioning. We used social network analysis (SNA) to discern the popularity of certain individuals in the network and the individuals that board members go to in order to acquire advice regarding commissioning issues. More specifically, we were able to measure the number of contacts CCG board members have (also called "degree") as well as the centrality of their position into the network (also known as "betweenness centrality") in order to understand which members act as brokers and have the ability to transfer knowledge from other parts of the network and across CCGs. Finally, we calculated the density of the CCGs which measures the extent to which board members go to their colleagues for advice. This measure indicates in someway the good communication and team-working activities among CCG members.

The visualization and analysis of the CCG board networks were performed using Gephi 8.0. Figure 4 provides an example of the outreach network structure of the board of directors of two clinical commissioning groups (A on the left and B on the right). These two cases illustrate two markedly different leadership and organisational styles.

Figure 4. Examples of CCG networks

[†] Out of the 63 board members that received the electronic survey 58 replied. Two of the five people that did not respond were new board members, however, we decided not to exclude them from our study for sensible reasons.





More specifically, the blue nodes on the graph are the CCG board members and the light grey nodes are their direct contacts to whom they go for advice regarding commissioning issues. These include PCT employees, frontline GP practices, providers, etc. The size (thickness) of the links represents the frequency of communication (communication intensity) between the members of the network and largely implies the flow of information and knowledge from one person to the other (in the form of advice or influence). The arrows represent the direction of the flow.

"Degree" is identified by the colour of the node (the darker the node the more contacts the individual has), and "betweenness centrality" is illustrated by the size of the node (the bigger the node the higher the centrality). All these organisational network metrics are important and provide information about the orchestration processes performed by CCGs as well as offer some indication on the capacity CCGs have to create and integrate knowledge.

Results

Overall, the figures and other facts mentioned in this study are based on the timing our data were collected (February to December 2011). However, during the course of our study, ongoing changes to commissioning entities occurred, such as moving from being called 'pathfinders' to 'GP commissioning consortia', to CCGs; however these designations do not affect the substantive findings.

The commissioning context: a challenge to network leadership

In principle, CCGs are GP-led commissioning hubs with the responsibility to design, negotiate, and purchase healthcare services for the population they cover. Accordingly, they will gradually take over commissioning (and other) activities from PCTs and will be accountable to the NHS commissioning board, a new body that will replace the current regional administration organisations (SHAs). These ongoing changes in conjunction with the increasing complexity of healthcare delivery and the explosion of knowledge and technological advances in the sector heighten the challenge for clinicians. In order to develop a stable healthcare network and deliver innovative, cost-effective solutions a collaborative network leader is required who will enable trusting relationships, provide incentives, and take into account patients' needs[13].

All CCGs are structured in a way that reflects the tension in achieving strong local commitment and efficiency through scale. The GP leaders we interviewed were aware of this: "there's this sense that we have to be big in order to have the clout and to negotiate" (Site B). Network size in our context, is directly related to the proportion of population covered as Government payments follow the patients. Larger networks create a more stable environment as risk (in particular for financial failure) can be spread across the whole network, thus minimising the chance of collapse. This more stable position also improves the leaders' ability to negotiate, due to their increased purchasing power across the network. By looking at Table 1 one can observe the range of sizes of the population and practices involved.

However, as network size increases, it becomes more difficult for leaders to engage with frontline members. Thus leaders also kept stressing that "if they [completely] ignore the size issue, they will fail to get [GPs]

engaged and on board" (site B), thus, highlighting the importance of a "bottom up" approach to clinical commissioning. To manage this tension, several sites developed smaller *localities*, clusters of practices within the network which resolve local issues, including commissioning. The localities' leaders are typically part of the CCG Board, responsible for leading the overall commissioning process. A GP commented, "[frontline engagement] won't work at three hundred thousand [patients] level […therefore] having those sub-groups, those cluster level groups is vitally important" (site C).

The challenge of engagement with frontline GPs (and other clinical providers) reflects the network challenge of developing internal network coherence, as clinicians frequently have access to information regarding specific local needs and trends, in addition to the clinical knowledge base they can contribute to commissioning decision making. In order for commissioning decisions to reflect the corpus of primary care views contained within the network structure, network leaders need to find mechanisms for knowledge exchange with frontline clinicians. Engagement within the network structure will help ensure that the knowledge held by frontline members of the network is made available to other network members, and in particular in guiding the leaders' decision making. Enabling network coherence in this manner will also support the flow of innovative ideas across the network, thus enabling novel commissioning arrangements. Whilst it is easier to develop internal network coherence in smaller networks, this remains in tension with maintaining network stability as there remains greater risks for key individuals or entities (e.g. a service provider) to leave the network, risking loss of critical knowledge and capabilities.

Perhaps a more important contextual factor than the size of the commissioning groups is the pre-existing culture and history of the clusters that form them. In particular, the legacy of Practice Based Commissioning (PBC- earlier forms of GP commissioning) appeared to have an important effect on the organisation and leadership of CCGs and the relationship of GPs with various stakeholders inside and outside their group. Even though PBCs never held actual commissioning funds throughout their existence, they had established a distinctive "organisational archetype"[14] which itself was a result of the sedimentation that took place during the organisational changes of the reform at the time. As such, former PBC groups drew on their network position and were merged into CCGs, transferring their knowledge and contacts into an overlaying network structure.

In our sample, groups B, D, E, and F which correspond to previous PBC teams, appear to have extensive knowledge regarding commissioning activities as well as knowledge of local requirements. On the other hand, groups A and C are newer network arrangements that drew on some practice-based commissioning experience but weren't formed by former PBC groups *per se*.

By and large, the specifications of the previous organisational archetype (in this case PBC groups) has an apparent effect on the change, formation, and abilities of newer CCGs. In this process, organisational change "represents not so much a shift from one archetype [PBC] to another [CCG], but a layering of one archetype on another"[14] (p.624), where the new establishment embodies the interlacing of previous structures and skills with novel network features. A good example of this is put forward by a GP (site A) who highlighted that the differences between PBCs and CCGs were "essentially in support and contracting […] those areas that there are glaring deficits now" thus, highlighting the disadvantages of the CCGs that did not result from PBCs.

The pre-existing configurations and localities of the CCGs also had an effect on the leadership structure (as described by the influence individuals have on others and on the commissioning decisions taken) and the knowledge exchange patterns among board members. As it can be seen from our social network analysis, Group B still holds a legacy of the former PBC groups that were in place prior to the reform and the locality leaders continue to have considerable influence at the board level. These leaders were well connected with PCT, GP practices, and providers as well as local health authorities. Group A is inclined towards a more centralized network leadership model where only one or two individuals have the majority of connections with third parties. Despite the more distributed structure of group B, the density of its board, is lower (0.622) than the one of group A (0.737) which is another indication of the competitive environment among the members of group B who are deeply committed to their localities.

Achieving coherence: relating to administrative entities

Overall, there was significant variation among CCG leaders in the way relationships with PCTs were managed. Leaders in some groups described the relationship with the PCTs as "open" and "supportive", "getting better at seeing each other's point of view". Group C also managed to establish a PCT sub-committee where GPs and PCT managers collaborate to resolve commissioning issues. Some CCG leaders viewed PCT employees as a useful source of information and commissioning expertise. A CCG board member (group B) pointed out: "I see my role as coordinating, having some ideas and then asking PCT people to develop those ideas. There's only so many hours in the week and I can't do everything, so I draw on the skilled people at the PCT". The institutionalisation of knowledge exchange through close collaboration (e.g. between clinical and administrative pairs) will remain limited if no one takes ownership of coordinating (yet not controlling) the whole process.

On the other hand, there seems to be a perception among some CCG leaders that PCTs are "being abolished [because they] haven't delivered what [they] should have done" (site B). A GP in site A also illustrated this: "the contracting has been poor and it hasn't been adequately informed […] it is basically a legacy […] There wasn't actually any thinking or decision making". The goal of seeking novel commissioning arrangements free from the constraints of legacy decisions foregrounds the complexity of interweaving existing knowledge and innovative ideas across the network.

From the PCT perspective two things were happening: On one hand, "you've got the PCT trying to offload its activities" to the CCGs, in a supportive manner. On the other hand, a number of PCT employees felt threatened by CCG formation and aware of their own job insecurity, as GPs "don't want to recreate a PCT". As a result PCT members were not always willing to openly cooperate with CCG leaders. For example, PCT members were noted to withhold funds - which they control until their dissolution in April 2013 - from being spent on new arrangements, A GP described how the indifference of the PCT employees led to frustration in his group: "nobody got the idea and they just refused to fund it" (site C).

In our study we also found that co-location arrangements further constrained (or enabled) communication between CCG members and PCT employees, leading to miss-interpretations and delays in the transfer of information and data. One PCT director (site D) felt that their good relationship with GP leaders "was due to geography […] we brought the PBC support unit into the PCT building so they are in the same place as us […] sitting side-by-side with the PCT staff […now with CCGs] that absolutely helped". In our sample, most of the networks that had supportive relations between respective PCTs and CCGs use the PCT premises to hold their board meetings. In networks where CCGs were detached from PCTs board meetings were held elsewhere (e.g. B and E). These results are being reinforced by the social network analysis. Site B has only 12 ties to PCT and Local Administration, whereas site A has 18 links and it is located at the local PCT.

External innovation coherence is fostered by the PCT, which shares common practices and skills with peer commissioning groups across the country. As such knowledge and novel arrangements from PCTs in commissioning networks across the country can be transferred to enable network coherence with knowledge external to the system. PCTs also transfer knowledge through training programs, often hiring the services of consulting organisations.

Relating to providers and users: the challenge of knowledge exchange

A critical CCG leadership task is developing relationships with health providers such as community or acute providers (e.g. hospitals). Most CCG leaders are aware of the historic barrier between primary and specialist care more broadly. Organisational boundaries within and between groups of practice can jeopardise access to information and knowledge which resides in different locations in the healthcare ecosystem. It should be the responsibility of network leaders to ensure knowledge mobility that will connect existing ideas and information with potential problems thus creating efficiencies within the system. A PCT manager on a CCG board suggested: "We need to get that relationship off from a good start […] to sort a strategy that is going to pull them in from the beginning [and realise] that it's not '*take all our money and continue to deliver as you've always done*'. We've got to do things differently" (site B). Another CCG board member highlighted: "you can't forget about the money, but […] ultimately this is about the patient and the patient's journey". The tension between GP commissioners and secondary care specialists is described by a PCT employee as a conflict of interest where "providers want to maximise their income while [commissioners] want to maximise efficiency" (group B).

One of the groups in our sample has demonstrated an exemplary strategy not only in developing good relationships with providers but also in managing the development of integrated care (group E). They invited two healthcare provider representatives (one from an acute trust and one from a community trust) onto their CCG board; these members were able to influence the decisions being made in the commissioning of services. In a number of other cases, PCTs helped broker the relationship. While this type of service co-creation is necessary for good quality integrated healthcare service, our results show that there is substantial lack of communication between CCGs and acute providers. In our CCGs network sample, each board had a maximum of 2-3 ties with acute providers which is very low if you think that the relationship between GPs and providers is at the core of clinical commissioning.

As illustrated in the table below, integration of services goes beyond the need of commissioning appropriate services, but also of enabling more knowledge exchange between primary and secondary care clinicians. In order to enable novel care integration, leaders need to go beyond arranging for innovative procurement of care, but also to facilitate the ongoing knowledge exchange between clinicians in both sectors, so that the patient's

journey is more holistic. CCG leaders were aware of extent and importance of this challenge, as evidence in their comments and examples below. Whilst cliques - isolation of network member groups or individuals – are not uncommon in social networks leaders felt that increased ownership of the evolving policy process as well as the new relationships entailed was an important strategic enabler.

In three cases, nurses were represented on the CCG leadership team. A nurse (site D) described the uniqueness of their role as being closer to the patient: "nurses have a slightly different stance when it comes to patient care. I mean doctors treat and nurses nurse", highlighting the distinctiveness of their perspectives in purchasing decisions. Given that nurses have a distinctive perspective their participation contributes to the knowledge available in the commissioning processes. However, given that nurses provide a bulk of the care being delivered, their knowledge and perspective will also work to support the integration across the care pathway.

Box 1: Examples of the importance of integrated care

Lack of communication between GPs and consultants

Communication between GPs and consultants are essential for the quality of care a patient receives throughout his journey. A GP describes: *"I say to the patients when they come back 'what did the consultant say was the plan?' and they reply 'he didn't say what the plan is', 'so what's happening next?', 'He hasn't told me' so [...] consultants are not used to communicating at that level"* (site B).

Lack of collaboration between GPs and between different consultants

A GP described the case where a woman had consistent bleeding every two weeks from her stomach. The woman had been receiving treatment from her cardiologist due to another heart issue. The gastroenterologists believed that the medication that she was under was the reason she was bleeding regularly. *"Now it's just going round and round"* and the patient is frustrated as the consultants do not appear to talk to each other: *"textbook says she has to be on this drug for a year"* and thus cardiologists insist she need to continue taking the treatment, thus, ignoring the side effects gastroenterologists believe the drug produces. *"And she listens to them because they are consultants"*. There is a need to approach healthcare differently and *"that's what's difficult to change"* (site B).

Need for greater integration in healthcare networks

Another GP described the path of a particular senior citizen who lives on her own and her main problem is that she is a bit forgetful: *"she doesn't know when to take her medication"* and therefore needs someone to go and check on her. *"Do we go down adult social care or is it a bit milder than that, and she needs a friend, a neighbour, and everyone starts to network into this system"*. The main concern is that the parties involved do not have the necessary information about the activities of the others: *"A doesn't know what B is doing, left hand doesn't know what right hand is doing, Salvation Army doesn't know what is going on in the Alzheimer's Society who don't know what is going on with Age Concern"* (site C).

Over half of the CCGs had a patient representative on their board (sites A, B, E, and F). This is somewhat anticipated as one of the main arguments behind the reform was to bring patients at the centre of the healthcare service; patient views are believed to improve the final service offering. One of the patient representatives interviewed felt that he made "direct input" into meeting he was attending and felt he made a real difference (group B). "Any service user knows what it's like on the other side, to be on the receiving end. They can give very practical suggestions about what works, what doesn't, what are glitches in the system" (Patient representative, site A). On the other hand, a GP leader (site C) highlighted that it had always been an issue to engage patient groups into providing inputs at the locality and or CCG level: "Patients are not usually interested in it", "they are busy and do not want to do things like this" (site B), "patients will only be involved if there is money to be made" (site A). In addition, many GPs commented that when inviting patients to provide feedback "you get half a dozen […] with particular reason or agenda", suggesting this form of engagement did not lead to constructive dialogue on improving patient care. A GP from site B pointed out: "I think they [patients] are just there representing their own views as they see it".

Even though the wider perception was that patient views were valuable, there was no mechanism in place to operationalize lay representation and overall it was left in piecemeal fashion. For example, in some of the locality meetings we observed individuals, who had the flexibility to attend and were listening attentively to discussions without engaging in overt dialogue. In other meetings, there was set time given to patient representatives to present their perspectives. There was voiced confusion amongst leaders regarding how lay inputs should be used and incorporated to the wider, population-level commissioning agenda of CCGs. As such, several GP leaders felt that in the current fiscal climate and organisational upheaval, it was not a priority to invest resources in organising patient groups and their input, revealing the challenge in genuine public or patient representation[15].

Policy documents on public and patient involvement in commissioning do not provide adequate insight on managing this process; for example identifying representative individuals, or merging competing perspectives between patients. A more systematic procedure is should enable systematic knowledge transfer from patient representatives into the commissioning decisions. The lack of a coordinated mechanism could reduce external innovation coherence and can diminish the relevance of commissioned services.

Complying with policy: managing network stability

Another significant relationship influencing the new commissioning scheme is the relationship between GPs and health policy makers and administrators who oversee the implementation of the policy. Numerous GP leaders expressed frustration that a number of their colleagues are hesitant to engage because of the perceived weak engagement and two way dialogue and knowledge exchange between policy makers (or their representatives) and CCG leaders. On the whole communication is seen as a one way process. In addition, during the course of the study we observed an increasing frustration among the CCGs we studied. Several who were enthusiastic and motivated in the beginning started to believe that their efforts are misplaced and that they will not have the opportunity to innovate in a direction that will improve the overall commissioning process: "it was clear that there were many unfinished episodes and contradictions in the legislation, the Minister then turned to the professions" in order to get their input and called those pathfinder organisations. A GP from group A mentioned: "I was happy to contribute as a pathfinder under those terms but the pathfinders were used as evidence that the profession supported the Bill […] then I felt that I'd been tricked into being a pathfinder".

As a result, numerous frontline GPs and CCG leaders commented they were becoming increasingly cynical and started questioning whether it is worth moving forward with their CCG activities overall. "We're in between at the moment, waiting to know what the new world is going to look like, and not really being able to get on with things until that's clear" (site A). In parallel with the uncertainty around the future of the reform, CCG leaders felt that they have little guidance from the DoH regarding their new activities and responsibilities: "the government is being less than explicit". As a result, there were many occasions in which leaders were wondering what they were allowed to do or not as part of the new policy, whilst also perceiving there was few if any lines of communication through which they could find out. The uncertainty was compounded by the simultaneous restructuring of PCTs.

Ultimately, network stability is threatened by policy decisions, loss of confidence to the policy makers, and lack of dialogue between policy makers and health professionals. Throughout our study GPs felt increasingly frustrated with the policy process and the uncertainty around them. This is mainly due to isolation of politicians who are perceived to have a "pre-set agenda" which they are implementing without engaging too much with clinical leaders to whom the changes are directed, presumably so as to maintain control. Conflicting views deteriorate this position and lead to the emergence of further cliques that do not communicate with each other. A positive future is the most efficient promoter of cooperation which can be strengthened further by encouraging the creation of multiple projects that demand many types of relationships occurring together. CCG leaders should take advantage of their current position (as orchestrators) and resources in hand to establish change that will form a constructive legacy to any future programme of change. In order to embed innovative forms of commissioning and collaboration, the role of policy makers in providing adequate resources (e.g. in terms of technology infrastructure) and engagement are critical.

Unstable networks can also occur due to isolation, migration, and the emergence of cliques. Drawing from our findings, isolation takes place when different actors (e.g. providers, or localities) decide to break their communication channels with CCGs due to conflict of interest. In addition, GP leaders can create cliques that are inward-facing and avoid engagement with other parties in the network, thus, limiting knowledge sharing and reducing the relevance of commissioning decisions. Finally, valuable actors may migrate to competing networks and leave a gap in the network.

Discussion

Main findings

Our study uncovers the social and political complexity of clinical leadership in the context of CCG and their networks. Implementation of the latest healthcare reform in the UK has advanced much more slowly and with much more difficulty than anticipated. Some of the main reasons for this have been the unstable national set-up, the lack of appreciation of the social and political complexities in the health sector, and the unrealistic expectations about the capabilities and capacity of GPs to lead such a major change. The above are illustrated with tensions between various parties within the healthcare network (e.g. relationships between PCTs, GPs, service providers, local structures etc.), uncertainty and lack of trust to the Department of Health, and pre-

existing establishments and legacies that have an effect on the recent efforts to change. The aim of the reform is to re-establish these relationships around the new role of GPs as clinical leads that will facilitate innovation and coordinate the commissioning process. This implementation demands a new breed of clinical (GP) leaders whose role will be to orchestrate the healthcare innovation network around them through managing knowledge exchange, ensuring network stability and supporting innovation coherence.

While the future of the reform is still uncertain in light of the resistance that the implementation of the UK healthcare plan faces from a large number of clinical professionals and healthcare associations, GPs are coming together to form clinical commissioning groups that are planed to take over commissioning duties from PCTs until mid 2013. In that process GPs are trying to organize their activities, build their capacity and understand their new role.

Policy implications

Recent research has shown that healthcare delivery has become fragmented and untidy due to the explosion of knowledge and technological advances. In order to deal with this complexity and new breed of clinical leaders is required that will coordinate innovative activity and ensure healthcare service delivery through collaborative and teamwork efforts in the broader healthcare network[13]. Current understanding of enabling innovation networks points to the importance of knowledge exchange, network stability and innovation coherence in achieving ecosystem outcomes[11, 12]. As in most networks, in the case of the CCG hubs, leaders are required to provide "subtle leadership"[16], which focuses on visioning, motivating and sense-making, rather than controlling[17]. Having said that, such loose orchestration or delegative leadership from one hand can enhance social autonomy and boost innovative outcomes but on the other hand it does little to drive knowledge integration[18]. In the absence of strict hierarchies, these leaders need to develop brokering strategies that will not only facilitate links between stakeholders but will also couple healthcare professionals in order to deliver outcomes. For example, it is necessary to adopt "soft" strategies that will inspire people and engage grass root GPs but might also need to provide "hard" incentives that will motivate people to commit to quality service and cost reduction.

In addition, GPs as network leaders will not only need to generally encourage more the involvement of PCTs, local authorities and providers in designing new cost-effective and better quality pathways, but will also need to streamline the patients' feedback and find a consistent and structured way to capture and take into account their views. Both these hard and soft strategies or network leadership processes are imperative in facilitating the development of new clinical practices and novel commissioning ideas. CCGs are in a good position to implement these as they are trying to establish a new organisational form and leadership style that will fit the current culture which does not adhere to directive leadership but encourages delegative direction.

Further, external innovation coherence goes beyond the patients' perspective. It is also necessary to follow medical and research developments, technological advancements, as well as international trends, and benchmark these with the practises and clinical decisions make locally. To manage coherence at this external level leaders need to draw knowledge in through clinical, research and public health networks in a systematic way.

Network stability is imperative in any organisational context, so a critical orchestration task for hub leaders is to promote it at any cost[11]. The risk to unstable innovation networks is inherent due to their flexible, un-hierarchical nature, which is necessary in order to encourage innovative activities based on *ad hoc* collaborations between different parties in the healthcare ecosystem. In that sense there is a trade-off between ordered relationships (that are forced from top down) and loosely coupled interactions that emerge from the personal incentives of the collaborators. However, excessive erosion of network relationships can lead to unstable states reducing the value and innovation output of the network[19].

Box 2: Summary of emerging key policy recommendations

Overall network leadership strategy

- GPs need to realise their new role not only as physicians but also as coordinators that will lead and coach the activity of the healthcare network.
- Build on a comprehensible strategy around clinical commissioning that will include not only the involvement of PCTs and local authorities but also the inputs of patients and the public (healthcare ecosystem).
- Develop "soft" strategies that will inspire people and engage grass root GPs and provide "hard" incentives that will motivate people to commit to quality service and cost-effectiveness. A system of measurement and accountability might be necessary to implement in order to ensure the above.

- Integration of healthcare activities is important in order to deliver a more cost-effective but also patient-centric clinical service.

Managing knowledge mobility

- Identify well-connected individuals who maintain extensive advice and knowledge-sharing networks. Because of their connectedness, knowledge brokers in the network are expected to bring novel information to the group as they have access to a lot of people outside their cluster, potentially allowing for better commissioning decisions.
- Considering the importance of the brokers (who may be clinicians, practice managers or PCT directors) in circulating knowledge it may be justified to develop personal coaching and training sessions to improve individual performance as well as that of the group.
- Developing digital networks and technological infrastructure can play a key role in disseminating best clinical practice and valuable knowledge by creating large information depositories where commissioners will be able to access the necessary intelligence and evidence to support their work.
- Apart from knowledge circulation that encourages healthcare service innovation, GPs will also need to translate and integrate this knowledge into their commissioning practice.

Managing innovation coherence

- CCGs need to streamline the patients' feedback and find a consistent and structured way to capture and take into account their views.
- Following medical and research developments, technological advancements, as well as international trends, will help benchmark and increase the quality of clinical decisions make locally.

Managing network stability

- Establish a stable clinical commissioning vision and values that will promote trust and collaboration among GPs and other healthcare professionals. This will also promote indirectly knowledge mobility and innovation coherence in the network.

Strengths and limitations of the study

The relatively small number of observations has always been an issue when it comes to qualitative evidence and analysis of interview data. This limitation makes researchers cautious about generalising such findings. The CCGs we studied were part of a particular geographic region (East of England), however, most of the issues and opinions mentioned in the study have been widely reported everywhere (e.g. national commissioning conferences, opinion pieces, King's Fund reports, etc.). In addition, the richness of our data were subject to time constraints of participants and their willingness to share information about their activities often deemed as confidential. Despite of the variability (in seniority and position) of the people we interviewed the same themes emerged and common issues were identified between the different CCGs.

Set against these limitations, our study provides in-depth accounts of the changes in commissioning practice and the emerging role of GPs as healthcare network leaders. Our multi-method approach allowed us to validate our findings and ensure there was no bias due to limitations of specific methods. In addition to interviews, observations of CCG board meetings and extensive study of documentation gave us a fuller perspective on the doings of GPs and their efforts to orchestrate clinical commissioning activities. Network analysis also showed a different perspective of knowledge sharing and collaboration among healthcare professionals and provided evidence on the influence of GPs and their ability to coordinate commissioning tasks.

Conclusion

In conclusion, clinical commissioning leaders can play a critical role in the coordination of healthcare innovation networks through a number of "soft" and "hard" orchestration processes which include managing knowledge flows, managing innovation coherence, and managing network stability. Although not all GPs acknowledge the potential of these processes, we suggest this is an important leadership issue for CCGs which are in the process of establishing and expanding their networks with local health administration, NHS providers, and other local organizations in order to develop their commissioning capacity. To achieve that they will need to assign and exploit knowledge brokering roles and leverage good communication between their board members and people outside their board in order to bring new ideas into the group, facilitate new synergies and alliances, and allow for projects that take advantage of the available resources. In addition, they will need to identify and assess pre-existing relationships, which have institutional influences on them (e.g. PBC groups), that they can capitalize upon while incorporating the views of local stakeholders as well as patient and public voice in a systematic way.

For the above to take place the dialogue between clinical leaders, policy makers, and local authorities, needs to continue (or be re-established) in order to support innovation as well as sustain network stability and ensure innovation coherence at regional and CCG levels. Finally, technology can play a key role in disseminating practices and knowledge by creating large information depositories – a critical resource in most industries – where commissioners will be able to access the necessary intelligence and evidence to support their work. In that process integration of databases should be one of the primary targets. Good commissioning will need to go beyond macro data analysis (aggregate population measures) and incorporate insights developed through multi stakeholder perspectives and micro (practice-level) data and events that will emerge from bottom-up.

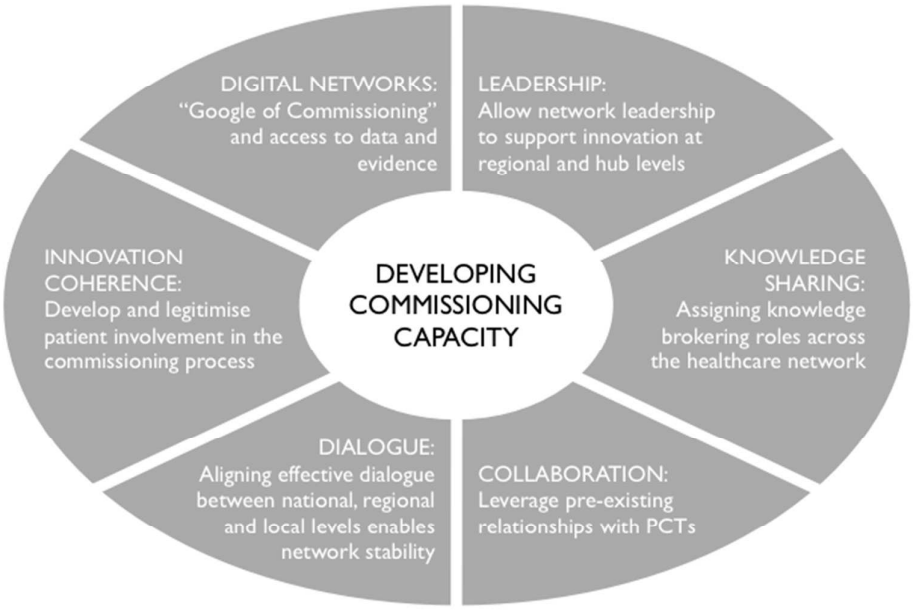


Figure 5. Summary of main implications for developing commissioning capacity at the CCG level.

What is already known on this topic

- Clinical commissioning is an important element of modern medical practice and has the potential to have a profound impact on patients and the public
- The responsibility of GP commissioners is understood to limit itself to planning, purchasing, and monitoring of the commissioned healthcare services thus, leaving their organizational and networking practices largely unexplored

What this study adds

- Clinical commissioning is a complex social practice that can be viewed as the orchestrating activity of large innovation networks through a set of coordination processes
- In this context encouraging knowledge sharing and collaboration between clinicians and other healthcare professionals are key tasks of clinical leadership and play a significant role in order to ensure innovation coherence and stability of the network
- Lack of clear political stimulus discourages lead general practitioners and boosts uncertainty which can hinder the activities of the CCGs
- Clinical leaders need to focus on enabling value to be add to services and systems locally as well as group-wide and ensure a patient-centered healthcare service integration
- Good commissioning should go beyond macro data analysis (aggregate population measures) and incorporate insights developed through multi stakeholder perspectives and micro (practice-level) data and events

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Ethical approval: n/a

Data sharing: No additional data available.

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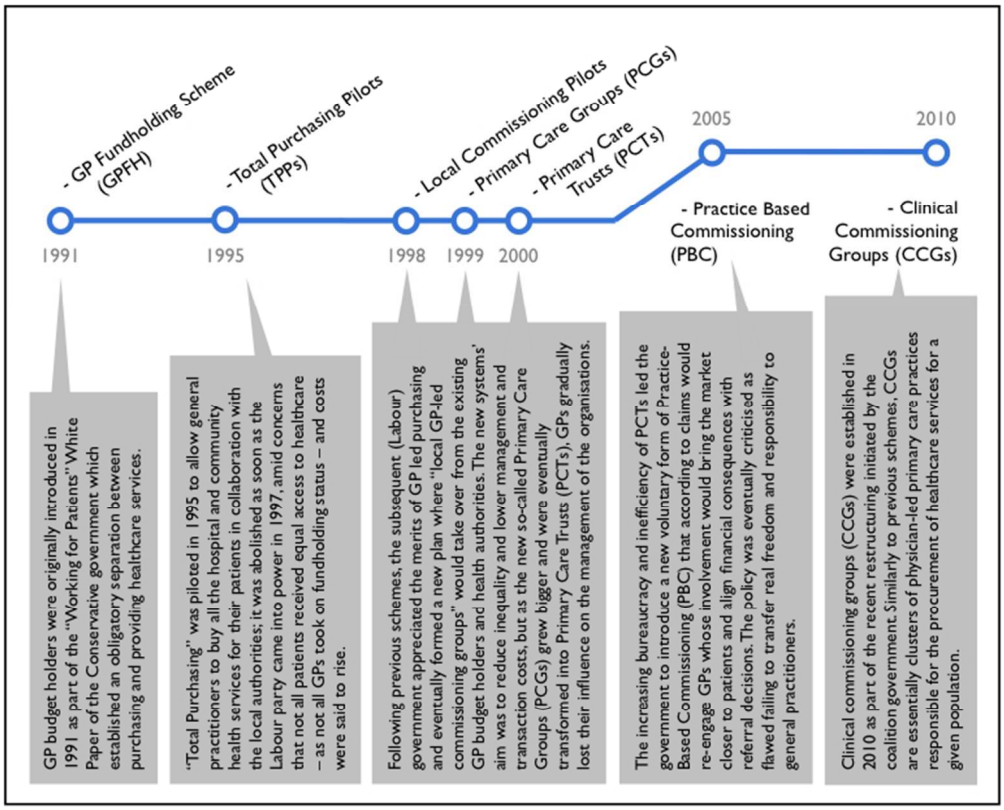

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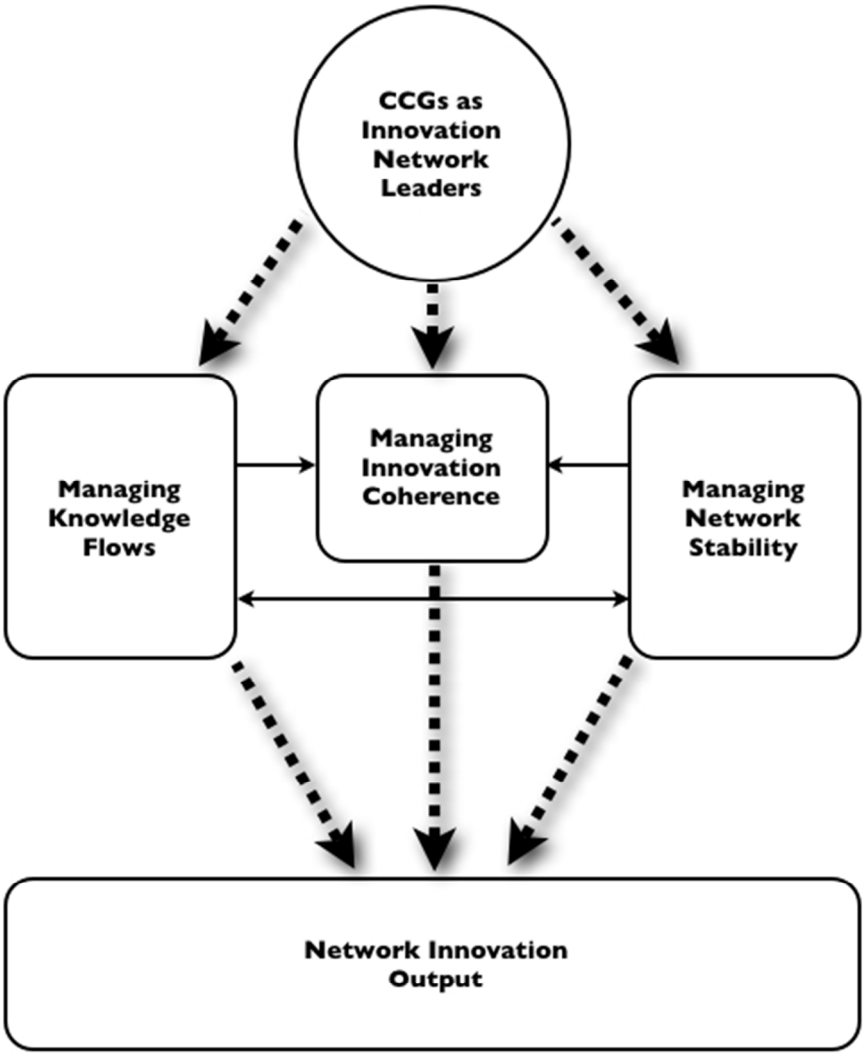

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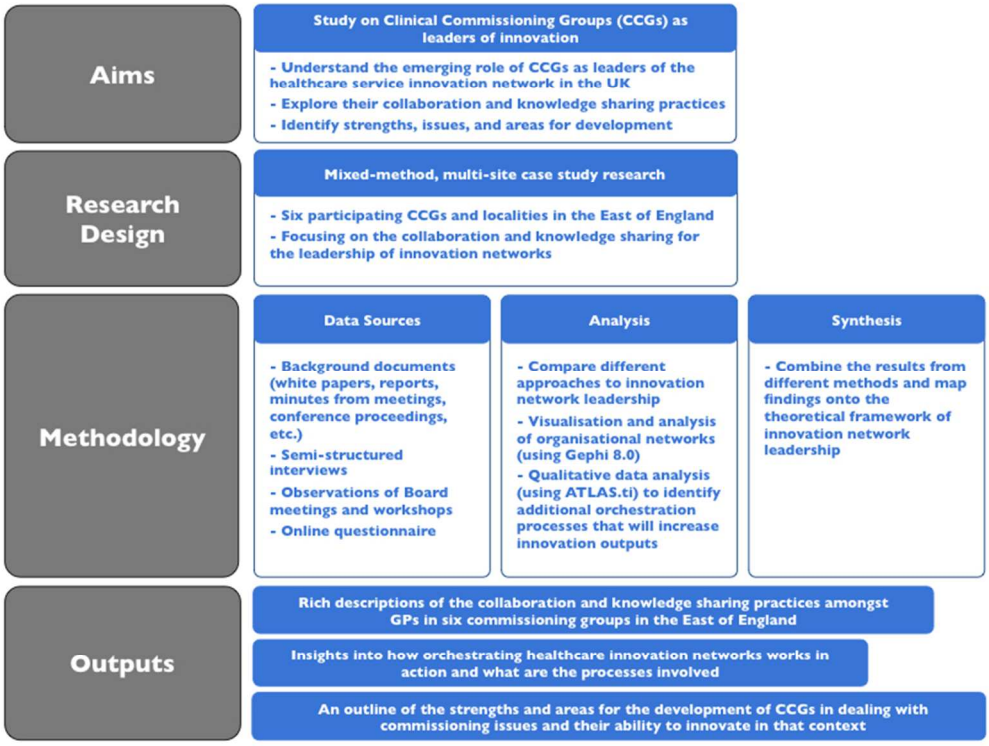

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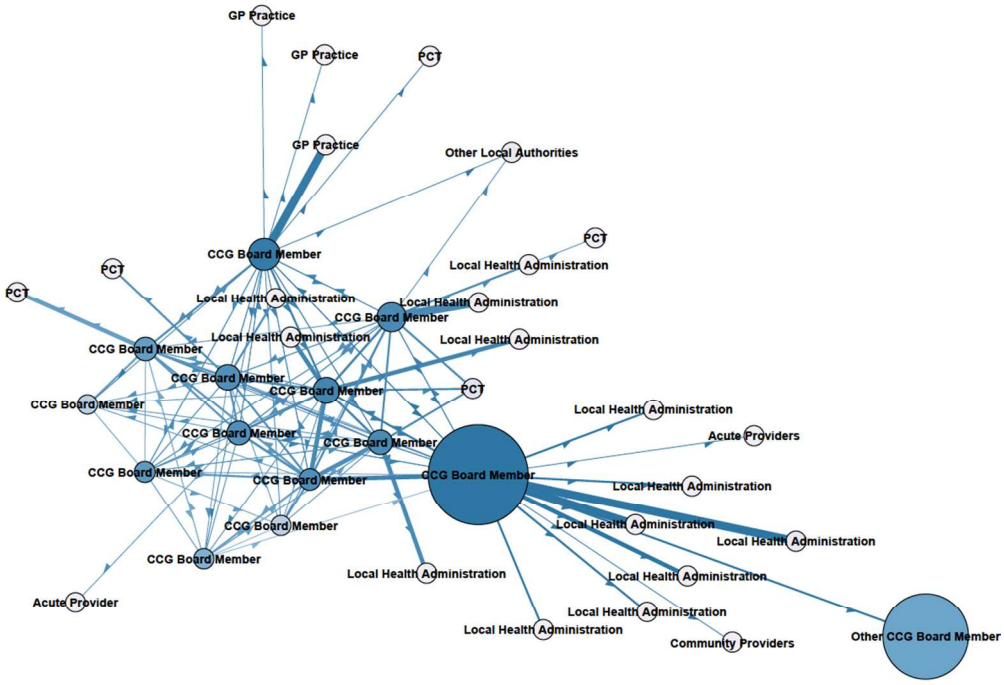

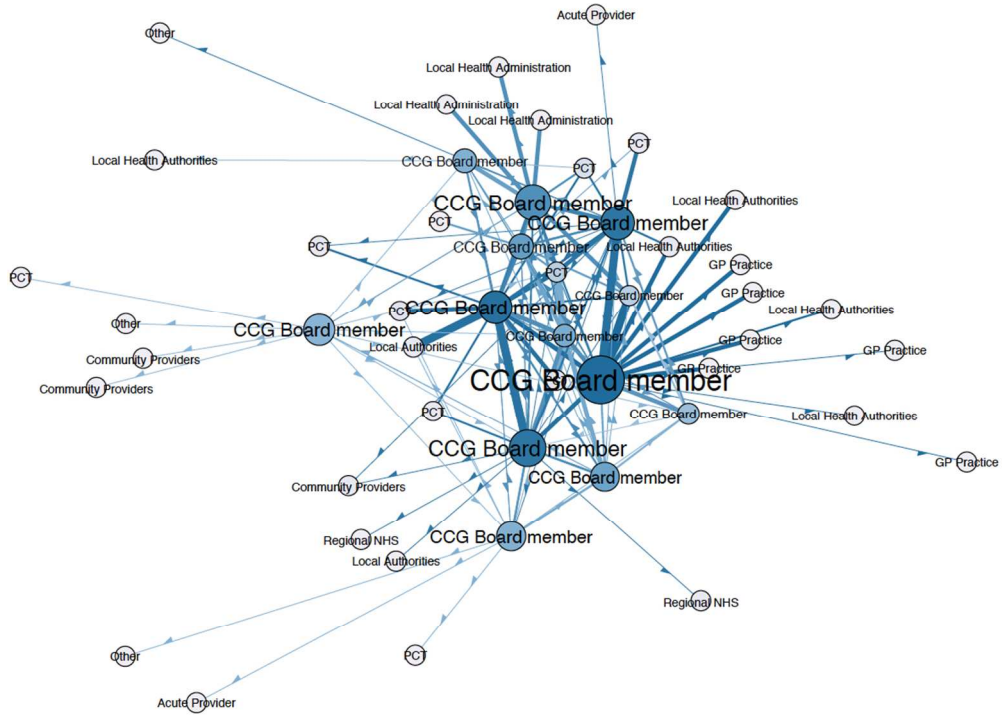
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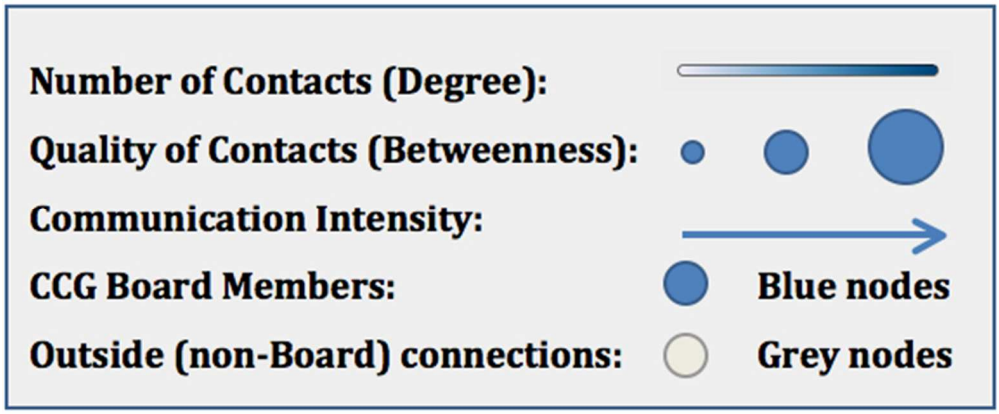

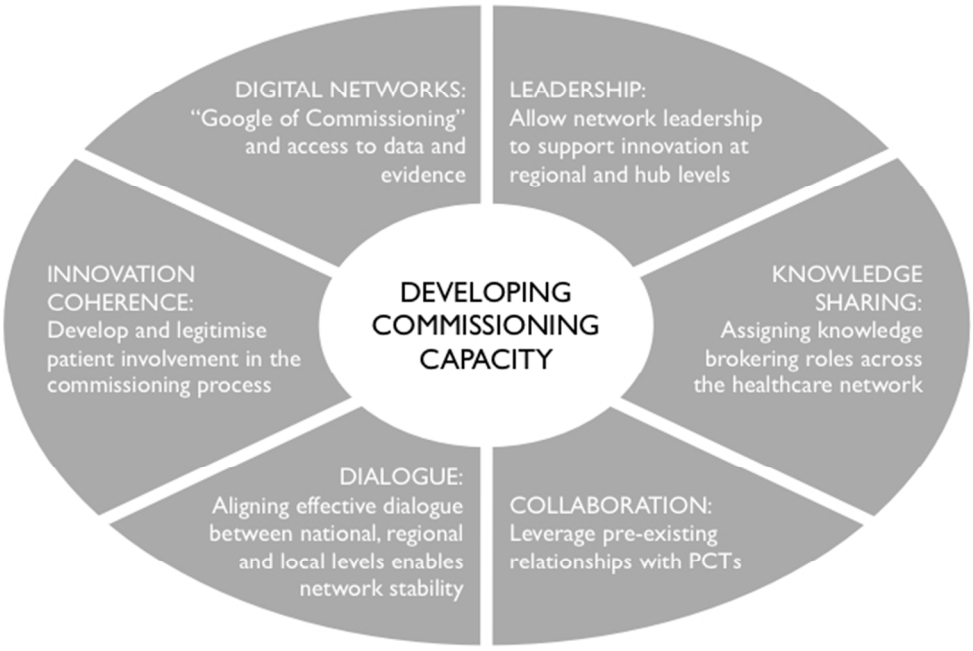

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	Status	Wave	Covering Population	Covering Practices	Localities (Clusters)	Board representation Sec/Care	Board representation Nurse	Board representation Patient	Executive Support	PBC roots
Site A	CCG	1	300,000	30	6	N	N	Y	N	N
Site B	CCG	2	550,000	60	4	N	N	Y	N	Y***
Site C	Locality	-	50,000	4	-	N	N	N	N	Y*
Site D	CCG	2	325,000	47	2	N	Y	N	Y	Y***
Site E	CCG	1	230,000	27	2	Y	Y	Y	Y	Y**
Site F	CCG	1	77,000	10	-	N	Y	Y	Y	Y***

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	GPs	PCT employees	Practice Managers	Hospital	Other	Total	Meeting Observations	Survey Participation
Site A	3	3	2	1	1	10	5	100%
Site B	6	5	3	1	1	16	7	92%
Site C	5	3	0	0	0	8	3	100%
Site D	3	1	2	0	1	7	2	92%
Site E	3	0	1	1	3	8	1	88%
Site F	1	1	1	1	3	7	3	83%
Total	**21**	**13**	**9**	**4**	**9**	**56**	**21**	**92%**

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Lack of communication between GPs and consultants

Communication between GPs and consultants are essential for the quality of care a patient receives throughout his journey. A GP describes: *"I say to the patients when they come back 'what did the consultant say was the plan?' and they reply 'he didn't say what the plan is', 'so what's happening next?', 'He hasn't told me' so [...] consultants are not used to communicating at that level"* (site B).

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Another GP described the path of a particular senior citizen who lives on her own and her main problem is that she is a bit forgetful: *"she doesn't know when to take her medication"* and therefore needs someone to go and check on her. *"Do we go down adult social care or is it a bit milder than that, and she needs a friend, a neighbour, and everyone starts to network into this system"*. The main concern is that the parties involved do not have the necessary information about the activities of the others: *"A doesn't know what B is doing, left hand doesn't know what right hand is doing, Salvation Army doesn't know what is going on in the Alzheimer's Society who don't know what is going on with Age Concern"* (site C).

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CCG leadership of healthcare commissioning networks in England

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Secondary Subject Heading:	Health policy, Qualitative research, Medical management, General practice / Family practice
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Research

CCG leadership of healthcare commissioning networks in England

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Abstract

Objective: To explore the relational challenges for GP leaders setting up new network-centric commissioning organisations in the recent health policy reform in England; we use innovation network theory to identify key network leadership practices that facilitate healthcare innovation.

Design: Mixed-method, multi-site, case study research.

Setting: Six clinical commissioning groups and local clusters in the East of England (EoE) area, covering in total 208 general practices and 1,662,000 population.

Methods: Semi-structured interviews with 56 lead GPs, practice managers and staff from the local health authorities (PCT) as well as various healthcare professionals; 21 observations of CCG board and executive meetings; electronic survey of 58 CCG board members (these included GPs, practice managers, PCT employees, nurses, and patient representatives) and subsequent social network analysis.

Main outcome measures: collaborative relationships between CCG board members and stakeholders from their healthcare network; clarifying the role of GP's as network leaders; strengths, and areas for development of CCGs.

Results: Drawing on innovation network theory provides unique insights of the CCG leaders' activities in establishing best practices and introducing new clinical pathways. In this context we identified three network leadership roles: managing knowledge flows, managing network coherence, and managing network stability. Knowledge sharing and effective collaboration among GPs enable network stability and the alignment of CCG objectives with those of the wider health system (network coherence). Even though activity varied between commissioning groups, collaborative initiatives were common. However, there was significant variation among CCGs around the level of engagement with providers, patients, and local authorities. Locality (sub)groups played an important role because they linked commissioning decisions with patient needs and brought leaders closer to frontline stakeholders.

Conclusion: With the new commissioning arrangements, leaders should seek to move away from dyadic and transactional relationships to a network structure, thereby emphasizing the emerging relational focus of their roles. Managing knowledge mobility, healthcare network coherence, and network stability are three clinical leadership processes that CCG leaders need to consider in coordinating their network and facilitating the development of good clinical commissioning decisions, best practices, and innovative services. To successfully manage these processes, CCG leaders need to leverage the relational capabilities of their network as well as their clinical expertise in order to establish appropriate collaborations that may improve the healthcare service in England. Lack of local GP engagement adds uncertainty to the system and increases the risk of commissioning decisions being irrelevant and inefficient from a patient and provider perspective.

Article summary

Article focus

- Examines how clinical commissioning group leaders can act as relational catalysts across their healthcare networks as they seek to facilitate healthcare innovation in light of the recent reform in the healthcare sector in England.

Key messages

- The new clinical commissioning scheme foregrounds the need for leaders to be relational and effective in integrating across innovation networks
- Knowledge sharing and collaboration between stakeholder groups are key tasks of clinical leadership which play a significant role in ensuring network coherence and stability
- Lack of clear political direction and dialogue discourages network participation and catalyzes instability
- Clinical leaders need to focus on aligning patient-centred services locally as well as across the network

Strengths and limitations of this study

- The study provides in-depth accounts of the emerging role of GPs as healthcare network leaders in the early stages of the new commissioning process
- We highlight the relational focus of the network leadership role which enables knowledge sharing, network coherence and network stability.
- The use of multi-method approach (interviews, observations of CCG board meetings, extensive study of documentation, and CCG network analysis) allowed us to validate our findings and minimise bias due to limitations of specific methods.
- The on-going change in the health sector and the political uncertainty limits the generalizability of this qualitative research.

Introduction

Following the announcement of the latest NHS reform[1] the health system in England has entered a new cycle of radical changes that aim to improve healthcare outcomes and increase efficiency. At the centre of the strategy proposed by the current coalition government is the goal to "liberate the NHS" by putting clinicians such as GP's "in the driving seat and set hospitals free to *innovate*, with stronger incentives to adopt best practice"[1], thus, challenging the way commissioning of healthcare services is organised and executed. In this context, the new Health and Social Care Bill creates a duty for the new Clinical Commissioning Groups (CCGs) to "promote research and innovation and the use of research evidence."

Commissioning of healthcare services is traditionally understood to be the process by which "the health needs of a population are assessed, the responsibility is taken for ensuring that appropriate services are available which meet these needs, and the accountability for the associated health outcomes is established"[2]. Until recently, commissioning activities such as planning (assessment and evaluation), purchasing (identifying and negotiating), and monitoring health services[3, 4] were performed primarily by non-clinical managers in primary care trusts (PCTs) with little clinical input. In response to that the recent reform transfers commissioning duties over to general practitioners (GPs), nurses, and other healthcare professionals who represent a range of both provider and purchasing interests. The diversity of the actors involved as well as the complexity of the tasks demand a more integrated approach to commissioning than performed previously.

Based on the NHS White Paper[1], apart from establishing population needs and planning and controlling their budgets, commissioners must also work with a wider group of stakeholders to identify opportunities to improve value through *innovation*. This new approach to clinical commissioning shifts from contracting of stand-alone healthcare services based on dyadic relationships to a more dynamic *network-centric* approach of the healthcare system that brings together a large number of actors in order to collaborate and purchase integrated services which will deliver the desired outcomes. Recent research emphasises the importance of networks in healthcare practice and argues that healthcare and clinical networks have the potential to enable multidisciplinary coalitions to address diverse agendas and achieve best practice. Integrating across networks, by allowing for people and ideas to come together, can also prevent fragmentation, which has been a key challenge of previous commissioning arrangements, and facilitate integrated care with the development of collective contracts that can be more cost effective and focus on new pathways and care packages, thus, increasing the quality of services and outcomes[5, 6, 7].

Given the importance of networks in healthcare and the fact that *innovation* is inherent in, and central to, the new commissioning structure we used an innovation network theory to study the newly established clinical commissioning groups (CCGs). GP leaders are seen as *network leaders* within their healthcare service environment with CCGs being the nucleus of innovation activity. Drawing on this theory we were able to obtain

unique insights of the emerging leadership activities of GPs and their efforts to establish best practices as well as develop new clinical services tailored to the needs of their population. We believe that this approach will shed light on the emerging forms and function of evolving commissioning entities and will offer a fresh viewpoint on clinical leadership in healthcare networks.

Clinical commissioning and healthcare networks

The success of clinical commissioning and its potential to deliver has long been discussed in health services research. In the past couple of decades, the government has endorsed and funded a number of alternative primary care-led purchasing schemes receiving mixed signals from clinicians, policy makers, and the public. Figure 1 provides a timeline of clinical commissioning initiatives since 1991 when the internal market reform took place and the separation of purchasing and providing health services was introduced for the first time in the English NHS[8].

-- Figure 1 about here --

Overall, the different primary care-led commissioning models can be seen as part of a continuum of schemes available to use for purchasing healthcare services. Smith, Mays, Dixon et al[9] provide a scale of the different commissioning levels in the UK, whereby approaches vary from the individual patient level to a whole nation's population. As the different commissioning levels in the continuum respond to different policies it is expected that there will be implications for the respective purchasing practices and for commissioners. More specifically, different approaches to commissioning will demand the involvement of actors across various levels and different locations. For example, GP fundholding was considered to be much more practice-led than PBC which involved groups of practices rather than individual practices[10]. Alternative approaches will also lead to the formation of different clinical and healthcare networks as a response to meeting commissioning challenges within the health system and bringing together purchasers and providers[5].

Drawing from the historical research evidence on commissioning organisations and their effectiveness a number of implications emerge for the structure, governance and size of clinical networks. For example, small, high-density networks can ensure alignment of services with the local population needs but are often costly. Overall, there has been a trade-off between lower levels of commissioning and transaction costs as the more 'local' and smaller the network, the more expensive it is to maintain and deal with an increased number of purchasers. This issue was evident during the GP fundholding and TPP periods where the average size of the commissioning consortia was small and purchasing decisions were divided between several local commissioning organisations. Having said that, GPFH and TPPs were more effective in dealing with a more focused set of issues and managed to reduce waiting times for patients as well as achieve better collaboration between participating GPs[11, 6, 8, 12]. Their voluntary character, however, created significant inequalities as those local networks that were engaged had a clear advantage over groups of GPs that were not involved.

In addition, as clinical networks aim to promote information exchange and understanding between physicians, local government, voluntary sector, etc. and translate this discussion into innovative healthcare solutions for patients, GP leaders need to develop leadership (and commissioning) skills that will enable these relationships across multiple stakeholder groups[13]. Rather than emphasising contracts and provider-purchaser negotiations, multiple stakeholders with different interests need to be integrated across an emerging network. Leadership activities in the new commissioning process, emphasises sharing knowledge and managing knowledge flows, collaborating with colleagues and external stakeholders, and seeking advice from peers in different clusters.

Finally, incentives need to be embraced in order to motivate GPs and to influence their behaviour in their network. This can be achieved by facilitating autonomy and independence in being creative around contracting appropriate services[14, 15]. In the wake of CCGs, commissioning groups were much larger than previous clinical networks[a] and attempts were made to put financial incentives in place. In addition, clinical networks are primarily led by GPs who will be managing real budgets and will be required to join a commissioning group. Within this system of regulation and governance, clinical leaders will need to balance between managerial and professional interests, encourage collaboration and knowledge exchange, and reduce boundaries between practitioners, institutions and other organisations[5].

Table 1 provides a breakdown of the different primary care-led commissioning organisations and the implications for the healthcare networks that were developed.

-- Table 1 about here --

[a] The median population covered by the 212 CCGs so far preparing for authorization is 226,000.

Although network leadership that seeks to achieve collaboration and knowledge sharing is important in the commissioning process, research in this area has largely been focused on describing and comparing the different policies[6, 8], by measuring resource allocation and economic outcomes[16, 17]. Our innovation network theory approach will explore GP-led commissioning by looking at knowledge mobility and collaborations in networks of clinicians, PCTs, patients, providers, and other entities which play an important role in the development of novel commissioning arrangements and improved outcomes. We carried out research on six clinical commissioning groups that examined the early function and emerging forms of CCGs; analysed how CCG leads orchestrate commissioning activities towards three key network leadership processes: managing knowledge flows, managing network coherence, and managing network stability; identified strengths, issues, and areas for development of the newly established CCGs; and contributed to the theoretical and methodological knowledge base in the study of clinical leadership in the context of commissioning practice.

Methods

This study is part of the Collaborations for Leadership in Applied Health Research and Care (CLAHRC) initiative, funded by the National Institute for Health Research (NIHR), which aims at supporting and translating research evidence into NHS practice. The study itself took place within NIHR CLAHRC for Cambridgeshire and Peterborough and was facilitated from the collaborative partnerships between the University of Cambridge and surrounding NHS organisations.

Design and theoretical framework

We conducted a theoretically informed, mixed-methods case study research across multiple CCG sites. While the responsibilities of the CCGs (initially known as GP commissioning consortia) are outlined in the recent government bill, very little is known about the organisational practices commissioners have adopted in order to develop novel local services. To fill that gap, the aim of the project is to understand the emerging role of CCG leaders and outline their coordination activities as leaders of their health network. In this process we chose to utilize innovation network theory for two reasons. First, the delivery of clinical commissioning and development of innovative services around it require complex collaborations between a large number of stakeholders including patients and the public, local government and authorities, acute and other providers as well as front line GPs, in the form of a value network. These so-called *innovation networks* are often characterised by loose, semi-temporal linkages between actors who seek to employ the right resources and engage in strategic collaborations in order to deal with specific problems and develop innovative services and solutions[18]. Secondly, this network-centric innovation model also recognises the need for a leading entity that will orchestrate the innovation activity within the network through a number of coordination processes[19, 20] thus emphasising the relationships that need to be established. Therefore, by mapping our findings on this theoretical framework we were able to identify various coordination processes that CCG leaders use. In addition, we are able to pinpoint particular strengths, issues and areas for further development of CCGs and identify key leadership skills that will help GP leads manage their network in the future.

-- Figure 2 about here --

Sampling

During our fieldwork we conducted an in-depth and systematic study of six clinical commissioning groups and local clusters (also called localities) in the East of England region (sites A, B, C, D, E, and F). These groups covered mixed patient populations varying between 50,000 and 550,000 patients. In total, our sample groups covered 1,662,000 patients served by 208 general practices. The number of board members of the CCGs also varied according to the size of the population they covered with the smallest numbering 4 members and the largest 14. The total number of board members of all six commissioning groups at the time of data collection was 63.

The first wave of GP commissioning consortia took place in December 2010 and introduced 52 “pathfinders” initially covering 12.9m people. Second, third, and fourth waves followed soon after and by the end of April 2011 GP commissioning covered 9 out of 10 people in England[b]. Most of the groups in our sample were given pathfinder status during the first two waves. Table 2 presents all the main characteristics of our CCGs and localities sample, and points to the variability of network structure. The size variation in our sample is similar to the national statistics of the first two waves (numbering 137 consortia): the average population covered per

[b] Statistics as well as interactive maps on GP commissioning consortia can be found online at: www.gponline.co.uk

CCG was approximately 207,000 with standard deviation 146,000 (min 14,000/max 693,000), and the average number of practices under a CCG was 30 with standard deviation 22 (min 1/max 105).

-- Table 2 about here --

Data collection and analysis

Access and pilot interviews were initiated in November 2010 and the main data collection took place between February and December 2011. During that time commissioning groups were in a preliminary pathfinder stage and did not have any fundholding rights or statutory powers. In addition, at the time there was no official guidance from the Department of Health other than the initial bill and supplementary information on commissioning. However, nearly all CCGs we examined had established formal operating procedures that allowed them to function as organisations with particular membership and board structure. In total 56 healthcare professionals were interviewed: 35 board members (mostly GPs but also PCT employees and practice managers) plus an additional 21 people from various organisations including acute provider representatives, and health authorities executives. In addition, we observed 21 CCG board meetings and executive committees within local clusters. This helped us to witness how these groups work in action rather than rely solely on the espoused views of their members. We kept field notes during meetings and transcribed all interviews after recording (apart from few exceptions). We used ATLAS.ti to categorize, code, and analyze qualitative data including hundreds of pages of background documents such as national-level policy reports, minutes from meetings, and speech transcripts from conferences and workshops.

-- Figure 3 about here --

Having CCG board members as our unit of analysis helped us to confine our research and also limit our study of their healthcare innovation network to their immediate contacts. Moreover, GP leaders as main stakeholders also assisted us in identifying potential targets to question. Additional interviewees were also recognized through the observation of board meetings with the intention of getting a variety of perspectives and evidence. Interviews usually lasted between 35' and 90' minutes and were conducted either by phone or in person. We compared organisational forms and leadership routines across the six groups and highlighted their variations. Key themes that emerged from the interviews were coded according to the coordination processes with which they were related. Based on network leadership theory, three innovation network leadership routines were identified as relevant with our CCG study: managing knowledge flows, managing network coherence, and managing network stability.

-- Table 3 about here --

In order to provide external validity to our research results, and debate whether the theoretical approach we have used could be useful for the future development of CCGs nation-wide we presented our findings to a number of CCG board of directors and (particularly to those that were interested in the feedback) at a regional event on clinical commissioning where most of the commissioning groups were represented.

Social network analysis

In addition to interviews, CCG documentation and other publications, we also collected responses using an electronic survey on knowledge sharing and collaboration practices that was sent out via email to all board members of the CCGs we studied. The response rate for this was approximately 94%[c] and the results helped us to identify knowledge exchange patterns amongst board members and outside parties regarding clinical commissioning. We used social network analysis (SNA) to discern the popularity of certain individuals in the network and the individuals that board members go to in order to acquire advice regarding commissioning issues. More specifically, we were able to measure the number of ties CCG board members have (also called "degree") as well as their centrality into the network (also known as "betweenness centrality") in order to understand which members act as brokers and have the ability to transfer knowledge from other parts of the healthcare network and across CCGs. Finally, we calculated the density of the CCGs which measures the extent to which board members are interrelated and go to their colleagues for advice. This measure indicates in someway the good communication and team-working activities among CCG members.

The visualization and analysis of the CCG board networks were performed using Gephi 8.0.

[c] Out of the 63 board members that received the electronic survey 59 replied. Two of the four people that did not respond were new board members.

Results

The commissioning context: the challenges of network leadership

The current commissioning context presents a number of challenges for leaders in establishing innovation networks. In the following analysis we examine the dynamics of multiple relationships which CCG leaders needed to establish in order to facilitate commissioning across their health networks, and in particular the need to enable knowledge exchange, network coherence and network stability as dynamic capabilities that support innovation networks. We consider the CCG board relationship with PCTs, health providers and service users, frontline GPs and the broader health polity. We conclude our analysis by comparing two innovative developments in CCG board commissioning practices in the sites studied, using them as illustrative rather than exemplars.

Establishing relationships with PCTs

There was variation among CCG leaders at the six sites as to the way relationships with PCTs were managed. Leaders in some sites worked well with PCT's describing the relationship as a cooperative and being "open" and "supportive", "getting better at seeing each other's point of view". Some CCG leaders viewed PCT employees as a useful source of information and commissioning expertise. A CCG board member at site B pointed out: "I see my role as coordinating, having some ideas and then asking PCT people to develop those ideas. There's only so many hours in the week and I can't do everything, so I draw on the skilled people at the PCT". At site C whereby leaders developed a novel and collaborative arrangement whereby GPs and PCT managers were paired together to form a PCT sub-committee to resolve commissioning issues. These examples reveal the important role many PCT staff played as knowledge brokers who facilitated knowledge sharing and transfer across the network.

At the same time, however, GP leaders were acutely aware of the perceived limitations of the knowledge held by PCTs in commissioning. It was generally understood by CCG board members that PCTs were "being abolished [because they] haven't delivered what [they] should have done" (site B). A GP in site A was similarly critical pointing out that: "the contracting has been poor and it hasn't been adequately informed […] it is basically a legacy […] There wasn't actually any thinking or decision making". Thus leaders were wary in adopting the knowledge and ideas of PCT commissioning practices.

A similar dilemma was faced by PCT staff. On the one hand they recognized that "you've got the PCT trying to offload its activities to the CCGs", in a supportive manner. On the other hand, a number of PCT employees felt threatened by CCG formation and were highly aware of their own job insecurity. As a result PCT members were not always willing to openly cooperate with CCG leaders, for example restricting funding of new commissioning arrangements. A GP described how the indifference of PCT employees towards the success of the CCG led to frustration in his board. There was a perceived view that a 'Not Invented Syndrome' limited the potential for innovation; "nobody got the idea and they just refused to fund it" (site C). The wavering support of PCT's stemming from the uncertainty of their future contributed to instability across the health network. There was also system-wide concern as to who would be responsible for the essential non-commissioning tasks currently being done by PCTs, and how they would be undertaken in the new health system. This hindered the development of trust and commitment as a critical basis for collaborative relationships with CCG board members.

Co-location arrangements further constrained (or enabled) communication between CCG members and PCT employees, leading to misinterpretations and delays in the transfer of information and data. One PCT director (site D) felt that their good relationship with GP leaders "was due to geography […] we brought the PBC support unit into the PCT building so they are in the same place as us […] sitting side-by-side with the PCT staff […Now with CCGs] that absolutely helped". In our research sample, sites that had supportive relations between respective PCTs and CCGs used the PCT premises to hold their board meetings. In networks where CCGs were detached from PCTs, board meetings were held elsewhere (e.g. in sites B and E). These results are reflected by the social network analysis (see comparison between sites A and B in Table 4).

Relating to providers and users

As discussed later on in our vignettes, a critical CCG leadership task is embedding relationships with health providers within the commissioning network, integrating secondary care provision with primary care in novel ways. A CCG board member suggested: "We need to get that relationship (commissioner-provider) off from a good start […] to sort a strategy that is going to pull them (providers) in from the beginning [and realise] that it's not '*take all our money and continue to deliver as you've always done*'. We've got to do things differently" (site

B). Establishing trust and adequate knowledge exchange between CCG and provider entities remained an on-going challenge.

Box 1 highlights multiple instances from our analysis regarding the importance of knowledge exchange and collaboration in enabling service integration across primary and secondary care.

-- Box 1 about here --

Further, our results from the SNA analysis showed that there was generally a substantial lack of communication between CCGs and acute providers. In our CCG network sample, boards had a maximum of 3 ties with acute providers; this is very low when considering that these relationships are at the core of clinical commissioning and central to all the sample local innovations, including those summarised in the vignettes.

Another important network dynamic between CCG boards and healthcare providers related to knowledge sharing around appropriate level and type of costing data relevant to commissioning. This lack of information often described as 'a black box' around the services being provided and their associated costs leads to challenges of network level coherence of information to support innovation. A GP board member at site C explained, 'we have actually no idea what the costs are of these pathways…it is very difficult to get any data or real information from [the acute provider]…they haven't had to share this before we can't commission [properly] without it.' Another GP board member reinforced that even in their own medical practice it was difficult to manage patients' care in a way that optimised commissioning efficiency; *"When I sign the referral letter I commission the spending of that money, but effectively what I'm doing is signing a blank cheque because I have no idea what the cost will be as the patient goes down that pathway. And if say there were two competing providers … which of those two pathways would be better to use and what are the costs and the outcomes of the two pathways, well I don't have that information".* As discussed later in the vignettes, comparative information and data analysis were important initial drivers of the innovation process. The tension between GP commissioners and secondary care specialists is described by a PCT employee as a conflict of interest where "*providers want to maximise their income while [commissioners] want to maximise efficiency*" (site B).

In addition to providers, users constituted another important stakeholder that contributed knowledge towards the commissioning process. Over half of the CCGs had a patient representative on their board (sites A, B, E, and F) to improve the final service offering. One of the patient representatives interviewed felt that he made "direct input" into the board meetings, and felt that he made an important contribution as "any service user knows what it's like on the other side, to be on the receiving end. They can give very practical suggestions about what works, what doesn't, what are glitches in the system" (Patient representative, site A).

However, there was voiced confusion amongst leaders regarding how experiential knowledge from service users should be used and incorporated to the wider, population-level commissioning agenda of CCGs. A GP leader (site C) highlighted it was a challenge to engage patient groups into providing inputs at the locality and or CCG level: "Patients are not usually interested in it", "they are busy and do not want to do things like this" (site B), "patients will only be involved if there is money to be made" (site A). In addition, many GPs commented that when inviting patients to provide feedback "you get half a dozen […] with particular reason or agenda", suggesting this form of engagement did not lead to constructive dialogue on improving patient care. A GP from site B pointed out: "I think they [patients] are just there representing their own views as they see it". Even though the wider perception from policy documents on public and patient involvement in commissioning was that patient views were valuable, there was no mechanism in place to operationalize lay representation and overall it was often carried out in a piecemeal fashion. For example, in some of the locality meetings we observed, individuals who had the flexibility to attend were listening attentively to discussions without engaging in overt dialogue. In other meetings, there was set time given to patient representatives to present their perspectives. As such, several GP leaders felt that in the current fiscal climate and organisational upheaval, investing scarce resources in organising patient groups and their input was questionable, revealing the challenge in genuine public or patient representation[21].

Engaging with frontline GPs

In order for commissioning decisions to reflect the corpus of primary care views across the network, CCG leaders need to find mechanisms for knowledge exchange with frontline clinicians. As shown though both case vignettes of innovations uncovered within our sample CCGs, novel ways of delivering a service or new services entailed commitment and engagement of frontline GPs, both in providing the new ideas and also enrolling colleagues in the new practice. Enabling knowledge flows across the network also enables the development of innovative ideas. Engagement and nurtured relationships with frontline GPs helps ensure that the knowledge held by these members is made available across the network, contributes to new practices and guides the leaders' decision making.

Yet the ability to engage with front line GPs is related to the CCG size; smaller networks can more easily be densely connected, as it is easier to maintain ties with a smaller number of individuals. Network size in our context, is directly related to the proportion of population covered as government payments follow the patients. In the commissioning context, larger networks create a more stable environment (i.e. network stability) as risk (in particular for financial failure) can be spread across the whole network. This more stable position also improves the leaders' ability to negotiate, due to their increased purchasing power across the network. "There's this sense that we have to be big in order to have the clout to negotiate" (site B). However, as network size increases, it becomes more difficult for leaders to engage with frontline members. Thus leaders also kept stressing that "if they [completely] ignore the size issue, they will fail to get [GPs] engaged and on board" (site B), thus, highlighting the difficulty of engaging frontline GP's in clinical commissioning.

To manage the concern of maintaining a necessary network size, several sites developed smaller *localities*, clusters of practices within their network which resolve local issues, including commissioning. The localities' leaders are typically part of the CCG board, responsible for leading the overall commissioning process. A GP commented, "[frontline engagement] won't work at three hundred thousand [patients] level […therefore] having those sub-groups, those cluster level groups is vitally important" (site C). CCGs structure reflects the tension in achieving strong local commitment and efficiency through scale (see Table 2 for a summary of the range in population size across study CCGs).

An important contextual feature that shaped the network size and its membership ties was the commissioning history; in particular, the legacy of Practice Based Commissioning (PBC). Even though PBCs never held actual commissioning funds throughout their existence, they had established a distinctive "organisational archetype"[22] which itself was a result of the sedimentation that took place during the organisational changes of the reform at the time. By and large, the specifications of the previous organisational archetype (in this case PBC groups) has an apparent effect on network formation and knowledge capability. In the reform process, change "represents not so much a shift from one archetype [PBC] to another [CCG], but a layering of one archetype on another"[22] (p.624), so that the new entity embodies the interlacing of previous structures and relationships with novel network features. As highlighted in our analysis of the vignettes around innovation between one former PBC and a non-PBC group, legacy ties between stakeholders influenced the innovation process.

CCG relationship with policy and administrative authorities

Another significant relationship influencing the new commissioning scheme is the relationship between GPs and health policy makers and administrators who oversee the implementation of the policy. Numerous GP leaders expressed frustration that a number of their colleagues are hesitant to engage because of the perceived weak engagement and lack of dialogue between policy makers (or their representatives) and CCG leaders. On the whole communication is seen as a one way process. During the course of the study we observed an increasing frustration among the CCG leaders. Several who were enthusiastic and motivated early on started to believe that their efforts were misplaced: "*it was clear that there were many unfinished episodes and contradictions in the legislation, the Minister then turned to the professions in order to get their input and called those pathfinder organisations*". A GP from site A mentioned: "*I was happy to contribute as a pathfinder under those terms but the pathfinders (forerunners of policy implementation) were used as evidence that the profession supported the Bill […] then I felt that I'd been tricked into being a pathfinder*".

As a result, numerous frontline GPs and CCG leaders commented they were becoming increasingly cynical and started questioning their engagement in CCG activities: "*We're in between at the moment, waiting to know what the new world is going to look like, and not really being able to get on with things until that's clear*" (site A). In parallel with the uncertainty around the future of the reform contributing to network stability, CCG leaders felt that they have little guidance from the policy makers regarding their new activities and responsibilities: "*the government is being less than explicit*". Yet at the same time CCG leaders did not feel able to shape the strategic direction nor develop new rules for the commissioning process, and this uncertainty was compounded by the simultaneous restructuring of PCTs.

Relational dynamics of early stage innovation in two CCG networks

In the vignettes below (Boxes 2 and 3), we compare two interesting examples as to how relational dynamics in nascent CCG networks surrounding site A and site B enabled (and constrained) early stage innovation. We develop our insights concerning the relational dynamics drawing on the social network data (Figure 4 and Table 4) and the leadership challenges of working across the multiple stakeholders involved.

-- Box 2 about here --

In site A, where CCG leaders had access to comparative data from across the health system, the board leaders drew on existing strong relationships with the PCT to develop a solution in the form of joint working groups within the specialist areas and pathways of concern. The stimulus for the innovation process came from the available data highlighting the importance of network (in)coherence, coupled with the numerous ties with the PCT. As can be seen from Table 4 the social network analysis comparatively illustrates the numerous ties amongst the CCG board and local health administration entities (PCT) in site A (18) which is higher than site B (13). The strong ties with the PCT was crucial in bringing together the other critical stakeholders (e.g. acute providers) as the CCG board, had established ties with other stakeholders. In addition, the density of the ties across the board itself (0.737) indicates a high level of knowledge sharing and cohesion amongst the CCG leaders. This facilitated centrally coordinated action to develop the multiple pathway groups.

-- Figure 4 and Table 4 about here --

The social network diagram in Figure 4 illustrates the relatively uniform communication pattern across the board; it also brings to fore the very heavy reliance on a single knowledge broker (large blue node with high degree and betweenness centrality in site A). Over reliance on a small number of knowledge brokers adds risk to the network, for example in the case where the individual should exit the network. The network also becomes dependent on a few individuals who are able to commit a considerable amount of time to developing leadership processes.

-- Box 3 about here --

Innovation emerged in site B from a frontline GP who recognised incoherence in one area of the network, given her knowledge of local primary based care and specialist care. The board in site B is characterised by high levels of front line GP engagement, illustrated both by the high numbers of direct ties to the board (6) and also the communication intensity between those ties, with relatively thicker blue lines in the social network diagram between board members and GP practices, as compared to site A. This enabled the innovation to be embedded and taken up by the GP community. However, as evidenced by the lower density of ties between CCG board members (0.622) there was an element of competition between the CCG leaders who represented the former PBC groups, indicated as the larger blue circles in the social network diagram (site B graph on the right of Figure 4). This influenced the integration and coordination of practices across the network as a whole, and hampered the scaling up of the innovative practice to other regions within the network.

In both cases, the development of novel care pathways arose from information regarding network incoherence, and a realisation that local care was out of alignment with care being provided in equivalent regions elsewhere. There was also a reliance on engaged frontline GPs and the use of strategically reconfigured knowledge flows to facilitate the development and delivery of a new service. Across the innovations new practices were knitted together from new relationships at multiple levels; structuring knowledge in new ways enabled novel insight as to how services could be integrated. Acting as relational catalysts rather than necessarily involved themselves in all relationship building, clinical leaders facilitated network coherence, stability and knowledge sharing in enabling innovations to emerge.

Discussion

In this study we have shown the importance of understanding and developing a network-centric approach to clinical commissioning and the need for network leadership to facilitate integrated care and provide innovative, patient-centred healthcare solutions. A critical part of the new role of GP leaders is to enable coordination and new relationships across the health network. Our study suggests that they need to go beyond focusing on transactions and bilateral relationships to fostering knowledge sharing with multiple stakeholders, while ensuring network stability and coherence. In addition to establishing a number of brokering ties themselves, leaders need to strategically enable adequate inter connectivity across the wider system acting like a relational catalyst.

Characteristics of clinical commissioning networks

Recent research and reviews have shown that commissioning arrangements have suffered from increasing fragmentation[6], hampered communication across primary and secondary care, challenged integration of purchaser and provider interests[23], high transaction costs[8], and unresponsive secondary care provision[8]. However, they do not have to focus only on the procurement and administrative aspects of commissioning.

We see the evolving clinical commissioning networks as falling within the characterization of innovation networks[19] whereby the coordination of network activities are usually performed by key entities. The newly

established CCGs act as innovation hubs ensuring that information and knowledge are circulated around the network in order to establish collaborations and warrant the creation and extraction of value[20]. Just as with any other research of healthcare networks, clinical commissioning networks have the potential to generate multidisciplinary coalitions[7] between GPs, acute providers, local authorities and other key healthcare professionals in order to agree on the services to be purchased. This network-centric approach can allow CCGs to revisit the existing clinical pathways and develop new integrated, patient-centred healthcare solutions by leveraging the structural characteristics of their network – expansive, decentralized, open, less hierarchical, thereby providing increased flexibility and encouraging knowledge brokering[5].

Network leadership and practice implications

A new breed of clinical leaders is required that will coordinate innovative activity and ensure healthcare service delivery through collaborative and teamwork efforts in the broader healthcare network[24]. Current understanding of enabling innovation networks points to the importance of knowledge exchange, network stability and network coherence in achieving ecosystem outcomes[19, 20]. CCG leaders are required to provide "subtle leadership"[25], focusing on visioning, motivating and sense-making, rather than controlling[26]. Having said that, such delegative leadership from one hand can enhance social autonomy and boost innovative outcomes but on the other hand it may be challenged to drive knowledge integration[27]. In the absence of strict hierarchies, these leaders need to develop brokering strategies that will not only facilitate links between stakeholders but will also couple healthcare professionals in order to deliver outcomes. For example, it is necessary to adopt 'soft' strategies that will inspire people and engage grass root GPs but might also need to provide 'hard' incentives that will motivate people to commit to quality service and cost reduction. We suggest that these skills are important to reemphasise given the historical commissioning focus on planning, monitoring and assessing.

CCGs need to encourage knowledge exchange and collaboration

Perhaps one of the most significant leadership practices of CCGs as innovation hubs should be to manage the flow of information and knowledge sharing across their clinical commissioning network. Such coordination of knowledge mobility can allow to direct efforts that will lead to strategic collaborations and synergies between commissioners, healthcare providers, and other key parties such as local organisations and authorities. Expansive and open networks allow for more information to travel from 'distant' members through knowledge brokers who will introduce new ideas. In turn, good interconnectedness and high-density at the CCG board level can help to operationalise these ideas and translate them to actual services. In relation to frontline GPs in particular, clinical CCG leaders are in a position to relate to them at a collegial level, relating to their priorities and practice dynamics; replacing this relational focus with a mind-set that emphasises tasks to be accomplished will more likely stymie engagement and innovation instead of helping.

Efforts need to be aligned with patient needs and medical developments

In addition, GPs as network leaders must not only generally encourage more involvement of PCTs, local authorities and providers in designing cost-effective and quality pathways, but will also need to streamline the patients' feedback and find a consistent and structured way to capture and take into account their views. Both these 'hard' and 'soft' strategies for network leadership are imperative in facilitating the development of new clinical practices and novel commissioning ideas. CCGs are in a good position to implement these as they are trying to establish a new organisational form and leadership style that will fit the current culture which does not adhere to directive leadership but encourages a delegative approach.

Further, external network coherence goes beyond the patients' perspective. It is also necessary to follow medical and research developments, technological advancements, as well as international trends, and to benchmark these with the practices and clinical decisions made locally. To manage coherence at this external level, leaders need to draw knowledge in through clinical, research and public health networks in a systematic way[7].

Develop incentives and accountability for network stability

Network stability is imperative in any organisational context, so a critical leadership task for network leaders is to promote it at any cost[19]. The risk to unstable innovation networks is inherent due to their flexible less hierarchical nature, which is necessary in order to encourage innovative activities based on *ad hoc* collaborations between different parties in the healthcare ecosystem. In that sense there is a trade-off between ordered relationships (that are forced from top down) and loosely coupled interactions that emerge from the personal incentives of the collaborators. However, excessive erosion of network relationships can lead to a state of instability thereby reducing the value and innovation output of the network[28].

In this context, clear financial incentives and transparent accountability mechanisms have the ability to prevent discouragement and distrust in the network. GP leads and the concerned polity need to keep network members motivated in order to engage with the commissioning activities and be encouraged to share their ideas and

knowledge and establish collaborations with other parties. In addition, some degree of accountability that will be open, transparent and comprehensible to everyone needs to be in place to manage risk and sharing of the rewards and value. These activities will motivate members and will sustain their efforts while contributing towards the stability of the overall commissioning network.

Box 4: Summary of emerging key policy recommendations

Overall network leadership strategy

- GPs need to realise their new role not only as clinicians but also as coordinators that will lead the healthcare network in both a delegative and directive manner.
- Build a strategy around clinical commissioning that will include not only developing collaborative relationships and knowledge sharing with PCTs and local authorities but also the inputs of patients and the public (healthcare ecosystem).
- The CCG board should develop 'soft' strategies that will inspire and engage front line GPs at the grass roots level and provide 'hard' incentives that will motivate people to commit to quality service and cost-effectiveness. Implementation of such a strategy should include a system of measurement and accountability.
- Integration of primary and secondary healthcare activities which delivers not only a more cost-effective but crucially ensures a patient-centric pathway service.

Managing knowledge mobility

- Identify well-connected individuals who maintain extensive advice and knowledge-sharing networks. Because of their connectedness, knowledge brokers in the network are expected to bring novel information to the group as they have access to a lot of people outside their cluster, potentially allowing for better commissioning decisions.
- Considering the importance of the brokers (who may be clinicians, practice managers or PCT directors) in circulating knowledge, it may be justified to develop personal coaching and training sessions to improve individual brokering performance.
- Developing digital networks and technological infrastructure can play a key role in disseminating best clinical practice and valuable knowledge by creating large integrated information depositories where commissioners will be able to access the necessary intelligence and evidence to support their work.
- Apart from knowledge circulation that encourages healthcare service innovation, GPs will also need to translate and integrate this knowledge into their commissioning practice.

Managing network coherence

- CCGs need to streamline the patients' feedback and find a consistent and structured way to capture and take into account their views.
- Following medical and research developments, technological advancements, as well as international trends, will help benchmark and increase the quality of clinical decisions make locally.

Managing network stability

- Establish a transparent clinical commissioning vision and values that will promote trust and collaboration among GPs and other healthcare professionals. This will also indirectly promote knowledge mobility and network coherence.
- Health policy and leaders need to provide clear incentives as well as evident accountability mechanisms to establish trust and prevent discouragement.

Strengths and limitations of the study

Our study provides in-depth accounts of the changes in commissioning practice and the emerging role of GPs as healthcare network leaders. Within that we use innovation network theory in order to identify key network leadership practices that could result to healthcare innovation. Our multi-method approach allowed us to validate our findings and minimise bias due to limitations of specific methods. In addition to interviews, observations of CCG board meetings and extensive study of documentation gave us a fuller perspective on the doings of GPs and their efforts to coordinate clinical commissioning activities.

The relatively small number of observations and the ever-changing environment of the health sector at the time of the study (mainly due to the political uncertainty) limits the generalizability of qualitative analyses, thus our study seeks to develop rather than test, exploratory concepts. The CCGs we studied were part of a particular geographic region (East of England) and were at a particular point in time of an on-going and dynamic reform; however, most of the issues and opinions mentioned in the study have been widely reported everywhere (e.g. national commissioning conferences, opinion pieces, King's Fund and Nuffield Trust reports, etc.). In addition, the richness of our data was subject to time constraints of participants and their willingness to share

information about their activities often deemed as confidential. Despite of the variability (in seniority and position) of the people we interviewed the same themes emerged and common issues were identified between the different CCGs.

Conclusions

In conclusion, clinical commissioning leaders can play a critical role in the coordination of healthcare innovation networks through a number of processes which include managing knowledge flows, managing network coherence, and managing network stability. Building relational capabilities in a delegative and directed manner is an important leadership issue for CCGs in establishing and expanding their networks with local health administration, NHS providers, and other stakholders. To achieve that they will need to assign and exploit knowledge brokering roles and leverage good communication between their board members and others outside their board in order to bring new ideas into the group, facilitate new synergies and alliances, and allow for projects that take advantage of the available resources. In addition, they will need to identify and assess pre-existing relationships, which have institutional influences on them (e.g. PBC groups), that they can capitalize upon while incorporating the views of local stakeholders as well as patient and public voice in a systematic way. Finally, technology can play a key role in disseminating practices and knowledge by creating integrated information depositories where commissioners will be able to access the necessary intelligence and evidence to support their work.

-- Figure 5 about here --

Footnotes

Acknowledgements: We thank the board members of the clinical commissioning groups (CCGs) for their participation as well as the rest of healthcare professionals that agreed to be interviewed for this project. The authors would also like to thank Celine Miani for her help on data collection and for providing administrative aid during the research project.

Contributors: EO and MB contributed to the research proposal, applied for the CLAHRC grant, and conceptualized the study. MZ, EO, and MB completed the data collection. All authors contributed to the analysis of the data, the writing and revising of the paper. EO is the guarantor for the paper.

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Ethical approval: n/a

Data sharing: No additional data available.

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Figure 1 **Clinical commissioning initiatives since 1991**

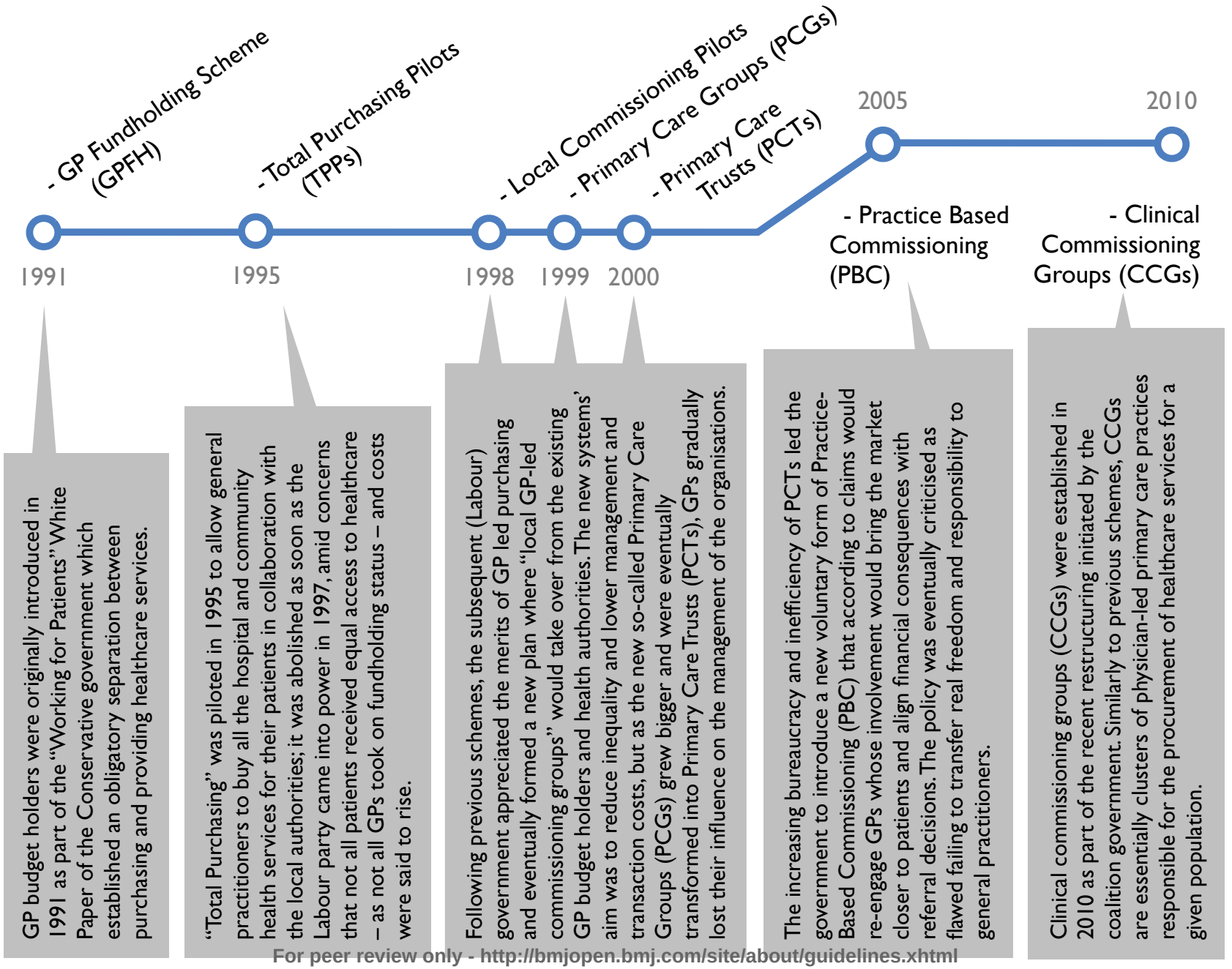


Table 1 Healthcare network implications of primary care-led commissioning organisations

	Coordinating mechanism (Ham, Smith, and Eastmure 2011; Ham 2008)	Key features (Mannion 2011; Checkland, Coleman, Harrison et al 2009)	Governance and autonomy (Curry, Goodwin, Naylor, et al 2008; Smith and Goodwin 2002)
GP Fundholding Scheme (GPFH)	- Market driven/emphasis on competition, strong procurement focus	- Good for local commissioning and healthcare practice, local coherence - Increased inequities	- No clinical governance, control of real budget, independent body
Total Purchasing Pilots (TPPs)	- Market driven/ emphasis on competition	- Better integrated purchasing and provision - Higher costs and risks	- No clinical governance, control of indicative budget, body within health authority
Primary Care Trusts (PCTs)	- Market driven/emphasis on competition, focus on administration of purchasing	- Better control, budget allocation/management and economies of scale due to centralisation - Less clinical input	- Statutory organisation, governed by PCT board (includes clinical input), own budget
Practice-Based Commissioning (PBC)	- Market driven/emphasis on competition, transactions oriented	- Increased engagement of clinicians - Higher management and transaction costs	- Led by GPs, little clinical governance, indicative budget, voluntary scheme
Clinical Commissioning Groups (CCGs)	- Network-centric, trust, collaboration driven with emphasis on good communication, some degree of accountability	- Potential to encourage innovation, best practice, higher quality, integration, and cost-effectiveness of commissioned services - High risk of network instability	- Clinical (GP) governance, real budget (2013), independent body, compulsory scheme

Figure 2 CCGs as innovation network leaders

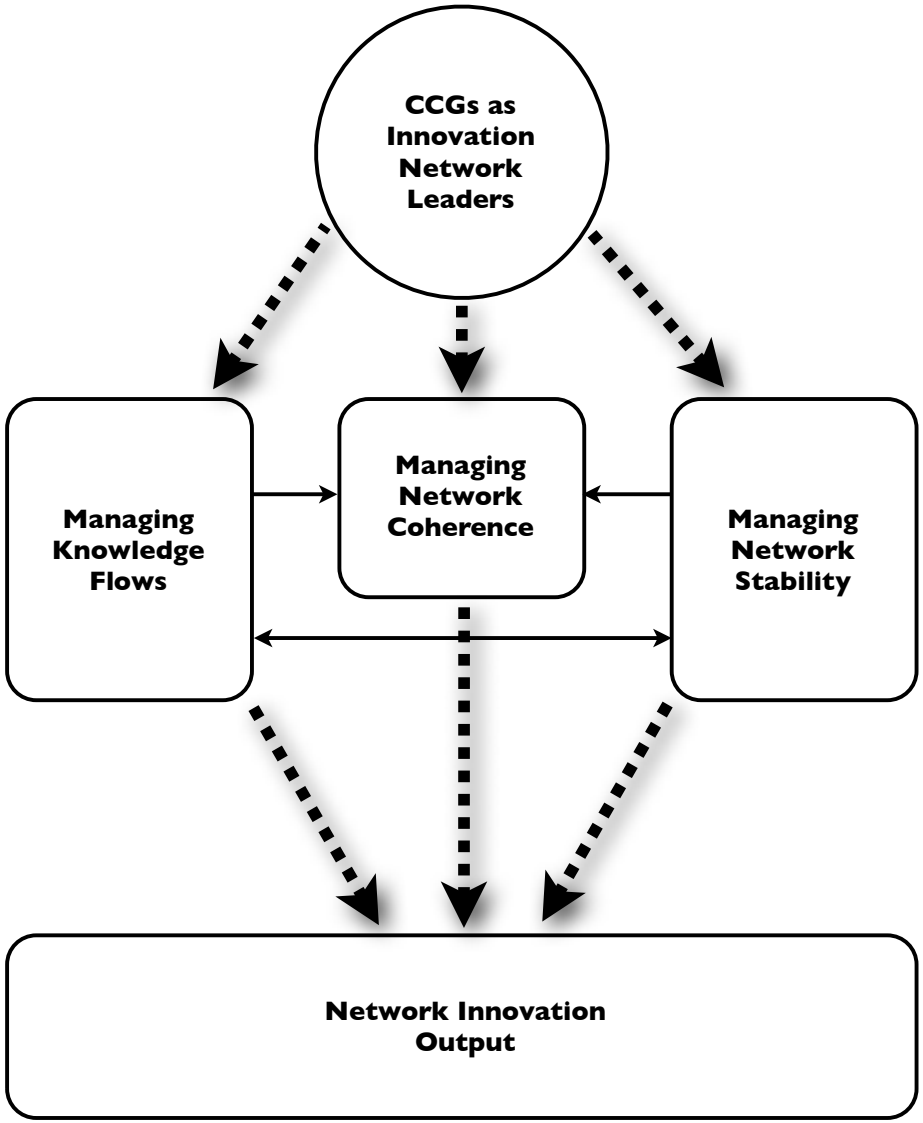


Table 2 Main characteristics of CCGs and localities sample

	Status	Pathfinder Wave	Covering		Localities (clusters)	Board representation			Executive support	PBC roots
			Population	Practices		Secondary care	Nurse	Patient		
Site A	CCG	1	300,000	30	6	N	N	Y	N	N
Site B	CCG	2	550,000	60	4	N	N	Y	N	Y***
Site C	Locality	-	50,000	4	-	N	N	N	N	Y*
Site D	CCG	2	325,000	47	2	N	Y	N	Y	Y***
Site E	CCG	1	230,000	27	2	Y	Y	Y	Y	Y**
Site F	CCG	1	77,000	10	-	N	Y	Y	Y	Y***

Figure 3 Summary of the study protocol

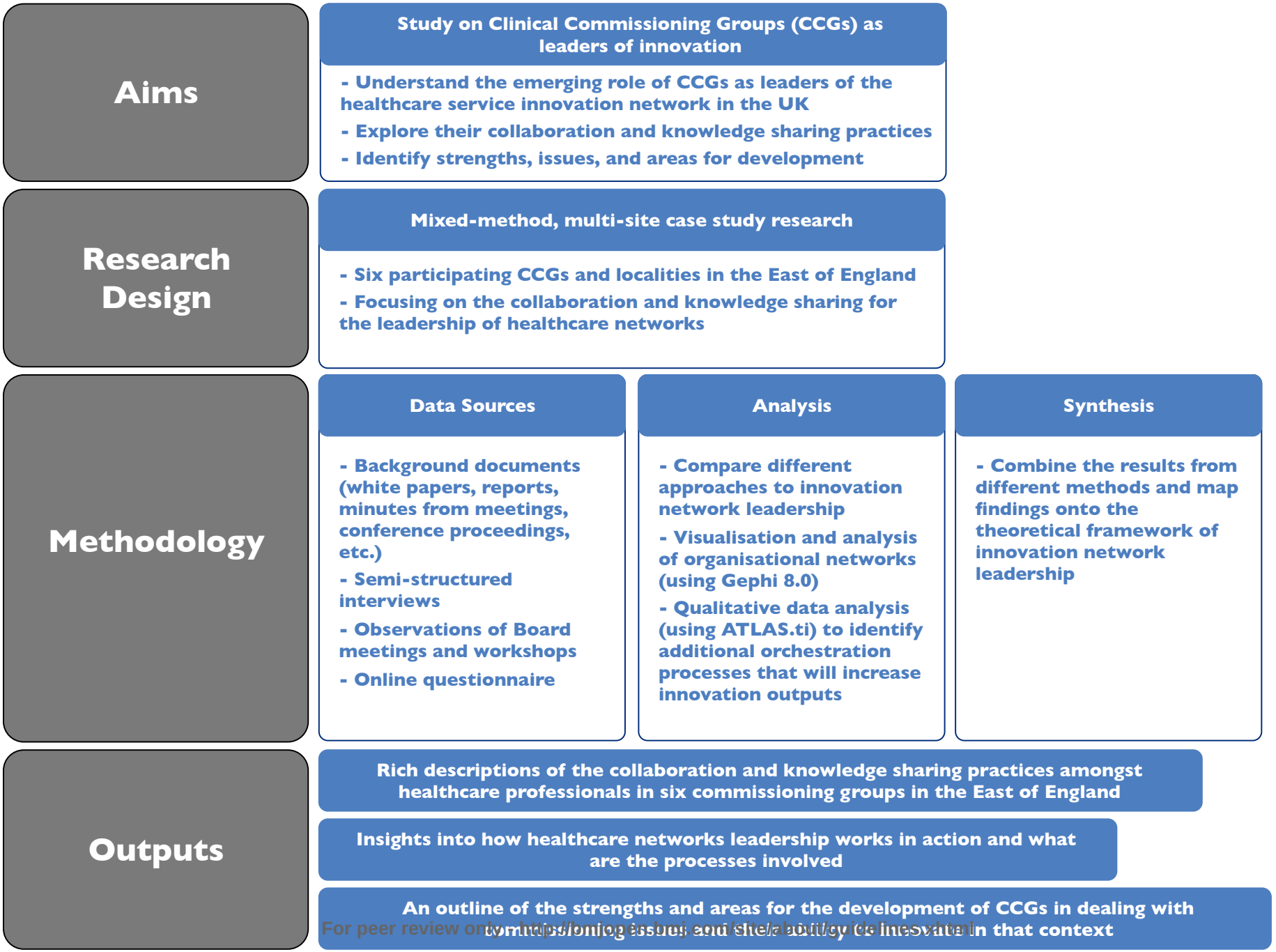


Table 3 Breakdown of interviews, observations and survey response by site and type

	GPs	PCT employees	Practice Managers	Hospital	Other	Total	Meeting Observations	Number of Board members	Survey Participation
Site A	3	3	2	1	1	10	5	13	100% (13/13)
Site B	6	5	3	1	1	16	7	13	92% (12/13)
Site C	5	3	0	0	0	8	3	4	100% (4/4)
Site D	3	1	2	0	1	7	2	13	92% (12/13)
Site E	3	0	1	1	3	8	1	14	93% (13/14)
Site F	1	1	1	1	3	7	3	6	83% (5/6)
Total	21	13	9	4	9	56	21	63	94% (59/63)

Box 1: Examples of the importance of integrated care

Lack of communication between GPs and consultants

Communication between GPs and consultants are essential for the quality of care a patient receives throughout his journey. A GP describes: *"I say to the patients when they come back 'what did the consultant say was the plan?' and they reply 'he didn't say what the plan is', 'so what's happening next?', 'He hasn't told me' so [...] consultants are not used to communicating at that level"* (site B).

Lack of collaboration between GPs and between different consultants

A GP described the case where a woman had consistent bleeding every two weeks from her stomach. The woman had been receiving treatment from her cardiologist due to another heart issue. The gastroenterologists believed that the medication that she was under was the reason she was bleeding regularly. *"Now it's just going round and round"* and the patient is frustrated as the consultants do not appear to talk to each other: *"textbook says she has to be on this drug for a year"* and thus cardiologists insist she need to continue taking the treatment, thus, ignoring the side effects gastroenterologists believe the drug produces. *"And she listens to them because they are consultants"*. There is a need to approach healthcare differently and *"that's what's difficult to change"* (site B).

Need for greater integration in healthcare networks

Another GP described the path of a particular senior citizen who lives on her own and her main problem is that she is a bit forgetful: *"she doesn't know when to take her medication"* and therefore needs someone to go and check on her. *"Do we go down adult social care or is it a bit milder than that, and she needs a friend, a neighbour, and everyone starts to network into this system"*. The main concern is that the parties involved do not have the necessary information about the activities of the others: *"A doesn't know what B is doing, left hand doesn't know what right hand is doing, Salvation Army doesn't know what is going on in the Alzheimer's Society who don't know what is going on with Age Concern"* (site C).

Figure 4 Site A (left) and site B (right) CCG network diagrams

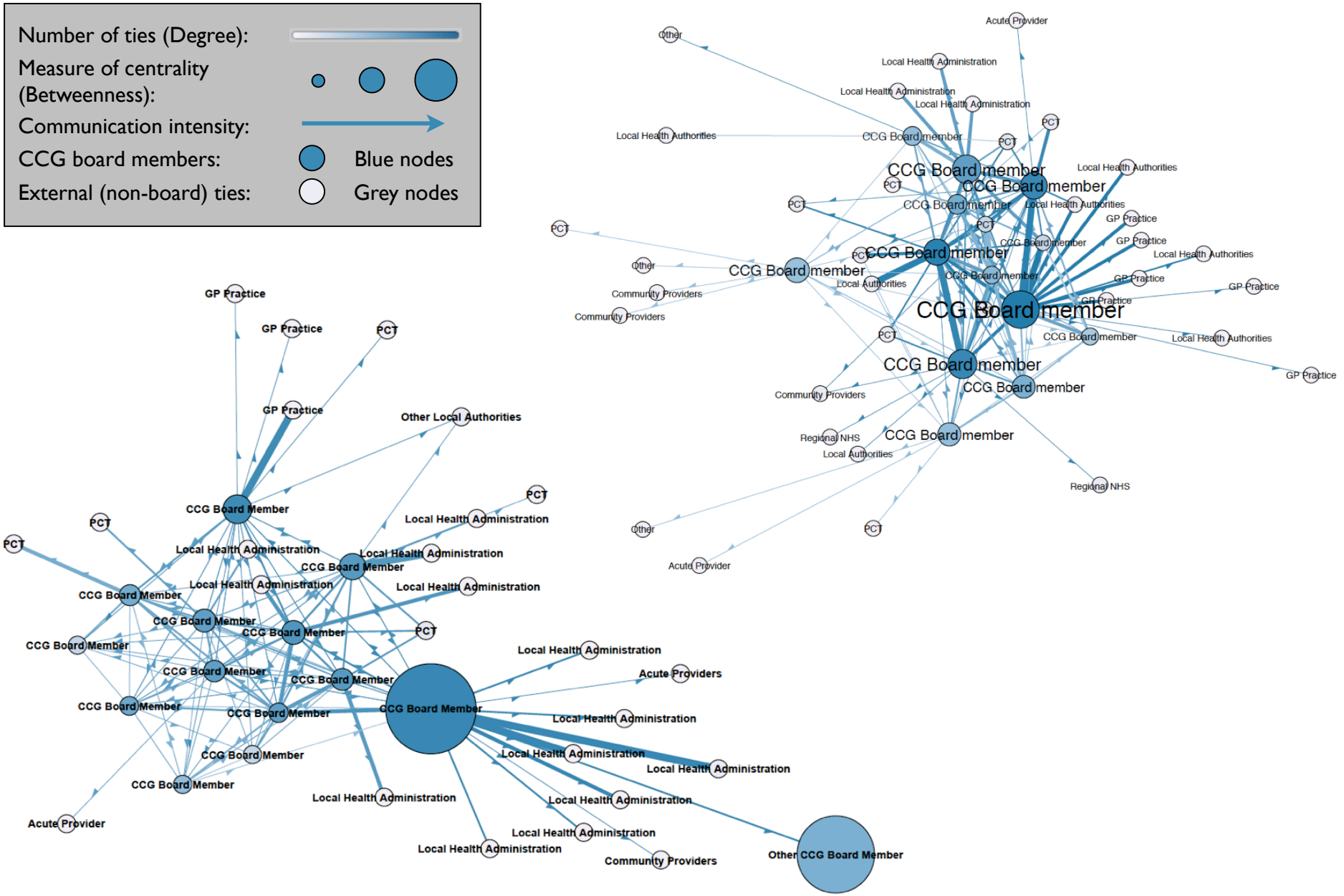


Table 4 Site A and site B network ties

	GP practices	PCT (Local health Administration)	Acute providers	Regional NHS (SHA)	Community providers	Local authorities	Other ties	Total ties	Board Density
Site A	3	18	2	0	1	1	1	26	0.737
Site B	6	13	2	2	3	7	3	36	0.622

Box 2: Site A - New outpatient referral pathways

GP Leaders at site A CCG were excited about the data available to them regarding the secondary referral rates for the population in their collective catchment. But in studying this data they came to realise that the local secondary referral rates were considerably higher than other regions, as were their associated costs in for elective procedures. Having strong central organisation and cohesion across the Board membership, they organised several working groups around selected specialist areas such as dermatology. Whilst the board members themselves did not sit on the working groups, their strong ties to the PCT enabled them to get engagement and support for all working groups from PCTs who in turn brought in representatives from community services and a number of provider representatives. The CCG board and pathway group members also identified several frontline GPs from across their catchment to contribute to group discussions. As highlighted by the CCG Chair:

> "*we have had meetings, meetings, and meetings and there have been lots of problems; that's collaboration ….previously there was no engagement at all, they never spoke … to one another actually*".

Communication and dialogue between specialists and GPs in some of the pathway groups led to educational initiatives where the hospital specialist came to GP practices to give a workshop on appropriate referrals. Hospital specialists were motivated to participate because their clinics were overcrowded making it difficult for them to hold optimal consultations. As explained by a board member:

> "*If the consultant is there and says 'if the patient has this, don't bother referring, but if he's got that then I need to see him'. That's very reassuring for the GPs who spend their life taking risks*".

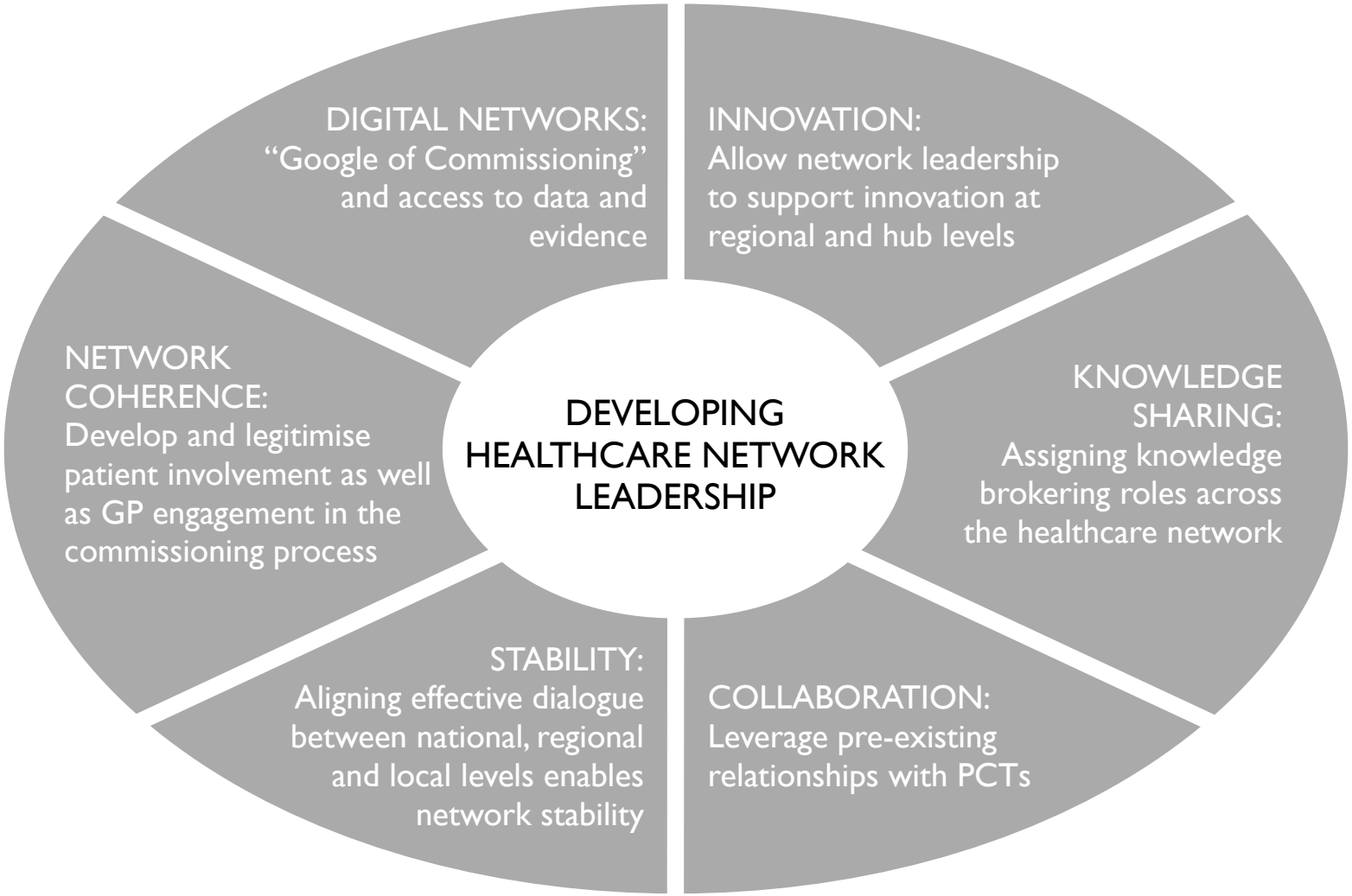
Box 3: Site B - Community based gynaecology clinics

A GP with a special interest (GPSI) in gynaecology was becoming increasingly aware that her GP colleagues were making a number of inappropriate referrals to secondary care and in some cases not caring for patients in accordance with evidence based standards; she conducted an audit to confirm the need for improving local practice. The GPSI regularly worked in the hospital gynaecology clinics providing primary care input and thus had very strong relationships with both acute and primary care medical colleagues. She spoke with the hospital specialist and also with other GP colleagues who had a special interest in gynaecology and they decided to try setting up a new specialist led clinic in her community area. As highlighted by a CCG board leader:

"the whole health system was overspent, so we knew we needed to do something".

Working closely with the local provider the board agreed to trial the new service and *"put in place lots of monitoring – to find that they were saving money".* A key challenge was getting GPs across the region to refer to the new service, highlighting the importance of frontline staff engagement in enabling innovative forms of care. Though the new service was considered a success in terms of patient care and financial savings, the board was not easily able to scale the innovation to other network regions; the GPSI and other community based colleagues, formerly members of a PBC group had few ties with medics from other network regions, which had been separate PBC groups previously.

Figure 5 **Main implications for developing healthcare network leadership in CCGs**



Research

ClinicalCCG leadership and of healthcare commissioning practice in healthcare innovation networks: An empirical analysis of CCGs in England

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Abstract

Objective: We use innovation and social network theory in order to To explore the emerging role of clinicians in leading newly established clinicalrelational challenges for GP leaders setting up new network-centric commissioning groups (CCGs);organisations in the recent health policy reform in England; we examine how GPs lead the orchestration of their healthcare networks as theyuse innovation network theory to identify key network leadership practices that facilitate healthcare innovation; we also provide insights on emerging forms and functions of CCG entities and discuss their strengths and shortcomings in relation to network leadership tasks.

Design: Mixed-method, multi-site, case study research.

Setting: Six clinical commissioning groups and local clusters in the East of England (EoE) area, covering in total 208 general practices and 1,662,000 population.

Methods: Semi-structured interviews with 56 lead GPs, practice managers and staff from the local health authorities (PCT) as well as various healthcare professionals; 21 observations of CCG board and executive meetings; electronic survey of 58 CCG board members (these included GPs, practice managers, PCT employees, nurses, and patient representatives).) and subsequent social network analysis.

Main outcome measures: collaborative relationships between CCG board members and partiesstakeholders from their broader healthcare network; clarifying the role of GP's new role from an innovation as network leadership perspectiveleaders; strengths, issues, and areas for development of CCGs.

Results: Drawing on innovation network theory enables aprovides unique understandinginsights of the clinical commissioningCCG leaders' activities of the GPs and their efforts to establishin establishing best practices as well as develop new services tailored to the needs of their population.and introducing new clinical pathways. In this context we identified three innovation network leadership processesroles: managing knowledge flows, managing innovationnetwork coherence, and managing network stability. Overall we find that knowledgeKnowledge sharing and effective collaboration among GPs are key leadership roles that enable network stability and the alignment of CCG objectives with those of the wider health system (innovationnetwork coherence). Even though activity varied between commissioning groups, collaborative initiatives were common between the clusters we observed. Most of the GPs involved in their locality or commissioning group had some idea regarding the major objectives of the CCG agenda though there was ongoing uncertainty around the future of the reform. In any case. However, there was significant variation among CCGs around the level of

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engagement with providers, patients, and local authorities. ~~Clinicians were often unaware of the value that this input carries and would pursue commissioning decisions without it.~~ Locality (sub)groups played an important role ~~in this context~~ because they linked commissioning decisions with patient needs and brought leaders closer to frontline stakeholders. ~~Lack of local GP engagement adds uncertainty to the system and increases the risk of commissioning decisions being irrelevant and inefficient from a patient and provider perspective. Finally, increased dialogue between clinical leaders and the Department of Health (DoH) and regional health organizations is deemed to be necessary for these leaders to enable innovation and provide stability to the system.~~

Conclusion: With the new commissioning arrangements, leaders should seek to move away from dyadic and transactional relationships to a network structure, thereby emphasizing the emerging relational focus of their roles. Managing knowledge mobility, healthcare ~~innovation~~network coherence, and network stability are three clinical leadership processes that ~~CCGs~~CCG leaders need to consider in ~~order to coordinate~~coordinating their network and ~~facilitate~~facilitating the development of good clinical commissioning decisions, best practices, and innovative services. To successfully ~~orchestrate~~manage these processes, CCG leaders need to ~~take advantage~~leverage the relational capabilities of their ~~(~~network~~)~~ ~~position and~~ as well as their clinical expertise in order to establish appropriate collaborations that may improve the healthcare service in ~~the UK~~England. Lack of local GP engagement adds uncertainty to the system and increases the risk of commissioning decisions being irrelevant and inefficient from a patient and provider perspective.

Article summary

Article focus

- ~~This study builds on the fact that~~ Examines how clinical commissioning ~~is an important element of modern medical practice and has the potential to have a profound impact on patients and the public~~
- ~~Following the recent reform of the healthcare sector in England, it examines how GPs lead the orchestration of~~group leaders can act as relational catalysts across their healthcare networks as they seek to facilitate healthcare innovation in ~~their CCGs~~light of the recent reform in the healthcare sector in England.

Key messages

- ~~Clinical~~ The new clinical commissioning ~~is a complex social practice that can be viewed as~~scheme foregrounds the ~~orchestrating activity of large~~need for leaders to be relational and effective in integrating across innovation networks ~~through a set of coordination processes~~.
- ~~In this context encouraging knowledge~~Knowledge sharing and collaboration between ~~clinicians and other healthcare professionals~~stakeholder groups are key tasks of clinical leadership ~~and~~which play a significant role in ~~order to ensure innovation~~ensuring network coherence and stability ~~of the network~~.
- Lack of clear political ~~stimulus~~direction and dialogue discourages ~~lead general practitioners~~network participation and ~~boosts uncertainty which can hinder the activities of the CCGs~~catalyzes instability
- Clinical leaders need to focus on ~~enabling value to be add to~~aligning patient-centred services ~~and systems~~ locally as well as ~~group-wide and ensure a patient-centered healthcare service integration~~across the network
- ~~Good commissioning should go beyond macro data analysis (aggregate population measures) and incorporate insights developed through multi-stakeholder perspectives and micro (practice-level) data and events~~

Strengths and limitations of this study

- ~~A particular strength of this~~The study ~~is that it~~ provides in-depth accounts of the ~~changes in commissioning practice and the~~ emerging role of GPs as healthcare network leaders in the early stages of the new commissioning process
- We highlight the relational focus of the network leadership role which enables knowledge sharing, network coherence and network stability.
- The use of multi-method approach (interviews, observations of CCG board meetings, extensive study of documentation, and CCG network analysis) allowed us to validate our findings and ~~ensure there was no~~minimise bias due to limitations of specific methods.
- ~~In that we were able to uncover different perspectives of knowledge sharing and collaboration among healthcare professionals and provide evidence on the influence of GPs and their ability to coordinate and lead commissioning tasks.~~

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- ~~The relatively small number of observations has always been a limitation when it comes to qualitative evidence and analysis of interview data.~~The on-going change in the health sector and the political uncertainty limits the generalizability of this qualitative research.

- ~~In addition, the richness of our data were subject to time constraints of participants and their willingness to share information about their activities often deemed as confidential. Having said that, similar themes emerged and common issues were identified between the different CCGs.~~

Introduction

Following the announcement of the latest NHS reform[1] the health system in ~~the UK~~England has entered a new cycle of radical changes that ~~aims~~aim to improve healthcare outcomes and increase efficiency. At the centre of the strategy proposed by the current coalition government is the goal to "liberate the NHS" by putting clinicians such as GP's "in the driving seat and set hospitals free to *innovate*, with stronger incentives to adopt best practice"[1] ~~(Department of Health 2010),~~ thus, challenging the way commissioning of healthcare services is organised and executed. In this context, the new Health and Social Care Bill creates a duty for the new Clinical Commissioning Groups (CCGs) to "promote research and innovation and the use of research evidence."

Commissioning of healthcare services is traditionally understood to be the process by which "the health needs of a population are assessed, the responsibility is taken for ensuring that appropriate services are available which meet these needs, and the accountability for the associated health outcomes is established"[2]. Until recently, commissioning activities such as planning (assessment and evaluation), purchasing (identifying and negotiating), and monitoring health services[3, 4] were performed primarily by non-clinical managers in primary care trusts (PCTs~~). However,~~) with little clinical input. In response to that the recent reform ~~intends to transfer~~transfers commissioning duties over to general practitioners (GPs), nurses, and other healthcare professionals~~. As part~~ who represent a range of both provider and purchasing interests. The diversity of the ~~new organisational structure it has been estimated that clinicians could control almost £65 billion of NHS funding yearly – a figure which accounts for more than half~~actors involved as well as the complexity of the ~~current NHS annual budget – in order~~tasks demand a more integrated approach to ~~carry out the~~ commissioning ~~of health services~~[5]than performed previously.

Based on the NHS White Paper[1] ~~the main reason for such an immense experiment is to provide flexibility,~~ apart from establishing population needs and ~~freedom to GPs to develop innovative, high~~ planning and controlling their budgets, commissioners must also work with a wider group of stakeholders to identify opportunities to improve value through *innovation*. This new approach to clinical commissioning shifts from contracting of stand-alone healthcare services based on dyadic relationships to a more dynamic *network-centric* approach of the healthcare system that brings together a large number of actors in order to collaborate and purchase integrated services which will deliver the desired outcomes. Recent research emphasises the importance of networks in healthcare practice and argues that healthcare and clinical networks have the potential to enable multidisciplinary coalitions to address diverse agendas and achieve best practice. Integrating across networks, by allowing for people and ideas to come together, can also prevent fragmentation, which has been a key challenge of previous commissioning arrangements, and facilitate integrated care with the development of collective contracts that can be more cost effective and focus on new pathways and care packages, thus increasing the quality ~~services that will increase the quality of healthcare and accomplish better use of the available resources.~~ of services and outcomes[5, 6, 7].

Given ~~that~~the importance of networks in healthcare ~~service~~and the fact that *innovation* is inherent in, and central to, the new commissioning structure~~,~~ we ~~studied~~used an innovation network theory to study the newly established clinical commissioning groups (CCGs~~) using an innovation network theory approach where),~~ GP leaders are seen as ~~innovation *network orchestrators*~~*leaders* within their healthcare service environment ~~and~~with CCGs ~~as~~being the nucleus of innovation ~~*hubs*~~activity. Drawing on ~~innovation~~this theory ~~enables us~~we were able to obtain ~~a~~ unique ~~understanding~~insights of the ~~clinical commissioning~~emerging leadership activities of ~~the GP leaders~~ GPs and their efforts to establish best practices as well as develop new clinical services tailored to the needs of their population. We believe that this approach will shed light on the emerging forms and function of evolving commissioning entities and will offer a fresh viewpoint on clinical ~~commissioning and innovation~~leadership in healthcare networks.

Clinical commissioning and healthcare networks

The ~~effectiveness~~success of clinical commissioning and its potential to deliver has long ~~being~~been discussed in health services research. In the past couple of decades, ~~different GP~~the government has endorsed and funded a number of alternative primary care-led purchasing schemes ~~have been tried~~ receiving mixed signals from

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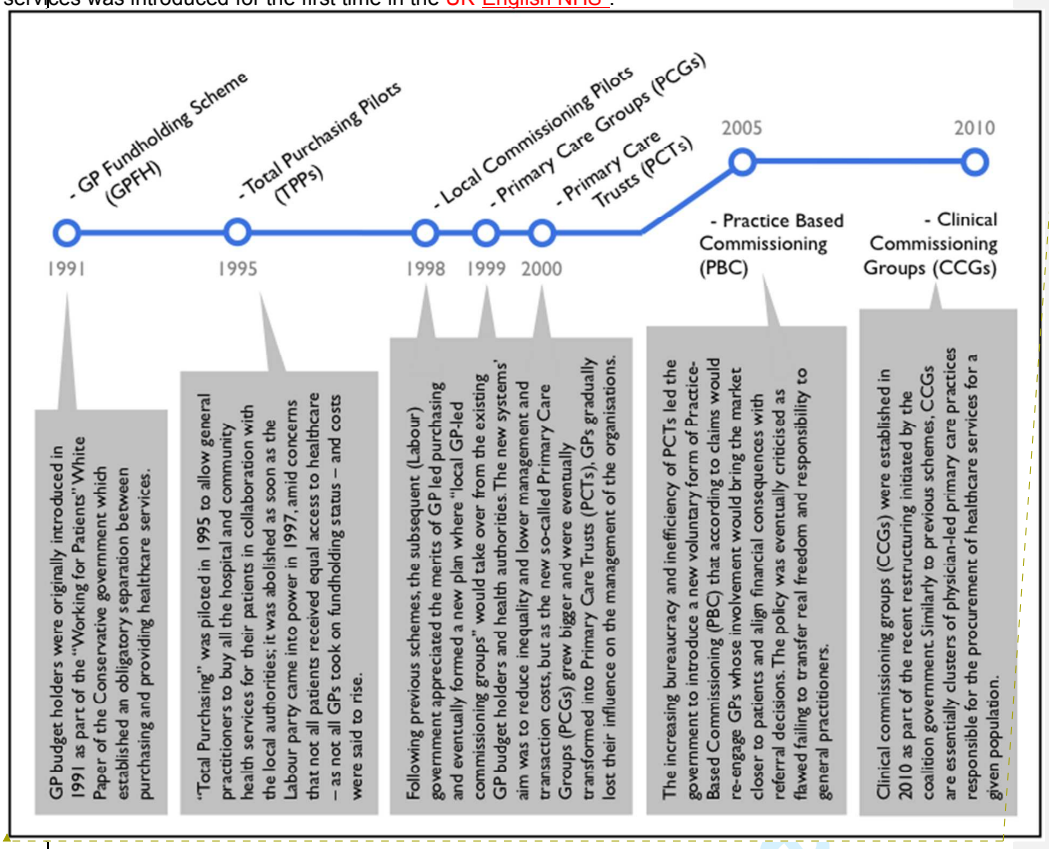
clinicians, policy makers, and the public. Figure 1 provides a timeline of clinical commissioning initiatives since 1991 when the internal market reform took place and the separation of purchasing and providing health services was introduced for the first time in the ~~UK~~[6]English NHS[8].



-- Figure 1. ~~Clinical commissioning initiatives since 1991~~ about here --

~~Despite the variability of~~Overall, the different ~~policies, all the implemented GP~~primary care-led commissioning models ~~aimed at improving quality and outcomes~~can be seen as part of a continuum of schemes available to use for purchasing healthcare services. ~~Commissioning decisions have a great impact on the health system so~~Smith, Mays, Dixon et al[9] provide a scale of the different commissioning levels in the UK, whereby approaches vary from the individual patient level to a whole nation's population. As the different commissioning levels in the continuum respond to different policies it is expected that there will be implications for the respective purchasing practices and for commissioners. More specifically, different approaches to commissioning will demand the involvement of actors across various levels and different locations. For example, GP fundholding was considered to be much more practice-led than PBC which involved groups of practices rather than individual practices[10]. Alternative approaches will also lead to the formation of different clinical and healthcare networks as a response to meeting commissioning challenges within the health system and bringing together purchasers and providers[5].

Drawing from the historical research evidence on commissioning organisations and their effectiveness a number of implications emerge for the structure, governance and size of clinical networks. For example, small, high-density networks can ensure alignment of services with the local population needs but are often costly. Overall, there has been a trade-off between lower levels of commissioning and transaction costs as the more 'local' and smaller the network, the more expensive it is to maintain and deal with an increased number of purchasers. This issue was evident during the GP fundholding and TPP periods where the average size of the commissioning consortia was small and purchasing decisions were divided between several local commissioning organisations. Having said that, GPFH and TPPs were more effective in dealing with a more focused set of issues and managed to reduce waiting times for patients as well as achieve better collaboration

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between participating GPs[11, 6, 8, 12]. Their voluntary character, however, created significant inequalities as those local networks that were engaged had a clear advantage over groups of GPs that were not involved.

In addition, ~~demand for particular knowledge and capabilities is particularly high. Within the current process~~as clinical networks aim to promote information exchange and understanding between physicians, local government, voluntary sector, etc. and translate this discussion into innovative healthcare solutions for patients, GP leaders need to develop ~~their expertise, manage and share~~leadership (and commissioning) skills that will enable these relationships across multiple stakeholder groups[13]. Rather than emphasising contracts and provider-purchaser negotiations, multiple stakeholders with different interests need to be integrated across an emerging network. Leadership activities in the new commissioning process, emphasises sharing knowledge and managing knowledge~~, collaborate~~ flows, collaborating with colleagues and external stakeholders, and ~~seek~~seeking advice from peers in different clusters.

Finally, incentives need to be embraced in order to ~~be innovative and develop novel commissioning arrangements~~motivate GPs and to influence their behaviour in their network. This can be achieved by facilitating autonomy and independence in being creative around contracting appropriate services[14, 15]. In the wake of CCGs, commissioning groups were much larger than previous clinical networks[a] and attempts were made to put financial incentives in place. In addition, clinical networks are primarily led by GPs who will be managing real budgets and will be required to join a commissioning group. Within this system of regulation and governance, clinical leaders will need to balance between managerial and professional interests, encourage collaboration and knowledge exchange, and reduce boundaries between practitioners, institutions and other organisations[5].

Table 1 provides a breakdown of the different primary care-led commissioning organisations and the implications for the healthcare networks that were developed.

-- Table 1 about here --

Although network leadership that seeks to achieve collaboration and knowledge sharing is important in the commissioning process, research in this area has largely been focused on describing and comparing the different policies[6, 7, ~~and~~8], by measuring resource allocation and economic ~~outcomes[8, 9]~~outcomes[16, 17]. Our innovation network theory approach will explore GP-led commissioning by looking at knowledge mobility and collaborations ~~between~~in networks of clinicians, PCTs, patients, providers, and other entities which play an important role in the development of novel commissioning arrangements and improved outcomes. We carried out research on six clinical commissioning groups that examined the ~~current~~early function and emerging forms of CCGs; analysed how CCG ~~leaders~~leads orchestrate commissioning activities ~~in~~towards three key network leadership processes: managing knowledge flows, managing ~~innovation~~network coherence, and managing network stability; identified strengths, issues, and areas for development of the newly established CCGs; and contributed to the theoretical and methodological knowledge base in the study of clinical leadership ~~and~~in the context of commissioning practice.

Methods

This study is part of the Collaborations for Leadership in Applied Health Research and Care (CLAHRC) initiative, funded by the National Institute for Health Research (NIHR), which aims at supporting and translating research evidence into NHS practice. The study itself took place within NIHR CLAHRC for Cambridgeshire and Peterborough and was facilitated from the collaborative partnerships between the University of Cambridge and surrounding NHS ~~organizations~~organisations.

Design and theoretical framework

We conducted a theoretically informed, mixed-~~method~~methods case study research across multiple CCG sites. While the responsibilities of the CCGs (initially known as GP commissioning consortia) are outlined in the recent ~~White Paper~~government bill, very little is known about the organisational practices commissioners ~~adopt~~have adopted in order to develop novel local services. To fill that gap, the aim of the project is to understand the emerging role of CCG leaders and outline their coordination activities as ~~orchestrators~~leaders of their ~~service innovation~~health network. In this process we chose to ~~adopt~~utilize innovation and network theory for two reasons. First, the delivery of clinical commissioning and development of innovative services

[a] The median population covered by the 212 CCGs so far preparing for authorization is 226,000.

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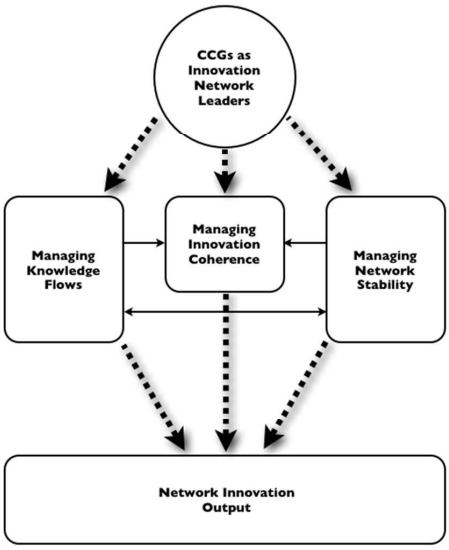
around it require complex collaborations between a large number of stakeholders including patients and the public, local government and authorities, acute and other providers as well as front line GPs, in the form of a value network. These so-called *innovation networks* are often characterised by loose, semi-temporal linkages between actors who seek to employ the right resources and engage in strategic collaborations in order to deal with specific problems and develop innovative services and ~~solutions~~[10]solutions[18]. Secondly, this network-centric innovation model also recognises the need for a leading ~~hub~~ entity that will orchestrate the innovation activity within the network through a number of coordination ~~processes~~[11, 12] processes[19, 20] thus emphasising the relationships that need to be established. Therefore, by mapping our findings on this theoretical framework we were able to identify various ~~orchestrating~~coordination processes that CCG leaders ~~as innovation hubs~~ use. In addition, we are able to pinpoint particular strengths, issues and areas for further development of CCGs and identify key leadership skills that will help GP leads manage their network in the future.



~~**Figure 2.** The role of CCGs as innovation network leaders and the management practices used to enhance innovation development~~

-- Figure 2 about here --

Sampling

~~We started~~During our fieldwork ~~by studying eight~~we conducted an in-depth and systematic study of six clinical commissioning groups and local clusters (also called localities) in the East of England region~~, six of which we studied in-depth~~ (sites A, B, C, D, E, and F). ~~The six commissioning~~These groups ~~that were investigated systematically (sample groups)~~ covered mixed patient populations varying between 50,000 and 550,000 patients. In total, our sample groups covered 1,662,000 patients served by 208 general practices. The number of ~~Board~~board members of the CCGs also varied according to the size of the population they covered with the smallest numbering 4 members and the largest 14. The total number of ~~Board~~board members of all six commissioning groups at the time of data collection was 63.

The first wave of GP commissioning consortia took place in December 2010 and introduced 52 “pathfinders” initially covering 12.9m people. Second, third, and fourth waves followed soon after and by the end of April 2011 GP commissioning covered 9 out of 10 people in ~~the UK~~England[b]. Most of the groups in our sample were given pathfinder status during the first two waves. Table ~~1~~2 presents all the main characteristics of our CCGs and localities sample, and points to the variability of network structure. The size variation in our sample is similar to the national statistics of the first two waves (numbering 137 consortia): the average population covered per CCG was approximately 207,000 with standard deviation 146,000 (min 14,000/max 693,000), and the average number of practices under a CCG was 30 with standard deviation 22 (min 1/max 105).

[b] Statistics as well as interactive maps on GP commissioning consortia can be found online at: www.gponline.co.uk

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	Status	Wave	Covering Population	Covering Practices	Localities (Clusters)	Board representation Sec/Care	Board representation Nurse	Board representation Patient	Executive Support	PBC roots
Site A	CCG	1	300,000	30	6	N	N	Y	N	N
Site B	CCG	2	550,000	60	4	N	N	Y	N	Y***
Site C	Locality	-	50,000	4	-	N	N	N	N	Y*
Site D	CCG	2	325,000	47	2	N	Y	N	Y	Y***
Site E	CCG	1	230,000	27	2	Y	Y	Y	Y	Y**
Site F	CCG	1	77,000	10	-	N	Y	Y	Y	Y***

-- Table 2 about here --

~~Table 1.~~ ~~Main characteristics of CCGs and localities sample~~

Data collection and analysis

Access and pilot interviews were initiated in November 2010 and the main data collection took place between February and December 2011. ~~In total 56 healthcare professionals were interviewed: 35 Board~~During that time commissioning groups were in a preliminary pathfinder stage and did not have any fundholding rights or statutory powers. In addition, at the time there was no official guidance from the Department of Health other than the initial bill and supplementary information on commissioning. However, nearly all CCGs we examined had established formal operating procedures that allowed them to function as organisations with particular membership and board structure. In total 56 healthcare professionals were interviewed: 35 board members (mostly GPs but also PCT employees and practice managers) plus an additional 21 people from various ~~organizations~~organisations, including acute provider representatives, and health authorities executives. In addition, we observed 21 CCG board meetings and executive committees within local clusters. This helped us to witness how these groups work in action rather than rely solely on the espoused views of their members. We kept field notes during meetings and transcribed all interviews after recording (apart from few exceptions). We used ATLAS.ti to categorize, code, and analyze qualitative data including hundreds of pages of background documents such as national-level policy reports, minutes from meetings, and speech transcripts from conferences and workshops.

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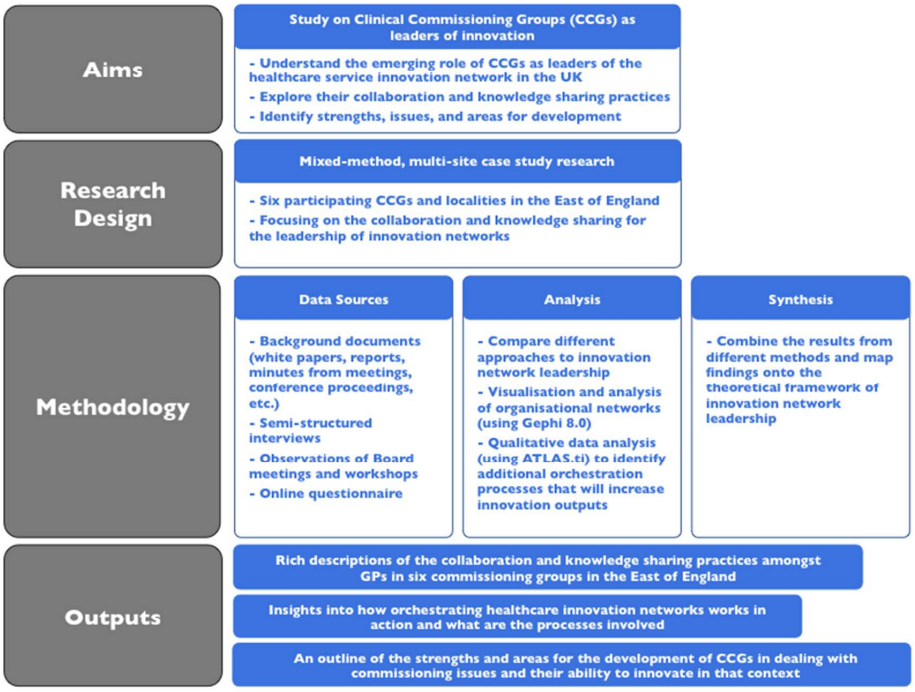

-- Figure 3. Summary of the study protocol about here --

Having CCG board members as our unit of analysis helped us to confine our research and also limit our study of their healthcare innovation network to their immediate contacts. Moreover, GP leaders as main stakeholders also assisted us in identifying potential targets to question. Additional interviewees were also recognized through the observation of board meetings with the intention of getting a variety of perspectives and evidence. Interviews usually lasted between 35' and 90' minutes and were conducted either by phone or in person. We compared organizationalorganisational forms and leadership routines across the six groups and highlighted their variations. Key themes that emerged from the interviews were coded according to the orchestrationcoordination processes with which they were related. Based on network leadership theory, three innovation network orchestration processesleadership routines were identified as relevant with our CCG study: managing knowledge flows, managing innovationnetwork coherence, and managing network stability.

	GPs	PCT employees	Practice Managers	Hospital	Other	Total	Meeting Observations	Survey Participation
Site A	3	3	2	1	1	10	5	100%
Site B	6	5	3	1	1	16	7	92%
Site C	5	3	0	0	0	8	3	100%
Site D	3	1	2	0	1	7	2	92%
Site E	3	0	1	1	3	8	1	88%
Site F	1	1	1	1	3	7	3	83%
Total	21	13	9	4	9	56	21	92%

Table 2. Breakdown of the interviewees by site and type

-- Table 3 about here --

In order to provide external validity to our research results, and debate whether the theoretical approach we have used could be useful for the future development of CCGs nation-wide we presented our findings to a

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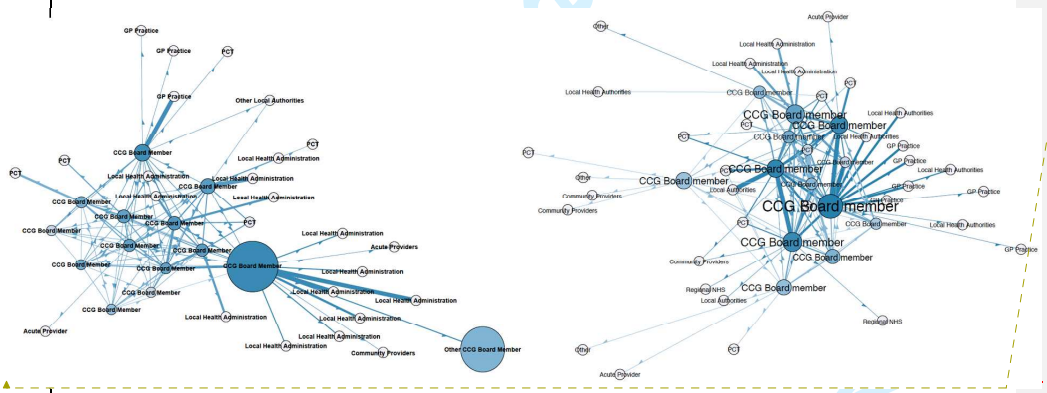
number of CCG board of directors and (particularly to those that were interested in the feedback) at a regional event on clinical commissioning where most of the commissioning groups were represented.

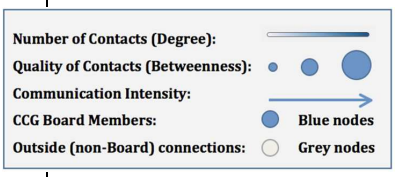
Social network analysis

In addition to interviews, CCG documentation and other publications, we also collected responses using an electronic survey on knowledge sharing and collaboration practices that was sent out via email to all ~~Boardboard~~ members of the CCGs we studied. The response rate for this was approximately ~~92~~94%[c] and the results helped us to identify knowledge exchange patterns amongst board members and outside parties regarding clinical commissioning. We used social network analysis (SNA) to discern the popularity of certain individuals in the network and the individuals that board members go to in order to acquire advice regarding commissioning issues. More specifically, we were able to measure the number of ~~contacts~~ties CCG board members have (also called "degree") as well as ~~the~~their centrality ~~of their position~~ into the network (also known as "betweenness centrality") in order to understand which members act as brokers and have the ability to transfer knowledge from other parts of the healthcare network and across CCGs. Finally, we calculated the density of the CCGs which measures the extent to which board members are interrelated and go to their colleagues for advice. This measure indicates in someway the good communication and team-working activities among CCG members.

The visualization and analysis of the CCG board networks were performed using Gephi 8.0. ~~Figure 4 provides an example of the outreach network structure of the board of directors of two clinical commissioning groups (A on the left and B on the right). These two cases illustrate two markedly different leadership and organisational styles.~~

~~**Figure 4.** Examples of CCG networks~~





~~More specifically, the blue nodes on the graph are the CCG board members and the light grey nodes are their direct contacts to whom they go for advice regarding commissioning issues. These include PCT employees, frontline GP practices, providers, etc. The size (thickness) of the links represents the frequency of communication (communication intensity) between the members of the network and largely implies the flow of information and knowledge from one person to the other (in the form of advice or influence). The arrows represent the direction of the flow.~~

~~"Degree" is identified by the colour of the node (the darker the node the more contacts the individual has), and "betweenness centrality" is illustrated by the size of the node (the bigger the node the higher the centrality). All these organisational network metrics are important and provide information about the orchestration processes performed by CCGs as well as offer some indication on the capacity CCGs have to create and integrate knowledge.~~

[c] Out of the 63 board members that received the electronic survey ~~58~~59 replied. Two of the ~~five~~four people that did not respond were new board members~~, however, we decided not to exclude them from our study for sensible reasons~~.

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Results

Overall, the figures and other facts mentioned in this study are based on the timing our data were collected (February to December 2011). However, during the course of our study, ongoing changes to commissioning entities occurred, such as moving from being called 'pathfinders' to 'GP commissioning consortia', to CCGs; however these designations do not affect the substantive findings.

The commissioning context: ~~a challenge to~~ the challenges of network leadership

In principle, CCGs are GP-led commissioning hubs with the responsibility to design, negotiate, and purchase healthcare services for the population they cover. Accordingly, they will gradually take over commissioning (and other) activities from PCTs and will be accountable to the NHS commissioning board, a new body that will replace the current regional administration organisations (SHAs). These ongoing changes in conjunction with the increasing complexity of healthcare delivery and the explosion of knowledge and technological advances in the sector heighten the challenge for clinicians. In order to develop a stable healthcare network and deliver innovative, cost-effective solutions a collaborative network leader is required who will enable trusting relationships, provide incentives, and take into account patients' needs[13].

All CCGs are structured in a way that reflects the tension in achieving strong local commitment and efficiency through scale. The GP leaders we interviewed were aware of this: "there's this sense that we have to be big in order to have the clout and to negotiate" (Site B). Network size in our context, is directly related to the proportion of population covered as Government payments follow the patients. Larger networks create a more stable environment as risk (in particular for financial failure) can be spread across the whole network, thus minimising the chance of collapse. This more stable position also improves the leaders' ability to negotiate, due to their increased purchasing power across the network. By looking at Table 1 one can observe the range of sizes of the population and practices involved.

However, as network size increases, it becomes more difficult for leaders to engage with frontline members. Thus leaders also kept stressing that "if they [completely] ignore the size issue, they will fail to get [GPs] engaged and on board" (site B), thus, highlighting the importance of a "bottom up" approach to clinical commissioning. To manage this tension, several sites developed smaller *localities*, clusters of practices within the network which resolve local issues, including commissioning. The localities' leaders are typically part of the CCG Board, responsible for leading the overall commissioning process. A GP commented, "[frontline engagement] won't work at three hundred thousand [patients] level [...therefore] having those sub groups, those cluster level groups is vitally important" (site C).

The challenge of engagement with frontline GPs (and other clinical providers) reflects the network challenge of developing internal network coherence, as clinicians frequently have access to information regarding specific local needs and trends, in addition to the clinical knowledge base they can contribute to commissioning decision making. In order for commissioning decisions to reflect the corpus of primary care views contained within the network structure, network leaders need to find mechanisms for knowledge exchange with frontline clinicians. Engagement within the network structure will help ensure that the knowledge held by frontline members of the network is made available to other network members, and in particular in guiding the leaders' decision making. Enabling network coherence in this manner will also support the flow of innovative ideas across the network, thus enabling novel commissioning arrangements. Whilst it is easier to develop internal network coherence in smaller networks, this remains in tension with maintaining network stability as there remains greater risks for key individuals or entities (e.g. a service provider) to leave the network, risking loss of critical knowledge and capabilities.

Perhaps a more important contextual factor than the size of the commissioning groups is the pre-existing culture and history of the clusters that form them. In particular, the legacy of Practice Based Commissioning (PBC- earlier forms of GP commissioning) appeared to have an important effect on the organisation and leadership of CCGs and the relationship of GPs with various stakeholders inside and outside their group. Even though PBCs never held actual commissioning funds throughout their existence, they had established a distinctive "organisational archetype"[14] which itself The current commissioning context presents a number of challenges for leaders in establishing innovation networks. In the following analysis we examine the dynamics of multiple relationships which CCG leaders needed to establish in order to facilitate commissioning across their health networks, and in particular the need to enable knowledge exchange, network coherence and network stability as dynamic capabilities that support innovation networks. We consider the CCG board relationship with PCTs, health providers and service users, frontline GPs and the broader health polity. We

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conclude our analysis by comparing two innovative developments in CCG board commissioning practices in the sites studied, using them as illustrative rather than exemplars.

Establishing relationships with PCTs

There was a result of the sedimentation that took place during the organisational changes of the reform at the time. As such, former PBC groups drew on their network position and were merged into CCGs, transferring their knowledge and contacts into an overlaying network structure.

In our sample, groups B, D, E, and F which correspond to previous PBC teams, appear to have extensive knowledge regarding commissioning activities as well as knowledge of local requirements. On the other hand, groups A and C are newer network arrangements that drew on some practice-based commissioning experience but weren't formed by former PBC groups *per se*.

By and large, the specifications of the previous organisational archetype (in this case PBC groups) has an apparent effect on the change, formation, and abilities of newer CCGs. In this process, organisational change "represents not so much a shift from one archetype [PBC] to another [CCG], but a layering of one archetype on another"[44] (p.624), where the new establishment embodies the interlacing of previous structures and skills with novel network features. A good example of this is put forward by a GP (site A) who highlighted that the differences between PBCs and CCGs were "essentially in support and contracting […] those areas that there are glaring deficits now" thus, highlighting the disadvantages of the CCGs that did not result from PBCs.

The pre existing configurations and localities of the CCGs also had an effect on the leadership structure (as described by the influence individuals have on others and on the commissioning decisions taken) and the knowledge exchange patterns among board members. As it can be seen from our social network analysis, Group B still holds a legacy of the former PBC groups that were in place prior to the reform and the locality leaders continue to have considerable influence at the board level. These leaders were well connected with PCT, GP practices, and providers as well as local health authorities. Group A is inclined towards a more centralized network leadership model where only one or two individuals have the majority of connections with third parties. Despite the more distributed structure of group B, the density of its board, is lower (0.622) than the one of group A (0.737) which is another indication of the competitive environment among the members of group B who are deeply committed to their localities.

Achieving coherence: relating to administrative entities

Overall, there was significant variation among CCG leaders inat the six sites as to the way relationships with PCTs were managed. Leaders in some groups describedsites worked well with PCT's describing the relationship with the PCTs asas a cooperative and being "open" and "supportive", "getting better at seeing each other's point of view". Group C also managed to establish a PCT sub-committee where GPs and PCT managers collaborate to resolve commissioning issues. Some CCG leaders viewed PCT employees as a useful source of information and commissioning expertise. A CCG board member (groupat site B) pointed out: "I see my role as coordinating, having some ideas and then asking PCT people to develop those ideas. There's only so many hours in the week and I can't do everything, so I draw on the skilled people at the PCT". The institutionalisation of knowledge exchange through close collaboration (e.g. between clinical and administrative pairs) will remain limited if no one takes ownership of coordinating (yet not controlling) the whole process.At site C whereby leaders developed a novel and collaborative arrangement whereby GPs and PCT managers were paired together to form a PCT sub-committee to resolve commissioning issues. These examples reveal the important role many PCT staff played as knowledge brokers who facilitated knowledge sharing and transfer across the network.

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On the other hand, there seems to be a perception among some CCG leaders that PCTs areAt the same time, however, GP leaders were acutely aware of the perceived limitations of the knowledge held by PCTs in commissioning. It was generally understood by CCG board members that PCTs were "being abolished [because they] haven't delivered what [they] should have done" (site B). A GP in site A also illustrated thiswas similarly critical pointing out that: "the contracting has been poor and it hasn't been adequately informed […] it is basically a legacy […] There wasn't actually any thinking or decision making". The goal of seeking novel commissioning arrangements free from the constraints of legacy decisions foregrounds the complexity of interweaving existing knowledge and innovative ideas across the network.Thus leaders were wary in adopting the knowledge and ideas of PCT commissioning practices.

From the A similar dilemma was faced by PCT perspective two things were happening:staff. On the one hand, they recognized that "you've got the PCT trying to offload its activities" to the CCGs,", in a supportive manner. On the other hand, a number of PCT employees felt threatened by CCG formation and were highly aware of their own job insecurity, as GPs "don't want to recreate a PCT". As a result PCT members were not always

willing to openly cooperate with CCG leaders. For, for example, PCT members were noted to withhold funds which they control until their dissolution in April 2013 - from being spent on restricting funding of new commissioning arrangements.. A GP described how the indifference of the PCT employees towards the success of the CCG led to frustration in his group:board. There was a perceived view that a 'Not Invented Syndrome' limited the potential for innovation; "nobody got the idea and they just refused to fund it" (site C).

In our study weThe wavering support of PCT's stemming from the uncertainty of their future contributed to instability across the health network. There was also found that cosystem-wide concern as to who would be responsible for the essential non-commissioning tasks currently being done by PCTs, and how they would be undertaken in the new health system. This hindered the development of trust and commitment as a critical basis for collaborative relationships with CCG board members.

Co-location arrangements further constrained (or enabled) communication between CCG members and PCT employees, leading to miss interpretationsmisinterpretations and delays in the transfer of information and data. One PCT director (site D) felt that their good relationship with GP leaders "was due to geography […] we brought the PBC support unit into the PCT building so they are in the same place as us […] sitting side-by-side with the PCT staff […nowNow with CCGs] that absolutely helped". In our research sample, most of the networkssites that had supportive relations between respective PCTs and CCGs useused the PCT premises to hold their board meetings. In networks where CCGs were detached from PCTs, board meetings were held elsewhere (e.g. in sites B and E). These results are being reinforcedreflected by the social network analysis. Site B has only 12 ties to PCT (see comparison between sites A and Local Administration, whereas site A has 18 links and it is located at the local PCT.B in Table 4).

External innovation coherence is fostered by the PCT, which shares common practices and skills with peer commissioning groups across the country. As such knowledge and novel arrangements from PCTs in commissioning networks across the country can be transferred to enable network coherence with knowledge external to the system. PCTs also transfer knowledge through training programs, often hiring the services of consulting organisations.

Relating to providers and users: the challenge of knowledge exchange

AAs discussed later on in our vignettes, a critical CCG leadership task is developingembedding relationships with health providers such as community or acute providers (e.g. hospitals). Most CCG leaders are aware of the historic barrier between within the commissioning network, integrating secondary care provision with primary and specialist care more broadly. Organisational boundaries within and between groups of practice can jeopardise access to information and knowledge which residescare in different locations in the healthcare ecosystem. It should be the responsibility of network leaders to ensure knowledge mobility that will connect existing ideas and information with potential problems thus creating efficiencies within the system. A PCT manager on a novel ways. A CCG board member suggested: "We need to get that relationship (commissioner-provider) off from a good start […] to sort a strategy that is going to pull them (providers) in from the beginning [and realise] that it's not '*take all our money and continue to deliver as you've always done*'. We've got to do things differently" (site B). Another CCG board member highlighted: "you can't forget about the money, but […] ultimately this is about the patient and the patient's journey".Establishing trust and adequate knowledge exchange between CCG and provider entities remained an on-going challenge.

Box 1 highlights multiple instances from our analysis regarding the importance of knowledge exchange and collaboration in enabling service integration across primary and secondary care.

-- Box 1 about here --

Further, our results from the SNA analysis showed that there was generally a substantial lack of communication between CCGs and acute providers. In our CCG network sample, boards had a maximum of 3 ties with acute providers; this is very low when considering that these relationships are at the core of clinical commissioning and central to all the sample local innovations, including those summarised in the vignettes.

Another important network dynamic between CCG boards and healthcare providers related to knowledge sharing around appropriate level and type of costing data relevant to commissioning. This lack of information often described as 'a black box' around the services being provided and their associated costs leads to challenges of network level coherence of information to support innovation. A GP board member at site C explained, 'we have actually no idea what the costs are of these pathways…it is very difficult to get any data or real information from [the acute provider]…they haven't had to share this before we can't commission [properly] without it.' Another GP board member reinforced that even in their own medical practice it was difficult to

manage patients' care in a way that optimised commissioning efficiency; *"When I sign the referral letter I commission the spending of that money, but effectively what I'm doing is signing a blank cheque because I have no idea what the cost will be as the patient goes down that pathway. And if say there were two competing providers … which of those two pathways would be better to use and what are the costs and the outcomes of the two pathways, well I don't have that information".* As discussed later in the vignettes, comparative information and data analysis were important initial drivers of the innovation process. The tension between GP commissioners and secondary care specialists is described by a PCT employee as a conflict of interest where "*providers want to maximise their income while [commissioners] want to maximise efficiency*" (groupsite B).

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One of the groups in our sample has demonstrated an exemplary strategy not only in developing good relationships with providers but also in managing the development of integrated care (group E). They invited two healthcare provider representatives (one from an acute trust and one from a community trust) onto their CCG board; these members were able to influence the decisions being made in the commissioning of services. In a number of other cases, PCTs helped broker the relationship. While this type of service co-creation is necessary for good quality integrated healthcare service, our results show that there is substantial lack of communication between CCGs and acute providers. In our CCGs network sample, each board had a maximum of 2-3 ties with acute providers which is very low if you think that the relationship between GPs and providers is at the core of clinical commissioning.

As illustrated in the table below, integration of services goes beyond the need of commissioning appropriate services, but also of enabling more knowledge exchange between primary and secondary care clinicians. In order to enable novel care integration, leaders need to go beyond arranging for innovative procurement of care, but also to facilitate the ongoing knowledge exchange between clinicians in both sectors, so that the patient's journey is more holistic. CCG leaders were aware of extent and importance of this challenge, as evidence in their comments and examples below. Whilst cliques - isolation of network member groups or individuals – are not uncommon in social networks leaders felt that increased ownership of the evolving policy process as well as the new relationships entailed was an important strategic enabler.

In addition to providers, users constituted another important stakeholder that contributed knowledge towards the commissioning process. Over half of the CCGs had a patient representative on their board (sites A, B, E, and F)

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In three cases, nurses were represented on the CCG leadership team. A nurse (site D) described the uniqueness of their role as being closer to the patient: "nurses have a slightly different stance when it comes to patient care. I mean doctors treat and nurses nurse", highlighting the distinctiveness of their perspectives in purchasing decisions. Given that nurses have a distinctive perspective their participation contributes to the knowledge available in the commissioning processes. However, given that nurses provide a bulk of the care being delivered, their knowledge and perspective will also work to support the integration across the care pathway.

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Box 1: Examples of the importance of integrated care

Lack of communication between GPs and consultants

Communication between GPs and consultants are essential for the quality of care a patient receives throughout his journey. A GP describes: *"I say to the patients when they come back 'what did the consultant say was the plan?' and they reply 'he didn't say what the plan is', 'so what's happening next?', 'He hasn't told me' so [...] consultants are not used to communicating at that level"* (site B).

Lack of collaboration between GPs and between different consultants

A GP described the case where a woman had consistent bleeding every two weeks from her stomach. The woman had been receiving treatment from her cardiologist due to another heart issue. The gastroenterologists believed that the medication that she was under was the reason she was bleeding regularly. *"Now it's just going round and round"* and the patient is frustrated as the consultants do not appear to talk to each other: *"textbook says she has to be on this drug for a year"* and thus cardiologists insist she need to continue taking the treatment, thus, ignoring the side effects gastroenterologists believe the drug produces. *"And she listens to them because they are consultants"*. There is a need to approach healthcare differently and *"that's what's difficult to change"* (site B).

Need for greater integration in healthcare networks

Another GP described the path of a particular senior citizen who lives on her own and her main problem is that she is a bit forgetful: *"she doesn't know when to take her medication"* and therefore needs someone to go and check on her. *"Do we go down adult social care or is it a bit milder than that, and she needs a friend, a neighbour, and everyone starts to network into this system"*. The main concern is that the parties involved do not have the necessary information about the activities of the others: *"A doesn't know what B is doing, left hand doesn't know what right hand is doing, Salvation Army doesn't know what is going on in the Alzheimer's Society who don't know what is going on with Age Concern"* (site C).

~~Over half of the CCGs had a patient representative on their board (sites A, B, E, and F). This is somewhat anticipated as one of the main arguments behind the reform was to bring patients at the centre of the healthcare service; patient views are believed~~ to improve the final service offering. One of the patient representatives interviewed felt that he made "direct input" into ~~meeting he was attending~~the board meetings, and felt that he made ~~a real difference (group B). "An~~an important contribution as "any service user knows what it's like on the other side, to be on the receiving end. They can give very practical suggestions about what works, what doesn't, what are glitches in the system" (Patient representative, site A). ~~On~~

However, there was voiced confusion amongst leaders regarding how experiential knowledge from service users should be used and incorporated to the ~~other hand, a~~wider, population-level commissioning agenda of CCGs. A GP leader (site C) highlighted ~~that~~ it ~~had always been an issue~~was a challenge to engage patient groups into providing inputs at the locality and or CCG level: "Patients are not usually interested in it", "they are busy and do not want to do things like this" (site B), "patients will only be involved if there is money to be made" (site A). In addition, many GPs commented that when inviting patients to provide feedback "you get half a dozen […] with particular reason or agenda", suggesting this form of engagement did not lead to constructive dialogue on improving patient care. A GP from site B pointed out: "I think they [patients] are just there representing their own views as they see it".

Even though the wider perception from policy documents on public and patient involvement in commissioning was that patient views were valuable, there was no mechanism in place to operationalize lay representation and overall it was ~~left~~often carried out in a piecemeal fashion. For example, in some of the locality meetings we observed, individuals~~,~~ who had the flexibility to attend ~~and~~ were listening attentively to discussions without engaging in overt dialogue. In other meetings, there was set time given to patient representatives to present their perspectives. ~~There was voiced confusion amongst leaders regarding how lay inputs should be used and incorporated to the wider, population level commissioning agenda of CCGs.~~ As such, several GP leaders felt that in the current fiscal climate and organisational upheaval, ~~it was not a priority to invest~~investing scarce resources in organising patient groups and their input was questionable, revealing the challenge in genuine public or patient ~~representation[15].~~ representation[21].

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Engaging with frontline GPs

In order for commissioning decisions to reflect the corpus of primary care views across the network, CCG leaders need to find mechanisms for knowledge exchange with frontline clinicians. As shown though both case vignettes of innovations uncovered within our sample CCGs, novel ways of delivering a service or new services entailed commitment and engagement of frontline GPs, both in providing the new ideas and also enrolling colleagues in the new practice. Enabling knowledge flows across the network also enables the development of innovative ideas. Engagement and nurtured relationships with frontline GPs helps ensure that the knowledge held by these members is made available across the network, contributes to new practices and guides the leaders' decision making.

Yet the ability to engage with front line GPs is related to the CCG size; smaller networks can more easily be densely connected, as it is easier to maintain ties with a smaller number of individuals. Network size in our context, is directly related to the proportion of population covered as government payments follow the patients. In the commissioning context, larger networks create a more stable environment (i.e. network stability) as risk (in particular for financial failure) can be spread across the whole network. This more stable position also improves the leaders' ability to negotiate, due to their increased purchasing power across the network. "There's this sense that we have to be big in order to have the clout to negotiate" (site B). However, as network size increases, it becomes more difficult for leaders to engage with frontline members. Thus leaders also kept stressing that "if they [completely] ignore the size issue, they will fail to get [GPs] engaged and on board" (site B), thus, highlighting the difficulty of engaging frontline GP's in clinical commissioning.

To manage the concern of maintaining a necessary network size, several sites developed smaller *localities*, clusters of practices within their network which resolve local issues, including commissioning. The localities' leaders are typically part of the CCG board, responsible for leading the overall commissioning process. A GP commented, "[frontline engagement] won't work at three hundred thousand [patients] level […therefore] having those sub-groups, those cluster level groups is vitally important" (site C). ~~Policy documents on public and patient involvement in commissioning do not provide adequate insight on managing this process; for example identifying representative individuals, or merging competing perspectives between patients. A more systematic procedure is should enable systematic knowledge transfer from patient representatives into the commissioning decisions. The lack of a coordinated mechanism could reduce external innovation coherence and can diminish the relevance of commissioned services.~~

~~Complying~~CCGs structure reflects the tension in achieving strong local commitment and efficiency through scale (see Table 2 for a summary of the range in population size across study CCGs).

An important contextual feature that shaped the network size and its membership ties was the commissioning history; in particular, the legacy of Practice Based Commissioning (PBC). Even though PBCs never held actual commissioning funds throughout their existence, they had established a distinctive "organisational archetype"[22] which itself was a result of the sedimentation that took place during the organisational changes of the reform at the time. By and large, the specifications of the previous organisational archetype (in this case PBC groups) has an apparent effect on network formation and knowledge capability. In the reform process, change "represents not so much a shift from one archetype [PBC] to another [CCG], but a layering of one archetype on another"[22] (p.624), so that the new entity embodies the interlacing of previous structures and relationships with novel network features. As highlighted in our analysis of the vignettes around innovation between one former PBC and a non-PBC group, legacy ties between stakeholders influenced the innovation process.

CCG relationship with policy~~: managing network stability~~ and administrative authorities

Another significant relationship influencing the new commissioning scheme is the relationship between GPs and health policy makers and administrators who oversee the implementation of the policy. Numerous GP leaders expressed frustration that a number of their colleagues are hesitant to engage because of the perceived weak engagement and ~~two way~~lack of dialogue ~~and knowledge exchange~~ between policy makers (or their representatives) and CCG leaders. On the whole communication is seen as a one way process. ~~In addition, during~~During the course of the study we observed an increasing frustration among the ~~CCGs we studied.~~CCG leaders. Several who were enthusiastic and motivated ~~in the beginning~~early on started to believe that their efforts ~~are~~were misplaced ~~and that they will not have the opportunity to innovate in a direction that will improve the overall commissioning process~~: "*it was clear that there were many unfinished episodes and contradictions in the legislation, the Minister then turned to the professions*", *in order to get their input and called those pathfinder organisations.*". A GP from ~~group~~site A mentioned: "*I was happy to contribute as a pathfinder under those terms but the pathfinders (forerunners of policy implementation) were used as evidence that the profession supported the Bill […] then I felt that I'd been tricked into being a pathfinder*".

As a result, numerous frontline GPs and CCG leaders commented they were becoming increasingly cynical and started questioning ~~whether it is worth moving forward with~~ their engagement in CCG activities ~~overall.~~: "*We're in between at the moment, waiting to know what the new world is going to look like, and not really being able to get on with things until that's clear*" (site A). In parallel with the uncertainty around the future of the reform contributing to network stability, CCG leaders felt that they have little guidance from the ~~DoH~~policy makers regarding their new activities and responsibilities: "*the government is being less than explicit*". ~~As a result, there were many occasions in which~~Yet at the same time CCG leaders ~~were wondering what they were allowed to do or~~did not ~~as part of the~~ feel able to shape the strategic direction nor develop new ~~policy, whilst also perceiving there was few if any lines of communication through which they could find out. The~~rules for the commissioning process, and this uncertainty was compounded by the simultaneous restructuring of PCTs.

Relational dynamics of early stage innovation in two CCG networks

In the vignettes below (Boxes 2 and 3), we compare two interesting examples as to how relational dynamics in nascent CCG networks surrounding site A and site B enabled (and constrained) early stage innovation. We develop our insights concerning the relational dynamics drawing on the social network data (Figure 4 and Table 4) and the leadership challenges of working across the multiple stakeholders involved.

-- Box 2 about here --

In site A, where CCG leaders had access to comparative data from across the health system, the board leaders drew on existing strong relationships with the PCT to develop a solution in the form of joint working groups within the specialist areas and pathways of concern. The stimulus for the innovation process came from the available data highlighting the importance of network (in)coherence, coupled with the numerous ties with the PCT. As can be seen from Table 4 the social network analysis comparatively illustrates the numerous ties amongst the CCG board and local health administration entities (PCT) in site A (18) which is higher than site B (13). The strong ties with the PCT was crucial in bringing together the other critical stakeholders (e.g. acute providers) as the CCG board, had established ties with other stakeholders. In addition, the density of the ties across the board itself (0.737) indicates a high level of knowledge sharing and cohesion amongst the CCG leaders. This facilitated centrally coordinated action to develop the multiple pathway groups.

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-- Figure 4 and Table 4 about here --

The social network diagram in Figure 4 illustrates the relatively uniform communication pattern across the board; it also brings to fore the very heavy reliance on a single knowledge broker (large blue node with high degree and betweenness centrality in site A). Over reliance on a small number of knowledge brokers adds risk to the network, for example in the case where the individual should exit the network. The network also becomes dependent on a few individuals who are able to commit a considerable amount of time to developing leadership processes.

-- Box 3 about here --

Innovation emerged in site B from a frontline GP who recognised incoherence in one area of the network, given her knowledge of local primary based care and specialist care. The board in site B is characterised by high levels of front line GP engagement, illustrated both by the high numbers of direct ties to the board (6) and also the communication intensity between those ties, with relatively thicker blue lines in the social network diagram between board members and GP practices, as compared to site A. This enabled the innovation to be embedded and taken up by the GP community. However, as evidenced by the lower density of ties between CCG board members (0.622) there was an element of competition between the CCG leaders who represented the former PBC groups, indicated as the larger blue circles in the social network diagram (site B graph on the right of Figure 4). This influenced the integration and coordination of practices across the network as a whole, and hampered the scaling up of the innovative practice to other regions within the network.

In ~~Ultimately, network stability is threatened by policy decisions, loss of confidence to the policy makers, and lack of dialogue between policy makers and health professionals. Throughout our study GPs felt increasingly frustrated with the policy process and the uncertainty around them. This is mainly due to isolation of politicians who are perceived to have a "pre set agenda" which they are implementing without engaging too much with clinical leaders to whom the changes are directed, presumably so as to maintain control. Conflicting views deteriorate this position and lead to the emergence of further cliques that do not communicate with each other. A positive future is the most efficient promoter of cooperation which can be strengthened further by encouraging the creation of multiple projects that demand many types of relationships occurring together. CCG leaders should take advantage of their current position (as orchestrators) and resources in hand to establish change that will form a constructive legacy to any future programme of change. In order to embed innovative forms of commissioning and collaboration, the role of policy makers in providing adequate resources (e.g. in terms of technology infrastructure) and engagement are critical.~~

~~Unstable networks can also occur due to isolation, migration, and the emergence of cliques. Drawing from our findings, isolation takes place when different actors (e.g. providers, or localities) decide to break their communication channels with CCGs due to conflict of interest. In addition, GP leaders can create cliques that are inward-facing and avoid engagement with other parties in the network, thus, limiting knowledge sharing and reducing the relevance of commissioning decisions. Finally, valuable actors may migrate to competing networks and leave a gap in the network.~~
both cases, the development of novel care pathways arose from information regarding network incoherence, and a realisation that local care was out of alignment with care being provided in equivalent regions elsewhere. There was also a reliance on engaged frontline GPs and the use of strategically reconfigured knowledge flows to facilitate the development and delivery of a new service. Across the innovations new practices were knitted together from new relationships at multiple levels; structuring knowledge in new ways enabled novel insight as to how services could be integrated. Acting as relational catalysts rather than necessarily involved themselves in all relationship building, clinical leaders facilitated network coherence, stability and knowledge sharing in enabling innovations to emerge.

Discussion

~~Main findings~~

~~Our study uncovers the social and political complexity of clinical leadership in the context of CCG and their networks. Implementation of the latest healthcare reform in the UK has advanced much more slowly and with much more difficulty than anticipated. Some of the main reasons for this have been the unstable national set-up, the lack of appreciation of the social and political complexities in the health sector, and the unrealistic expectations about the capabilities and capacity of GPs to lead such a major change. The above are illustrated with tensions between various parties within the healthcare network (e.g. relationships between PCTs, GPs, service providers, local structures etc.), uncertainty and lack of trust to the Department of Health, and pre-existing establishments and legacies that have an effect on the recent efforts to change. The aim of the reform~~

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~~is to re-establish these relationships around the new role of GPs as clinical leads that will facilitate innovation and coordinate the commissioning process. This implementation demands a new breed of clinical (GP) leaders whose role will be to orchestrate the healthcare innovation network around them through managing knowledge exchange, ensuring network stability and supporting innovation coherence.~~

~~While the future of the reform is still uncertain in light of the resistance that the implementation of the UK healthcare plan faces from a large number of clinical professionals and healthcare associations, GPs are coming together to form clinical commissioning groups that are planed to take over commissioning duties from PCTs until mid 2013. In that process GPs are trying to organize their activities, build their capacity and understand their new role.~~

~~Policy implications~~

~~Recent research has shown that healthcare delivery has become fragmented and untidy due to the explosion of knowledge and technological advances. In order to deal with this complexity and~~In this study we have shown the importance of understanding and developing a network-centric approach to clinical commissioning and the need for network leadership to facilitate integrated care and provide innovative, patient-centred healthcare solutions. A critical part of the new role of GP leaders is to enable coordination and new relationships across the health network. Our study suggests that they need to go beyond focusing on transactions and bilateral relationships to fostering knowledge sharing with multiple stakeholders, while ensuring network stability and coherence. In addition to establishing a number of brokering ties themselves, leaders need to strategically enable adequate inter connectivity across the wider system acting like a relational catalyst.

Characteristics of clinical commissioning networks

Recent research and reviews have shown that commissioning arrangements have suffered from increasing fragmentation[6], hampered communication across primary and secondary care, challenged integration of purchaser and provider interests[23], high transaction costs[8], and unresponsive secondary care provision[8]. However, they do not have to focus only on the procurement and administrative aspects of commissioning.

We see the evolving clinical commissioning networks as falling within the characterization of innovation networks[19] whereby the coordination of network activities are usually performed by key entities. The newly established CCGs act as innovation hubs ensuring that information and knowledge are circulated around the network in order to establish collaborations and warrant the creation and extraction of value[20]. Just as with any other research of healthcare networks, clinical commissioning networks have the potential to generate multidisciplinary coalitions[7] between GPs, acute providers, local authorities and other key healthcare professionals in order to agree on the services to be purchased. This network-centric approach can allow CCGs to revisit the existing clinical pathways and develop new integrated, patient-centred healthcare solutions by leveraging the structural characteristics of their network – expansive, decentralized, open, less hierarchical, thereby providing increased flexibility and encouraging knowledge brokering[5].

Network leadership and practice implications

A new breed of clinical leaders is required that will coordinate innovative activity and ensure healthcare service delivery through collaborative and teamwork efforts in the broader healthcare ~~network~~[13]network[24]. Current understanding of enabling innovation networks points to the importance of knowledge exchange, network stability and ~~innovation~~network coherence in achieving ecosystem ~~outcomes~~[11, 12]~~. As in most networks, in the case of the CCG hubs,~~outcomes[19, 20]. CCG leaders are required to provide "subtle leadership"[16]~~, which focuses~~[25], focusing on visioning, motivating and sense-making, rather than ~~controlling~~[17]~~.~~controlling[26]. Having said that, such ~~loose orchestration or~~ delegative leadership from one hand can enhance social autonomy and boost innovative outcomes but on the other hand it ~~does little~~may be challenged to drive knowledge ~~integration~~[18]integration[27]. In the absence of strict hierarchies, these leaders need to develop brokering strategies that will not only facilitate links between stakeholders but will also couple healthcare professionals in order to deliver outcomes. For example, it is necessary to adopt ~~"soft"~~'soft' strategies that will inspire people and engage grass root GPs but might also need to provide ~~"hard"~~'hard' incentives that will motivate people to commit to quality service and cost reduction. We suggest that these skills are important to reemphasise given the historical commissioning focus on planning, monitoring and assessing.

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CCGs need to encourage knowledge exchange and collaboration

Perhaps one of the most significant leadership practices of CCGs as innovation hubs should be to manage the flow of information and knowledge sharing across their clinical commissioning network. Such coordination of knowledge mobility can allow to direct efforts that will lead to strategic collaborations and synergies between commissioners, healthcare providers, and other key parties such as local organisations and authorities. Expansive and open networks allow for more information to travel from 'distant' members through knowledge

brokers who will introduce new ideas. In turn, good interconnectedness and high-density at the CCG board level can help to operationalise these ideas and translate them to actual services. In relation to frontline GPs in particular, clinical CCG leaders are in a position to relate to them at a collegial level, relating to their priorities and practice dynamics; replacing this relational focus with a mind-set that emphasises tasks to be accomplished will more likely stymie engagement and innovation instead of helping.

Efforts need to be aligned with patient needs and medical developments

In addition, GPs as network leaders ~~will~~must not only ~~need to~~ generally encourage more ~~the~~ involvement of PCTs, local authorities and providers in designing ~~new~~ cost-effective and ~~better~~ quality pathways, but will also need to streamline the patients' feedback and find a consistent and structured way to capture and take into account their views. Both these ~~hard~~'hard' and ~~soft~~'soft' strategies ~~or~~for network leadership ~~processes~~ are imperative in facilitating the development of new clinical practices and novel commissioning ideas. CCGs are in a good position to implement these as they are trying to establish a new organisational form and leadership style that will fit the current culture which does not adhere to directive leadership but encourages a delegative ~~direction~~approach.

Further, external ~~innovation~~network coherence goes beyond the patients' perspective. It is also necessary to follow medical and research developments, technological advancements, as well as international trends, and to benchmark these with the ~~practises~~practices and clinical decisions ~~make~~made locally. To manage coherence at this external level, leaders need to draw knowledge in through clinical, research and public health networks in a systematic ~~way~~way[7].

Develop incentives and accountability for network stability

Network stability is imperative in any organisational context, so a critical ~~orchestration~~leadership task for ~~hub~~network leaders is to promote it at any ~~cost~~[11]cost[19]. The risk to unstable innovation networks is inherent due to their flexible~~, un-~~ less hierarchical nature, which is necessary in order to encourage innovative activities based on *ad hoc* collaborations between different parties in the healthcare ecosystem. In that sense there is a trade-off between ordered relationships (that are forced from top down) and loosely coupled interactions that emerge from the personal incentives of the collaborators. However, excessive erosion of network relationships can lead to ~~unstable states~~a state of instability thereby reducing the value and innovation output of the ~~network~~[19]network[28].

In this context, clear financial incentives and transparent accountability mechanisms have the ability to prevent discouragement and distrust in the network. GP leads and the concerned polity need to keep network members motivated in order to engage with the commissioning activities and be encouraged to share their ideas and knowledge and establish collaborations with other parties. In addition, some degree of accountability that will be open, transparent and comprehensible to everyone needs to be in place to manage risk and sharing of the rewards and value. These activities will motivate members and will sustain their efforts while contributing towards the stability of the overall commissioning network.

Box ~~2~~4: Summary of emerging key policy recommendations

Overall network leadership strategy

- GPs need to realise their new role not only as ~~physicians~~clinicians but also as coordinators that will lead ~~and coach the activity of~~ the healthcare network in both a delegative and directive manner.
- Build ~~on a comprehensible~~a strategy around clinical commissioning that will include not only ~~the involvement of~~developing collaborative relationships and knowledge sharing with PCTs and local authorities but also the inputs of patients and the public (healthcare ecosystem).
- ~~Develop "soft"~~The CCG board should develop 'soft' strategies that will inspire ~~people~~ and engage front line GPs at the grass ~~root GPs~~roots level and provide ~~"hard"~~'hard' incentives that will motivate people to commit to quality service and cost-effectiveness. ~~A~~Implementation of such a strategy should include a system of measurement and accountability ~~might be necessary to implement in order to ensure the above~~.
- Integration of primary and secondary healthcare activities ~~is important in order to deliver~~which delivers not only a more cost-effective but ~~also~~crucially ensures a patient-centric ~~clinical~~pathway service.

Managing knowledge mobility

- Identify well-connected individuals who maintain extensive advice and knowledge-sharing networks. Because of their connectedness, knowledge brokers in the network are expected to bring novel information to the group as they have access to a lot of people outside their cluster, potentially allowing for better commissioning decisions.

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- Considering the importance of the brokers (who may be clinicians, practice managers or PCT directors) in circulating knowledge, it may be justified to develop personal coaching and training sessions to improve individual brokering performance ~~as well as that of the group~~.
- Developing digital networks and technological infrastructure can play a key role in disseminating best clinical practice and valuable knowledge by creating large integrated information depositories where commissioners will be able to access the necessary intelligence and evidence to support their work.
- Apart from knowledge circulation that encourages healthcare service innovation, GPs will also need to translate and integrate this knowledge into their commissioning practice.

Managing ~~innovation~~network coherence

- CCGs need to streamline the patients' feedback and find a consistent and structured way to capture and take into account their views.
- Following medical and research developments, technological advancements, as well as international trends, will help benchmark and increase the quality of clinical decisions make locally.

Managing network stability

- Establish a ~~stable~~transparent clinical commissioning vision and values that will promote trust and collaboration among GPs and other healthcare professionals. This will also ~~promote~~ indirectly promote knowledge mobility and ~~innovation~~network coherence ~~in the network~~.
- Health policy and leaders need to provide clear incentives as well as evident accountability mechanisms to establish trust and prevent discouragement.

Strengths and limitations of the study

~~The relatively small number of observations has always been an issue when it comes to qualitative evidence and analysis of interview data. This limitation makes researchers cautious about generalising such findings. The CCGs we studied were part of a particular geographic region (East of England), however, most of the issues and opinions mentioned in the study have been widely reported everywhere (e.g. national commissioning conferences, opinion pieces, King's Fund reports, etc.). In addition, the richness of our data were~~Our ~~subject to time constraints of participants and their willingness to share information about their activities often deemed as confidential. Despite of the variability (in seniority and position) of the people we interviewed the same themes emerged and common issues were identified between the different CCGs.~~

~~Set against these limitations, our~~ study provides in-depth accounts of the changes in commissioning practice and the emerging role of GPs as healthcare network leaders. Within that we use innovation network theory in order to identify key network leadership practices that could result to healthcare innovation. Our multi-method approach allowed us to validate our findings and ~~ensure there was no~~minimise bias due to limitations of specific methods. In addition to interviews, observations of CCG board meetings and extensive study of documentation gave us a fuller perspective on the doings of GPs and their efforts to ~~orchestrate clinical commissioning activities. Network analysis also showed a different perspective of knowledge sharing and collaboration among healthcare professionals and provided evidence on the influence of GPs and their ability to coordinate commissioning tasks.~~coordinate clinical commissioning activities.

The relatively small number of observations and the ever-changing environment of the health sector at the time of the study (mainly due to the political uncertainty) limits the generalizability of qualitative analyses, thus our study seeks to develop rather than test, exploratory concepts. The CCGs we studied were part of a particular geographic region (East of England) and were at a particular point in time of an on-going and dynamic reform; however, most of the issues and opinions mentioned in the study have been widely reported everywhere (e.g. national commissioning conferences, opinion pieces, King's Fund and Nuffield Trust reports, etc.). In addition, the richness of our data was subject to time constraints of participants and their willingness to share information about their activities often deemed as confidential. Despite of the variability (in seniority and position) of the people we interviewed the same themes emerged and common issues were identified between the different CCGs.

~~Conclusion~~Conclusions

In conclusion, clinical commissioning leaders can play a critical role in the coordination of healthcare innovation networks through a number of ~~"soft" and "hard" orchestration~~ processes which include managing knowledge flows, managing ~~innovation~~network coherence, and managing network stability. ~~Although not all GPs acknowledge the potential of these processes, we suggest this~~Building relational capabilities in a delegative and directed manner is an important leadership issue for CCGs ~~which are in the process of~~in establishing and expanding their networks with local health administration, NHS providers, and other ~~local organizations in order to develop their commissioning capacity~~stakholders. To achieve that they will need to assign and exploit

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knowledge brokering roles and leverage good communication between their board members and ~~peopleothers~~ outside their board in order to bring new ideas into the group, facilitate new synergies and alliances, and allow for projects that take advantage of the available resources. In addition, they will need to identify and assess pre-existing relationships, which have institutional influences on them (e.g. PBC groups), that they can capitalize upon while incorporating the views of local stakeholders as well as patient and public voice in a systematic way. Finally, technology can play a key role in disseminating practices and knowledge by creating integrated information depositories where commissioners will be able to access the necessary intelligence and evidence to support their work.

~~For the above to take place the dialogue between clinical leaders, policy makers, and local authorities, needs to continue (or be re-established) in order to support innovation as well as sustain network stability and ensure innovation coherence at regional and CCG levels. Finally, technology can play a key role in disseminating practices and knowledge by creating large information depositories – a critical resource in most industries – where commissioners will be able to access the necessary intelligence and evidence to support their work. In that process integration of databases should be one of the primary targets. Good commissioning will need to go beyond macro data analysis (aggregate population measures) and incorporate insights developed through multi stakeholder perspectives and micro (practice level) data and events that will emerge from bottom-up.~~

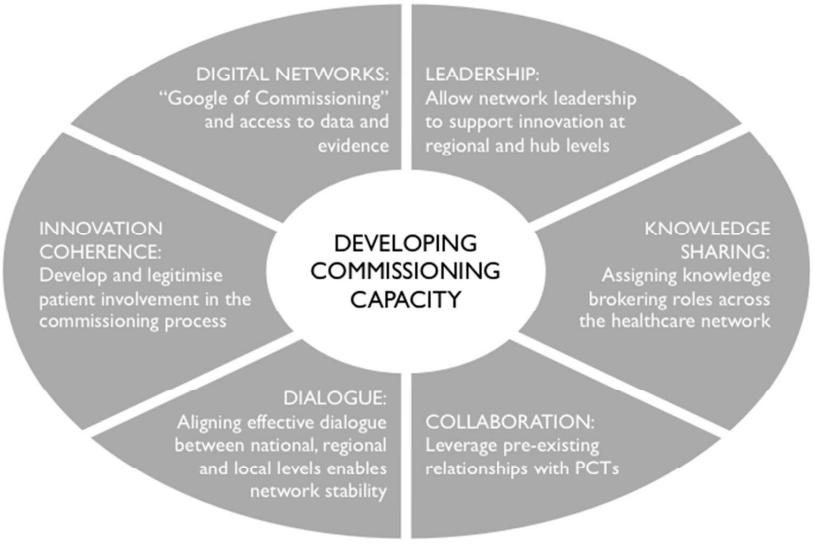

Figure 5. Summary of main implications for developing commissioning capacity at the CCG level.

What is already known on this topic

- Clinical commissioning is an important element of modern medical practice and has the potential to have a profound impact on patients and the public
- The responsibility of GP commissioners is understood to limit itself to planning, purchasing, and monitoring of the commissioned healthcare services thus, leaving their organizational and networking practices largely unexplored

What this study adds

- Clinical commissioning is a complex social practice that can be viewed as the orchestrating activity of large innovation networks through a set of coordination processes
- In this context encouraging knowledge sharing and collaboration between clinicians and other healthcare professionals are key tasks of clinical leadership and play a significant role in order to ensure innovation coherence and stability of the network
- Lack of clear political stimulus discourages lead general practitioners and boosts uncertainty which can hinder the activities of the CCGs
- Clinical leaders need to focus on enabling value to be add to services and systems locally as well as group-wide and ensure a patient-centered healthcare service integration
- Good commissioning should go beyond macro data analysis (aggregate population measures) and

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incorporate insights developed through multi stakeholder perspectives and micro (practice-level) data and events

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Footnotes and acknowledgements

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