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Addressing the challenges of knowledge co-production in quality improvement: learning from the implementation of the researcher-in-residence model

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► Additional material is published online only. To view please visit the journal online (http://dx.doi.org/10.1136/bmjqs-2017-007127).

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Received 5 July 2017
Revised 7 May 2018
Accepted 13 May 2018
Published Online First 4 June 2018

Check for updates

To cite: Vindrola-Padros C, Eyre L, Baxter H, *et al*. *BMJ Qual Saf* 2019;**28**:67–73.

ABSTRACT

The concept of knowledge co-production is used in health services research to describe partnerships (which can involve researchers, practitioners, managers, commissioners or service users) with the purpose of creating, sharing and negotiating different knowledge types used to make improvements in health services. Several knowledge co-production models have been proposed to date, some involving intermediary roles. This paper explores one such model, researchers-in-residence (also known as 'embedded researchers').

In this model, researchers work inside healthcare organisations, operating as staff members while also maintaining an affiliation with academic institutions. As part of the local team, researchers negotiate the meaning and use of research-based knowledge to co-produce knowledge, which is sensitive to the local context. Even though this model is spreading and appears to have potential for using co-produced knowledge to make changes in practice, a number of challenges with its use are emerging. These include challenges experienced by the researchers in embedding themselves within the practice environment, preserving a clear focus within their host organisations and maintaining academic professional identity.

In this paper, we provide an exploration of these challenges by examining three independent case studies implemented in the UK, each of which attempted to co-produce relevant research projects to improve the quality of care. We explore how these played out in practice and the strategies used by the researchers-in-residence to address them. In describing and analysing these strategies, we hope that participatory approaches to knowledge co-production can be used more effectively in the future.

INTRODUCTION

The concept of knowledge co-production is increasingly used in health services research to describe a culture of partnership (which can include academic researchers, practitioners, managers, commissioners or service users) with the purpose of creating, sharing and negotiating different types of knowledge.[1–4] The underlying assumption is that if knowledge is created through the interaction of these different groups of stakeholders, it will be able to reflect a wider range of perspectives, provide insight into the issues affecting each group, be more relevant to the local context and, therefore, more easily translatable into changes in policy and practice.[5–11] The concept of knowledge co-production is also based on the premise that there are multiple and coexisting forms of knowledge, all of which are important for making improvements in the health sector.[6 12]

Several models of knowledge co-production have been proposed to date, involving different gradients of engagement between academics as researchers and practitioners within healthcare organisations.[13–17] This paper focuses on one approach to knowledge co-production—the researcher-in-residence model (also known as 'embedded research').[4 18–20] Researcher-in-residence models have the following characteristics: (1) researchers are part of a local team with shared responsibility for the success or failure of the research or improvement initiative,[21] and (2) researchers-in-residence negotiate the meaning and use of research-based knowledge and co-produce knowledge that is sensitive to the local context and responsive to the continuously changing needs of the organisation.[19]

The researcher-in-residence model is a 'way of working' that might draw from a

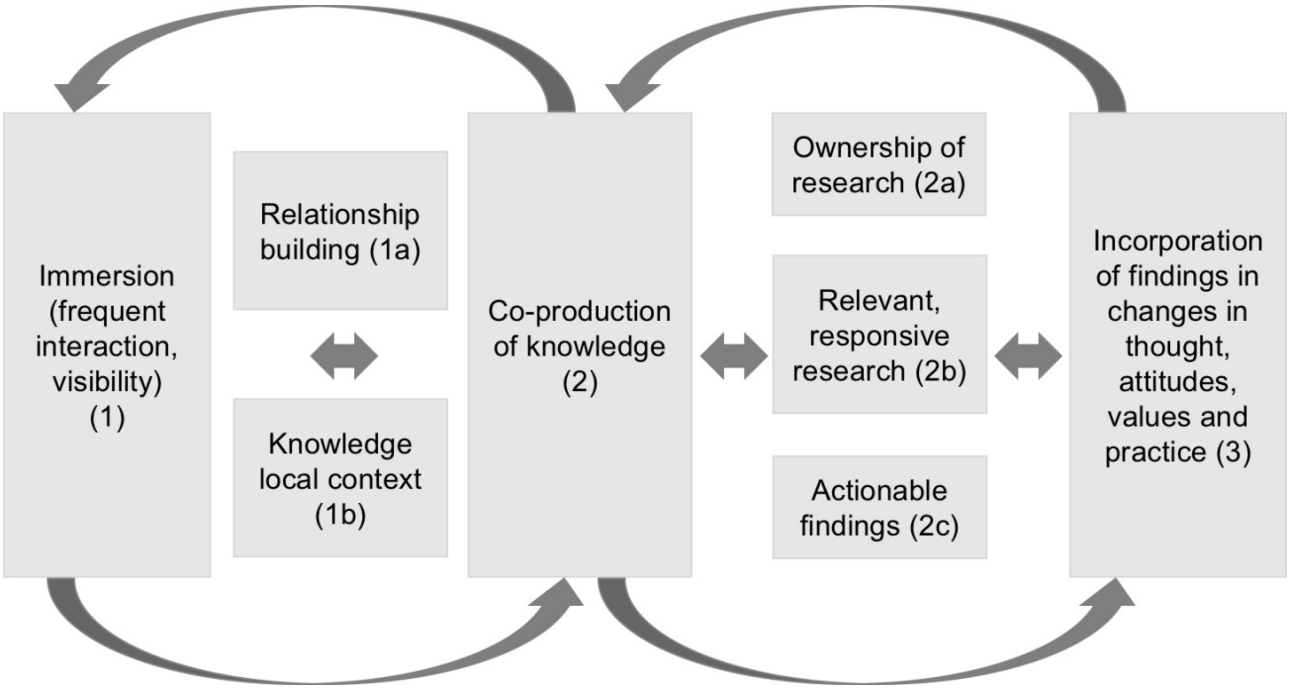

Figure 1 Researcher-in-residence model.

wide range of academic approaches (ie, various types of evaluation designs, ethnographic research and operational research methods), but has the ultimate goal of co-producing knowledge in order to make improvements. The model is based on the premise that changes are desired or required in an organisation, and it is the responsibility of the researcher-in-residence to collaborate with staff to co-produce research that can indicate how these changes are to be made and/or evaluated.

These embedded roles do not come without challenges.[20] In this paper, we draw from the experiences of researchers-in-residence from three case studies implemented in the UK to identify the main challenges encountered by these researchers, how these have manifested themselves in practice and the strategies used to address them. We use these findings to critically reflect on the researcher-in-residence model and propose a series of lessons learnt that can be used by other researchers interested in using this approach.

RESEARCHER-IN-RESIDENCE MODEL

Researcher-in-residence models are based on the premise that the presence of researchers in healthcare organisations promotes the building of relationships through daily interaction. Through these relationships and immersion in the organisation, researchers acquire knowledge of the local context and collaborate with staff members to co-produce research that is relevant and responsive (see figure 1).

Researcher-in-residence models presume that if the research-related outputs are co-produced, staff members of the host organisation will have greater ownership of the research (and of the findings), and the research will be more relevant and responsive to the changing needs of healthcare organisations. Furthermore, the process of co-production provides researchers with greater insight into the types of findings required by the organisation, the times when these should be shared and the best format to share them, making findings more actionable and facilitating their incorporation into changes in practice (see summary of expected impact in box 1). The collaborative process of knowledge co-production could also help generate research capacity in the host organisation through the transfer of skills and knowledge. This is not a linear

Box 1 Expected impact of a successful researcher-in-residence model

Co-production
Increase in research or research grants co-produced between staff members in the host organisation and academics

Changes in attitudes and values
Development of research curious and research aware staff members in the host organisation

Service evaluation and research capacity and capability
Development of staff members' research skills, so they are able to conduct evaluations and other types of research independently

Changes in practice
Greater use of research evidence to inform decision-making in healthcare planning, organisation and delivery

process, as it often entails various iterations of immersion (relationship-building and analysis of the local context) and co-production of research.

CASE STUDIES

In this paper, we analyse the application of the researcher-in-residence model in three contexts (see Table 1). The first case study is the evaluation of the Waltham Forest and East London (WEL) integrated care pioneer programme,[19] carried out by the Improvement Science London group from the Department of Primary Care and Population Health at University College London. The second case study is the University College London Hospital (UCLH) Embedded Research Team (ERT). The UCLH ERT is allied to the North Thames Collaboration for Leadership in Applied Health Research and Care, a partnership between universities and healthcare organisations designed to facilitate knowledge mobilisation.[22] The third case study, the Bristol Knowledge Mobilisation team, was composed of local healthcare policy-makers and researchers-in-residence from academic primary care at the University of Bristol who were embedded into each other's organisation to create a two-way, multiprofessional, co-located team (see also online supplementary appendix 1).

The three researcher-in-residence models differed in a number of ways. For instance, the WEL evaluation was carried out by one researcher, while the UCLH ERT and Bristol KM used teams of researchers with four to five members. The Bristol KM team was different in the sense that it included researchers and local healthcare commissioners as part of the team. The UCLH ERT was the only case to have an interdisciplinary team of researchers from three fields of research (anthropology, health economics and operational research). The WEL evaluation had a large geographical scope, containing nine organisations, while the UCLH ERT worked in one large organisation and the Bristol KM team with three organisations.

CHALLENGES AND STRATEGIES

The challenges encountered in the three applications of the model had different degrees of intensity and the strategies used in the three case studies depended on the local context and case characteristics (see online supplementary table 1).

Building relationships

According to the researcher-in-residence model (figure 1), the co-production of research is facilitated by a process of immersion in the organisation. This immersion, characterised by frequent interaction, is based on developing relationships with stakeholders and understanding the culture and context of the operational or programme team(s). Relationships are important because they help facilitate the sharing of information from different points of view (gaining a more holistic view of the situation) and help foster a sense of ownership over the study and its findings.

The initial establishment of relationships required a high level of physical presence and face-to-face interactions in the host organisation (ie, using desk space in the host organisation, attending meetings regularly). Once these relationships started to emerge, it was possible to sustain them in part through more 'virtual' forms of visibility (ie, email), but some face-to-face contact continued to be necessary. Using virtual media for maintaining relationships was particularly important for the WEL evaluation, where the researcher engaged with nine organisations and could not be physically present in all of them for prolonged periods of time.

The process of building relationships was not easy. The three cases encountered problems such as lack of access to areas and staff members (producing delays with recruitment and observations), lack of staff engagement with the research (meaning that only some members of staff could benefit from capacity-building activities or the use of findings to improve practice), and not enough familiarisation with the local context before the research started (produced by the pressure to begin the research as quickly as possible).

In all three case studies, the researchers drew from pre-existing relationships to gain access to the relevant networks and organisations for their specific projects. Generally, these contacts and relationships were facilitated by individual senior academics and/or managers in practitioner/policy-making organisations. Key people within the host organisations where the researchers were embedded played the role of 'sponsor' or 'champion', introducing team members to staff and guaranteeing access to areas.

This strategy worked in several cases, but did not guarantee engagement from all staff, as even though contact was established, it did not mean staff saw the potential value of collaborating with the research team. Furthermore, in some cases, sole reliance on sponsors meant that the people researchers gained access to as research participants were more likely to share the sponsor's views, limiting the range of perspectives and interests represented in the study. Over-reliance on sponsors was also risky in the sense that when sponsors left the organisation or moved on to other roles (a situation experienced by the UCLH ERT and the Bristol KM team), researchers-in-residence had to develop new relationships all over again.

A combination of pre-established contacts and new relationships appeared to be a better approach for the creation of networks in the host organisation. The Bristol KM team found building relationships less difficult, partly because those funding the Bristol KM team (who were co-located within policy-making premises) had already built useful relationships. The most helpful lever, however, was that local policy-makers were seconded into the team and worked

in tandem with the researchers-in-residence to achieve objectives. These KM team members used their own contacts, knowledge, experiences and credibility to guarantee that of the researchers-in-residence, thereby introducing the researchers-in-residence to a range of useful staff. Over time, they helped the researchers-in-residence develop a complex network within the host healthcare policy-making organisation including 'champions' (ie, senior well-respected policy-makers), 'allies' (ie, friendly policy-makers who offered contacts and support) and 'chaperones' (ie, a key person within the host organisation who met regularly with the researcher-in-residence to keep an eye on progress).

In all case studies, the researchers used a 'scoping phase' or 'introductory period' lasting several months to familiarise and immerse themselves in their host organisations. The UCLH ERT, for instance, carried out a 3-month 'introductory period' where they met staff members using a snowball technique based on referrals by colleagues, spent time in key areas of the organisation and familiarised themselves with the main initiatives taking place across the Trust in which they were embedded. In two of the teams (WEL evaluation and UCLH ERT), a formal group composed of senior staff members from across the organisations was established to oversee the progress of the work (acting similarly to a steering group) and make sure the researchers had access to the required areas in the organisations and people.

Defining and adapting the scope of the projects

According to the model (figure 1), researchers-in-residence are often required to review and re-negotiate their contribution to the programme, team or project once in post as well as the focus and methodology of the research project or evaluation. The responsiveness of researchers-in-residence to these changes and flexibility to adapt to changing circumstances are a crucial component of the model, but the need to maintain a balance between adaptability and 'holding the line' to preserve the consistency and rigour of the research might produce tensions for researchers.

In practice, this flexibility can be difficult for researchers-in-residence dealing with complex problems and deadlines. Furthermore, researchers might struggle to maintain a clear and consistent understanding of their roles and the aims of the research or evaluation project as it progresses. In the case of the three cases, the selection of potential research topics, questions and methods was carried out in collaboration with those from the stakeholder organisation(s). For the UCLH ERT and the WEL evaluation, this was primarily done via the formal groups that had been established in the introductory period. The UCLH ERT also formed a panel comprising patient and carer representatives to advise on the research. For the Bristol KM team, the researchers-in-residence became members of commissioning steering meetings, where potential research topics emerged that were later agreed. Opportunistic encounters with commissioning leads also generated possible areas of investigation. All three case studies cite the importance of addressing stakeholder expectations during early stages of the research.

Projects were continuously reviewed in relation to the organisations' changing needs. In some cases, protocols could be adapted if the needs of the organisation changed, but in other cases (ie, cases where the suggested changes jeopardised the validity and independence of the research), the researchers needed to stress the importance of maintaining the original study design. In the WEL evaluation, the researcher-in-residence shared and collaboratively interpreted emerging findings with stakeholders at regular intervals, for example, using the advisory group, and used these discussions to plan the next steps of the research. In Bristol, the researchers-in-residence, along with the commissioning evaluation lead (a former KM team member), set up a 'community of practice'[23] made up of provider managers, community matrons, commissioners, healthcare analysts, and qualitative and quantitative researchers who met every 6 to 8 weeks.

Maintaining academic professional identity

The dual affiliation of a researcher-in-residence can represent a real risk for career development in academia. The required outputs for academic advancement (in particular the publication of academic papers in high-impact journals) can be more challenging to produce for researchers-in-residence because they spend a larger proportion of their time in the field than is the case of traditional researchers. Furthermore, feelings of isolation might also affect the researcher-in-residence's identity, where they might consider themselves more as members of staff of the healthcare organisation and less like academics able to maintain a critical distance.

The researcher working on the WEL evaluation was the one who struggled the most with professional isolation, possibly because she worked alone. In order to deal with this, she had weekly meetings with her academic supervisor with email or telephone contact between and a group of mentors (academic and practitioners) were convened to support her in the role. The UCLH ERT and the Bristol model involved teams of multiple researchers (and local policy-makers (Bristol)), so senior and other team members could provide support through regular meetings (monthly and fortnightly respectively) to discuss and make decisions on various topics. Within Bristol, academic isolation was less problematic as the researchers-in-residence had a 1-day-a-week role at the healthcare policy-making organisation, leaving time at the university for contact with academic colleagues. Nonetheless, although professional isolation was not problematic, the professional progression of the researchers-in-residence was hampered, with less time to publish academic papers.

Box 2 Lessons learnt in the application of the researcher-in-residence model

Set-up
Pre-existing relationships between researchers and health service staff can be used to secure access for researchers-in-residence. A set-up period before the research begins can be used to ensure they have points of contact.

Introductory period
An introductory or scoping period (minimum 3 months) at the start of the project can be used to allow the researchers-in-residence enough time to familiarise themselves with the organisation and build relationships.

Agree the scope of the research early
Research priorities, expectations and expected outcomes (including when findings are to be shared) need to be agreed by all relevant stakeholders at an early stage of the project and re-assessed regularly. It is vital to have conversations about the need to maintain the independence of the research.

Provide regular feedback
The regular sharing and interpretation of findings with relevant stakeholders can be used to make sure that the research is still relevant and identify the need for adaptations.

Maintain links with academic institutions
Researchers-in-residence can benefit from maintaining close relationships with senior supervisors, groups of researchers and academic networks. These relationships can help researchers-in-residence maintain a critical perspective and build their academic careers.

DISCUSSION

The potential benefits of closing the gap between research and practice are well recognised,[4 18] but the challenges associated with practical attempts to do so are significant and poorly understood. This paper highlights three main challenges, which have been identified by the authors while testing a model that attempts to bridge this gap, and discusses strategies used to overcome them. We have also developed a set of lessons learnt to guide other researchers-in-residence encountering similar challenges (box 2).

A significant challenge is developing supportive and facilitative relationships with members of staff to enable the co-production of knowledge. The strategies used in the three case studies are well aligned with Lewis and Russell's[24] perspective that it is vital for the researcher to undergo a period of immersion within their host organisation. This can facilitate the researchers' familiarisation with an organisation to ensure that any subsequent study is tailored appropriately.[20 21 25 26] It therefore seems important that, as in these case studies, an 'introductory period' or a 'scoping phase' is built into the project plan and formalised as an integral part of any evaluation or research to be undertaken by a researcher-in-residence. This introductory period normally takes time (anywhere from 3 to 6 months in our case studies), but it is an essential component of building relationships.

The negotiation of the scope of the research was also identified as a challenge due to the rapidly changing needs and priorities of healthcare organisations and the temporal realities of the conduct and processes of academic research. This negotiation requires that researchers acknowledge and negotiate power relations in both host and academic organisations, as these relations might influence the format and language used to transfer knowledge and share findings (as these might have political implications), staff members' willingness to collaborate in research (and collaboration across professional groups) and which research topics can be studied.[14] Researchers-in-residence will need to balance flexibility with 'holding the line' in relation to maintaining the rigour and independence of the study. They will also need to be clear with host organisations that they will seek to share all findings of the research, even if these are 'uncomfortable' in the sense that they go against expected outcomes or intended results.[27] The extent to which researchers are able to share challenging or 'uncomfortable' findings while maintaining relationships is one measure of the researcher's success.

Several researchers-in-residence faced challenges maintaining their professional academic identity, but this challenge had less impact on the implementation of the model. The challenges experienced by the authors of this paper are not dissimilar from those identified in the literature on other intermediary or boundary roles, where researchers might experience 'role strain' produced by the competing demands of the organisations they are affiliated to.[20 28 29] There is also a potential risk that researchers will 'go native' in the sense that they will see themselves solely as a staff member of the host organisation, losing their 'critical friend' perspective and potentially compromising the independence of the research. In our analysis, we found that maintaining regular dialogue with academics about their research allowed researchers to preserve a critical perspective and ensure their research was rigorous.[24]

This article uses just three applications of the researcher-in-residence model, which might limit the transferability of the strategies proposed to address challenges in knowledge co-production. It is based on the assumption that co-production will lead to the smoother incorporation of research knowledge into changes in practice, an assumption that has been widely debated in the literature.[30] Additional work is required to examine the impact of this model in other organisational contexts and learn more about its challenges and benefits.

Table 1 Three researcher-in-residence case studies

	WEL evaluation	UCLH ERT	Bristol KM
Team composition and expertise	1 full-time researcher (social scientist)	Originally two full-time researchers (anthropologist and operational researcher). Team later reconfigured to include five part-time members (two anthropologists, two operational researchers and one health economist)	Two researchers working 1 day a week (anthropologist and mixed-methods researcher) plus two local healthcare commissioners (policy-making transformation teams)
Team supervision	1 senior academic based at UCL	3 senior academics based at UCL	1 Senior Research Fellow who also acted as a researcher-in-residence
Duration	Initially 2 years, then extended for a further year	3 years	2-year contracts, team ran for 3 years
Team university affiliation	Improvement Science team, Department of Primary Care and Population Health, UCL	Department of Applied Health Research and Clinical Operational Research Unit, UCL	Centre for Academic Primary Care, Bristol University
Funding source	NHS Commissioners from the WEL IC programme partners	NIHR RCF funding administered by UCLH	NIHR RCF funding administered by the Avon Primary Care Research Collaborative
Setting (host organisation/s)	Nine organisations participating in WEL IC programme in East London	UCLH NHS Foundation Trust	Bristol Clinical Commissioning Group, Centre for Academic Primary Care, South Gloucestershire and North Somerset Clinical Commissioning Groups

NHS, National Health Service; NIHR RCF, National Institute for Health Research Research Capability Funding; UCLH ERT, University College London Hospital Embedded Research Team; WEL, Waltham Forest and East London.

CONCLUSION

The researcher-in-residence model is a potentially useful model of knowledge co-production that can help address some of the problems quality improvement in healthcare faces today.[31 32] This article represents ongoing learning around the practical implementation and development of the researcher-in-residence model as a methodological tool to address the research–practice divide. Our comparative study of the application of the researcher-in-residence model in three contexts has shed light on implications for this type of research, which include researcher-in-residence models take time, flexibility needs to be built into research designs to allow for changes throughout the implementation of projects, and clear links and feedback loops need to be established between researchers-in-residence and academic institutions to maintain professional academic identity. We hope the sharing of this learning can help further develop the use of the researcher-in-residence model in practice.

Acknowledgements The WEL IC evaluation team are grateful to all those involved in the Waltham Forest and East London Integrated Care Pioneer Programme for their support, involvement in and contributions to the evaluation. We are also grateful for the mentors who gave their support and advice throughout the project: Dr Michael Farrelly, John Wardell and Professor Martin Roland. The Knowledge Mobilisation Team would like to thank Bristol Clinical Commissioning Group and Avon Primary Care Research Collaborative for all their assistance and support with this project. We are particularly grateful to the clinical leads Dr Peter Goyder and Dr Gill Jenkins, who championed and guided this work throughout. The UCLH ERT would like to thank the UCLH Embedded Research Board and the ERT PPI Panel for their ongoing support and guidance.

Contributors MM and LE conceived the idea for the paper. LE and CV-P led on drafting the paper. All authors contributed substantially to writing the paper and all reviewed and approved the final draft.

Funding This study was funded by National Institute for Health Research Knowledge Mobilisation Research Fellowship, Avon Primary Care Research Collaborative, University College London Hospitals NHS Foundation Trust, Waltham Forest and East London integrated care programme. NJF, MU and CV-P were in part supported by the National Institute for Health Research (NIHR) Collaboration for Leadership in Applied Health Research and Care (CLAHRC) North Thames at Bart's Health NHS Trust. The views expressed are those of the authors and not necessarily those of the National Health Service, the NIHR or the Department of Health.

Competing interests CV-P worked as an embedded researcher in the UCLH ERT. NJF oversaw the work of the UCLH ERT. MM supervises and mentors a team of researchers-in-residence and lectures on the model nationally and internationally. HC was an embedded researcher at BCCG. HB works as an embedded researcher at BCCG. MU started a modellers-in-residence programme at Great Ormond Street Hospital, contributed to the work of the UCLH ERT and currently works as a researcher-in-residence at Care City London. LE and LW have no competing interests. NP has collaborated with an embedded research team.

Patient consent Not required.

Provenance and peer review Not commissioned; externally peer reviewed.

Data sharing statement Not applicable.

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