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Sharing leadership for diffusion of innovation in professionalized settings

Graeme Currie and Dimitrios Spyridonidis

Abstract

Innovation often flourishes in organizational pockets, but then fails to diffuse more widely. This represents a particular global challenge in healthcare where demands of an ageing population with increasing long-term conditions need to be addressed in the face of financial constraints. Shared leadership to support diffusion of innovation may offer a panacea for the challenge. Our study shows how changing configurations of shared leadership support diffusion and adaption of innovation. Managers remain important actors for the mandate and resourcing of innovation but, over time, powerful professionals, specifically doctors come to the fore, to engage their peers and influence resource allocation. Nurses complement doctors' leadership efforts around engagement of frontline professionals and in adapting innovation to local context. Significant contingencies in shaping shared leadership for diffusion and adaption of innovation are: organizational financial performance; whether nurses enact hybrid leadership roles; whether organization is hierarchical or collaborative. Theoretically, by focusing upon leadership configuration in the process of diffusion of innovation, our study renders visible practices of shared leadership, interdependency of hierarchical managerial or professional influence, its effect upon innovation diffusion and contingencies that underpin this.

Introduction

Innovation management research increasingly emphasizes interest in diffusing promising innovation across national, regional, and organizational boundaries, however efforts to promote and diffuse innovation across such boundaries often fail (Delre et al., 2010). Leadership is deemed crucial for diffusion of innovation, we need to better understand its dynamics (Battilana et al., 2010; De Vries Bekkers and Tummers, 2016; Fitzgerald et al., 2002), specifically as it affects adaption of innovation as it diffuses (Hartley and Benington, 2010; Rosing, Frese and Bausch, 2011).

First, the dynamics of leadership around diffusion of innovation across time represents a research gap, requiring a more longitudinal research design (Chreim 2015; Gronn, 2015; White, Currie and Lockett, 2016). Second, addressing a need for more contextualized understanding of leadership dynamics (Liden and Antonakis, 2009), we lack insight into the dynamics of leadership for diffusion of innovation in professionalized contexts, notably healthcare (Fitzgerald et al., 2002, 2013; Greenhalgh et al., 2004; Hartley and Benington, 2010; Martin et al., 2013). On the one hand, in professionalized contexts, diffusion of innovation requires shared leadership, "a dynamic, interactive influence among individuals and groups for which the objective is to lead one another to the achievement of group or organizational goals or both" (Pearce and Conger, 2003:1). On the other hand, professionalized contexts, such as healthcare, are characterized by managerial and professional hierarchy that is likely to concentrate rather than spread leadership (Currie and Lockett, 2011; Denis, Langley and Sergi, 2012). Such a setting is likely to illuminate dynamics of interaction between shared and hierarchical leadership (Holm and Fairhurst, 2018) as innovation diffuses and adapts to context.

Empirically, our study examines leadership for diffusion of twelve innovations in a large city healthcare system, all of which encompass a new way of delivering a service (commonly

an attempt to move part of a service out of the hospital into community settings) and new organizational processes underpinning this (such as new roles developed to offer the service in community settings). That is, the innovations we examine combine service innovation and process innovation (De Vries, Bekkers and Tummers, 2016; Hartley, 2005). We conceive innovation as processual, encompassing a temporal element through which new practices, processes, or structures are introduced, sustained, and scaled up by key actors to improve the organization's performance (Van de Ven, 1986; Van de Ven and Poole, 2000). Empirically within our study, a central management team within a citywide R&D organization provide resource and other support to encourage a pilot innovation within one hospital and related healthcare providers focused upon a range of long-term health conditions for which mortality rates are increasing (such as respiratory disease), which they then seek to diffuse to other healthcare providers across the city, and then nationally in some cases. In initiating innovation and its diffusion, R&D managers interact with two main professional groups (doctors and nurses) and their respective clinical leaders. Our study focuses on leadership interactions of managers, doctors and nurses, encompassing 210 interviews and 56 hours observation over a three year period as twelve innovations diffuse.

Our manuscript is structured as follows. First, we discuss challenges of innovation diffusion in healthcare settings including likely adaption of the original innovation, and shared leadership necessary to support this (Denis, Langley and Sergi, 2012) . While we highlight some highly relevant studies (Fitzgerald et al., 2002, 2013; Greenhalgh et al., 2004; Martin et al., 2013), we note limited insight into leadership dynamics over time and practices enacted by leaders to support diffusion and adaption of innovation in healthcare settings. Second, we introduce the context for our study, our data gathering techniques and data analysis. Third, we present our empirical analysis of leadership practices for innovation diffusion across three groups of actors -- managers (without a clinical background), higher

status professionals (doctors), lower status professionals (nurses) – structured by three phases of innovation diffusion and adaption. Having summarized comparative cases, we focus upon our success case (Chronic Obstructive Pulmonary Disorder or COPD), following which we then derive comparative case analysis to draw out the contextual dimensions that underpin shared leadership for diffusion of innovation. In our conclusion, we summarize our empirical analysis, highlight our theoretical contribution, practical implications, and a need for further research.

Leadership for diffusion of innovation in healthcare

There is longstanding recognition that diffusion of innovation is non-linear and complex (Robertson, Swan and Newell, 1996; Van de Ven et al., 1999; Wolfe, 1994). Innovation diffuses through social networks, and is adapted by actors as it does so, with professionals playing a key role, not least in healthcare settings. On the one hand, healthcare managers may want to ensure that diffusion of innovation remains faithful to its evidence-based origins, which determine its efficacy. On the other hand, as the original innovation diffuses it needs to 'fit' the recipient organizational context to ensure its longer-term sustainability (Mathers, Taylor and Parry, 2014). As innovation diffuses to other healthcare organizations, it needs to align with pre-existing organizational routines and frontline professional staff must be engaged in its implementation (Martin et al., 2013; Rodriguez et al., 2016). Professionals that adopt innovation are not passive recipients, but active participants in the alteration and customization of innovation as it moves from one organizational context to another (Ferlie et al., 2005; Fitzgerald et al., 2002; Kimberly and Evanisko, 1981). In a healthcare setting both managers and different professionals participate in and enact leadership focused upon diffusion and adaption of innovation.

Studies of innovation, during its early stages, privilege managers as initiators of innovation through creation of an organizational climate to support innovation (Mumford, 2000; Mumford et al., 2002). Managers develop shared awareness of organizational policies, practices, and procedures for innovation (Anderson and West, 1998), enable innovative endeavour by identifying and defining problems worth pursuing, create a context that encourages multiple actors to work together in generating viable ideas, and manage the context of idea development and its implementation, to ensure that viable ideas are likely to be adopted in the marketplace (Jung et al., 2003; McNally, Durmusoglu and Calantone, 2013; Smith and Tushman, 2005); promote organizations' innovation performance by inspiring and rewarding the open exchange of ideas, and reinforcing curiosity, risk taking and trying new things (Mumford, 2000; Slater, Mohr and Sengupta, 2014), mobilize evidence into practice (Fischer et al., 2016). However, such advocacy for managerial leadership underplays the role others may play in innovation, such as professionals, particularly during its diffusion when more pluralist leadership is necessary (Empson and Langley, 2015; Fitzgerald et al., 2013; Greenhalgh et al., 2004).

There are a plethora of terms that capture pluralist leadership -- 'super leadership' (Sims and Lorenzi, 1992), 'distributed leadership' (Gronn, 2002) and 'collective leadership' (Denis et al., 2001). We suggest all these terms lie within the broad confines of 'shared leadership' (Pearce and Conger, 2003), within which strategic leadership roles are shared, with each member of a 'leadership constellation' playing a distinct role and all members working together harmoniously. Taking account of the critique of the limit upon the potential for any individual driving innovation through a complex organization, shared leadership assembles the necessary variety of skills, expertise, and sources of influence and legitimacy (Denis et al., 2012).

Shared leadership, first, re-envisions the 'who' of leadership, with leadership representing

a set of practices that can and should be enacted by actors at all levels, rather than a set of personal characteristics and attributes located in senior level managers. Second, it re-envisions the 'what' of leadership through its emphasis upon social interactions around leadership influence; i.e. shared leadership is a group phenomenon with followers playing a role in influencing and creating leadership. Finally, shared leadership re-envisions the 'how' of leadership by focusing on the skills and abilities required to create conditions in which collective learning can occur (Pearce and Conger, 2003).

There is a particular need for shared leadership in professionalized settings such as healthcare (Currie and Lockett 2011, Denis et al., 2012), where professional (rather than managerial) power and leadership influence is prevalent (White, Currie and Lockett, 2014, 2016), specifically to drive innovation (Empson and Langley, 2015; Fitzgerald et al., 2013; Greenhalgh et al., 2004). Participation of clinical leaders, both in formal positions and exerting informal influence, alongside managers, is essential otherwise innovation does not diffuse outwards to practice (Denis, Lamothe and Langley, 2006). In such settings, leadership influence may be derived from different and perhaps conflicting resources; i.e. professional status and managerial accountability (Currie and Lockett, 2011). As a consequence, shared leadership is likely to interact with hierarchical leadership, with different actors enacting different leadership roles and practices to diffuse innovation (Holm and Fairhurst, forthcoming).

Commonly, in healthcare, an executive manager may enact strategic leadership to initiate innovation with a focus upon creating a strategy for innovation. At the same time, another actor (e.g. a middle level leader with a professional background) may act as a linking pin between the strategic apex of the organisation and frontline professionals (Currie and Procter, 2005; Burgess and Currie, 2013; Spyridonidis and Currie, 2016) to ensure professionals buy into the executive leader's vision and strategic objectives as innovation develops. Finally,

other actors that have stronger affiliation with professionals on the ground, may facilitate the implementation process by acting as champions of change (Dopson et al., 2002). In healthcare settings, opinion leaders or champions drawn from professional ranks, through leadership influence gleaned from their social ties, political skills, professional and personal authority and credibility, have a particular influence upon peers to diffuse innovation (Fitzgerald et al., 2002; Greenhalgh et al, 2004; Hartley and Benington, 2010; Locock et al., 2001). Innovation thus emerges as a result of shared leadership, linked to hierarchical managerial or professional influence, that must be performed in a particular sequence or in parallel (Spillane, 2005). However, empirical examples of such shared leadership effect are relatively absent. To re-ietrate our research concern, our study seeks to illuminate dynamics of shared leadership as innovation diffuses and adapts to context.

Methods

The empirical setting

Our empirical study is set in the English National Health Service (NHS), which represents a propitious empirical site for study of leadership for innovation diffusion from which more generalizable insight can be gleaned (Buchanan et al., 2007; Fitzgerald et al., 2013). In the English NHS as with global health systems generally, innovation diffusion has proved particularly challenging (Chaudoir, Duggan and Barr, 2013; Damschroder et al., 2009; De Vries, Bekkers and Tummers, 2016; Greenhalgh et al., 2004; Herzlinger, 2006). In response to this, leadership has been offered as a panacea (Greenhalgh et al., 2004), with suggestions that leadership should be shared amongst professional and managerial actors (Martin et al., 2013). Healthcare systems globally are characterized by fluid and equivocal authority and subtle power (Denis et al., 1996; Currie and Suhomlinova, 2006), with a myriad of professions arranged in a hierarchy of status (Abbott, 1988). The English NHS is

historically dominated by a powerful cadre of doctors, who control their performance by virtue of their specialist training, expertise and knowledge, to whom others, such as nurses and managers are subordinated (Currie and Procter 2005). Doctors' leadership influence tends towards a more collegiate model, but one within which hierarchical leadership influence may be evident by senior doctors that represent 'first amongst equals' (Currie and Croft, 2015). Nurses represent the largest professional group moving into operational management positions in healthcare organizations (Buchanan et al., 2013). Nurses enact leadership influence, but often only over their nursing peers, and in a more explicitly hierarchical way (Currie, Burgess & Hayton, 2015). They are commonly subordinated to doctors' demands and so struggle to enact leadership influence over doctors (Currie and Lockett, 2011). Meanwhile managers attempt to exert leadership influence over doctors and nurses through a range of mechanisms, such as organizational strategy, business plans, human resource management, and performance management systems (Ferlie et al., 1996).

The specific empirical setting for this research is a city wide R&D organization (Metro Healthcare Innovation [MHI]) within the English NHS that received five years' government funding to implement a programme that initiated and diffused promising innovation into everyday practice (Cooksey, 2006). MHI was formally led by a leadership team, consisting of executive managers responsible for setting its strategic vision. The executive management leadership team put in place new structures, people and initiatives to encourage innovation projects oriented towards improving patient outcomes. 12 innovation projects addressing specific clinical problems were provided with funding and other support for 18 months to build innovation capacity and implement a local project. Following which, the aim was for successful local innovation to be diffused within the same city and potentially more widely to other healthcare economies over the next three and a half years. Each project was led by a nominated senior doctor and team membership was multidisciplinary, including other

doctors, nurses (commonly with managerial responsibilities), and where relevant, other clinicians, such as pharmacists, psychologists, therapists. We gathered data from all 12 innovation projects (and all of which helped inform our emerging analysis), however in our empirical presentation, we particularly focus in-depth upon one of these, the Chronic Obstructive Pulmonary Disease (COPD) project. The COPD project sustained over the five years of our research programme in a way particularly illuminating of our research concern about dynamics of leadership and its effect upon innovation diffusion and adaption. In summary, the COPD project diffused from its originating site to 15 other healthcare providers in the city and beyond. While it was intended to diffuse to 15 healthcare providers in the original plan, the expectation was the project would diffuse with fidelity to its original evidence base about the most effective care pathway and the most effective workforce reconfiguration. However, the intervention was adapted as it diffused, with doctors and nurses enacting leadership influence towards adaption. We detail these dynamics further below.

Research design

Examining dynamics of shared leadership often requires a process lens (Langley et al., 2013), with a temporal orientation towards understanding sequentialized moves (Fairhurst, 2017; Fairhurst and Uhl-Bein, 2012). To 'zoom in' on sequentialized moves related to the dynamics of leadership in innovation diffusion, we must look to the practice of leadership rather than focus upon traits or behaviours of particular individuals. A leadership-as-practice view aligns with a focus upon shared leadership since it recognizes leadership is accomplished, emerges and unfolds in a co-ordinated effort by many participants through their day-to-day experiences (Raelin, 2016). To generate a process sensitive and sequentialized understanding of leadership dynamics around innovation diffusion, we

adopted a longitudinal case-study design, initiating fieldwork in year two of the innovation programme by MHI and continuing fieldwork for three years, with qualitative methods and an interpretive approach to allow issues of importance to emerge from the stories that key stakeholders -- executive managers, doctors, nurses, other professionals -- told us in across our 12 cases.

Data collection

We examined 12 comparative cases, for which the data collection techniques are summarized in Table 1. Data collection took place through face-to-face interviews with key informants, complemented by observations of strategic management meetings and evaluation of documentary evidence, such as meeting minutes (See Table One). In total, we conducted 210 semi-structured interviews. We observed 56 hours of strategic meetings and educational workshops. These events involved executive managers, doctors, nurses, and other professionals. Periods of observation lasted between 1-8 hours at any time and included informal conversations with participants we were observing to clarify aspects of key leadership practices. Notes were taken during or immediately following such observations or conversations as appropriate. These fieldwork notes were encompassed within a case study database, alongside interview transcripts and documentation, and subjected to analysis as detailed below. All managers of the leadership team (12) were interviewed four times across the lifespan of the research (48 interviews). 40 doctors (some of whom were formally appointed as medical leaders, some on the frontline who emerged as medical leaders), and 27 nurses (in a supporting role for doctors during innovation diffusion -- see empirical data below) were interviewed at least twice over the lifespan of the research, once during the initial 18 month funding period, and up to twice again after this period as attempts at scale up ensued (152 interviews). A further 10 interviews were conducted with other professionals,

where they enacted leadership roles, such as pharmacists involved in the medications management project. The latter were interviewed once. All interviews were fully transcribed.

Insert Table 1 About Here

Our empirical findings regarding the dynamics of shared leadership for diffusion of innovation across the 12 comparative cases are set out in Table Two. These provide the springboard for in-depth presentation of a single empirical case of the COPD (Chronic Obstructive Pulmonary Disorder) project within the 12 comparative cases, across which shared leadership for diffusion of innovation was the most extensive (in terms of the number of healthcare providers across which it diffused). As set out in Table 1, our analysis of the COPD project is derived from 32 face-to-face interviews with 19 key informants (in addition to those with MHI managers), 12 hours of workshop observations, and collection of documentation across three time periods in the COPD project: year 2 (12 interviews); year 3 (10 interviews), and year 4 (10 interviews) of our research programme relating to leadership influence over the diffusion and adaption of the COPD innovation. Following our empirical presentation of the 'success' case of COPD, we derive comparative case analysis to identify contingencies that shape shared leadership for diffusion of innovation in our final empirical section.

Data analysis

Our detailed analysis of the longitudinal data set was developed through a process explanation that was time-sensitive through a temporal bracketing strategy, anchoring the

data into three successive phases, which we identified on the basis of changes in the dynamics of shared leadership in the diffusion of innovation (Langley, 1999; Langley, Smallman, Tsoukas & Van de Ven, 2013). The unit of analysis was the leadership configuration or patterns of relationships across time (Gronn, 2009), and we track the dynamic of leadership configurations for innovation diffusion.

We followed an abductive logic. Abductive reasoning is characterized by constant dialogue between theory and empirical findings, which involves an analytical strategy based on continuous formulation and iteration of questions and answers from literature to both focus and explain emerging findings (Alvesson & Kärreman, 2007; Locke, Golden-Biddle & Feldman, 2008; Mantere & Ketokivi, 2013). In exploring the dynamics of shared leadership in diffusing innovation across phases, we observed the significance of shared leadership and the emergence of three key actors -- executive managers, doctors and nurses -- who enacted discrete but complementary leadership roles that changed over time.

Data analysis progressed in three stages, during which the level of analytical generalization was raised step by step (Yin, 2013). In the first stage, we examined each of the 12 cases separately. After transcribing interviews, each of the two authors read the transcripts in conjunction with the other data to identify: leadership practices of key leadership actors and its timing in relation to diffusion and adaption of innovation. After which we discussed first-order coding (as we did with second and third order coding), particularly where there were differences in analysis, and achieved agreement about first-order codes. At the second stage, we moved to more theoretical codes and conducted our analysis in a cross-case manner. We elaborated theoretical concepts and their relationships, using a constant comparative method (Glaser & Strauss, 1967; Eisenhardt, 1989), contrasting findings across the 12 cases, to arrive at out final theorical interpretation as presented in our next section, empirical presentation.

Empirical presentation

Cross-case analysis

We summarize leadership influence enacted by three sets of actors (managers, doctors, nurses) across all 12 comparative over time periods in Table 2 below across three years of analysis. We can delineate distinctive roles and practices for executive managers, doctors and nurses as they shared leadership to diffuse and adapt innovation.

Executive managers created a supportive climate for innovation through their initial mandate and continuing resourcing for innovation and they supported capacity of professional staff to engage in innovation through an educational programme. They could not per se incentivize engagement of professionals in innovation since they were located in an R&D organization, which was an overarching structure, but not a direct employer for staff, for the healthcare providers which their innovation programme impacted.

Doctors facilitated diffusion of innovation outwards from its originating hospital to other healthcare providers in the city through actively promoting innovation to commissioners and so influencing resource allocation, presenting evidence-based innovation to their peers within professional networks as well as the educational programme, with their adopting medical peers then adapting the innovation as it spread.

Nurses' leadership role was one that followed that of doctors, and they also adapted the innovation to fit with local context and organizational routines as it diffused, and in so doing engaged frontline professionals in its implementation.

Across the 12 cases we thus see leadership is shared across three groups of actors: executive managers, doctors, and nurses, with each playing a distinctive role in the diffusion of innovation. We detail the dynamics of shared leadership across these three groups and its effect upon diffusion and adaption of innovation through focusing upon the in-depth case of the COPD project, which of all the 12 cases was the innovation that diffused most

extensively. Between year 2 of our study and year 4 of our study the bundle of care

constituting the COPD innovation diffused, albeit with adaption as detailed below, across 15

healthcare providers in the city and beyond that our empirical study focuses upon.

Insert Table 2 About Here

In-depth case: Chronic obstructive pulmonary disorder

COPD leadership dynamics in Phase 1 (years 1–2)   Examining the temporal

dimension of leadership influence suggests executive managers' leadership influence is

particularly prominent in the first phase of innovation diffusion (Year 2), with doctors and

nurses relatively absent. In this early phase, executive managers focused first upon mandating

diffusion of innovation, with their efforts aimed less at clinicians and more at senior

executives within potential adopting organizations.

> The key element is working with key stakeholders particularly those chief
>
> executives who aren't buying into innovation at the moment, getting them
>
> up to speed with local innovations across the patch, communicating what we
>
> can do for them (MHI Manager 4).

Second, executive managers enhanced capability of those professionals that aimed to

drive innovation through the establishment of an educational programme.

> Our overall aim is to support the implementation of tools that can support innovation through project management development, clinical leadership, improved performance and how you would go about introducing new knowledge into practice (MHI Manager 12).

Finally, executive managers garnered resource to support innovation diffusion, with the focus of their attention upon commissioners (other managers) that planned and funded healthcare in the city.

> And we like being in a position… we need to look at the funding for that. Actually, we can put some… pump priming money into that, which we couldn't do last year. Unfortunately we don't have enough money in the budget to do it, so we have to get buy-in from our commissioners (MHI Manager 3).

Doctors complemented the leadership efforts of executive managers through working with them to promote local innovation to commissioners to shape prospects for recurrent funding as it diffused in later years.

> As a result of getting the money from MHI, the other thing that's been absolutely spectacular is we've been able to go along to the commissioners and say, here you are, this is the package, and we've got funding to make this happen. In the short term, you have got no cost implications, it's here. This could be the template for lots of other innovation attempts" (Senior Doctor 9, COPD).

Nurses were absent at this stage from the leadership configuration, however happy to accept doctors' leadership in this matter, as a consequence of the latters' position in professional hierarchy and their influence over other potential adopters.

> Once you get some passionate champions that they go to places and start talking about the great work that they've been doing, that's where it really starts to kind of take off because you get other people saying well, actually I want to be doing that in my place too. But you do need, relatively high up respected doctors saying that (Specialist Nurse 1, COPD).

As can be seen above, in this first phase, shared leadership was relatively parsimonious. As the diffusion of innovation gathered pace, shared leadership became more extensive.

COPD leadership in Phase 2 (Year 3)   In phase two, those who diffused innovation required legitimacy, thus powerful doctors came to the fore. They particularly acted as champions to promote innovation to others, specifically their medical peers, through the educational programme set up by executive managers.

> I walked into the workshop meeting and they [medical leads of the COPD innovation] are advising us [other potential adopters] about how we can implement the innovation and asking us how can they help (Senior Doctor 3, COPD).

Doctors promoted innovation to others, and with greater force in phase two, through building networks and creating momentum for diffusion amongst others in their professional

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group.

> It has to do with developing networks of people who are willing to be involved across [name of the region], and to offer a degree of peer support to these people. The idea is that over the next few years we encompass people from all backgrounds, and enable them to be involved more in some of our research and development activities. Through doing this, our aim is to create a supportive network across [name of region], to really deliver this. I mean, you can only do so much on your own (Senior Doctor 5, COPD).

In turn, the new adopting doctors in turn adapted the innovation as it diffused.

> Our high-level strategy was to be responsive and in terms of the detail of what we diffused, we responded to the challenges we faced in our local area, what was likely to work or not, and we adapted the original model considerably to fit the local situation (Senior Doctor 1, COPD).

In this phase more charismatic leadership was evident from doctors.

> He was seen as the 'first amongst equals' in our ranks. Whenever I come out of a meeting with [name of the medical leader] I usually feel very energised and excited and as though anything's possible because he has that kind of leadership personality" (Senior Doctor 2, COPD).

Reflecting the specificities of a professionalized context, managers behaved "diplomatically" and stepped back a little from their leadership role, albeit they continued garnering resource across the course of our fieldwork.

> From the commissioning perspective, there are so many changes happening across the sectors? Is it this, that, and the other? Who do we need to influence changes every week, so it's just keeping up with that. And then it's about cultivating those relationships. The doctors rely on us for this (MHI Manager 3).

Managers ceded leadership influence to champions drawn from the ranks of doctors.

> Through the leadership development programme and other interventions we [managers] initiated, we're generating new knowledge about how you implement innovation. Although you may have a great idea that works in one setting, how do you implement it across a piece? We are contributing to that by giving staff the time to focus on innovation, to become skilled up in leadership of innovation with a practical project and to sustain and roll out innovation across the piece, drawing in champions for innovation from junior, as well as senior, doctors. We work closely with the doctors to ensure innovation spread (MHI Manager 10).

Doctors leading the diffusion of innovation recognized the importance of sharing leadership with executive managers.

If you've got a senior executive lead there that is supporting you that can make the difference for you and your project. And because they were there and supported it, it made a huge difference in how everybody else looked at it. It made it more likely that your innovation spreads (Senior Doctor 2, COPD).

Meanwhile, nurses both ensured the innovation aligned with organizational routines in the adopting hospital.

They are all in a different organizational context and the COPD care processes start in a different state and need to reach different outcomes. That requires some quite significant innovation adjustment in order to be suitable to the context, so, yes, that has been my role (Specialist Nurse 2, COPD).

And worked with doctors to adapt the innovation as they did so.

It's a tightrope between what producers of the new service model thinks needs to be done, what the doctors think needs to be done and what national policies encourage. We do this bit, aligning local efforts and national mandates (Specialist Nurse 3, COPD).

In summary, at the end of phase two, we see leadership is shared more widely from managers to doctors and nurses. This was a trend that continued in phase 3.

COPD leadership in Phase 3 (Year 4)   In phase 3, doctors' leadership efforts focused upon building networks through which evidence and best practice were presented:

> I'm rather fond of the idea of boundary spanning, that if you want two different worlds to speak to each other you need someone who is fluent in both languages and got their own kind of microclimate around them of followers, and so on. So, I hunt around for people who show those sensitivities to be able to speak more than one language, who are natural networkers, and I pull them in (Senior Doctor 3, COPD).

Following the development of medical networks to diffuse evidence and best practice around the COPD innovation, doctors other than those that initiated the innovation were further drawn into enacting leadership influence. Such leadership influence orientated towards adaption of the original innovation when moving the innovation across clinical areas; for example, the innovative approach in COPD was one picked up by doctors concerned with heart failure.

> We conducted another project in heart failure and we arranged for [names of heart failure consultants] to come and meet with our consultants. Both projects were looking into the bundle of care relating to the pathway for patient discharge so the aim was to see whether the COPD bundle could be adapted to treat heart failure patients in the same way. Their lead consultants adapted our bundle of care, and led its spread into heart failure (Senior Doctor 5, COPD)

Leadership influence by nurses orientated towards adaption was also evident when the COPD innovation crossed healthcare settings.

> We crossed into community care, and engaged a large community care organization. So I'm dealing with community teams, who may not always understand the process of an acute hospital, and their processes are very different. Their priorities are very different. So, the community care nurses have worked to adapt our innovation to fit with their practices, a process in which our original bundle of care has changed four times, The nurses explain to their frontline colleagues as they engage them in the change, 'we're adding this because, we're changing this because, we're taking this out because' (Senior Doctor 11, COPD).

Meanwhile, managers' leadership influence in this phase of innovation diffusion orientated even more towards a diplomat stance, as they ceded leadership influence to doctors.

> We cede responsibility for innovation to medical leaders, but provide support for their projects, specifically through supporting leadership development for innovation. The result is sharing of leadership extending to many, beyond senior doctors with junior doctors now emerging as champions for innovation (MHI Manager 7).

At the same time, managers sought to assure resources to sustain and diffuse the COPD innovation.

> Engaging our commissioners is increasingly important in the current financial environment. We have been using the strap-line 'more health for the money' to persuade them to release budget for the COPD service. We bring together other relevant agencies and partners that can help us assure continued resourcing (MHI Manager 9).

Managers were reliant upon doctors to support their leadership efforts to influence commissioners to release resource.

> The money from MHI initiated the innovation, but to sustain and diffuse it requires recurrent funding from commissioners, whom we have approached to say, 'here you are, this is the package, we have made it happen. In the short term, you have got no cost implications, it's here. This could be the template for lots of other innovation attempts'. Following which, they supported the roll out of our COPD intervention (Senior Doctor 19, COPD).

Doctors appeared to have greater legitimacy with commissioners when it came to resourcing matters, "at the end of the day, they know the detail of clinical context and the specificities of care, so we best step back" (MHI Manager 3).

Nevertheless, even as they took up more significant leadership roles, doctors recognized the need to share leadership with managers.

> Two sets of people are important to the project's spread. Managers have knowledge, through their professional networks, of the increasing

importance of COPD as a policy priority at national level, while clinical project leads have excellent knowledge of the problems and priorities of delivering respiratory care within the local healthcare economy (Senior Doctor 1, COPD).

So, that's been it's been really reassuring that there is this continual buy-in from management. We can only be successful if we're useful to our stakeholders and engage different managers at many levels including, Chief Executives, Medical Directors, Finance Directors (Senior Doctor 6, COPD).

In summary at the end of phase 3, the configuration of shared leadership was one in which doctors were pre-eminent influencers of innovation diffusion, nurses had enhanced their leadership influence through engagement and adaption activity, and managers had ceded leadership to doctors albeit the former continued to influence innovation diffusion in the background.

Contextual influences upon shared leadership

The empirical analysis above highlights how leadership was shared over time across three groups of actors in the COPD innovation project. We focused upon COPD as the project site within which diffusion of innovation was most extensive of all sites. This begs the question: What were the contextual influences at play that supported this. Table 3 provides a summary of case comparision.

Insert Table 3 Here

Table 3 highlights three contextual dimensions that impact shared leadership. Managerial dominance in leadership is derived in organizational contexts, first, where there exist financial challenges. In these situations, top down performance management of the innovation project is prevalent, a more transactional approach that drives out leadership influence from others. In the quote below, the hospital within which the doctor was employed, was under pressure from government agencies regarding its financial deficit, following which hospital management required that cost savings resulted from the CHF innovation, and these clearly accrued to the hospital rather than the healthcare system more generally, and that such cost savings could be realized in the short-term. Managerial demands for this caused doctors to rein back their leadership of the innovation project.

> The hospital managers threatened to pull my funding if I didn't respond to their indicators for financial performance , at which point I just about got to the point of telling him to 'do one' and to pull it because I was sick of him (Senior Doctor 1, CHF)

That the contingency of the financial situation shapes shared leadership for diffusion of innovation is confirmed in Table 3, where the financial situation in the COPD case (Q1) stands in stark contrast to the financial situation and its ensuing management in the HIV case (Q2).

Second, shared leadership is stymied amongst the ranks of nurses where they fail to enact the leadership role expected of them. Instead some nurses cast as leaders, remain orientated towards their clinical duties and fail to enact leadership towards engaging the frontline and adapting the innovation to fit with context, so that diffusion of innovation is limited.

> [Name of senior executive] demanded clinical outcomes and other things, and he said to all of staff that it's mandatory, but saying that it's mandatory meant the senior nurse didn't really follow it up. She just paid lip service to the innovation and got on with managing the day-to-day stuff (Senior Doctor 1, HIV)

> They [managers] really struggled with getting buy in from us, the senior nurses. I think there needed to be something more tangible of relevance for us, to emphasize why innovation is this important to engage us in its leadership (Nurse Project Manager 1, Diabetes).

Again, we can see a contrast between the COPD case (Q3) and the HIV case (Q4) in Table 3, with the senior nurse enacting a leadership role towards innovation in the former, but orientating towards their clinical delivery duties in the latter.

Third, we see managerial leadership dominant where organization is less collaborative than is desirable to support shared leadership. In one healthcare provider, the culture was autocratic, in another leadership was concentrated at the apex of the organization, with consequent deleterious effect upon shared leadership for diffusion of innovation.

> I must say that the management style was quite autocratic and wasn't sensitive to the voices of people who were actually supposed to be

collaborating in innovation. As a consequence it didn't take off (Senior Doctor 1, CAP).

[Talking about two senior managerial leaders] Both like to have their fingers in all the pies and like to have control over what's happening and so that discourages innovation because often I've been in a situation where I have hesitated or stalled because I'm waiting for senior management to say yes or no and that isn't conducive to distribution of leadership (Senior Doctor 1, Diabetes).

Whether organization was hierarchical or collaborative was particularly evident in the workshops. Evident in Table Three, across COPD healthcare providers, the workshops engendered a collaborative ethos supportive of shared leadership for diffusion of innovation (Q5), whereas hierarchical leadership tendencies were were evident in workshops across CHF healthcare providers with a consequent deleterious effect upon shared leadership for diffusion of innovation (Q6).

Discussion

Empirically, our study highlights diffusion of innovation emerges as a result of shared leadership, within which hierarchical tendencies are encompassed (Holm and Fairhurst, forthcoming) and that appears performed in a particular sequence or in parallel (Spillane, 2005), as shown in Figure One.

-- Insert Figure One About Here: Configuration of Leadership in Innovation Diffusion --

Our study shows how, as diffusion of innovation ensues, leadership is shared across managers and professionals. Figure One simplifies a complex process and represents the

interdependence of our key leadership actors (e.g. managers, doctors and nurses) with a focus upon their leadership influence that reveals how leadership is shared during innovation diffusion. On the one hand, it might still be argued that managerial leadership is important through developing an organizational context that encourages innovation (Anderson and West, 1998 Jung et al., 2003; McNally et al., 2013; Mumford, 2000; Mumford et al., 2002; Smith and Tushman, 2005), since the MHI is an organization set up by, and populated by managers in the first instance that sets out to promote innovation and its spread across a regional healthcare ecosystem. Hence the leadership practices of managers, to mandate innovation, to encourage agency amongst frontline professionals, build capacity in others through the development of an educational programme, and garner resource through influence with commissioners and other partners, is necessary and welcomed, particularly in the early phase of innovation diffusion (Currie and Spyridonidis, 2015).

On the other hand, in professional organizations, over time, leadership for diffusion of innovation was passed to doctors with understanding of context and legitimacy to influence others, acting as champions to engage professional peers and influence partners, such as commissioners to resource innovation (Dopson et al., 2002). The shared leadership efforts of managers and doctors are similar and build on each other with respect to building capability for innovation amongst frontline professionals through education and influencing commissioners and other partners that might allocate resource for innovation. So over time, MHI managers enact more of a diplomat role (Giaimo, 2002) as doctors take on the baton of leadership. As they do so, doctors play a significant role in adapting the innovation to ensure it fits with routines and practices in its new context.

In a similar fashion, our study highlights how nurses complement the leadership efforts of doctors. While commonly subordinate to doctors (Currie and Procter, 2005), nevertheless, over time nurses enact key leadership practices that both engage frontline professionals and

so mediate potential resistance to innovation, and at the same time, adapt innovation as it diffuses to fit with exigencies of local context. In this adaptation endeavour, they work closely with those doctors adopting the innovation. Thus, over time, as innovation diffuses, the leadership role of managers, doctors and nurses, moves towards a more shared leadership configuration (Denis et al., 2012; Pearce and Conger, 2003).

Shared leadership for diffusion of innovation was particularly evident in the COPD innovation case, but less evident in other cases; i.e. where innovation diffused across fewer healthcare providers. Our empirical analysis suggests, first, variation in financial performance of the hospitals explains less sharing of leadership for diffusion of innovation. This is consistent with extant literature (Currie and Spyridonidis, 2015; Spyridonidis and Currie, 2016). In a situation of financial constraint for example, managers may prove to be pre-eminent actors, and so stymie the enactment of shared leadership necessary for diffusion of innovation. Second, whether those nurses expected to enact leadership alongside their clinical duties, 'hybrid' leaders, do so explains variation in diffusion of innovation (Croft et al., 2015a; 2015b). Third, we cannot assume that managerial-professional relations are good. Commonly, tension characterized in managerial-professional relations (Raelin, 1985), thus potential for the different actors to bring different capabilities to diffuse innovation is never realized. Similarly, nurse leader capabilities may never be realised in diffusion of innovation because they are rendered subordinate to doctors (Lockett et al., 2014). What we see in the 'success' case of COPD case is more collaborative community as advocated by Adler et al., (2015) amongst others (see also Adler, Kwon and Heckscher, 2008; Heckscher and Adler, 2006; Irvine, 1999; Mitchell and Ream, 2015), free of managerial-professional tensions and inter-professional hierarchy.

Conclusion

Theoretically, our study extends recent studies regarding shared leadership for diffusion of innovation (Fitzgerald et al., 2002, 2013; Greenhalgh et al., 2004; Martin et al., 2013). Our study highlights who leads within different phases of innovation diffusion and how they lead (Empson and Langley, 2015; Fitzgerald et al., 2013; Greenhalgh et al., 2004). Within a professionalized context, first, our study confirms the co-existence of hierarchical and shared leadership (Holm and Fairhurst, forthcoming) during innovation diffusion with doctors emerging as key actors, but with managers remaining as important leadership actors because they have access to, and are accountable for, resources allocated to innovation (Currie and Lockett, 2011).

Second, our study highlights a temporal dimension to the dynamic of leadership configurations for innovation diffusion, which thus far have been under-emphasized (Chreim 2015; Gronn, 2015; Holm and Fairhurst, forthcoming; White, Currie and Lockett, 2016). In doing so, we note an ongoing and dynamic blending of leadership actors and leadership practices as they relate to not just adoption of innovation, but its adaption to local context as it diffuses with those closer to the frontline, such as nurses, crucial to such adaption (Hartley and Benington, 2010; Rosing, Frese and Bausch, 2011).

Third, rather than managerial dominance in diffusion of innovation, our study shows how, at least in professionalized settings, managers need to exhibit leadership ambidexterity (Bledow, Frese, and Mueller, 2011; Rosing, Frese and Bausch, 2011), and switch towards a facilitating 'diplomat' role (Giaimo, 2002) as diffusion of innovation progresses.

Fourth, our study extends our understanding of shared leadership practice as it relates to adaption of innovation as it diffuses in professionalized settings (Ferlie et al., 2005; Fitzgerald et al., 2002; Kimberly and Evanisko, 1981; Martin et al., 2013; Mathers, Taylor and Parry, 2014; Rodriguez et al., 2016). In contrast to existing studies, in our study, professional hierarchy was mediated as nurses, commonly characterized as subordinate to

doctors (Currie and Procter, 2005), enacted a key leadership role that complemented doctors' efforts to engage others and adapt innovation as it diffused. Indeed it might be argued that the nurses' leadership role in adaption was more significant than that of doctors.

Finally, our study responds to calls for more contextualized understandings of leadership dynamics (Liden and Antonakis, 2009). Our study highlights the effect of organizational financial performance (Currie and Spyridonidis, 2015; Spyridonidis & Currie, 2016), enactment of hybrid leadership (Croft et al., 2015a; 2015b), and existence of hierarchical or collaborative organization (Adler et al., 2015; Adler, Kwon and Heckscher, 2008; Heckscher and Adler, 2006; Irvine, 1999; Mitchell and Ream, 2015) upon shared leadership for diffusion of innovation.

Regarding transferability of analysis and future research, we emphasize the exemplary nature of our study setting with lessons likely to transfer to other research contexts in professionalized settings. Notwithstanding our assertion, we recognize the healthcare setting is rather distinctive in terms of plural organizational objectives shaped by professional and organizational goals (FitzGerald et al., 2002), and the myriad of professions arranged in a hierarchical relationship (Abbott, 1988). Consequently, we encourage others to pursue a similar research agenda focused upon the contextual understanding of leadership, how is leadership enacted on the ground in other public professionalized settings, including private sector organizations (e.g. law, accountancy). Of the three contingencies we identified as shaping shared leadership for diffusion of innovation, organizational form appears particularly intriguing to examine further, with managerial-professional relations remaining tense in many organizations, yet with emerging calls for more collaborative community.

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Table 1: Summary of innovation projects and fieldwork

Innovation case	Case description	Extent of innovation diffusion	Interviewees	Total number of interviews with doctors and other clinicians	Observation	Documentation
Mental health	To introduce a new community clinic that aims to improve access to mental health & rapid assessment & diagnosis	Diffused from its originating site to three other hospitals in the city	Senior Doctor; 2 Specialist Nurses; 2 Psychotherapists; Nurse Project Manager	13	1 MHI training workshop (3hrs)	Annual report summarizing implementation progress (1)
Stroke	Introduce a new educational intervention to improve the provision of secondary prevention information & life style change for minor stroke patients	Diffused from its originating site to four other hospitals in the city	Senior Doctor; 2 Specialist Nurses; Nurse Project Manager; Senior Occupational Therapist	12	3 meetings between MHI managers & project team (4.5hrs)	Annual report summarizing implementation progress (1) Meetings minutes (3)
HIV	To assess the feasibility & acceptability of a new HIV test in the Emergency	Diffused from its originating site to four other hospitals in the city	Senior Doctor; Nurse Project Manager; 2 Junior Doctors	7	1 MHI training workshop (3hrs)	Annual report summarizing implementation progress (1)

	Department (ED) & the community.					
Acute diabetic foot	Develop a new community service to Improve management of acute diabetic foot	Diffused from its originating site to six other hospitals in the city	Senior Doctor; Nurse Project Manager; Physiotherapist; 2 Junior Doctors	15	2 meetings between MHI managers & project team (4 hrs)	Annual report summarizing implementation progress (1) Meetings minutes (2)
Diabetes	Introduce a new educational intervention to improve diabetes self-management, by raising awareness about diabetes; the risk factors in contracting diabetes; how people can test for diabetes	Diffused from its originating site to six other hospitals in the city	Senior Doctor; 2 Specialist Nurses; Nurse Project Manager; Physiotherapist	12	1 MHI training workshop (3hrs)	Annual report summarizing implementation progress (1)
Community acquired pneumonia (CAP)	Introduce a new pathway to improve accurate clinical CAP diagnosis & increase reliability of outcome data.	Diffused from its originating site to six other hospitals in the city	Senior Doctor; 2 Nurse Specialists; Nurse Project Manager; 3 Junior Doctors	13	1 meeting between MHI managers & project team (1.5hrs)	Annual report summarizing implementation progress (1) Meetings minutes (1)

Chronic heart failure (CHF)	Introduce a new clinic to encourage patients with heart failure to exercise.	Diffused from its originating site to seven other hospitals in the city	Senior Doctor; Specialist Nurse; Occupational Therapist; Nurse Project Manager	9	2 MHI training workshops (6hrs)	Annual report summarizing implementation progress (1)
Case management	To assess whether protocol-driven case management for patients with complex disease profiles improves patient outcomes	Diffused from its originating site to seven other hospitals in the city	Senior Doctor; Nurse Project Manager; 2 Social Workers	7	-	Annual report summarizing implementation progress
Medicines management	New service that aims improve medication management at discharge from acute medical care through improved medication reconciliation in line with national recommendations	Diffused from its originating site to nine other hospitals in the city	3 Senior Doctors; Nurse Project Manager; 3 Junior Doctors	14	1 meeting between MHI managers & project team (3hrs) 2 MHI training workshop (3hrs)	Meeting minutes (3) Annual report summarizing implementation progress (2)
Antibiotic prescribing	Develop a new policy to feedback on the quality of antibiotic use across an organisation	Diffused from its originating site to 12 other hospitals in the city	Senior Doctor; Senior Pharmacist; Chief of Service (Pharmacy); 3 Junior Doctors	18	2 meetings between MHI & project team (3hrs)	Meetings minutes (2) Annual report summarizing implementation progress

					1 MHI training workshop (3hrs)	
Allergy	To create an integrated allergy pathway for children across primary & secondary care.	Diffused from its originating site to 12 other hospitals in the city	3 Senior Doctors; 3 Specialist Nurses	10	2 MHI training workshops (9hrs)	Annual report summarizing implementation progress (2) Executive summaries to inform the commissioners of progress of the project (2)
Chronic obstructive pulmonary disease (COPD)	Introduce a new pathway to improve the safe discharge of patients & improve patient experience.	Diffused from its originating site to 15 other hospitals in the city	12 Senior Doctors; 3 Specialist Nurses; 3 Nurse Project Managers	32	3 MHI training workshops (12hrs)	Annual reports summarizing implementation progress (3) Executive summaries to inform the commissioners of progress of the project (2)

Table 2: Dynamics of leadership practices for innovation diffusion across comparative cases

Leadership practice	Year 2	Year 3	Year 4	Exemplary data excerpt	Outcome
Managers					
Providing mandate for innovation	X	X		"My role is cultivating a culture that supports innovation" (MHI Manager 7).	Encouraging agency amongst professionals towards innovation
Developing educational programme for innovation	X	X	X	"The series of bespoke learning events that draw in all local health providers in our area are very, very powerful in terms of scaling up the projects, building the rationale for innovation amongst doctors, advising them about implementation" (MHI Manager 7).	Building capability for innovation amongst professionals
Influencing commissioners & other partners towards innovation	X	X	X	"From the commissioning perspective, there are so many changes happening across the sectors? Is it this, that, and the other? Who do we need to influence changes every week, so it's just keeping up with that. And then it's about cultivating those relationships. The doctors rely on us for this" (MHI Manager 3).	Garnering resource for innovation
Doctors					
Promoting innovation to commissioners	X	X		"The reason why commissioners got interested, is because [name of local medical leader] got involved in it, we're promoting that idea to them, day in and day out and we couldn't do that without the support of our local clinical champions" (MHI Manager 9, commenting on Stroke case).	Garnering resource for innovation
Presenting evidence & best practice to peers through networks		X	X	"In fact, on Monday, [name] and I are going to see the senior clinicians, two of them, one for children and one for adults in [name of hospital] and try and bring them in, quite powerful people that we want involve in scale up of the project" (Senior Doctor 2, Allergy).	Engaging peers in diffusing innovation, whom adapt innovation

Adopting doctors adapt innovation		X	X	"[name of doctor] has it sold and championed all the way through we take practical things and say they're not working so we're going to adapt them"(Senior Doctor 5, COPD).	Ensures innovation diffusion is less sticky
Nurses					
Ensuring frontline support for innovation		X	X	"You've got a whole organic system that needs to act differently or to change the way it's working it's a massively challenging area, but it's also about really grounding that in the practical… pragmatic issues of frontline staff face, and for me, I mean it's about people and it's about methods and processes. It's about getting the right people around the table, um, and getting frontline staff (Nurse Project Manager 1, Diabetes).	Counters potential resistance to innovation on the frontline
Adapting innovation to local context		X	X	"[The way we work, you know is to support routine implementation or the administrative infrastructure to facilitate innovation, you know, audit on demand or whatever, understand what works and what doesn't work and that's what you do and that's part of, of continuous quality improvement or whatever process you want to call it to be responsive to local health need (Nurse Project Manager 1, Medicines Management)	Ensures diffusion of innovation is less sticky

Table 3: Contextual influences upon shared leadership

	Chronic obstructive pulmonary disease (COPD)	HIV	Community acquired pneumonia (CAP)	Chronic heart failure (CHF)	Quotes
Diffusion success	Yes	No	No	No	
Financial performance	Strong	Unsuccessful financial performance Shared leadership stymied Managerial leadership dominates			Quote 1 (Q1) "Financially, it is an advantage, because we show a financial return in that financial year... so they[managers] are very enthusiastic, so they're very much interested in employing more people for something that will have an impact in the short term .. so we work together" (Senior Doctor 5, COPD) Q2. "That's something that we're acutely aware of and if you're asking for a weakness, we can't resolve the financial stuff, so I think they [managers] want to have a framework around what we're doing so we don't respond" (Senior Doctor 1, HIV)
Hybrid roles	Present		Nurses did not successfully transition into hybrid leadership roles Shared leadership stymied Managerial leadership dominates		Q3. That I really liked what the they [CLAHRC] offered which was a bridging role between management and the frontline and what I would seek with my role and beyond would be to continue to function in that bridging role to both work with frontline staff and get change implemented and work with social media to help them implement change but also roll it out more broadly" (Specialist Nurse 3, COPD) Q4. "I was frustrated because I felt I had a clear purpose on this dual role of doing both innovation and clinical work, but I I didn't feel the rest of the team saw me that way. I think, especially my line manager is very focused on clinical delivery and he wanted me to deliver and he would say you should support innovation, but he wouldn't actually put anything in place to allow that to happen. He would just vaguely want it while also expecting me to heap my plate high with all these things I had to deliver. So that was my frustration, why I was getting really frustrated with it because it has been going on for a while, but it never really quite worked out for the first year or so". (Nurse Project Manager 1, HIV)
Collaborative community	Present			Collaborative community as exhibited in workshops never emerged Managerial leadership	Q5. "I do think these workshops are an opportunity to network, and there are people in the room that I can see are key people, and that I want to know and influence, and that's one aspect of spreading successful project, bringing those people together in the room" (Senior Doctor 2, COPD) Q6. "It's an irritation that they [managers] are too much hands on. You know, when you get a grant to do improvement work, you say what you're going to do and you say what your timeframe is going to be and then you agree when you're going to report back to the funders at

| | | | | dominates. | intervals, usually not more frequently than six or 12 months. However [name of managers] want reporting week by week, month by month; so called workshops, which are just reporting mechanisms, incredibly frequently. And for somebody like me who's got a fulltime job and lots of other things to do, that really is intrusive. We want to get on with work but we don't want to have to feed back so frequently because there's not much to say week by week. It doesn't feel collaborative." (Senior Doctor 1, CHF) |
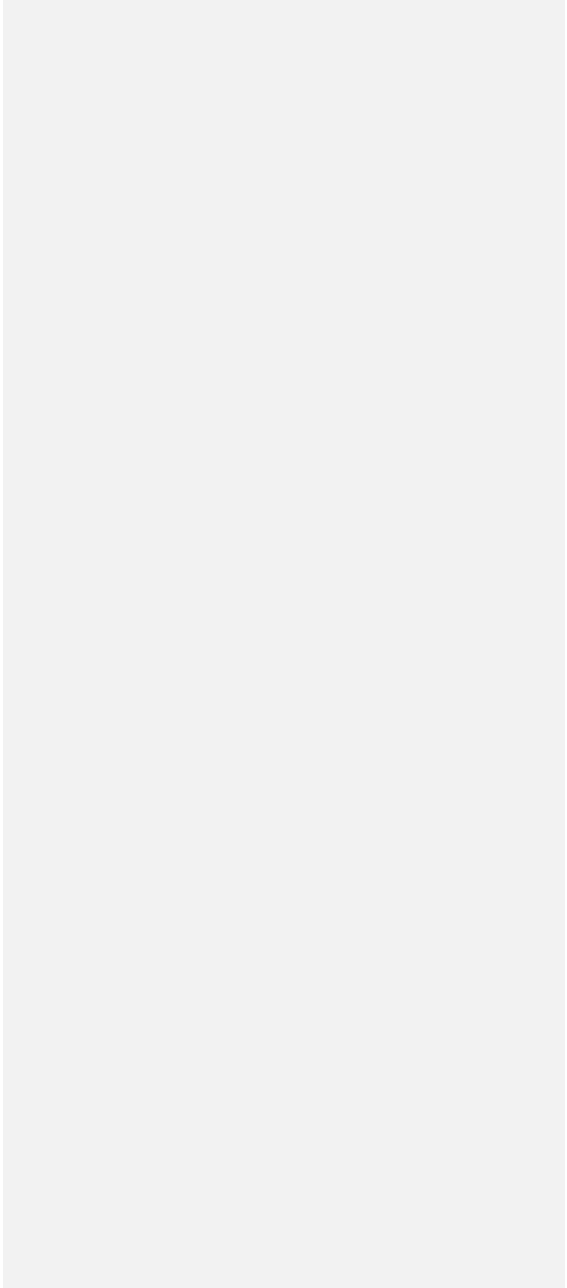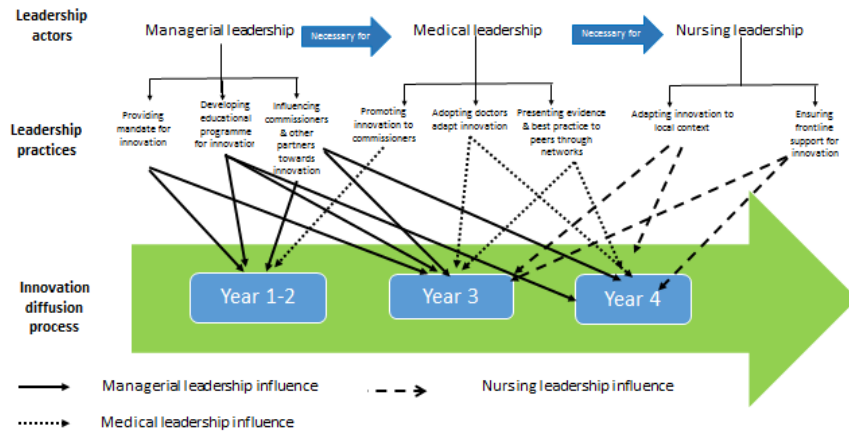
Figure 1. Configuration of leadership in innovation diffusion.

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