NHS top managers, knowledge exchange and leadership: the early development of Academic Health Science Networks – a mixed-methods study

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Declared competing interests of authors: none

Disclaimer: This report contains transcripts of interviews conducted in the course of the research and contains language that may offend some readers.

Published May 2017
DOI: 10.3310/hsdr05170

Scientific summary

The early development of Academic Health Science Networks

Health Services and Delivery Research 2017; Vol. 5: No. 17
DOI: 10.3310/hsdr05170

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Background

Academic Health Science Networks (AHSNs) have been created to accelerate the spread of innovations that can promote health gain and also pursue novel goals of wealth creation. AHSNs are regionally based networks involving many sectors and partners, including private sector firms. Their creation reflects a continuing stream of health policy to stimulate NHS knowledge mobilisation. Our study responded to a National Institute for Health Research call for research into knowledge mobilisation in health care, taking the AHSNs as a substantive site.

Objectives

Our research aims were to (1) explore AHSNs' strategies and practices of knowledge mobilisation in their formative phase and (2) investigate how knowledge leadership took place and the characteristics of people perceived as knowledge leaders (KLs). We initially focused on AHSN very senior managers (VSMs) as possible KLs, although in practice a broader set of KLs later emerged. Our initial research objectives operationalised our aims as follows:

1. What role does 'knowledge networking' play both formally and informally (within knowledge mobilisation strategies and practices in AHSNs)?
2. How is 'knowledge' (in particular about knowledge mobilisation strategies and practices) diffused by VSMs in their AHSNs?
3. Is there a subgroup of VSMs emerging who are highly engaged with knowledge mobilisation events and who appear to act as KLs in their AHSNs?
4. If so, what explains such knowledge leadership behaviours?

Methods

This is a mixed-method study, comprising a linked sequence of work packages:

- Scoping work, including an examination of all 15 AHSN prospecti to select a balanced sample of five AHSNs [rural/urban; north/south; hosted/not hosted; linked or not linked to a local Academic Health Sciences Centre (AHSC); strongly/more weakly developed regional life sciences cluster].
- An analysis of the relevant national policy stream back to the early 2000s examining key policy texts and undertaking semi-structured interviews with influential policy level respondents ($n = 16$); theoretically, we here examined the extent to which pluralisation of the health policy-making process was evident.
- A structured and narrative-based literature review of academic journals and books, along with grey literature. We here identified interesting literature to inform the design of interview pro formas.
- A social network analysis (SNA) of health and wealth networks at AHSN level. This was conducted at two time points by administering a short electronically based survey. SNA is a well-known analytical technique that maps the structure of social networks. We used VSMs in our AHSNs as 'seeds' to nominate their knowledge contacts, and then snowballed out. The SNA survey yielded data on 1016 individuals [time point 1, $n = 818$; time point 2 (T2), $n = 198$]. The T2 responses are smaller, reflecting some attrition and fatigue from respondents, and, in addition, the T2 survey was open for a shorter period. The data helped us to produce SNA maps by region.

- For qualitative data we started with semi-structured interviews with AHSN senior managers and their teams, followed by interviews with their nominated 'knowledge contacts' (135 interviews in total). We undertook five case studies of AHSNs, with an intensive examination of 10 innovation tracers (two per AHSN), selected in conjunction with AHSNs. We undertook observation of some AHSN 'network of networks' meetings nationally. The AHSN case studies used data from attendance at events, semi-structured interviews and AHSN texts. Case study reports were originally written up in a standardised and descriptive way; this was followed by more analytic treatment (e.g. the typology of AHSN approaches to innovation promotion).
- Finally, we undertook semi-structured interviews with individuals ($n = 9$) nominated by AHSN respondents as nationally important 'knowledge beacons' to identify their career histories and their basis of influence.

Results

Diverse Academic Health Science Network knowledge mobilisation strategies and practices

First, we highlight strong AHSN-level diversity in the pre-existing assets of AHSNs that then influences their knowledge mobilisation strategies. These assets included the strength of inherited academic health sciences infrastructure (e.g. AHSC, Biomedical Research Centre) and the relative development of science parks and clusters, alongside other health networks [e.g. Collaborations for Leadership in Applied Health Research and Care (CLAHRC)]. These inherited regional characteristics shape the development of regional innovation ecosystems.

Academic Health Science Networks had different types of knowledge mobilisation networks: some were loose and others were more tightly organised. Although there is no 'one size fits all' formula for success, each of these different types has advantages and disadvantages. For example, looser networking systems may draw in more and varied new contacts to support health and wealth objectives; however, implementation of newly acquired knowledge may here require more effort, given that networks remain highly dispersed. Conversely, tighter networks may expedite implementation through their strong interconnections, but be less open to new ideas and actors.

Academic Health Science Networks were engaged in a spectrum of knowledge mobilisation activities, which we plotted in a typology of four models or ideal types. We emphasise diverse strategies found, reflecting the wide remit of AHSNs and their multiple stakeholders, which now cross public and private sector boundaries. AHSNs were involved in very differently scaled discussions about how to scale up a regional innovation ecosystem with other partners [e.g. with local enterprise partnerships (LEPs) and higher education institutions (HEIs)], but also how to support individual clinical entrepreneurs to scale up research-based innovations.

We reiterate the complexity of AHSN performance measurement, given the many agencies and stakeholders involved (e.g. AHSNs, LEPs and HEIs). These bodies may well all claim the attribution of any innovation success, but do so according to their distinct key performance indicators (KPIs). In addition, AHSNs have different involvement in and ownership levels of the tracer innovations studied, which may affect the returns that can be realistically expected to go back to them.

Academic Health Science Networks' approaches to knowledge mobilisation were often pragmatic. There was some use of Rogers' diffusion model, as well as CLAHRC-related service and quality improvement approaches (Rogers E. *Diffusion of Innovations*. 5th edn. New York, NY: Free Press; 2003). Texts were used from the Institute for Healthcare Improvement and occasionally from NHS Improving Quality. However, a theoretically well-developed and empirically grounded framework for their knowledge mobilisation activity was generally lacking.

The shape of knowledge networks within and around Academic Health Science Networks

We identified two different forms of knowledge networks, which differed in the types of contacts and knowledge being exchanged. Early knowledge exchanges and networking were more linked to the implementation of national policy and local projects. They were associated with pre-existing ties and established relationships. In the later phases, the knowledge being exchanged around wealth objectives suggested the emergence of new AHSN connections and activities, linked more to pan-regional developments and initiatives. These emergent wealth networks were less mature and based on newer relationships and contacts. AHSN board members importantly helped bridge new contacts. Our later survey suggested that the knowledge being implemented was becoming more specific and 'joined up' across the region. We further note that across the five AHSNs, different network types were found locally.

The construction of knowledge leadership

An important finding is that those in formal leadership positions (i.e. in AHSNs or in associated organisations) may not necessarily be the most effective knowledge brokers, as leadership in a complex health system may well be dispersed. The holding of formal authority by itself does not always lead to effective knowledge mobilisation, as it may arise at different points and be undertaken by those with less formal role power.

We identified some attributes of individuals seen as effective KLs: acting as powerful gatekeepers and brokers (indeed easier for those in senior formal positions); having strong access to material, cognitive and social resources or capital; and operating with a broad outlook and breadth of skills. Such individuals might wear multiple hats and/or act as skilled social brokers with strong interpersonal networks. They were good communicators, able to transmit their vision or passion widely. So, we suggest that effective knowledge leadership involves strong relational capital (i.e. strong networks, high-trust relationships). Although personality traits (e.g. communication skills and drive) have a role to play alongside formal role position in knowledge leadership, access to social capital also plays an important role.

We then explored a subset of national knowledge 'beacons'. These individuals were hyperconnected and influential beyond their own region. We differentiated them from region-specific KLs and contacts. These were high-profile individuals at the top of their profession. Many had long tenure in the NHS or public service; fewer came from private industry. Their generally non-linear careers could explain their high degree of connectivity, as over time they had moved across sectors and professional communities. These peer-nominated beacons were not directly involved in operational-level AHSN work but had wide indirect influence with AHSN leaders and/or teams. They also needed to be visibly rooted in a specialism to have the necessary legitimacy to 'spread the gospel'. In short, complete generalists, hypernetworkers and celebrities – perhaps with a lot of Twitter (Twitter, Inc., San Francisco, CA, USA) followers but with no NHS track record – are unlikely to be effective as KLs. We found that these beacons grew their network organically and used their position actively to increase their influence, so these mechanisms at some point become self-reinforcing. This finding is different from the traditional SNA argument that one becomes important simply because of structural positioning, and stresses the role of activity.

Conclusions

Implications for the future direction of Academic Health Science Networks

We here summarise the implications of the research for the future direction of AHSNs.

The national policy process and implications for Academic Health Science Networks

Those at a distance from AHSNs may be confused by the number of agencies and initiatives aimed at supporting innovation in the NHS in a 'crowded landscape'.

The important and developing macro national policy level and the micro level of the individual AHSN could usefully be connected at the middle level where the existing AHSN 'network of networks' could continue to play an important role.

'Mission creep' and frequent reorganisation may cause problems for AHSNs.

National knowledge networking

The health and wealth networks took very different forms. Building new networks around a new policy 'problem' (here, wealth creation) takes time and effort. AHSNs may need to place continuing special emphasis on building up their novel wealth-related networks.

Non-executive board members and chairpersons need to be chosen carefully so that they can help widen existing health-orientated networks.

Regional knowledge mobilisation systems

Different knowledge mobilisation systems emerged in each AHSN region in terms of their structure. Connected and hybrid networking systems were found in regions with mature infrastructure, whereas loosely organised networking systems were found in regions with developing infrastructure. These different network forms have distinctive advantages and disadvantages. An awareness of these findings and core SNA concepts might help network leaders to understand and then develop their own regional networking processes.

Processes of knowledge mobilisation and innovation spread in action

Academic Health Science Networks may find our four-category typology of approaches to knowledge mobilisation helpful in developing their own strategies.

Intermediary networks and agencies (such as AHSNs) can provide the local capacity to support an important group of innovators and clinical entrepreneurs. AHSNs might wish to think about how they engage and sustain this critical group.

Because AHSNs engage with a wide and diverse array of stakeholders, they may be well situated to understand how different institutional and organisational objectives can be aligned regionally to support innovation processes (i.e. provide systems leadership and support).

Academic Health Science Networks may wish to reflect on 'what works' and what does not in their strategies of knowledge diffusion and to build an applied knowledge base. They may wish to access some clear change models (e.g. Rogers) to inform their approach.

We suggest that innovations will often take the form of a complex and long 'innovation journey'; this should be realistically recognised in the KPIs set for AHSNs.

Knowledge leadership

Academic Health Science Networks may want to reflect on the research's implications for (1) the skills and competences needed in senior AHSN leaders and what this analysis implies for selection to these key posts and (2) how they can best identify and engage with a small but hyperconnected set of 'national knowledge beacons'.

Recommendations for future research

Top priority

Although our study was not an evaluation of AHSN impact, there was a desire in the policy and practice fields for such a study. This would not be without some methodological challenges. Nevertheless, we suggest that this is the highest research priority, to be designed in consultation with AHSNs.

Second priority

We suggest that the AHSNs' wealth creation role is the second priority for research: there is as yet little research on their wealth creation role – despite its rising importance in the policy domain – as opposed to a more traditional health improvement and clinically orientated focus. Our SNA produced early evidence about evolving wealth networks, but only over a short period. We need more longitudinal survey data on the presence of small and medium-sized enterprises (SMEs) and industry in these wealth networks and how this pattern changes over time. We also found that the health innovation landscape was highly diverse, with radically different innovation types. So, large pharmaceutical companies were found alongside smaller start-ups and SMEs that lacked substantial experience of navigating the NHS. Therefore, future research should explore how such conditions of high diversity influence AHSN strategies.

We have as yet few English case studies of 'triple helix'-style regional innovation ecosystems, especially when the life and health sciences sector is developing as a key component. This is also a high-priority area in the wealth field. Partnerships and alliances may be forming between sectors and agencies that are novel and should be explored.

Third priority

Our analysis of the national policy process around life sciences policy suggested a broadening of the actors engaged as policy partners, reflecting possible movement beyond a traditional lobbying role for industry associations to greater incorporation in the policy-making process. The Office for Life Sciences was seen as important, again highlighting changes in the wider institutional landscape nationally. The question of where national leadership for AHSN development (and related policy developments) sits was also raised. This policy stream could usefully be informed by more political science-informed research.

Fourth priority

As a fourth priority, our study suggested that an important pro-innovation role was being played by a small group of academics, entrepreneurs and inventors. This insight should be explored further: what is their role, career trajectory and skill set? We noted that these people tended to span different sectors, often having a basic professional identity (e.g. nurse, doctor, engineer or academic) and later acquiring a more entrepreneurial approach and skill set.

Fifth priority

As a final and fifth research priority, our study drew a distinction between actively managing networks on the basis of formal role authority and a wider, more diffuse knowledge leadership role. It is important to study more intensively the nature and operation of knowledge-based forms of leadership in these settings. Our idea of a national 'knowledge beacon' should be explored more.

Funding

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

Health Services and Delivery Research

ISSN 2050-4349 (Print)

ISSN 2050-4357 (Online)

This journal is a member of and subscribes to the principles of the Committee on Publication Ethics (COPE) (www.publicationethics.org/).

Editorial contact: journals.library@nihr.ac.uk

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This report

The research reported in this issue of the journal was funded by the HS&DR programme or one of its preceding programmes as project number 12/5002/19. The contractual start date was in September 2013. The final report began editorial review in April 2016 and was accepted for publication in January 2017. The authors have been wholly responsible for all data collection, analysis and interpretation, and for writing up their work. The HS&DR editors and production house have tried to ensure the accuracy of the authors' report and would like to thank the reviewers for their constructive comments on the final report document. However, they do not accept liability for damages or losses arising from material published in this report.

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