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1 Health Services Management Centre, School of Social Policy, College of Social Sciences, University of Birmingham, Birmingham, UK

2 Division of Medical Sciences, University of Oxford, UK

3 Oxford Academic Health Science Network, Oxford, UK

4 Department of Applied Health Research, University College London, London, UK

5 SaferCare Victoria, Melbourne, Victoria 3000, Australia

Correspondence to: C M Roberts
mike.roberts@safercare.vic.gov.au

COVID INQUIRY

Learning networks in the pandemic: mobilising evidence for improvement

Manbinder S Sidhu and colleagues examine how communities of practice developed and shared knowledge about covid-19 and how the process could be more effective

Manbinder S Sidhu,[1] Gary A Ford,[2,3] Naomi J Fulop,[4] C Michael Roberts[5]

Key messages

- The paucity of evidence during the early phase of the pandemic provided an opportunity for real time learning driven by communities of practice
- Learning from these communities led to clinical and service innovation
- A mix of opportune and strategic support from regional and national bodies in England created clinical learning networks, which adopted and spread change rapidly
- Health systems should develop learning networks to coordinate resources to innovate, evaluate, and implement emerging best practice for both pandemic and non-pandemic times

The challenges of embedding evidence into practice are well known in clinical practice, service organisation, and delivery. Less discussed is an effective mechanism to generate and implement evidence rapidly into clinical practice. During the covid-19 pandemic clinicians needed to develop and spread novel practice both for managing patients with covid-19 and to adapt existing models of care to make them safe for patients with other conditions.

Clinicians and researchers came together organically to develop learning networks, in the absence of national or regional coordination. At the onset of the pandemic sharing of evidence was reliant on personal relationships and individual leadership but was eventually supported by regional and national NHS systems to facilitate evaluation. We consider whether more could have been done earlier to support communal learning and how the networks formed can be embedded to improve implementation of research both routinely and in future pandemics.

Rapid knowledge generation

Covid-19 was a new disease with no evidence on treatment. Clinicians initially extrapolated from existing evidence of other viral respiratory diseases, but it rapidly became clear that previous guidance was inadequate for the complexities of covid-19. This led clinicians to begin sharing emerging knowledge about "what works best" nationally and then internationally in real time.[1,2]

UK research funders responded to the pandemic by mobilising rolling rapid research calls from February 2020. In parallel, several national and regional groups emerged to develop innovations in practice during the early stages of the pandemic.[3,4] Such collaborations are described as communities of practice.[5] They provide a mechanism for people working across health services to share tacit knowledge, leading to innovative practice and new learning.[6,7] Communities of practice move beyond the acquisition of knowledge and centre on three domains: joint enterprise (what it is about); mutual engagement (the interactions that lead to the shared meaning); and a shared repertoire (of resources such as techniques, tools, experiences, or process and practice).[8-10] They allow people to come together to solve complex problems with common goals using mechanisms for synthesising knowledge from their practice and support formal and informal interaction between members with resultant learning and knowledge sharing.[11,12]

Some of these communities of practices evolved into more formal clinical learning networks. These networks are characterised by structured exchange of information and learning with members, sharing of practical insights of adaption and adoption of evidence based protocols, and using innovation to overcome deficiencies in care.[5,6,13] As the pandemic unfolded these networks were supported to incorporate data and emerging evidence while also generating new evidence through partnerships with NHS England's academic health science networks, NHS regional offices, National Institute for Health Research (NIHR) applied research collaboratives, and rapid research and evaluation centres. Below we describe three examples of these new care models and draw lessons from their approach.

Networks in action

Intensive care unit clinical learning network

As a pragmatic response to covid-19, clinicians in intensive care initially applied National Institute for Clinical Evidence (NICE) guidance for managing acute respiratory distress syndrome. However, this was associated with high mortality. The Intensive Care Society (ICS) approached UCLPartners, an academic health science partnership, to form a collaboration to share emerging clinical experience (eg, insights from experts, ICU staff, and patients) between intensivists across the UK. Weekly webinars were established for ICS members to share emerging experience such as the value of proning and the early recognition of thromboembolic disease.[14] The sessions were recorded, and the academic team carried out thematic analysis. Within 24 hours these analyses were distributed by email to ICS members.

Applied health researchers supported the group with evidence searches of trial data where relevant.

Within the first week members had begun to disseminate the summary through multiple media channels to over 5000 intensivists worldwide. As it became clear that covid-19 was a multisystem disease, experts in renal medicine, haematology, respiratory, and cardiology were drawn into the learning network.

Shared learning to develop national remote home monitoring

An evaluation, completed in two months by the two NIHR rapid evaluation teams, provided evidence of how remote home monitoring with pulse oximetry (also referred to as virtual wards) was implemented during the first wave.[15] This, together with a rapid systematic review,[16] helped prepare for the second wave and the national roll out of these services.[17 -19]

Findings from the evaluation were rapidly disseminated during autumn 2020 through networks that had been established to share best practice, resources, and learning, including the covid-19 oximetry community of practice group, the National Learning Network, and its regional forums. The forums were facilitated by patient safety collaboratives established by academic health science networks and supported by the NHS Futures Platform (a network of NHS staff who want to connect with each other to accelerate their work). Some communities of practice were established from scratch while others built on established networks such as the National Deterioration Forum, an NHS funded improvement community of practice that sits within the Patient Safety Collaborative, but all brought together clinicians from primary, community, and secondary care. As a result, this programme was rolled out across the whole of England within weeks in late 2020.[20]

Adapting to virtual first approach for transient ischaemic attack and stroke care

Researchers and clinicians rapidly pivoted to focus on managing the pandemic, but less attention was given to evidence on how to provide services for patients with other conditions. Oxford academic health science network and programmes such as Getting It Right First Time adopted a learning network approach, rapidly producing guidance and resource hubs to support clinicians and health system planners organise non-covid-19 services during the pandemic, synthesising existing evidence on remote evaluation and management as well as drawing on the early experiences of sites (eg, guidance on the organisation of stroke and transient ischaemic attack services).[21]

In some instances, this work supported the rapid rollout of service models that had been tested before the pandemic, such as senior clinicians remotely assessing patients with acute stroke for reperfusion therapies.[22] In other instances recommendations were based on clinical experience and reasoning without drawing on a research evidence base—for example, remote assessment of suspected transient ischaemic attack and stroke more generally.[22 23]

Delivering change

The three cases described evolved differently but all show how new clinical learning networks can rapidly deliver change when facilitated by an administrative infrastructure. The networks brought together researchers, evaluative and academic organisations, and funders to incorporate emerging evidence. Several mechanisms enabled the networks to produce real time evidence without robust methodological evaluation. First, the networks generated new learning through collaborative and interdisciplinary working. For example, gathering both evidence based and tacit knowledge from key experts, frontline clinicians, and patients led to new learning that was applicable to different clinical contexts.

Secondly, both evaluation and research were grounded in service need, with clinical innovation driving the research agenda across networks. Notably, the networks show that transferable learning can be obtained from rapid service evaluation and not just formal research. Lastly, electronic media offered an unrealised opportunity in forming networks and in disseminating learning. This was observed both in the formal use of video conferencing software such as Microsoft Teams and Zoom to facilitate organised meetings and informally by the personal use of WhatsApp and Twitter among those with a shared interest. This can be a particularly effective mechanism for spreading learning quickly across clinical specialties. Electronic media were most effective in networks that achieved a high level of trust among their members and those which had a clear collective commitment under a common purpose.[24 25]

What worked well?

A key strength of clinical learning networks was clinicians stepping up and focusing on a clinical priority that brought large numbers of multidisciplinary experts together in a common cause. As part of a shared community of purpose, clinicians had to be honest about the challenges they faced (and expected) when establishing relationships that grew organically as part of the networks. For example, the networks were proactive in getting the "right" people (that is, active practitioners and key leaders who were able to share current experiences that were relevant and valuable to others involved). This may partly explain why the networks that emerged during the pandemic had novel collaborative and hierarchical structures.[26]

The engagement between applied health researchers and the networks was vital to the speed of dissemination of the knowledge generated.[27] A key component to achieving this engagement was the role of knowledge brokers—that is, people with hybrid professional roles who were members of several networks, facilitating interaction and coordination.[12]

As the pandemic progressed, regional NHS services provided leadership to support system-wide service change. Such coordination was absent before the pandemic, and the risk is that such collaborations will diminish as the health sector returns to business as usual. However, some examples of good practice did exist before the pandemic. The National Patient Safety Collaborative,[28] for example, operates with support from the academic health science networks. Manchester Academic Health Science Centre also operates across regionally based research and innovation organisations to provide a rapid research response group.[29] Other collaborations emerged during the pandemic, including the London evaluation cell,[30] which brought together the NHS regional team with three regional NIHR applied research collaboratives and three academic health science networks to agree on priorities for research evaluation of pandemic related service changes. Importantly, none of these initiatives had central oversight.

What were the challenges?

The first challenge was an apparent lack of national planning for or coordination of real time clinical learning and service innovation at the onset of the pandemic. In parallel, there was no national plan to use existing administrative structures to support emerging clinical networks. All were initially hampered by the lack of a supportive infrastructure at national and regional level. This could have provided access to clinical data, research organisations for rapid evaluation, and planned rather than opportunistic support from

academic health science networks. As a result, few of the clinical learning networks systematically incorporated patient and carer co-design, and only the home monitoring network considered health inequities as a key driver. Many of the networks developed for covid-19 have now discontinued rather than continue with revised goals because of lack of ongoing national or regional NHS support and direction.[26]

There was also a shortage of staff with the expertise to support rapid evaluation of frontline innovation during the pandemic. The lack of national alignment of the NIHR infrastructure was a result of a pre-existing failure to systematically address the competing pressures from the academic and policy worlds, while many staff were deployed to respond to the national research agendas.[31]

Barriers to shared learning and how to overcome them

Across our three cases we identified several barriers. Shared learning was largely limited to members of the networks. Disseminating learning in real time to frontline practitioners took time and constant refinement to ensure messages were clear. Furthermore, traditional dissemination strategies such as conferences and roundtable discussions were paused. However, other much faster routes of dissemination were developed such as electronic media (WhatsApp, Twitter) as well as NIHR rapid evaluation teams working closely with clinical learning networks to share feedback on findings using slide decks and online workshops. National alignment of networks with NICE when it occurred helped facilitate shared learning and dissemination but was limited as well as unsystematic.

The organically developed clinical learning networks during the pandemic provided an opportunity for an alternative model of knowledge generation linked to rapid implementation rather than traditional research methods. The NHS has run clinical networks previously and last made major policy changes to these in 2013,[32] the same year that academic health science networks were established. However, the two were never formally linked. These previous iterations established effective knowledge sharing, but their effect on bottom-up service transformation was ultimately diminished by top-down government demands[33] and an absence of a formal implementation partner. As NHS clinical networks were not linked to the academic research and evaluation community, and ultimately relevant and contemporary data, they never met the criteria for a true clinical learning network.

Other countries had established successful learning networks before the pandemic, including the United States (100 000 lives),[34] Denmark (operation LIFE),[35] and Japan (Partners campaign).[35] These all sought to create a sustainable national learning network that would outlive a time bounded health improvement initiative.[36] They had clear aims and leadership alongside brokering relationships with a range of stakeholders, rapid dissemination of learning to frontline practitioners using web based applications, and encouraging critique and reflection.[36]

In the UK, common interests broke down silos between specialties and across secondary and primary care. Relationships developed with the research community that highlighted the need for rapid evidence generation through evaluation and research so binding clinicians and academics to an aligned purpose. Most importantly, collaborative knowledge production and mobilisation, as part of clinical learning networks, during a pandemic required health system improvisation and collective leadership to drive forward an agenda in the absence of evidence.

However, promulgating "best practice" before robust evidence is available could result in implementing a clinical practice that later proves to be ineffective or harmful. Determining what is good enough evidence to support best practice is an ongoing challenge: whether clinicians believe available evidence is sufficiently reliable and relevant to support service change and if more robust evidence will be generated. Collaboration between clinical learning networks and academics is needed to evaluate new practice rapidly and provide evidence in a format that supports its implementation into practice. Alignment of rapid evaluation and applied health research generated by clinical learning networks is essential to create robust evidence on relevant questions for the NHS (eg, effect on workforce and workflow) and to optimise translation at scale and pace.

This approach has been used successfully overseas with strategic partnerships between academic researchers and clinical services such as the United States Veterans Administration's Office of Research and Development[37] and Kaiser Permanente's Health Research Institute.[38] Others have embedded academic researchers within the health system[1] to promote research priorities driven by the needs of the health system. Achieving an effective clinician-academic alliance requires change throughout the academic research system. A recent analysis of UK research showed that half of all funding is spent on underpinning (understanding normal biological, psychological, and socioeconomic processes, which forms the basis for subsequent research) and aetiology (the risks, causes, and development of disease).[39] In comparison just 5.6% of funds were allocated to health service research,[39] and this is compounded by the limited capacity within NHS non-research budgets for evaluation.

So what is the opportunity for the future? Box 1 suggests some questions for the English government's inquiry into the covid-19 pandemic to consider. Learning from the pandemic experience, government funding bodies, including the NHS and NIHR, should recognise the potential to align clinical communities with evaluation, research, and implementation resources to establish clinical learning networks. Linking multiprofessional clinical communities, together with patients and carers, into existing regional and national infrastructure can create an effective system for change. Those who commission current academic and applied research networks and other regional support structures now need to show decisive leadership on alignment so that we can maintain the value of working as a collaborative system.

Box 1: Questions for the covid-19 inquiry

- What were the plans to support and evaluate the innovation (both clinical and service) required of the NHS during the first phase of the pandemic?
- What infrastructure is necessary to integrate research and services, to ensure rapid evaluation of service innovation takes place?
- Should there be a national repository of all NHS service evaluation supported by national funders?
- How can we encourage NHS trusts to integrate evaluation into their practice?
- How can a system be developed across the NHS for the rapid dissemination of new learning during events such as a pandemic?

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