Supplementary Table 1. Summary of challenges and strategies used by each team

Embedded research case studies	**Challenge**	**Description of how challenge presented itself**	**Strategies developed by the researcher/team**
Building relationships			
WEL Evaluation	Difficulties accessing people and areas	RiR initiative owned by small number of senior executives in programme; many senior leaders initially unaware that the evaluation had been commissioned.	Engagement of programme manager by project lead several months prior to appointment of RiR.
		RiR initially unsure which of many possible individuals and meetings to prioritise in terms of their attendance.	Negotiate key contact points within the programme (e.g. meetings, individuals, etc.) to familiarise stakeholders with the RiR's presence and role.
		Gaining physical access to nine different organisations regularly proved fatiguing, time consuming and practically difficult, e.g. gaining access cards, etc.	As above, plus use of phone calls and emails to maintain contact.
	Difficulties securing engagement from staff	Staff were very busy doing their 'day jobs' and did not see engagement with the RiR as a priority.	Continual use of physical and electronic forms of communication to maintain visibility through the evaluation.
		Staff said they had experience of previous researchers 'doing their own thing and then leaving' and were	Collaborative development of evaluation protocol between RiR, project lead and programme stakeholders during scoping phase, plus ongoing

		sceptical that researchers were committed and could be useful.	building and maintenance of relationships with key stakeholders and maintenance of visibility levels throughout the evaluation.
	Difficulties carrying out familiarisation before study design	The RiR had a background in local government work and little knowledge or experience of working in the health service and so felt unprepared to work with health partners.	Initial 3 month scoping phase during which RiR immersed self in programme to become familiar with context and organisational partners, working with gatekeepers and key informants to facilitate introductions and access to both formal (meetings, events, etc.) and informal (office spaces, canteens, corridor conversations, etc.) settings.
UCLH ERT	Difficulties accessing staff members across the six hospitals that formed part of the Trust. The team was not able to work evenly across the organisation.	In some of the projects, team members experienced difficulties recruiting staff members to take part in the study.	Key 'sponsor' roles (one of the overall team, and two sponsors per research project) were established within the organisation so the team could be introduced to relevant members of staff. Team members also escalated access issues to the sponsors. The team attempted to maintain regular presence in both formal (steering and working group meetings, governance meetings, etc.) and informal (day-to-day meetings, desk space and random encounters in the corridors, toilets and kitchen, etc.) settings. Due to the size of the organisation and pressures on time, the researchers selected key meetings or events (i.e. when a group of staff relevant to the study would be present) to attend, thus ensuring they would gain visibility and be able to interact with specific

			members of staff.
	Difficulties securing engagement from some staff; some Divisions within the Trust were more engaged than others.	Not all staff members saw the potential value of an embedded research team or using research in their daily work. Some staff members were too busy to engage with the team. Lack of engagement was evident when staff failed to propose research topics or did not attend steering group meetings.	Team members shared the value of using research to make changes in clinical practice to staff on a continuous basis. They also responded to requests to share knowledge of available scientific evidence on topic that were not always related to the immediate research or aid in the design of patient experience questionnaires, etc. The team members' contribution to topics or projects that were not part of their daily work as RiRs, but were nonetheless important to UCLH staff, was an effective way to secure engagement.
	Importance of carrying out familiarisation of relevant service context priot to study design	In order to develop an embedded research model and research projects that responded to the needs of the organisation, team members had to familiarise themselves with the organisational structure, roles of staff members, and main problems experienced by the Trust within a short timeframe.	Initial "introductory period" during which RiRs met staff members using a snowball technique based on referrals, spent time in key areas of the organisation and familiarised themselves with the main initiatives taking place across the NHS Trust.
Bristol KM	Difficulties accessing people	RiRs had limited understanding of the healthcare policy-making landscape and did not know whose support was essential or how to obtain it (i.e., who to contact and how to persuade those with	Accessing people was less problematic for the Bristol KM team, as RiRs drew on the knowledge, contacts, expertise and credibility of the healthcare policy-makers who were part of the KM team to negotiate access on behalf of the

		data governance responsibilities to supply hospital data).	RiRs. RiRs became connected to the policy-making 'transformation team' and had desks located in key areas where informal exchanges of information took place (near to kitchen and directors' offices) enabling understanding of relationships and maximising opportunities for informal interactions.
	Difficulties securing engagement from staff	RiRs needed ongoing senior policy-making support to get organisational approval to set up and continue with evaluations. Evaluations required the input of many other healthcare organisations (i.e., healthcare providers and business analytics organisations that managed healthcare data). Staff said they did not trust researchers' commitment as they perceived most researchers to be motivated by personal gain and career advancement.	Securing engagement from staff was less problematic for the Bristol KM team, as they relied on the policy-making KM team members. Wider policy-making professionals acted as allies, champions and 'chaperones' in supplying contacts and 'insider' knowledge and using their own credibility to guarantee that of the RiRs. Trust building took time. Ongoing concrete demonstrations of commitment and usefulness helped.
	Understanding and working in the organisational context	The complexity, speed, reactivity, unrelenting urgency and changeability of the healthcare policy-making agenda was unfamiliar to RiRs, as was the noise and busyness of working in open plan	RiRs were formally inducted. With time and repeated appearances in the policy-making organisation, RiRs became used to how policy-makers worked and policy-makers became used to seeing RiRs on the premises.

		offices with dozens of others. The RiRs experienced 'culture shock' over the first few months.	
Defining and adapting the scope of the projects			
WEL evaluation	Making sure the topic and focus of research were relevant and useful for the organisation	The commissioners of the RiR initiative knew that they wanted a participatory evaluation but recognised that the scope of the work was large and were initially unclear what areas they wanted the RiR to focus on.	Stakeholder high-level expectations defined prior to the RiR joining programme by project lead in collaboration with stakeholder organisation representatives. Make use of Evaluation Steering Group to formalise negotiations with all stakeholder partners.
	Adapting the research to changing needs and priorities	A key theme emerged at an early stage of the work, around the disconnect between the integrated care strategy and its delivery on the ground. NHS project leads accepted this main focus, but wanted the RiR to explore other areas as they emerged and these could be a distraction for the researcher. The researcher wanted the service leads to be aware of the implications of taking on new areas of work.	Ensure regular periods of reflection, discussion and action planning using a mixture of formal (i.e, presentations and discussions at meetings) and informal (i.e, one to one conversations, emails, telephone calls) methods to enable collaborative interpretation of emerging findings with stakeholders and to consider how the evaluation should progress Re-visit the evaluation focus regularly throughout the evaluation to ensure continued support and buy in of stakeholders.
UCLH ERT	Making sure the topic and focus of research are relevant and useful for the	Team members worked with staff to make sure research topics reflected the priorities of the organisation, were relevant for staff working on-the-ground	Research topics emerged from the collaboration of the ERT with local staff members. Criteria for the selection of topics was agreed at an early stage by the Steering Group. Local teams of staff

	organisation	(to avoid only top-down topics), and were suitable for academic research.	members identified a lead for the project to present the topic at a Steering Group meeting using a 'dragon's den' approach. These topics were discussed by the Steering Group and a selection of these were selected for a short scoping exercise to make sure the topic was feasible.
	Adapting the research to changing needs and priorities	On one occasion, the team was not able to carry out the evaluation of a service because not enough patients were referred to the new service. The team changed the project from a mixed-methods evaluation of the service to a rapid appraisal of the factors acting as referral barriers.	Findings were shared on an ongoing basis to inform changes in the interventions/areas under study and adjust the research, if required and suitable. On one occasion, changes to a study were proposed by the organization which were perceived by the team as potentially jeopardising the independence and rigour of the study. In this instance, the senior academics in the team discussed these issues with the staff and reaffirmed the independence of the research ('holding the line').
Bristol KM	Making sure the topic and focus of research are relevant and useful for the organisation	RiRs were attached to policy-making sub-committees and regularly attended meetings. Through observing and contributing in these meetings, RiRs aimed to find potential topics for evaluations that would be of interest to both policy-makers and academics to foster collaborations. However, the number of potential topics for	Potential research areas were identified by sifting through information gathered at meeting observations and in discussions with relevant clinical leads, other Bristol KM team members and academic colleagues to find common ground.

		involvement was sometimes overwhelming in the packed agendas of sub-committee meetings.	
	Adapting the research to changing needs and priorities	The policy-makers' 'wish list' of what they wanted to evaluate constantly grew e.g. with the telehealth evaluation in addition to the existing research evidence on effectiveness, they wanted to know if their own service was effective in reducing hospital admissions, its impact on quality of life, prescribing, service users' self-management and staff satisfaction and recommendations for future roll out of technology.	The RiRs negotiated with policy-makers to attempt to keep the evaluations doable and within scope. This strategy was not very effective, as RiRs also wanted to be flexible and accommodating to keep policy-makers engaged.
Maintaining academic professional identity			
WEL evaluation	Supporting researchers to develop the required outputs for academic progression	The RiR spent a large amount of time in the field building and maintaining relationships and found it difficult to create time and space to work on papers for peer reviewed publication. The	The project lead, RiR and programme manager jointly convened a group of mentors to support the researcher in their role. The group included an academic mentor in the researcher's own methodological field; an academic mentor with

		academic base for the researcher was geographically distant from the field work.	expertise in the evaluation of integrated care programmes; and a practitioner mentor with expertise and experience in health services management.
	Maintaining academic professional identity	The RiR was well respected by the managers and clinicians that they worked with and was quickly seen as ‘one of the team’ and ‘a spare pair of hands’. This, and the geographical separation from academic colleagues, led to a feeling of academic isolation.	The RiR met fortnightly on a one to one basis with the WEL programme manager and weekly with the academic project lead. The RiR joined an existing group of embedded researchers working across London. The group met regularly to discuss their work, consider challenges, and develop strategies for overcoming those challenges. The RiR also joined a qualitative research group within UCL and ensured regular attendance at seminars, workshops and national and international conferences throughout the duration of the post. Involvement in teaching within the RiR’s own department at UCL.
UCLH ERT	Supporting researchers to develop the required outputs for academic progression	During the first year of the team, it became evident that remaining with a structure where researchers were 100% of their time on the ERT could pose risks to their career development (i.e., they might not be able to develop the	Each team member combined their RiR role with a more ‘traditional’ researcher role by working on more ‘mainstream’ research projects.

		publications in high impact journals or submission of grant applications required for academic progression).	
Bristol KM	Supporting researchers to develop the required outputs for academic progression	No time was available for significant periods of analysis or writing.	Shared team authorship on papers developed by the academic lead was offered to help compensate for the lack of individual time for RiR to develop their own papers. In addition to the KM team lead, an academic who met with the RiRs regularly both individually and at KM team meetings, the RiRs had academic line managers who were responsible for supporting career progression.
	Maintaining academic professional identity	The RiR role was not very well understood by academic colleagues and mainly perceived by some as a supportive and linking role.	Income and new posts generated by co-produced grants and authorship on joint papers helped to raise the academic profile of the RiR role. RiRs also had part-time contracts and spent 2-3 days a week in their academic base, so their link with academia was maintained.

RiR: researcher-in-residence