Networking for Health, Networking for Wealth: A Study of English Health Innovation Policy in Practice

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Introduction and Background

There is an observable trend in English health policy that emphasises the productive potential of the National Health Service (NHS) to generate economic wealth whilst also treating ill health. This has manifested in a 'health and wealth' discourse in policy that has progressed with greater urgency during an austerity period and brings together an economically orientated narrative with a population health narrative. The NHS in this context is understood as playing a critical role in supporting the health and life sciences sector in the UK and attracting investors. Importantly, rather than viewing 'health' and 'wealth' policy objectives as fundamentally at odds, these goals are presented as complimentary.

This 'health and wealth' policy discourse has primarily been delivered through network modes of governance in the UK focused on research and

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innovation. This has resulted in new forms of networked collaboration within regional health systems involving the NHS, universities, charities, industry and other stakeholders. Ambiguous policy aims have required those working within these networks to translate policy goals into local and regional strategies for health care improvement which also support national economic goals.

While there is a well-established body of research on the role of publicly financed networks in the health sector, particularly research translation networks or CLAHRCs[1] (Currie et al. 2013; Rycroft-Malone et al. 2011; Evans and Scarbrough 2014), far less has been documented about how 'health and wealth' policy objectives have been enacted at the regional level of Academic Health Science Networks (AHSNs). Collaborations for Leadership in Applied Health Research and Care (CLAHRCs) were evaluated from their first wave of implementation, leading to a body of knowledge about these networks and how they varied across England, whereas AHSNs have not been researched to the same degree despite having complimentary responsibilities. In this chapter, I address this gap, presenting an analysis from an empirical study of the early development of AHSNs involving case studies, policy interviews and a social network analysis (Ferlie et al. 2017). I explore how AHSN leadership teams responded to the dual policy ambition of population health improvement and wealth creation in practice. Rather than perceive 'health and wealth' policy objectives as binary and inherently at odds, I apply decentred network theory (Bevir and Waring 2018) to explore how AHSN leaders brought together these goals and turned them into network strategies. Over time, AHSNs began to position themselves at the forefront of the UK's health innovation landscape and forge new partnerships across highly fragmented health systems, operating as innovation advocates and mediating between institutional actors with varied interests. AHSNs were found to be broking different stakeholder groups and, at the same time, seeking to prioritise innovations that would address local population health needs. I suggest that by analysing local and regional-level responses to governmental 'health and wealth' policy ambitions, we arrive at insights about why innovation adoption across the NHS is challenging and the types of contingencies

[1]Collaboration for Leadership in Applied Health Research and Care. In 2019, these networks were re-launched as Applied Research Collaborations (ARCs).

that have to be negotiated in practice by AHSNs which operate across multiple boundaries.

This chapter draws on an empirical study that aimed to understand the networking, policy and leadership dynamics associated with the creation of AHSNs (Ferlie et al. 2017). Data was collected during the first phase of AHSN licensing (2013–2018) and five out of the 15 networks were studied intensively, leading to the production of detailed regional case studies that included 'tracers' of innovations selected by AHSNs for adoption within their regions. The study involved a large number of interviews with AHSNs teams and stakeholders ($n = 133$), and analysis of documents outlining AHSN strategies. Finally, national 'AHSN Network' meetings were observed to understand the strategic coordination taking place across the 15 networks. This chapter focuses predominately on the qualitative, meso-level case studies and interview data. For interested readers, the final report of this study and further details about the methods are available online at the NIHR Journals Library (Ferlie et al. 2017).

The chapter proceeds as follows: I briefly outline the study methods before describing antecedents to the creation of AHSNs. An analytical discussion follows about how a 'health and wealth' policy mandate was enacted in English health policy and interpreted by AHSN leaders locally, drawing on decentred governance theory which "analyzes governance in terms of contingent meanings embedded in activity." (Bevir 2013, p. 15). The evolution of the innovation networks is described as involving a balancing act between managing regional conditions, member relationships, and central policy. This was particularly challenging at the outset of AHSNs given ambiguity in policy and a lack of clear, strategic leadership for health innovation at the national level.

> During their early phase, AHSNs were predominately focused on what I term 'network anchoring'. With time, greater inter-network coordination and collaboration across AHSNs become increasingly apparent as they sought to balance health and wealth objectives and prioritise specific innovations for adoption and spread. This later period was characterised by consolidation of the AHSN mandate and "brand". Due to their network form and lack of formal powers, AHSNs operated largely through influencing, communication and networking strategies to achieve their aims.

The UK Health Policy Context: Financial Austerity and Poor Population Health

Since the global financial crisis in 2007–2008, the UK economy has experienced slow economic growth and a period of sustained austerity. Public services are struggling to keep financially afloat and maintain services following a prolonged period of tight fiscal policy and cuts (Dowling 2017; Ferlie et al. 2018). Local authorities, which have responsibilities for public health planning and social care, have had their contributions from government drastically reduced. A referendum on the UK's EU membership in the summer of 2016 has added an additional layer of complexity and pressures on both public services and private industry and unprecedented political and economic turmoil. The context of health policy has become increasingly "turbulent" and focused on tighter financial control and efficiency, especially within commissioning organisations (Ledger 2014). At the same time, a political discourse has arisen focused on greater national self-governance, regionalism and autonomy from the EU.

Consequently, it is arguable that health policy in the UK has become more decentred and nation-centric than in previous decades, especially with Scotland, England, Wales, and Northern Ireland following their own health policy trajectories since devolution. Yet the demographic and epidemiological challenges confronting national health systems remain unifying. These include the prevalence of non-communicable diseases which are consuming increasing proportions of health care budgets (e.g. cardiovascular disease, cancer, chronic respiratory disease and diabetes), a growing ageing population and increasing numbers of persons living with multi-morbidities, including at a younger age, and epidemic levels of obesity (Peralta et al. 2018; WHO 2018). Health inequalities and disparities within nations and across regions have rightly garnered policy attention, raising important questions about the equity of access to innovative treatments and the social determinants of health (Marmot et al. 2010, 2020). The UK is falling behind other Western countries in tackling premature deaths from chronic diseases, such as cancer, with low income communities and minority ethnic groups most likely to be affected by poor health and the consequences of austerity

policies (Public Health England 2017; Buck and Maguire 2015). Even though the NHS remains a high performing health system when compared to other countries internationally, particularly in terms of accessibility and affordability (The Commonwealth Fund 2017; Schneider et al. 2017), population health needs are requiring new forms of service delivery innovation, especially at the boundaries of health and social care. It is against this economic, political and demographic backdrop that contemporary policy narratives around 'wealth and health' have emerged.

Harnessing the Potential of Health Innovation as a Policy Solution

Three policy problems are frequently articulated in health policy discourse in England: (1) rising health costs and increasing demands on services due to chronic diseases and an ageing population; (2) variation in clinical outcomes and standards of care; specifically, patchy compliance with evidence based practice and standards; (3) a slow pace of innovation adoption across the NHS. The English health sector is viewed as well placed to exploit new knowledge originating in scientific research, although the NHS has historically been understood as less strong at adopting innovations at scale. The Five Year Forward View (NHS England 2014) and Five Year Forward View Update (NHS England 2017) describes these policy problems in terms of 'a health gap, a quality gap, and a financial sustainability gap' (NHS England 2017, p. 9), and suggests that one way to help the NHS meet its challenges is by leveraging innovations and new technologies such as Artificial Intelligence (AI), genomics, digital health and improved diagnostics. There is also close alignment between NHS policy at the macro level and the UK's Industrial Strategy which has among its themes the aim of harnessing 'the power of innovation to help meet the needs of an ageing society' (BEIS 2017).

The Cooksey report of 2006 provided a critical review of the fragmented research and innovation landscape in the UK, the under-utilisation of clinical research by the NHS and poor investment

in R&D and innovation. Challenges were diagnosed as being predominately cultural with parts of the NHS lacking '*a research and innovation friendly culture*' and research being '*considered a secondary activity*' (Cooksey 2006, p. 49). Since its publication there has been an evident shift to a more pro-research culture in the NHS and sizeable investment in translational and research architecture in England, such as through the creation of the National Institute for Health Research (NIHR), the CLAHRCs, Academic Health Science Centres (AHSCs) and Biomedical Research Centres (BRCs). These programmes have had a strong focus on 'bench' science, applied health research and implementing research into local clinical settings. NIHR spending has been maintained and the UK is ranked fourth in government expenditure on health R&D when compared internationally, behind the USA, Germany and Spain (OLS 2019).

Yet the innovation adoption "problem" has persisted and with it concerns about patchy uptake and poor commercialisation of research and innovations in the NHS. Furthermore, against a backdrop of economic recession and austerity, pressures have emerged for the NHS to demonstrate that is not only cost effective, research-friendly and evidence based, but that it can contribute to economic growth and fully embrace cutting-edge innovations. This is closely connected to national strategies that aim to ensure the UK has an internationally competitive health and life sciences sector attractive to foreign investors, such as large pharmaceutical companies, with opportunities for streamlined clinical trials and research on large, anonymised patient data sets. The wealth dimension is especially distinctive in contemporary health policy since it brings a variety of actors to the cusp of health policy discussions: industry associations, life sciences experts, and university and business representatives. Even though the major health policy problems have remained consistent over the past decade (an ageing population, rising costs, variation in practice and chronic conditions), the policy narrative has noticeably shifted and started to pay more attention to the *productive capacity* of the NHS and its ability to support economic growth in a post-recession climate.

For example, in March 2011, *Plan for Growth* was published by HM Treasury and the Department for Business, Innovation and Skills

(BIS). This plan restated the value of the health and social care system to the UK economy, adjoining the themes of welfare, health and wealth. Health care innovation was viewed as "a key driver of long-term growth" and there were aims to support the growth of "NHS intellectual property" (HM Treasury and BIS 2011, pp. 91–92). But it was the government paper, '*Innovation, Health and Wealth*' (DH 2011a) that most clearly brought together the themes of 'health and wealth' and outlined its meaning for the NHS:

> the NHS remains a major investor and wealth creator in the UK, and in science, technology and engineering in particular. NHS success in adopting innovation helps support growth in the life sciences industries that in turn enables these industries to invest in developing the technology and other products the NHS needs for its development. (DH 2011a, p. 9)

The report *Innovation, Health and Wealth* (DH 2011a, p. 10) outlined six barriers to innovation adoption and diffusion in the NHS:

1. Poor access to evidence, data and metrics
2. Insufficient recognition and celebration of innovation and innovators
3. Financial levers that do not reward innovators (and may actually function as disincentives)
4. Lack of capability/tools to drive innovation amongst health purchasers (commissioners)
5. Inconsistent leadership culture supporting innovation
6. A lack of an effective and systemic 'innovation architecture'.

The NHS is construed as having considerable influence as a 'macro purchaser' of health care technologies, medical products and innovations. Nevertheless, as a public service, the NHS functions somewhat as an innovation paradox: it is a leading health system by international standards, connected to a strong life sciences sector and with many leading research institutions and firms located in the UK. At the same time, the NHS is conceived as being a slow implementer of innovative solutions that have potential to transform services and improve population health outcomes.

Similar themes were later reiterated in the NHS Five Year Forward View (NHS England 2014) which framed the NHS as a 'test bed' for innovations arising from the UK's life sciences sector:

> The NHS will become one of the best places in the world to test innovations that require staff, technology and funding all to align in a health system, with universal coverage serving a large and diverse population. In practice, our track record has been decidedly mixed. Too often single elements have been 'piloted' without other needed components. Even where 'whole system' innovations have been tested, the design has sometimes been weak, with an absence of control groups plus inadequate and rushed implementation. As a result they have produced limited empirical insight. (NHS England 2014, p. 34)

An update of this strategy continued notions of prestigious, cutting-edge scientific advancement and innovation implementation:

> The UK has a world-leading life sciences industry which is both a magnet for investment and an engine for economic growth - enhancing productivity, driving healthcare innovation and employing over 220,000 people across the regions of the UK. Many important healthcare technologies - from vaccines to MRI scanners - have been nurtured by our strong science base and universities, innovative culture and leading healthcare system. (NHS England 2017, p. 68)

Antecedents to the Formation of AHSNs

Evolving health policies therefore intended to close the gap between leading research in the life sciences, new technologies and frontline NHS services. However, in recent years there has been greater movement beyond research translation and towards evidence-based innovation, implemented at scale. A 'wealth and health' narrative gained traction in policy, yet left open questions about how transformational change and an 'innovation architecture' would be developed in practice, particularly regionally. In June 2011, the Department of Health put out a call for evidence about the adoption of innovations

in the NHS and how the process could be accelerated as part of the NHS Chief Executive's Innovation Review. Recommendations received included the need to 'Improve horizontal knowledge exchange, networks and links' and have clearer innovation pathways (DH 2011b, c). In December 2011, *Innovation, Health and Wealth* was published (DH 2011a) and recommended the formation of regional, cross-boundary networks to enact health and wealth objectives, and support innovation uptake at scale in the NHS. An expression of interest followed from the Department of Health to establish the AHSNs. These would provide:

> A systematic delivery mechanism for the local NHS, universities, public health and social care to work with industry to transform the identification, adoption and spread of proven innovations and best practice. It is a partnership organisation in which the partners are committed to working together to improve the quality and productivity of health care resulting in better patient outcomes and population health. (DH 2012).

On the theme of 'wealth', the same document stated that:

> The AHSN will become the single local mechanism to enable productive partnerships with industry and run transparent procurements. The partnership cannot allow individual commercial companies to have unfair advantage or access but must enable a new and constructive relationship between the NHS, educational institutions and the representatives of industry that reflect the diversity of the health technology, information, biotech and pharmaceutical industries. (DH 2012)

Other key developments arose around this time and are noteworthy: firstly, the publication of the Strategy for UK Life Sciences in 2011 (BIS, OLS 2011) which outlined the need to build a national "life sciences ecosystem". The strategy stated the importance of reducing "regulatory bureaucracy to provide a route for early adoption and diffusion in the NHS" (ibid., p. 7). The presence of the Office of the Life Sciences (OLS) was equally important since it connected the Department of Health and BIS, signifying political support for the health and life sciences sectors and cross-governmental working to meet

shared objectives.[2] One interviewee from the OLS described their perception of the health innovation challenge thus:

> There's a whole number of issues about the way the NHS works and the way it's structured which actually makes it very hard to get innovation into the NHS. It works for other parts of the, you know, the localisation in the region, it obviously works for other kind of aspects of the NHS but it doesn't necessarily work for innovation. And I think, you know, those issues will have to be addressed if we really want to, you know, speed up the process and, you know, and ultimately benefit patients. (Policy respondent, OLS)

The 15 regional AHSNs were launched in 2013, this leading on from the earlier formation of AHSCs in England. AHSNs were initially licensed for five years (comparable to CLAHRCs) and were later re-licensed in 2018. The latter decision was supported by the independent Accelerated Access Review which recommended that 'AHSNs, tertiary academic teaching hospitals and clinical leaders across the NHS should drive and support the evaluation and diffusion of innovative products.' (Accelerated Access Review 2016, p. 12).

'Networking Anchoring': Tracking the Early Progress of AHSNs

Many academics and researchers have attempted to describe the different features of networks in the health landscape to help avoid confusion between policy networks, health care collaborations and more informal, professional networks (Ferlie et al. 2013). AHSNs can be considered examples of *mandated* policy networks because their origins lie in health policy and the terms of their licenses were overseen by a central health agency. Mandated networks provide an 'implementation structure' for a programme of work that can broaden over time (Sheaff and Schofield

[2]The Office of Life Sciences is now part of the renamed Department of Health and Social Care and Department for Business, Energy & Industrial Strategy.

2016, pp. 442–444). This was indeed the case for AHSNs as they gradually took on more functions, such as supporting a national Patient Safety Collaboratives programme, providing evaluation support to the NHS and, in some instances, encouraging quality improvement initiatives.

Mandated networks have a tendency to be formally managed by an external body or sit within a hierarchy. During the period of study (2014–2016), AHSNs reported to NHS England, not the Department of Health, and worked with the NHS to develop AHSN metrics. Overall, the empirical evidence on the early development of the AHSNs suggested that, although these were mandated networks, they did not recreate internal hierarchies and operated in practice as relatively flat, flexible and outward-looking organisations focused on building lateral ties with external organisations and partners (both private and public) within their regions and beyond. Early efforts concentrated on organising teams around clinical and local health priorities—such as diabetes, atrial fibrillation, alcohol dependency, dementia and maternal health. AHSNs began, from the outset, to engage with a diverse pool of actors across organisational boundaries and sectors: public health agencies, NHS providers, NHS commissioners, charities, pharmaceutical companies, SMEs, industry associations (ABHI and ABPI), universities and local authorities. Many AHSNs devised plans to compliment other local networks and their regional health research architecture (e.g. CLAHRCs, CRNs, AHSCs), yet there was a broadening out of AHSN partners and stakeholders beyond the groups traditionally found in clinical or research networks. AHSNs were appointing diverse teams with business experience—such as in commercial director roles—because of their wealth creation objectives. Some located their offices in regional science and business parks as opposed to NHS Trusts or universities, perhaps because this signalled independence from any one institution and offered opportunities to network with local firms.

The early stage of the AHSNs concerned priority setting, building teams, identifying sources of additional funding, achieving a balanced membership and establishing self-governing structures. In terms of their approaches, the AHSNs varied considerably. Some of the networks decided to register as limited companies by guarantee providing distance from NHS organisations. Others chose to be hosted by NHS

hospitals where this conferred advantages, such as being linked to a leading teaching and research-intensive institution.

Beyond internal business processes, the broader strategic approaches taken by the AHSNs varied too. Some were more overtly ambitious about wealth creation opportunities, such as job creation, regional economic growth plans or connecting with major international firms, such as big pharma. As one AHSN leader put it:

> Industry and wealth, yes, a big part of what we do is widening out this access to the NHS for industry and entrepreneurs and that the AHSN is indeed providing that brokering, signposting, accessibility service if you like. (AHSN 2)

Other AHSNs tended to lean more toward quality improvement and incremental change in the NHS, as another director observed:

> I think some of the problems are that elsewhere some of the AHSNs… have taken a much more QI health improvement focus and are less focused on the wealth creation in terms of the core work and pulling through innovation from an academic and commercial sources… (AHSN 4)

AHSNs managers and directors described a fine-balancing act between "marketing our value to people", attracting partners to the work of the AHSNs, and bringing about measurable improvements to local health systems and the NHS. Another director described the challenge as follows:

> I think one of the things we found most difficult is, you know, the membership is so enormous, is getting out and getting people involved in the dialogue. So my experience of that is a mixture of really positive and really quite negative. (AHSN 1)

The networks were not statutory bodies with formal powers to expedite the uptake of innovations in the NHS and their remit was broad in scope. AHSNs were therefore required to enact strategic influence locally and coordinate themselves nationally as a collective body. These conditions were conducive to a different mode of leadership and

management practice from that traditionally found in large, vertical, managed health care organisations, as one AHSN director explained:

> Chief Execs, have been used to authority that a, you know, a direct command and control leadership brings, and actually to influence people in other ways is quite tricky and some people have got that skill and some people haven't. So it's all about sort of negotiation and influencing in more subtle ways than having direct control over people, some people respond well to that and some people don't… you have a lot of senior people involved, all who have a subtly different view of life and what we're trying to achieve. (AHSN 1)

A commercial lead in the same AHSN commented similarly:

> I think people who are very introverted in an organisational sense probably wouldn't go for those roles in the first place. (AHSN 1)

Another director described their role *as having* "*a good understanding of what you would call various partners' institutional logic models*" and being able to "*wear a set of clothes that appeals to the different logic models that are operating*". The point was, that to enact the remit of 'health and wealth', AHSN leadership teams had to adapt to the interests of different partners and members and find areas of mutual compatibility and interest with their localities. Indeed, to be captured or financed by only one type of institutional member, business or group of stakeholders would be to de-rail the brokering mission and legitimacy of the AHSN locally:

> So getting wholehearted, you know, honest collaboration between the public and private sector is I think a huge leadership challenge for anybody involved in this whole thing. And I think also just keeping people's enthusiasm and momentum going, because there is, you know, you do go through a period of two or three years where you're setting up groups and they're establishing priorities and, you know, they're making some progress, three steps forward, two steps back.. I think the hardest thing actually, as I think about it, is the [network] is about creating networks or encouraging networks that never existed before, however the NHS is an

> in-crowd really. You know, if you've ever been in a room with doctors or, you know, yes, I worked as a registrar with him and, you know, I worked at that hospital, and it's all very – what's the word I'm looking for? I mean it's a world of its own right? (AHSN 1)

The membership bodies of AHSNs reflected their broad policy mandate, and also the dynamic regional health economies of which they were a part. Engagement with a multitude of stakeholders helped to engender a pluralist outlook, with AHSNs essentially networking-upon-networks. AHSN teams purposively engaged with industry representatives, NHS chief executives, government, university researchers, patient charities, health care education boards, and local enterprise partnerships (LEPSs), building on both pre-existing networks and contacts and brokering new relationships. Internally, AHSNs were varied as well with a mixture of industry boards to provide commercial expertise and clinicians to lead health programmes.

From Network Anchoring to Network Consolidation

> Inevitably we're starting to think around our response to being two years away from the end of the licence and we are sceptical whether the necessary policy thinking and policy framework is going to be put in place quickly enough by NHS England to, for us to rely on their response to sustain our functions which are adding value to the system…I think there are problems with NHS England funding in the entirety of what we do, you know, which relate to the wealth agenda basically. (AHSN 4)

The networks were managed from the centre by NHS England, although there was a lack of clarity about how network effectiveness could best be measured. The networks came together as a collective group (the 'AHSN Network') to discuss how to monitor and demonstrate their impact internally and communicate this externally. Nevertheless, half way through their license period, there was much uncertainty about the types of performance metrics most beneficial for tracking progress. Consistent with decentered theory, there was

evidence that the AHSNs were enacting and interpreting policy in response to specific historical circumstances that were shifting (Bevir 2013). This found those working in AHSNs interpreting and negotiating the meaning of moving policy goals—both independently and as part of a collective. AHSNs were anchoring themselves regionally to support cross-sector working and innovation adoption in the NHS. Their opportunities were, however, contingent on the assets found within their particular regional health systems; for example, the prevalence of life and health sciences businesses and universities, the quality of existing relationships between NHS organisations and also commissioners. A further dilemma for AHSNs was how to carve out a leading innovation role that was additive rather than muddying an already complicated health innovation landscape. Locally, many NHS provider organisations were struggling to adopt existing best practice solutions (e.g. NICE-approved interventions and technologies) and maintain financial stability. Would they afford the time and money to support another iteration of health networks in their region? Another challenge was how to demonstrate wealth creation in tangible terms, over short, medium and long-term timeframes, alongside population health improvement:

> there is this tendency, which is like a bureaucratic tendency in the NHS to, you know, draw up the report card and have us spend a lot of time filling it in. And we're actually not spending much public money, so it's not as if we're spending billions on this and we're going to be accountable to the public accounts committee. We will have wasted quite a few million if this initiative doesn't work, but I think we're almost certain to waste it unless we give the AHSNs some freedom to be entrepreneurial. (AHSN 1)

There was not a clear policy blueprint for these looser, cross-sectoral 'entrepreneurial' networks and numerable AHSN practices evolved. These included: leveraging external funds; institutional brokering; mapping local businesses and assets; membership engagement activities; running events to showcase ideas; supporting NHS clinical entrepreneurs; quality improvement projects; and building up networks pan-regionally, nationally and to a lesser extent, internationally. AHSNs were thrashing out the meaning of 'wealth and health' in practical

terms, and cooperating as a 'network of networks'. Inevitably, there was a high level of variation found in both structure and strategy, although towards the end of the study, an "AHSN brand" appeared to be consolidating and a clearer narrative about their contribution was being communicated in annual impact reports produced by the AHSN Network. At a local level, AHSNs continued to perceive themselves as inclusive and membership focused networks, larger than their constituent parts:

> So, you know, so the achievements that we make are the achievements of members and wider partners, so that's a difficult thing to pull off. (AHSN 5)

Discussion

Policy diagnosis of a 'gap' between clinical research and health care practice is already well established, and an economic narrative has been in ascendency in health policy for at least a decade. What appears more novel, however, is the closer intertwining of innovation, 'wealth creation' and 'population health' themes as policy objectives at the macro level, this leading to the creation of regional networks as a delivery vehicle for innovation scale up across the NHS at the meso level. This has resulted in more representation from the life sciences industry within regional networks and AHSNs acting as brokers across public and private sector boundaries, and public and commercial interests. Whilst 'wealth creation' can bring to mind the dynamics of a competitive market and lofty aspirations for economic growth, neither the market nor bureaucracies alone have proved successful in policy terms at expediting the uptake of innovations (or research) in the NHS. Inter-organisational networks like AHSNs therefore represent an alternative in the health care landscape; a solution to intractable, "wicked policy problems" that require joined up working and the combining of resources from more than one professional group or organisation (Sheaff and Schofied 2016; Popp et al. 2014; Ferlie et al. 2011; Ferlie et al. 2013).

The creation of AHSNs fits with accounts of the 'New Public Governance' which describes a 'pluralist environment where the delivery of public services requires the negotiation of complex inter-organizational

relationships and multi-actor policymaking processes' (Osborne 2010, p. 2). Newman (2001) views network governance theory as an 'open systems model' in which governance is heavily influenced by the environment and characterised by fluidity, decentralisation and innovation. The AHSNs in this study certainly had more in common with ideas of "collaborative government" (Hartley and Torfing 2016) and decentred governance than they did with more contractual and performance management approaches, such as the New Public Management (Hood 1991). Yet Hartley and Torfing (2016) suggest that there is a difference in motivations between the public and private sector actors in collaborative modes of governance, arguing that: "*diffusion, or spread, of innovation is particularly salient for public organizations, which are morally if not operationally bound to try to share innovations which improve quality or reach of public services or which contribute to greater social justice*."

AHSNs appeared to be finding ways to mediate between social and public interests and commercial motivations rather than treating them as inherently opposing forces. This obviously created some tensions. The very creation of AHSN networks speaks to the way in which the delivery of modern public services now typically involves multitudinous networks and interest groups rather than a small number of central planning bodies (Osborne 2010). Whereas the New Network Governance theory views networks as a means to handle the fragmentation found in public service delivery, what became evident in the study of AHSNs is that these networks were not providing services that fitted within a traditional conceptualisation of public sector delivery, and instead were playing a distinct brokering and innovation advocacy function across the wider health system. Central government had set the agenda, but was relatively hands-off, with a health agency (NHS England) and the 15 AHSNs negotiating the 'NHS innovation paradox' described earlier in this chapter. As Bevir writes, "The state sometimes may set limits to network actions, but it has increased its dependence on other actors. State power is dispersed among spatially and functionally distinct networks." (2013, p. 9) A decentred theory of governance suggests that the variation found across the AHSNs is not surprising given that the networks were interpreting a broad policy remit and adapting to the local conditions in which they were situated, operating at the boundaries between different

institutions and stakeholder interests (ibid., pp. 66–67). Their outcomes were contingent on the interactions, networking strategies and opportunities pursued by each network and the responses they received. Only later, as the networks began to consolidate their focus and remit, did a collective AHSN narrative begin to transpire.

I characterise the earlier phase of AHSNs—the period during which they built up their teams, set strategic priorities and accessed available networks—as 'network anchoring'. In this phase, it was especially important for AHSNs to avoid capture by any particular interest group and to tailor their search for innovations to the health needs of their local populations. This involved developing trust and partnerships with regional health stakeholders and leveraging the social capital of pre-existing professional networks. There was difficulty for AHSN leaders in terms of monitoring progress along these lines, yet with time, there was increased national coordination to demonstrate impact and value. Interestingly, an evaluation of *Innovation, Health and Wealth* by RAND noted that culture change in the NHS and 'leadership for innovation' was one of most tricky policy ambitions to deliver and measure (Bienkowska-Gibbs et al. 2016, p. 12).

AHSNs, with their pluralist memberships have in some ways come to represent the sheer number of stakeholders and actors now involved in innovation adoption pathways in health care, which are by no means linear or straightforward, nor limited to just one sector. Take, for example, a diabetes monitoring tool traced in this study: the development of this product involved a leading academic team of engineers, university-based researchers, a NHS diabetologist and an industry partner that could build a glucose monitoring device. NHS organisations were persuaded by the local AHSN to pilot and adopt the blood-glucose monitoring device so that patients could use it remotely and clinicians better manage their diabetes. The local AHSN helped to mobilise the innovation into NHS clinical care and coordinate activities between different stakeholders, yet the pathway of the specific innovation—from idea to evidence-based product suitable for use in practice—involved numerous parties, sources of funding and had taken many years to come to fruition, this history pre-dating AHSNs. In fact, given the complexity and research behind many of the health care innovations identified in

the study, it was difficult to imagine adoption pathways and processes that did *not* involve a complex, mixed economy of public and private actors, even within a publicly financed health system.

In addition, the rather sweeping observation that the NHS is slow to adopt innovations is, when explored more closely, not a feature of singular institutional dynamics nor the result of poor innovation quality in the market. The picture is far more complex and the creation of AHSNs has rendered apparent issues such as poor coordination of innovation and health policy agendas at the macro and meso levels, strained inter-organisational relations within health systems, and longstanding cultural perceptions about both the NHS *and* industry that influence opportunities for collaboration. Because AHSNs have been deliberately situated *between* sectors, they are well placed to perceive how industry and innovators may develop exciting solutions but fail to attend to the most pressing population health needs and problems. At the same time, parts of the NHS can be inward looking and suspicious of industry, with a more conspicuous wealth creation and commercial agenda being particularly unfamiliar to many stakeholders. In short, AHSNs reveal how inter-dependent and complex the relationships behind modern health care systems actually are.

In their review of the network governance literature in public administration, Lecy et al. (2014) argue that collaborative networks require 'the development of significant levels of trust to effectively address new and particularly complex problems that are beyond the capacity of any single actor' (p. 648). Whilst AHSNs were focused on achieving various objectives, it was in practice difficult to measure what many AHSN leaders considered most valuable: high trust partnerships that would result in tangible benefits to patients.

Conclusions

Academic Health Science Networks (AHSNs) are a particularly decentred form of coordinating network in the English health care system. They are charged with implementing a policy to accelerate the adoption

of innovations into NHS frontline services and practice, improve population health and create wealth. This has required substantial partnership brokering by AHSNs across sectors and negotiation at local, regional and national levels. There is uncertainty and ambiguity within the AHSN movement as a whole: how to measure wealth creation and network effectiveness over time; what population and health care priorities should take precedence; what innovations should be scaled up, and when; how to support culture change in the NHS *and* industry to enable meaningful partnership working across private and public sector boundaries? Network actors report that delivering on this mandate requires a different set of leadership and influencing skills than traditionally found in vertically integrated organisations in the NHS or in clinical networks.

In the early phase, AHSNs were engaging in 'network anchoring' and looking outwards to their regions to ground their activities in local health needs and opportunities for generating wealth. The networks were not ashamed to "piggyback" on previous initiatives or programmes (such as CLAHRCs) and borrow ideas from within their health systems, particularly where pre-existing structures had been lost due to structural health care reforms. AHSNs therefore interfaced and often worked alongside other policy-mandated networks, or the remnants of them. There was a risk that the AHSNs would overlap with other initiatives and not add value (e.g. with CLAHRCs), or become too distracted by other national innovation programmes (for example, innovation tests beds, vanguards or patient safety collaboratives). They might also fail to secure enough membership support and funding to place them on a sustainable footing. To have their licenses renewed, the networks were required to demonstrate a unique role and demonstrate their impact as a system of networks, and articulate the "AHSN brand" and contribution. Whilst central funding from government provided the networks with impartiality, the downside was that delays in funding and a re-licensing decision meant that the future of AHSNs was uncertain and this made longer-term planning difficult with AHSN partners. At the end of the study, many of these issues remained unresolved.

Afterword

The empirical research study of the early development of AHSN finished in 2016 and the findings were published in a full report in early 2017 (Ferlie et al. 2017). The networks were re-licensed in 2018 after a period of ambiguity about their future. However, due to innovation adoption and technology spread remaining a high priority in health policy, one connected to the UK's Industrial Strategy, the networks have since been viewed in policy as a promising mechanism for supporting health care innovation and better relations at the interface of industry and the NHS. At a national level, the AHSNs have continued to demonstrate collective impact, such as by quantifying metrics on wealth and health outcomes. These include statistics such the 15 AHSNs creating over 500 jobs, leveraging over £330m and over 22 million patients benefiting from 'AHSN input'. Attribution of successes to the AHSNs remains complicated to ascertain however given the numerous stakeholders, co-existing health networks and funding programmes involved in health care innovation pathways and processes.

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