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practice

From dissemination to engagement: learning over time from a national research intermediary centre (Four Fs)

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Background: There has been little applied learning from organisations engaged in making evidence useful for decision makers. More focus has been given either to the work of individuals as knowledge brokers or to theoretical frameworks on embedding evidence. More intelligence is needed on the practice of knowledge intermediation.

Aims and objectives: This paper describes the evolution of approaches by one UK Centre to promote and embed evidence in health and care services. This is not a formal evaluation, given the lack of critical distance by authors who led work at the Centre, but a reflective analysis which may be helpful for other evidence intermediary bodies.

Conclusions: We analyse the founding conditions and theoretical context at the start of our activity and describe four activities we developed over time. These were filter (screening research for relevance and quality); forge (engaging stakeholders in interpreting evidence); fuse (knowledge brokering with hybrid teams); and fulfil (sustained interaction with implementation partners). We reflect on the tensions between rigour and relevance in the evidence we shared and the way in which our approaches evolved from a programme of evidence outputs to greater focus on sustained engagement and deliberative activities to make sense of evidence and reach wider audiences. Over the lifetime of the Centre, we moved from linear and relational modes towards systems type approaches to embed and mobilise evidence.

Key words evidence use • knowledge exchange • dissemination • health decisions

Key messages

- There is little shared learning on the practice of evidence use by knowledge intermediaries.
- Our account of a national evidence centre for health decision makers shows the shift towards more engaged and embedded approaches.
- We identify four central activities – filter, forge, fuse and fulfil – and how they evolved over time.
- We note the value of sustained engagement with stakeholders in shaping new evidence narratives relevant to practice.

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The know-how of evidence use

It is a truth, not universally acknowledged (Morris et al, 2011), that evidence takes 17 years to embed in practice. Except when it takes longer. It took more than 20 years from the first systematic review of infant sleeping positions in 1970 to national advice on cot deaths in 1991 (Breckon, 2016). The powerful common-sense view that babies placed on their backs might inhale vomit proved stronger than counterintuitive formal evidence.

The need to accelerate this journey from evidence into practice has given rise to many initiatives by research funders at national and local level. This is mirrored by scholarly interest with a proliferation of theoretical frameworks on knowledge exchange (Wilson et al, 2010). But Davies et al (2015), reviewing national research 'intermediary' bodies, found that few had explicit theoretical models driving their practice or were sharing learning with others. Another international study of research funders noted much dissemination activity and little strategic direction, concluding 'It is paradoxical that funders' efforts to get evidence into practice are not themselves evidence-based' (McLean et al, 2018). The gap between knowledge and practice appears to be mirrored in the distance between theory and 'doing' of knowledge exchange work.

The National Institute for Health Research (NIHR) Dissemination Centre was one such intermediary agency in the UK. Responding to the identified lack of empirical evidence on the *craft* of embedding research, this paper describes the Centre's evolution from inception in 2015 to 2020 and the development of models to engage diverse audiences at scale.

We provide a brief overview of the backdrop of scholarly debate on embedding evidence and the founding conditions of the Centre within the NIHR as context that shaped early activity. We then discuss how a blend of theory and praxis led to the emergence of four distinctive activities of the Centre which matured over time:

- filter (screening for quality and practice relevance);
- forge (using deliberative dialogue with stakeholders);
- fuse (blending research and practice knowledge);
- fulfil (partnerships to implement evidence).

Defining the problem

The challenge starts with clarifying objectives. Evidence use has different definitions, theoretical models and traditions driving distinct activities and outcomes.

The gap between theory and practice is typically framed as a knowledge transfer problem, with primacy given to research knowledge. A linear model assumes that research is universally applicable and that people change behaviour when prompted by high-quality evidence. The task of knowledge management organisations is to test the scientific rigour of research outputs and produce short, easy to read, summaries for busy practitioners. These are shared through passive diffusion (an unplanned and unpredictable process) or through more active dissemination (formal and managed) to target populations. The ambition is to disseminate 'at scale' focusing on breadth of awareness rather than depth of application.

In contrast, Best and Holmes (2010) argued that evidence should be used to trigger emergent local solutions. Systems theory can be applied to dissemination to recognise a series of complex, non-linear interactions between evidence, context and decision makers (Holmes et al, 2017), and has driven the development of interactive dissemination activities, such as knowledge brokering and knowledge mediation.

This line of thinking can go further, recognising knowledge co-production as a dialogue between evidence and its users. Langley et al (2018) use design principles in active social models of 'collective making' of knowledge, where the boundaries between knowledge creators and users are purposively blurred. Practitioners generate as well as use knowledge, in an act of 'bricolage' improvising with a mixed bag of tools and tacit knowledge to adapt to local needs (Freeman, 2007). Users select and interpret evidence on the basis of local relevance, rather than technical merit.

Context is critical and those seeking to mobilise and co-produce knowledge are often deeply embedded in service. This approach is resource intensive, highly contingent and relational.

This contrasts with the movement in health policy and practice to standardise practices and processes to reduce unwarranted variation, codifying research in knowledge products like clinical guidelines. Staff need to be seen (sometimes in a performative sense) to be adhering to 'best research evidence'. The development and growth of the NIHR embodies many of these tensions as it established a new Dissemination Centre.

Founding conditions

The NIHR was established in 2006 as an ambitious national integrated health research system. It was successful in attracting and sustaining public investment of around £1 billion a year, shaped by trends in new public management and evidence-based healthcare which also drove the creation of other agencies such as the National Institute for Health and Care Excellence (NICE). Atkinson et al (2019) note that the NIHR harnessed research to the 'health and wealth' agenda and emergent industrial strategy, foregrounding the commercial potential of research in biomedical, technology and related fields. Centre stage was the NIHR's flagship health technology assessment programme funding high quality pragmatic trials to address uncertainties identified by clinicians. These trials, synthesised through further NIHR investment in Cochrane collaborations and systematic review infrastructure, fed directly into NICE clinical guidelines.

The Department of Health and Social Care carried out a competitive tendering process for a Dissemination Centre in 2014. The stated aim in the specification was a new function 'to promote outputs from NIHR and other research'. The scope was broad in line with NIHR remit, covering all aspects of healthcare, public health and adult social care. The use of the term 'dissemination' is important and reflects underlying assumptions. The ask was functional, with targets for a number of evidence products, focused mainly on systematic reviews and clinical effectiveness research.

The tender was awarded in 2015 to Southampton University (Wessex Institute) in partnership with an independent critical appraisal unit, Bazian. Responding to the specification, the new Centre promised 'industrial scale' production of defined high- quality, high-volume evidence products. Little emphasis at the start was placed on the role of deliberative activity in selecting and contextualising evidence.

Over time, four distinctive operational principles evolved – filter, forge, fuse and fulfil.

Filter

What it was

The Centre's Signals product (emphasising the 'signals' against the wider 'noise' of ever- increasing levels of research production) was a high-volume activity, with three to four summaries published each week. These were new products, combining assessments of internal validity (such as risk of bias) with contextualised, critical summaries providing implications for policymakers and practitioners, drawing on existing formats such as policy briefs (Lavis et al, 2009). This required a robust sifting process, including a system of raters advising on importance; and a deliberative editorial process to make final decisions about reliability and relevance. We recruited raters across health and social care settings, including public contributors, adapting and expanding the model of medical raters developed by McMaster University in Canada (http://hiru.mcmaster.ca/more/).

Sifting and rating process

Studies were selected pragmatically for longlisting from top 100 high-impact health journals, generating around 300–400 abstracts a week. At the start, these were only systematic reviews. In addition, all substantive NIHR outputs were reviewed every week – around 5–10 outputs.

A combination of automated and human screening filters reduced this pool of several hundred abstracts to around 20 for rating from a pool of 1500 raters who assessed importance of research.

Editorial group

Centre staff with clinical, service and critical appraisal skills met weekly to review abstracts with rater scores and comments. Discussion focused on research quality, including risk of bias (systematic errors, such as confounding factors or partially reporting outcomes in clinical studies) and value to the service. The group typically selected around a third of eligible NIHR-funded outputs and 1–2% of systematic reviews and landmark studies from top journals.

How did we evolve?

Over time, we recognised that Signals were not engaging audiences like managers and nurses. The initial focus was on high-quality biomedical research, reflecting NIHR priorities. We added more journals later on quality improvement, management and service delivery. The focus shifted from practice-changing to reframing debates – a nod to Weiss models of enlightenment as well as instrumental knowledge use (Weiss, 1977).

Initially, we placed emphasis on rater scores for our selection processes in a semi-automated model. Over time, we realised the value of rich free-text comments (Box 1), including divergent opinion on current practice or knowledge, and invested more in deliberative decision making by the editorial group. We worked with partner organisations to recruit new raters in shortage areas like public health and engaged in more reciprocal activity with raters, giving feedback on selection of Signals and certificates for completed tasks. The rater pool became more like a community of practice over time.

Topline on filter feature

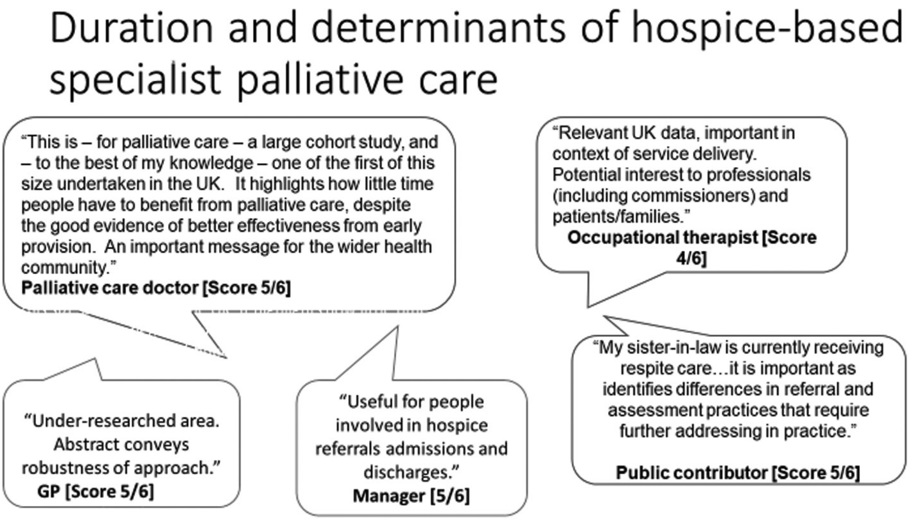
We developed a pragmatic but structured process to select 1–2% of 'top' health-relevant research and the best of NIHR funded research to share with the service, using independent raters for clinical/service insights and an editorial group with critical appraisal and health expertise. We know of no comparable national scanning service assessing all health-related systematic reviews and landmark primary research every week for relevance to health and care services.

Forge

What did we do?

The value of our products was in their relevance to decision makers and how we engaged stakeholders in interpreting the evidence. We aimed to 'forge' – or shape – evidence narratives with the audiences we wanted to reach. Our advisory group helped us select topics for themed reviews of NIHR evidence on priority, contested or neglected areas, from ward staffing to care homes.

Box 1: Filter – example of rater comments



Duration and determinants of hospice-based specialist palliative care

"This is – for palliative care – a large cohort study, and – to the best of my knowledge – one of the first of this size undertaken in the UK. It highlights how little time people have to benefit from palliative care, despite the good evidence of better effectiveness from early provision. An important message for the wider health community."
Palliative care doctor [Score 5/6]

"Relevant UK data, important in context of service delivery. Potential interest to professionals (including commissioners) and patients/families."
Occupational therapist [Score 4/6]

"Under-researched area. Abstract conveys robustness of approach."
GP [Score 5/6]

"Useful for people involved in hospice referrals admissions and discharges."
Manager [5/6]

"My sister-in-law is currently receiving respite care…it is important as identifies differences in referral and assessment practices that require further addressing in practice."
Public contributor [Score 5/6]

We convened an expert steering group of 15–20 people for each review including managers, researchers, at least two people with relevant lived experience and frontline practitioners across professions and disciplines. These included national clinical directors, who enabled professional buy-in and alignment with policy and service incentives.

Steering groups agreed the scope of the review and advised on the narrative and interpretation of included research. Boyko et al describe the value of *deliberative dialogues* 'by creating opportunity for policymakers and stakeholders to discuss, contextualise and determine what the research evidence means in light of the tacit knowledge and real world experience that they bring to the discussion' (Boyko et al, 2012: 1939)

How did we evolve?

Initially the key function of steering groups was to approve draft reports. Over time, we developed more active processes of sense-making and engaging steering group members as connectors and opinion leaders.

There was tension in producing an agreed narrative while acknowledging different epistemologies and power relations in the group. The stroke review foregrounded difficulties for some allied health professionals in presenting negative findings when services were under pressure. Some of these debates and conflicts were 'smoothed out' in the interests of a single narrative but warrant further investigation and debate. In terms of power dynamics, the final themed review saw charities and advocacy groups of people with learning disabilities driving the outputs, initiating and shaping an easy-read report.

Topline on forge feature

Early and close engagement of an expert steering group with stakeholders in deliberative dialogues strengthened themed reviews by contextualising and interpreting evidence and increasing reach to intended audiences.

Box 2: Forge – learning disability review

The Centre's review of evidence for learning disability services was launched in February 2020. As well as researchers, the steering group included care workers, social workers, occupational therapists, learning disability nurses, general practitioners, psychologists and psychiatrists, policymakers (through the national clinical director), patient advocates and charities. In parallel, the Centre commissioned patient advocacy groups to conduct focus groups with people with learning disabilities and family carers. This resulted in vignettes for the main report, a co-produced easy-read version and film. These outputs were shared widely with networks and communities of the steering group at face-to-face events, service conferences and webinars.

Fuse

What did we do?

We employed a number of clinical advisors as knowledge brokers (Kislov, 2016) fusing knowledge of evidence with clinical or service experience. This helped to provide credibility and context, facilitating 'deep reach' for linkage and exchange events and follow-on activity. As well as core staff, we co-opted individuals with particular backgrounds like physiotherapy to lead musculoskeletal work.

How did we evolve?

Over time, the *relational* activity between individual knowledge brokers and professional groups and networks – the second phase in Best and Holmes' evolution of knowledge- exchange practices (Best and Holmes, 2010) – was complemented with a *systems*-level approach. The focus shifted from contact with individual practitioners (Box 3) to developing absorptive capacity in organisations. In 2020, the Centre produced a 'how to' guide for senior nurses with the Chief Nursing Officer for England on embedding research in their organisations (NHS England, 2020). Working with national and local organisations shaped evidence summaries and general engagement approaches.

Topline on fuse feature

Knowledge brokers spanning service and research worlds were important in extending reach and these relational activities were augmented by a later systems focus, working with health leaders to embed research in organisations.

Fulfil

What did we do?

A principle of good communication is to go where people already gather – and membership organisations, advocacy groups and professional bodies are a good way of reaching individuals. An early feature of the Centre was forging partnerships with

Box 3: Fuse

The Centre's broad and deep engagement with nurses was led by an individual with research and senior nursing/management experience. This led to opportunities, from joining policy steering groups on frailty to hosting fringe events of mainstream UK national nursing conferences. The focus was not just on promoting individual Centre evidence products of interest to nurses, but influencing wider debates on evidence literacy and use. There were also tailored versions of Signals in a leading practice journal, with reflective questions to embed research in learning and improvement activities. Contacts and knowledge of policy ensured active Twitter presence in debates and tweetchats.

Box 4: Fulfil

We engaged the Chartered Society of Physiotherapy early in our 2018 review of evidence on musculoskeletal services. They hosted our first steering group, provided contacts (like commissioners and specialist practitioners) and promoted our review findings to their members (95% of the total profession). They hosted regional workshops and set up an implementation taskforce to support and monitor acceleration of evidence to practice, with videos and patient-facing summaries. They also provided a platform for promoting the findings through a popular physiotherapist podcast, with reach of over 80,000 practitioners. Through their membership journal, the Society documented examples of evidence-led innovation such as physiotherapy-first clinics and new triage approaches as part of the impact story.

organisations, from medical royal colleges to health charities. This needed effort to build and maintain relationships over time – what Huberman has called ‘sustained interaction’ (Huberman, 2012).

How did we evolve?

As a small Centre, there was a limit to what we could achieve on our own. We were able to seize opportunities to bolt onto existing initiatives by implementation partners. This included work with a local service/research innovation agency (Wessex AHSN, 2018) to develop an audit of local hospitals against evidence-based best practice from our 2018 review of frailty, leading to potential national scale-up. We were able to align other themed reviews with local and regional research implementation activity in areas like end of life care and serious mental illness.

Topline on Fulfil feature

We developed strategic partnerships with membership organisations and implementation bodies to strengthen reviews and extend reach and impact.

Discussion

The NIHR Dissemination Centre in its five-year history published more than 790 Signals (summaries of single studies with commentary and implications), selected with input from more than 1500 clinical and service raters, and worked with over a thousand stakeholders including clinical opinion leaders to debate and produce fourteen research overviews on priority themes, from assistive technology to end-of-life care. In its last year, the Centre attracted more than a million viewers to its digital platform. Many of the initial aspirations of the Centre were achieved, but its work also highlighted tensions and challenges in the mission to make evidence more used and useful.

Rigour vs relevance

The focus on products and outputs was determined by contract performance targets. This reflected the need, particularly acute at the start, to demonstrate ‘return on investment' with tangible outputs. As Davies et al note, 'Despite widespread understanding about ideas of linkage and exchange, many agencies experience a strong pull back to the creation of knowledge products, with a strong emphasis on the rigours of the underlying research base and the credibility of the evidence sources. This rigour–relevance tension lies largely unresolved at the heart of many debates within agencies, and many agencies seem to struggle to break free from "push" dominated activities' (Davies et al, 2015: 124). These expectations persist for many knowledge intermediary bodies, in the face of well-established research over decades supporting more collaborative, integrated and systemic approaches which are more difficult for funders to monitor, manage and assess.

When selecting research to work up as individual Signals (summaries), the default was to focus on experimental evaluation of treatment effectiveness, rather than more enlightenment or conceptual-type knowledge (Weiss, 1977). The editorial group, largely with biomedical backgrounds, found such studies harder to assess in terms of quality and rigour and struggled to craft action-oriented headline messages. At the same time, trials and effectiveness studies were also problematic, given potential overlap with clinical guidelines, highlighted by some medical practitioners in feedback on Signals. As we evolved, we were able to position the Signals more clearly, as single studies which might prompt decision makers to 'think twice', but not replacing comprehensive clinical guidelines.

Other feedback from our internal evaluations included concern around the status of our themed reviews as partial evidence from one (large) funder, rather than a systematic review of all published evidence in a field. As the Centre matured, we were more confident in positioning these reviews as a response to the 'pull' of policy and practitioner needs. A focus only on the NIHR was justified by the quality bar for studies, active commissioning on areas identified as important gaps, and focus on UK health and care delivery systems. The reviews were grounded in wider evidence and policy, as a digest of relevant research with a narrative for action, creating a golden thread linking disparate studies of varying degrees of certainty and generalisability to inform clinical mindlines (Gabbay and Le May, 2004) driving practice. As such, they filled a gap beyond narrow but technical systematic reviews on the one hand, and policy-scoping papers on the other which were light on evidence. This further informed the choice of topics by our service-facing advisory group, selecting under-served areas such as assistive technology or workforce where evidence was emergent, contested or dispersed.

While perhaps other parts of the evidence eco-system privileged rigour over relevance, the Centre gave both equivalence. In this sense it chimed with others who note that readability, relevance and rigour are 'interrelated principles' (Thomson, 2013) when it comes to evidence-informed practice and policy.

Evolution of evidence use

Our reflections are informed by the three-stage model of evidence use by Best and Holmes (2010), moving from linear – how can we best disseminate and package research content? – to relational – how can we use people to connect the worlds of research to practice or policy – to systems thinking – how can we embed structures and processes to support research use? We can see this evolution in our overview of the Centre's work, although we would counter some of the more 'straw man' critiques of the linear model with our experience that to present and package evidence well, with input and context from evidence users, is itself a sophisticated activity which requires skill and attention. Our approach included carefully crafted products, with linkage and exchange events and use of knowledge brokers in the relational mode. Later phases of the Centre's work saw more systems thinking, working with implementation partners to translate review findings into service improvements and co-produce policy guidance on using evidence in health organisations. Best and Holmes note, rightly, that we move through these perspectives cumulatively. We can see layers of these different approaches and models in all of our work (Best and Holmes, 2010).

Existing literature has perhaps focused more on the relational, from the work of individual knowledge brokers (Thompson, 2006) to use of guidelines by individual clinicians, than on collective forms of knowledge exchange (Contandriopoulos et al, 2010). Kislov et al (2016) call for a shift towards knowledge brokering as a collective process unfolding at the team level and actively supported by the broader organisation. Little attention has been paid to date to the work of organisations, rather than individuals – the overlooked 'third community' between research and practice (or policy) (Isett and Hicks, 2020).

Other areas of evidence use have been under-examined. Kitson et al (2013) note that existing frameworks underplay the complex ways in which the role of stakeholders needs to be negotiated, structured and formalised in knowledge-exchange activities. In our themed review steering groups, there were many examples of power dynamics, hierarchies and interplay in terms of who spoke (or not) and whose interpretations of evidence dominated. We need more research into the deliberative processes of using evidence in similar exercises, such as clinical guideline development.

Reaching the parts that others don't

The NIHR Dissemination Centre was appointed in 2015 at a time of expanding growth in health research production, synthesis and promotion. This included a web of research funding bodies, academic units, national and regional collaboratives tasked with getting evidence into practice. It was important to position the Centre in a complex evidence eco-system and to find its distinct role.

One was to be an independent, trusted source to validate and filter evidence. While research funders demand planned dissemination activity, relying on researchers alone is problematic. Recent research noted exaggeration and 'spin' in university press releases (Sumner et al, 2014), exacerbated perhaps by focus on impact.

Much early work of the Centre was determined by the initial contract, with a demanding programme of evidence outputs. This was presented largely as a technical, objective exercise. Our early thinking reflected this, with an emphasis on processes and structures for reliable sifting, searching and extraction of relevant material. As we developed, we put greater focus on the service-informed knowledge and assessment of evidence in terms of what mattered to whom.

Features such as raters and an editorial group with a range of clinical and service experience assumed greater importance than envisaged at the start. The programme of themed reviews, with stakeholders making sense of the evidence with skilled facilitation from the Centre, became more important over time, having been a relatively slight part of the original bid. The small team at the Centre, which was remarkably stable, included individuals with service experience and credibility with policymakers and practitioners. Over time, our focus shifted towards sustained partnership with service and implementation partners to support organisations and individuals to use evidence in practice. We built on experience in developing sophisticated linear models and credible relational activity to explore systems approaches to embedding evidence at the point where decisions happen.

Reflections, limitations and future directions

This is a descriptive study of dissemination and engagement activities by one national research funder over five years. We developed broad and deep engagement approaches to shape evidence products, reach audiences with sustained relational activity, and engage system levers to embed research. Our approach evolved over time, drawing on theoretical models and experience to develop filter, fuse, forge and fulfil functions. What difference did it make? We only have a partial answer. Aside from particular evaluations of flagship products, using interviews and focus groups with target audiences, surveys of product users and stakeholder feedback, the team also regularly used metrics on reach, social media engagement and marketing intelligence. We found it easier to measure activity, downloads and audience share, and harder to assess outcome and impact.

Other agencies have found this challenging. Straus et al (2010) discussed the difficulties in distinguishing between the impact of the research itself and activities of intermediary bodies to amplify this for target users. McLean et al (2018) developed a useful framework for assessing knowledge-translation activities of research funders, distinguishing between intended strategy (initial plans), realised strategy (programme of activity as delivered) and emergent strategy (adapted after use). The activities in this paper are not so clearly delineated as distinct stages. The four features described here were shaped by the initial funder's brief, reflecting more linear approaches to evidence use, but then adapted incrementally. This reflected a turn towards more relational and systems thinking, while delivering agreed programmes of work. Meeting funder needs was important. Developing better metrics on reach and high quality engagement may give funders confidence in the future to invest in more activities, not just evidence products and 'push'.

This is not an independent evaluation, but the case studies and analysis are informed by close experience and insights of the authors and resonate with existing theoretical frameworks, extending them with focus on the four Fs. Given problems in organisational memory – see for instance, Maybin's study of civil servants showing policy (over)dependence on informed individuals (Maybin, 2015) – it is important to record and distil experiential learning for others. This kind of analysis would have been helpful to us at the start of our journey.

Some of our core learning is that it takes time and senior skilled staff with credibility in research and service settings to develop trust, sustain relationships with partner organisations, and deliver meaningful engagement and evidence 'work'. We were most successful when we started with audiences and their needs, particularly under-served groups like paramedics, not with the evidence itself. As an organisation with a broad remit, we needed to prioritise and target audiences carefully.

To date, there has been insufficient attention to the practice of 'knowledge intermediation' (Greenhalgh and Wieringa, 2011) by organisations. This gap is recognised by others, including recent analysis from a public health research intermediary body (Van der Graaf et al, 2020). Mechanisms are needed to share learning between evidence intermediary bodies and evaluate practice, from tailored outputs to new forms of facilitation. We hope that this reflective piece will provide some insights and learning in an emerging field and generate further discussion.

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Contributor statement

TL and EM wrote the first and subsequent drafts of the paper.

Conflicts of interest

The authors held senior posts at the NIHR Dissemination Centre (TL Deputy Director/Director and EM Clinical Lead) and still hold NIHR contracts.

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